Watermain Replacement on Martin Grove Road, Toronto, Ontario, Canada Municipal Class Environmental Assessment to Cross Mimico Creek

Project File Report

Final

August 17, 2022

Prepared for: City of Toronto

R.V. Anderson Associates Limited
2001 Sheppard Avenue East Suite 300
Toronto Ontario M2J 4Z8 Canada
Tel 416 497 8600 Fax 855 833 4022
www.rvanderson.com

August 17, 2022 RVA 194398

Metro Hall
55 John St
20th Floor
Toronto, ON M5V 3C6

Attention: Amir Gafoor, P. Eng.

Dear Sir:

Re: Watermain Replacement on Martin Grove Road, Toronto, Ontario, Canada
Municipal Class Environmental Assessment to Cross Mimico Creek

Please find enclosed our final report that summarizes the evaluation of the alternative solutions for the proposed watermain replacement and a screening of the environmental impacts. This report includes the input we have received to-date.

We appreciate the opportunity to conduct the Class Environmental Assessment for the City of Toronto.

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED

Ken Wallace, P.Eng.
Senior Associate

Encls.

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Watermain Replacement on Martin Grove Road, Toronto, Ontario, Canada

Municipal Class Environmental Assessment to Cross Mimico Creek

Project File Report

Final

City of Toronto

In Association With:

Englobe
Soils Materials Environment

LGL LIMITED
environmental research associates

ARCHEOWORKS INC.

RVA 194398

August 17, 2022

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1.0 Introduction

The City of Toronto retained R.V. Anderson Associates Limited to complete a Municipal Class Environmental Assessment to determine the preferred solution to replace / rehabilitate aged watermains crossing Mimico Creek as part of the watermain replacement program along Martin Grove Road between south of Savalon Court and Lorraine Gardens.

The following report outlines the Environmental Assessment process followed and includes background information in the Appendices. The Appendices include reports that were undertaken to support the process such as determining site characteristics that assisted in determining the best solution for the project, and selection of appropriate mitigation.

1.1 Class Environmental Assessment Process

The portion of the watermain replacement outside the City right-of-way within the vicinity of Mimico Creek is subject to a Class Environmental Assessment process for Schedule 'B' projects.

In order to select the replacement watermain route (preferred solution), the Municipal Engineers Association Class Environmental Assessment process was followed. This process is applicable to a range of projects that have similar issues and outcomes. The Municipal Engineers Association Class Environmental Assessment process identifies a watermain replacement as a Schedule 'A' (approved) activity. However, the proposed watermain replacement options located outside the City right-of-way are considered as a Schedule 'B'. It should be noted that the watermain replacement within the City right-of-way is not subject to this Environmental Assessment in accordance with the Municipal Engineers Association Class Environmental Assessment process.

The Class Environmental Assessment process for Schedule 'B' projects is as follows:

Phase 1: Identify the problem or deficiency.

Phase 2: Identify alternative solutions to the problem by taking into account the existing environment and establishing the preferred solution taking into account public and agency review input. Document process in a Project File Report.

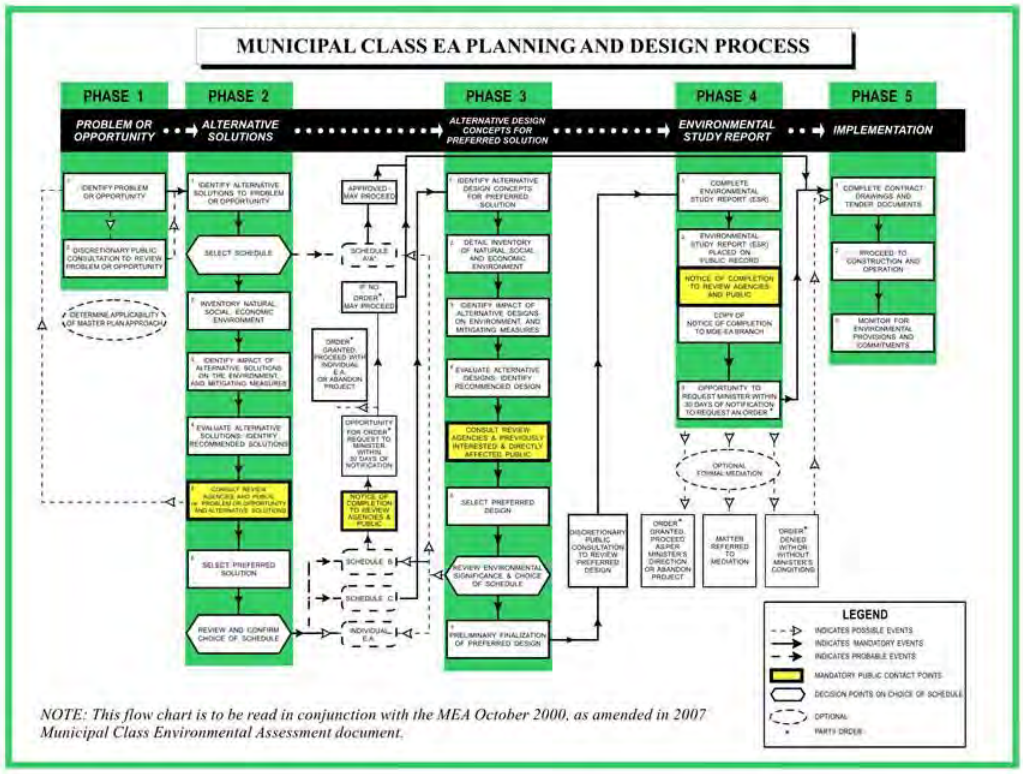
Notice of Completion: Upon completion of the Project File Report, a Notice of Completion is advertised and issued to the public and agencies expressing interest in the project, for a 30-day review period.

Implementation: Provided no Part Two Order requests are made to the Minister of the Environment within the 30-day review period, the project is approved and may proceed to detailed design, construction, operation and monitoring, if specified, for adherence to environmental provisions and commitments.

1.2 Part Two Order

A Part Two Order allows members of the public, interest groups and review agencies to request the Minister of the Environment, Conservation and Parks (the "Minister") to require a proponent to comply with Part Two of the Environmental Assessment Act, which addresses individual Environmental Assessments, before proceeding with a proposed undertaking. This is allowed under subsection 16 of the amended Environmental Assessment Act, and provides the opportunity for the Minister to review the project. The Minister has the final decision to determine if this project is necessary.

Prior to making the Part Two Order, the concern raised by a member of the public needs to be appropriately addressed through the Class Environmental Assessment process. Adequate attempts to resolve the issue should be made, and only then can the Minister be contacted, in writing.



1.3 Study Area

As shown in Figure 1.1, the Study Area is generally along both sides of Martin Grove Road between Savalon Court to the north and Rathburn Road to the south. The Study Area was selected to include sufficient surrounding area that may provide reasonable solutions (routes) for the replacement / rehabilitation of the watermain.

Current land uses in the Study Area is residential and open space / park area. Portions of the existing watermains to be replaced are located within Ravenscrest Park. This park is owned by the Toronto and Region Conservation Authority.

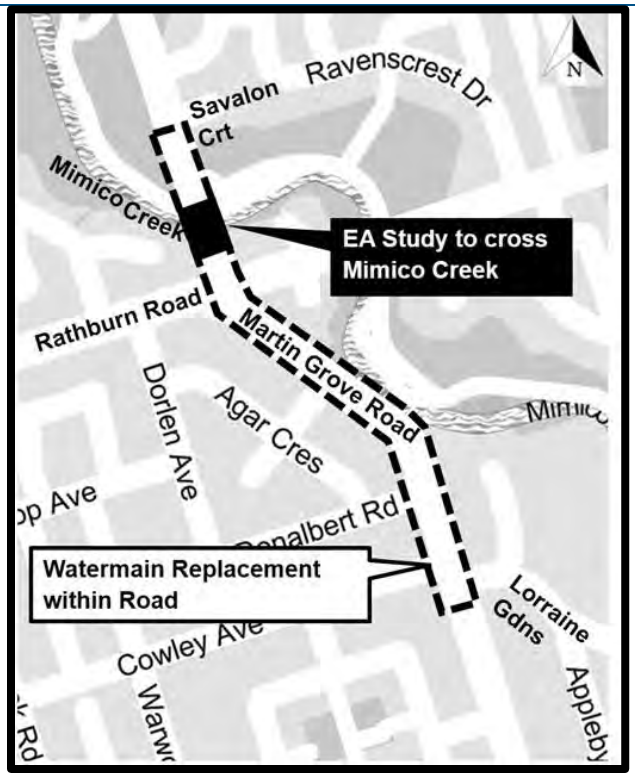


Figure 1.1: Study Area

2.0 Need and Justification

Toronto Water (operator of the water distribution system) has identified the need to replace the existing 300 mm and 400 mm diameter watermains located within Martin Grove Road under the 2021 Capital Works Program as indicated in Figure 2.1. The material of these watermains are cast / ductile iron and were installed between 1930 and 1950.

The watermain north of Savalon Court was recently replaced in 2019. The watermain south of Savalon Court at Rathburn Road has experienced over ten breaks since 2010. The existing watermains are at the end of their service life and require to be brought to a state of good repair.

The watermain crossing Mimico Creek is of a similar age and is one of the last segments remaining that needs to be replaced / rehabilitated. A watermain break under the creek will be very difficult to repair. To address this issue, the watermain has been scheduled for replacement / rehabilitation. The portion of the watermain crossing Mimico Creek is not a candidate for cement mortar lining because of the number of bends originally used in the crossing of Mimico Creek.

The subject watermain crossing Mimico Creek is integral to the water distribution system in the neighbourhood as it not only provides drinking water, but also redundancy for fire fighting purposes.

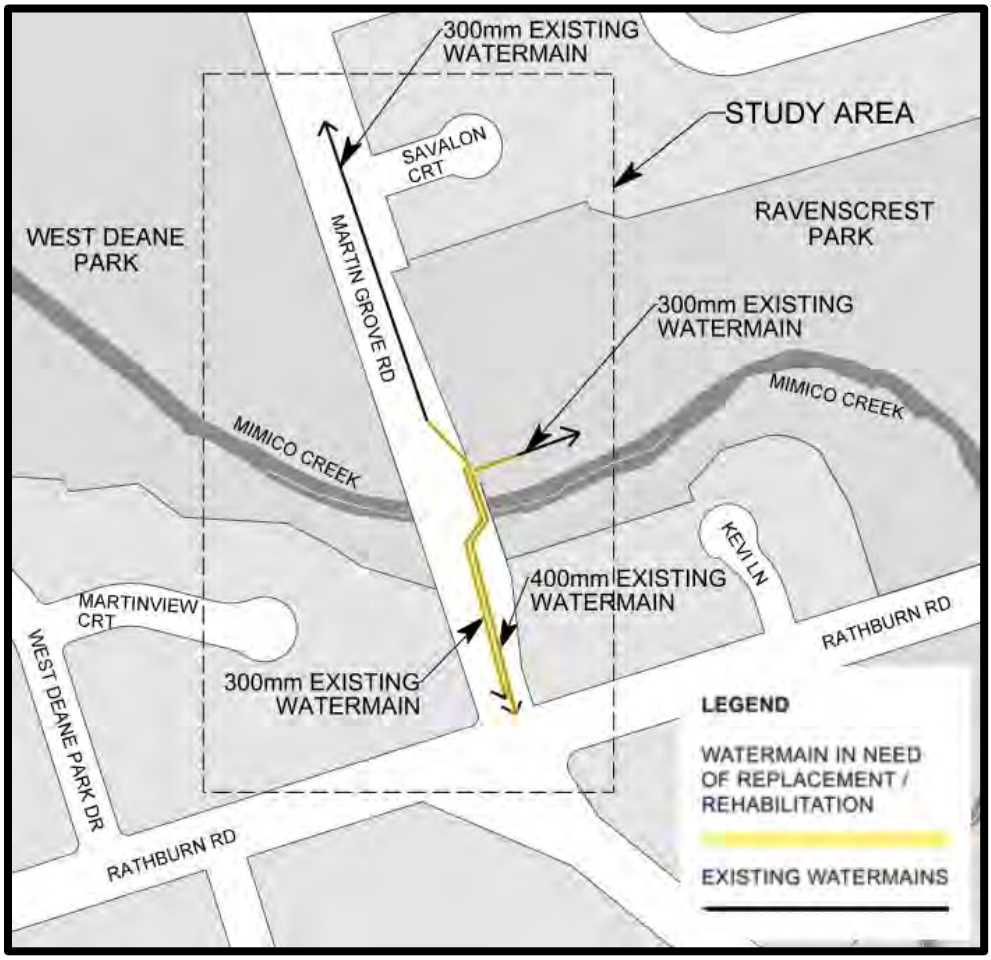


Figure 2.1: Watermain in Need of Replacement / Rehabilitation

3.0 Pre-Screening of Solutions

Pre-screening of solutions have been developed and include:

- Abandon the watermain below the creek and upgrade watermain system elsewhere.
  - This option reduces the redundancy in the watermain network and creates a dead-end, which would create water quality concerns, additional maintenance and does not comply with Toronto Water policies.
- Abandon the watermain below the creek and attach the new watermain to the side of the existing bridge crossing above the creek.

  - This option would require the watermain to be insulated and heat-traced to prevent from freezing which will add maintenance. This is not preferred by Toronto Water from an operational perspective. The structural integrity of the bridge would also need to be reviewed. Therefore, this option is screened out.
- Replace the watermain in the existing alignment.
  - This option would require open trench to replace the watermain pipe in the same alignment which is not preferred due to the significant environmental disturbance this would cause. Therefore, this option is screened out.

These options were not carried forward.

4.0 Pre-Screening of Construction Methods

A variety of construction methods can be used for watermain construction. The project team reviewed the following methods and selected one that best works for the area.

Screened out:

Open Trench: Excavation would require a temporary coffer dam to pump out water in the creek in order to work in dry conditions. This would create significant environmental disturbance within Mimico Creek and Ravenscrest Park.

Micro-tunnel and auger boring: Tunneling / boring requires deep shafts on either side of the Mimico Creek. Depths of tunnel and shafts would need to be installed in bedrock shale and below the water table and require pumping of water in order to work in the dry. This would create an environmental disturbance within the banks of Mimico Creek and Ravenscrest Park

Cement mortar / structural re-lining: Trenchless relining of the existing watermain from within the pipe using cement mortar or plastic structural liner / hose is not an option due to bends in the existing watermain crossing Mimico Creek.

Carried forward:

Horizontal Directional Drilling: Standard directional drilling practice is anticipated and involves a drill machine set-up a distance back from the Mimico Creek and drilling 'horizontally' into the ground surface to get below the bottom of the creek to beyond the other side of the creek.

5.0 Alternative Solutions

Alternative solutions to replace the watermain along a new alignment to cross Mimico Creek using Horizontal Directional Drilling have been developed and include:

- Do nothing.
- Install watermain along a new alignment below the bridge structure and inside Martin Grove road right-of-way.
- Install watermain along a new alignment west of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within an existing utility easement.
- Install watermain along a new alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way.

The following sections describe in more detail the alternative solutions:

Alternative #1: Do nothing. This alternative does not resolve the maintenance and operations issues of breaks and may continue to experience watermain breaks and service disruptions in the future. Therefore, this option is screened out.

Alternative #2: Watermain aligned below bridge and inside road right-of-way (Figure 5.1).

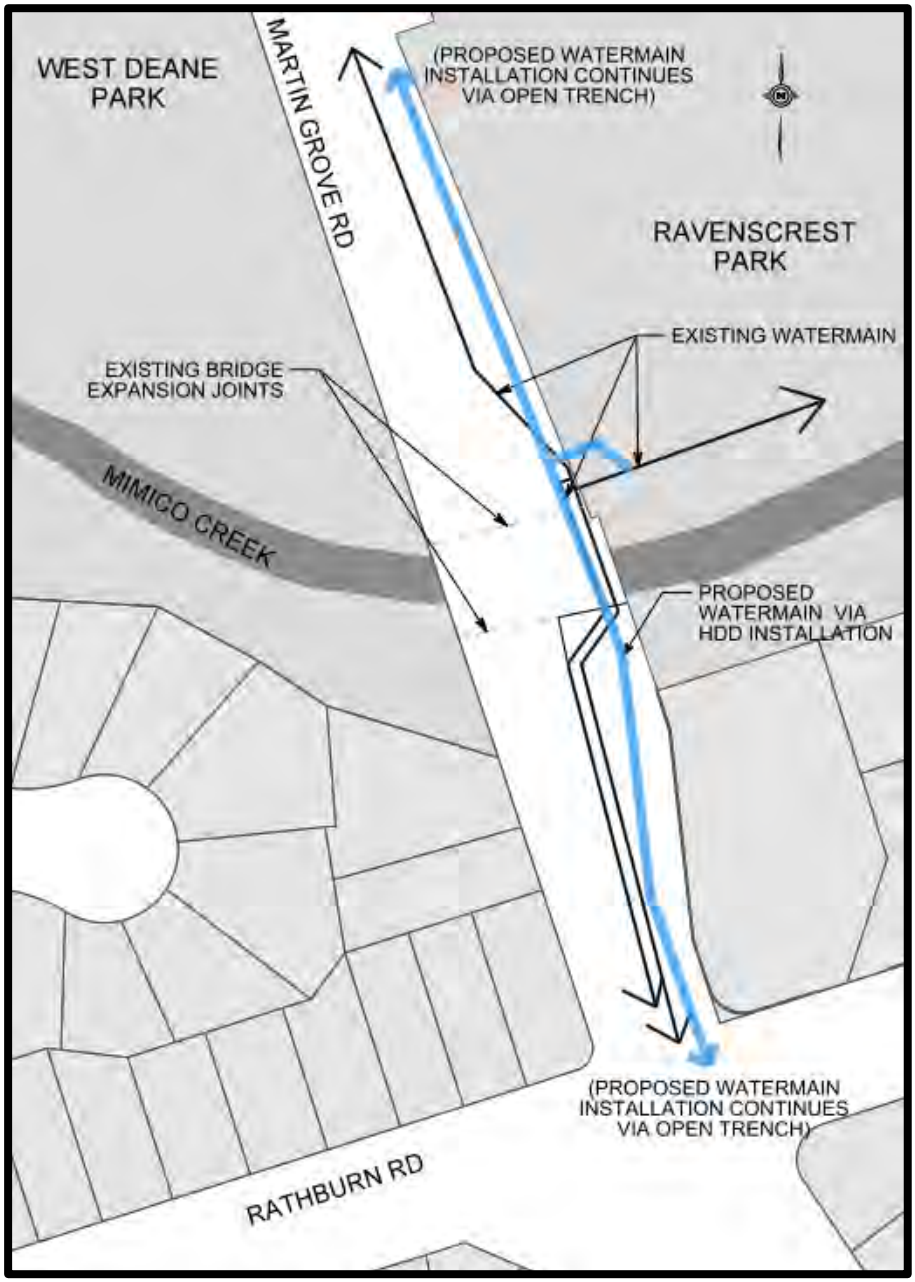


Figure 5.1 – Alternative #2: Watermain aligned below bridge and inside road right-of-way

Installing the new watermain by Horizontal Directional Drilling below the bridge structure and under the existing piles will require complex construction method to extend the drill into shale bedrock. Significant risk of drill failure (passing through

different soil types, stuck within bedrock, conflict with piles) may require excavations to retrieve equipment or the equipment to be abandoned completely.

To ensure the bridge structure is protected from watermain breaks in the future, the watermain must be installed inside a larger sized casing so that if a break did occur, it would not impact the bridge structure. A larger casing requires a larger horizontal directional drill machine to penetrate the shale bedrock and reach the deeper depths below the piles. The deeper depths will require a larger construction staging area and the length of the watermain will need to be increased to avoid severe curves in the watermain pipe.

Up to 10 trees may need to be removed for the construction staging area. The trail entrance off Martin Grove Road may need to be detoured for construction access and staging area.

This alternative solution has an overall high level of complexity and medium risk of failure.

Alternative #3: Watermain aligned west of Martin Grove Road / Bridge (Figure 5.2).

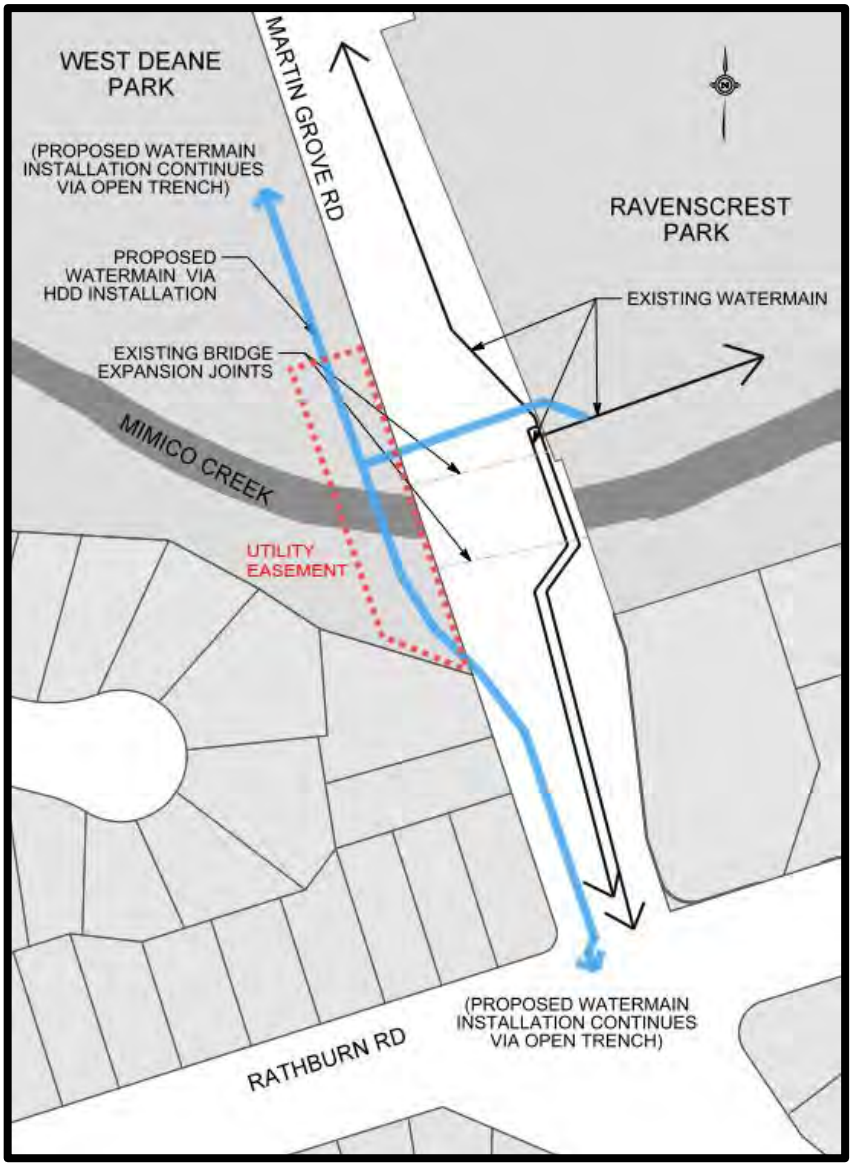


Figure 5.2 – Alternative #3: Watermain aligned west of Martin Grove Road / Bridge

Installing the new watermain by Horizontal Directional Drilling along an alignment west of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within an existing utility easement, will be challenging to avoid conflicts with existing the existing underground utilities within the easement. The existing

utilities within the easement consist of a 300 mm natural gasmain (Enbridge) and a 1200 mm diameter trunk watermain (City of Toronto).

Sharp curves in the Horizontal Directional Drilling alignment would exceed the drill manufacturer's recommended use which would lead to an unacceptable high constructability risk.

Up to 20 trees may need to be removed for the construction staging area. However, impacts to the park is not anticipated.

This alternative solution has an overall high level of complexity and an unacceptable risk of failure.

Alternative #4: Watermain aligned east side of Martin Grove Road / Bridge (Figure 5.3).

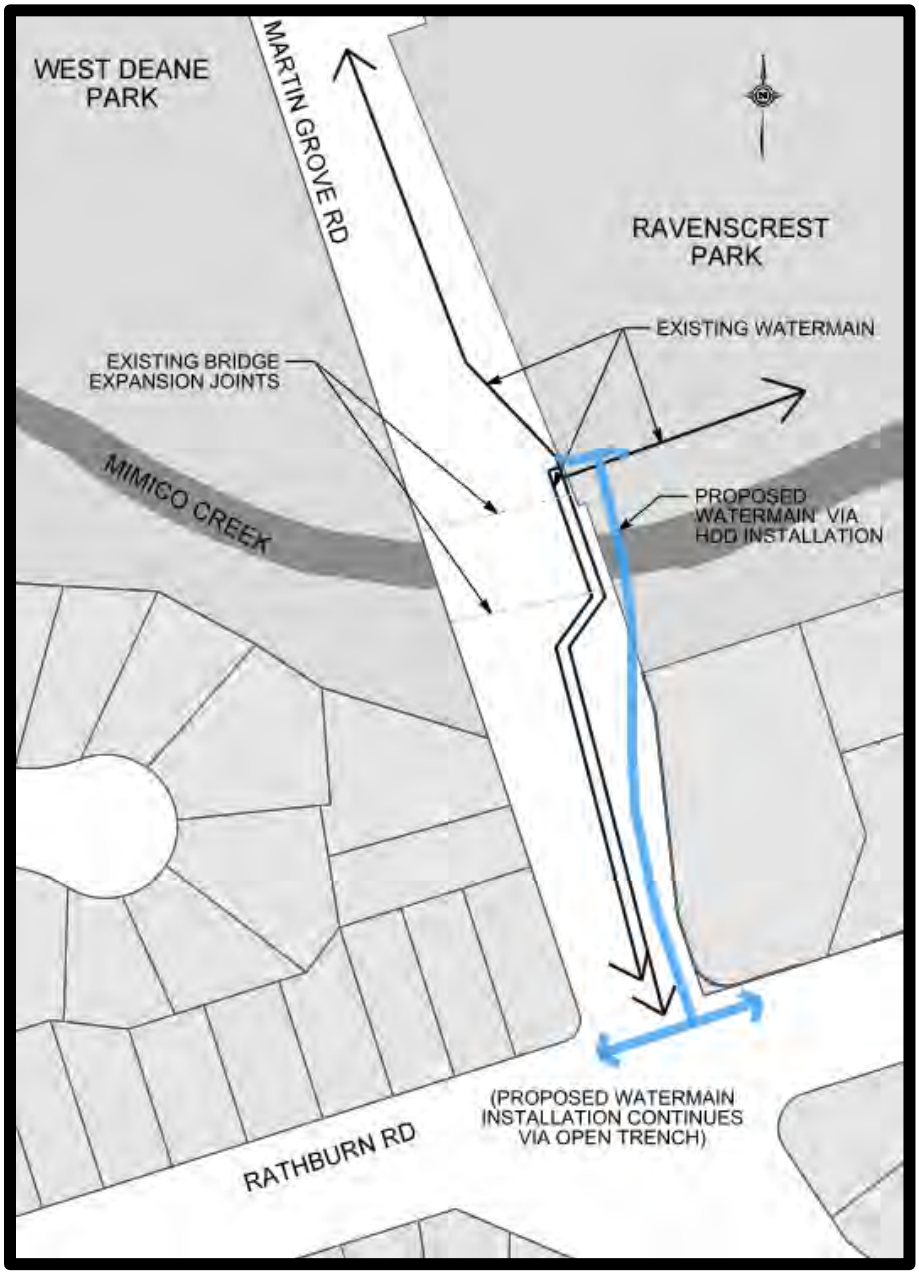


Figure 5.3 – Alternative #4: Watermain aligned east side of Martin Grove Road / Bridge

Installing the new watermain by Horizontal Directional Drilling along an alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within Ravenscrest Park, has acceptable construction impacts. The curves in the Horizontal Direction Drill are within the drill manufacturer's

recommended use. Furthermore, there will be no conflicts with the bridge structure or shale bedrock.

Up to 5 trees may need to be removed for the construction staging area. The trail entrance off Martin Grove Road will need to be detoured for construction access and staging area.

This alternative solution has an acceptable level of complexity and risk.

6.0 Evaluation Criteria

The evaluation criteria were developed with consideration to the features present within the Study Area.

The following three criteria will be used to evaluate each alternative solution:

1. **Constructability and Impacts**

   - Potential impacts with other underground utilities and bridge structure
   - Technical challenges due to ground conditions
   - Technology limitations of construction equipment

2. **Natural and Environmental**

   - Tree injuries and removals

3. **Socio-Cultural**

   - Impacts to park use and access, park features and amenities

7.0 Evaluation of Alternative Solutions

For each alternative, the potential impacts and associate ratings are described in Table 7.1. The Natural Science Report, Stage 1 Archaeological Assessment, Stage 1-2 Archaeological Assessment and Geotechnical Report are found in Appendices 1 to 4 respectively.

Table 7.1 – Evaluation of Alternative Solutions

Alternative Alignments	Natural and Environmental	Socio-Cultural	Technical (Constructability, Alignment and Impacts)	Economic	Summary
#2 Below Bridge & Inside ROW	Moderate impact	Moderate impact	Highest Risk	Highest Cost	Significant potential of equipment failure resulting in additional costs
#3 West of Martin Grove Road Bridge	Greatest impact	Least impact	High Risk	High Cost	Affects the most trees and includes high risk of equipment failure resulting in additional costs
#4 East of Martin Grove Road Bridge	Least impact	Moderate impact	Low Risk	Lowest Cost	Moderate tree and park access impacts. Construction method is capable of constructing this alignment

8.0 Recommended Alternative Solution

The preferred solution for the watermain is Alternative #4 – installing the new watermain by Horizontal Directional Drilling along an alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within Ravenscrest Park, for the following reasons:

- Least impact to trees.
- Interruption to pedestrian and park user access will be minimized.
- The cost of replacement of the watermain will be minimized.
- The project will meet the schedule of the City's 2023 Capital Works Program.
- Environmental impacts are manageable and may be addressed by incorporating mitigation measures that are typically used on projects of this nature, including: erosion and sedimentation controls, tree protection, controlled equipment fuelling and maintenance, and vegetation restoration plan.
- Construction impacts on the community can be accommodated using best management construction practices, including: traffic coordination (local and emergency access), dust suppression, proper mufflers on equipment, appropriate working hours.

9.0 Mitigation

Mitigation requirements are indicated in accordance with the following categories:

- Vehicular and Pedestrian Traffic
- Social
- Environmental
- Archaeological
- Cultural Heritage
- Source Water Protection

9.1 Vehicular and Pedestrian Traffic

No significant vehicular traffic impacts (i.e. long-term road closures) are anticipated for the recommended alternative solution since there will not be any construction within City roads except where connections to the existing watermains are made at Martin Grove Road. Connections of this nature typically require temporary lane closures for one to two days at each location.

No significant pedestrian impacts are anticipated for the recommended alternative solution. Where necessary, the pedestrian pathways would be temporarily diverted around the construction areas. Excavations and machinery / equipment areas will be secured at all times with temporary chain link fencing to preclude inadvertent pedestrian access.

9.2 Social

Social impacts include the effects of dust, noise, vibration, etc., caused during construction.

It is recommended that standard construction mitigation regarding noise, dust, vibration be incorporated. Construction working hours should be restricted (7 a.m. to 7 p.m. Monday to Friday and 9 a.m. to 7 p.m. on Saturdays). Utility / municipal services shut-offs (i.e. when connections are made to existing watermains) will be scheduled with the affected residents to minimize impact. These requirements will be incorporated into the construction contract.

9.3 Environmental

A Natural Sciences Report was conducted by LGL Limited, to determine the natural features impacted by the project (see Appendix 1). Construction could affect the natural environment such as vegetation, wildlife, aquatic habitat and communities. This study identifies what can be done to mitigate harm to the natural features.

Background

Documentation of existing conditions included a desktop assessment of orthoimagery and a review of background data from secondary sources to establish natural heritage conditions within the area. The review of existing background documentation and data layers, including the following resources:

- Site orthophotography;
- GIS data layers obtained from the Ministry of Natural Resources and Forestry (MNRF), Lands Information Ontario (LIO), City of Toronto (City) and the Toronto and Region Conservation Authority (TRCA);
- The Natural Heritage Information Centre (NHIC) database;
- City of Toronto Official Plan;
- Background watershed and subwatershed studies;
- Mapping of physiography and soils; and,

- Online wildlife databases (e-bird, Ontario Breeding Bird Atlas).

Secondary source information was compiled and analyzed in order to develop a general description of the terrestrial and aquatic ecosystems, vegetation and wildlife within the project area and to inform the Species at Risk Screening. In addition, MNRF and TRCA were consulted to confirm information collected and/or to provide additional information regarding the natural heritage system and potential species at risk in the project area.

City of Toronto Natural Heritage System (NHS) and Environmentally Significant Areas (ESA's)

The Natural Heritage System (NHS) is described within the City of Toronto Official Plan (OP) as parks and open spaces and natural areas/features. These consist of areas that are designated for protection, restoration and enhancement of natural features and function within the City. Within the City's natural heritage system there may be natural areas which are particularly significant or sensitive, and have been identified to warrant additional protection to preserve their environmental qualities. These areas are referred to as Environmentally Significant Areas (ESA's) in the City's Official Plan.

Areas associated with the Mimico Creek corridor are part of the City's Natural Heritage System in the study area. However, the study area does not include any ESAs.

Areas of Natural and Scientific Interest (ANSI)

Areas of Natural and Scientific Interest (ANSI) are determined by the MNRF. The agency defines ANSIs as "lands and waters with features that are important for natural heritage protection, appreciation, scientific study or education". Records contained within the MNRF's LIO database did not indicate the presence of any Life Science or Earth Science ANSIs within the study area.

Provincially Significant Wetlands (PSWs)

No PSWs are present within the study area. Unevaluated wetlands are associated with Mimico Creek downstream of Rathburn Road. No impacts are anticipated to these wetlands given the proximity to the proposed watermain works.

Woodlands and Valleylands

Woodlands and valleylands are considered within the City's Official Plan and governed largely by the Ravine and Natural Feature Protection (RNFP) By-Law. A RNFP area is defined to include features described as discernable land forms with a minimum of 2m change in grade between the highest and lowest points that may contain vegetation cover and either once had, or currently have, water flowing through, adjacent to, or standing on them for some period of the year (City of Toronto By-law 513-2008). The City of Toronto's Ravine and Natural Features By-law encompasses not only ravines within the City but other tableland natural features as well.

The extent of the RNFP within the project area is fairly similar to the delineation of City Natural Heritage System designated in the City's Official Plan.

Toronto and Region Conservation Authority

The Toronto and Region Conservation Authority (TRCA) administers the Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. This regulation establishes areas where development is subject to approvals by TRCA, to ensure the protection of public safety, property and watershed health. The extent of the project area is wholly under TRCA regulation.

Data was gathered from the TRCA for the study area and summarized in Appendix A of the Natural Sciences Report. A single species at risk (Butternut) is reported in the TRCA background data which will be discussed further in the following sections.

Existing Conditions

Vegetation and Vegetation Communities

Vegetation communities surrounding the bridge and along Martin Grove Road were cleared of their natural forest cover in the past. Vegetation communities have naturalized following disturbance and are dominated by non-native trees species. Vegetation communities include deciduous forest and cultural woodland.

Flora:

Twenty-nine of the sixty-one vascular plants observed are considered introduced and non-native to Ontario. These are found throughout the study area as all communities have various degrees of disturbance and are the result of disturbance. Six species of TRCA conservation concern were observed within the study area: white oak, butternut, woolly sweet cicely, creeping partridgeberry, eastern white cedar and red oak.

Vegetation Species at Risk:

Butternut a species regulated by the Endangered Species Act, 2007 was observed in a few locations throughout the study area. A health assessment was conducted by LGL's Certified Butternut Health Assessor on these trees. Of the five trees all but one are considered healthy and retainable. Two of the trees are planted amenity tree within the front yards and not considered protected under the ESA. A Butternut Health Assessment on the two remaining trees has reveled that one of these two of the trees is a hybrid while the other is a true Butternut.

It should be noted that none of these butternut trees will be impacted by this project.

Aquatic Habitat

They study area lies within the Mimico Creek watershed. The Mimico Creek Watershed is a completely urbanized watershed within the TRCA jurisdiction. Over 60% of the channels are artificially channelized.

Mimico Creek supports warmwater habitat. A fish inventory, as identified by the Aquatic Resource Area (ARA) information within the LIO database, lists 11 possible species inhabiting the reaches of Mimico Creek (Brook Stickleback, Western Blacknose Dace, Bluntnose Minnow, Common Shiner, Creek Chub, Flathead Minnow, Goldfish, Longnose Dace, River Chub, Sand Shiner and White Sucker). The majority of these species are warmwater or coolwater baitfish species that are tolerant to moderately tolerant. The anticipated construction timing window from Mimico Creek is July 1- March 31, when work in or near a stream can be conducted with reduced risk to warmwater fish and fish habitat.

At the Martin Grove Road bridge crossing, Mimico Creek is approximately 10m wetted width. Habitat is all runs, with no riffles in this section. Both banks are armoured in sections and entirely beneath the bridge. Substrates in the creek are an equal mix of rubble and fines. Bank erosion and undercutting is present.

Depth is estimated at 1m. Flow was moderate and water was clear. No fish were observed but are considered present in this reach. Bank erosion and slumping, and failed armouring, is evident in many areas along Mimico Creek. The aquatic habitat of Mimico Creek will be avoided through the proposed trenchless crossing (horizontal directional drilling or HDD) of infrastructure, so impacts to the aquatic habitat will be avoided.

No aquatics species at risk is shown on the Fisheries and Oceans Canada Aquatics Species at Risk mapping. No other aquatic SAR were identified through background review or noted through field investigations.

Wildlife Habitat and Communities

Field investigations were conducted to document wildlife and wildlife habitat and to characterize the nature, extent and significance of wildlife usage within the study area in June, July and November of 2020.

Breeding Birds:

Many bird species are known to use the habitat along the Mimico Creek, including both natural and anthropogenic habitat. Twenty-four bird species were observed during the Breeding Bird Surveys (BBS) along with TRCA records, with varying evidence of breeding success across the study area. Of these twenty-four species, breeding evidence was confirmed for three species, probable for six species, possible for seven species and six species were observed with no indication of breeding, outside of the BBS stations or on the TRCA species list only. Confirmed breeding was confirmed for Mallard based on the observation of a female with young swimming in the Mimico Creek. Species which were most commonly encountered across the study area were generally species associated with highly disturbed habitat types.

Of particular interest, there was a nesting Barn Swallow at the Rathburn bridge over the Mimico Creek, despite ongoing repair work. An Eastern Phoebe was also nesting under the bridge of Martin Grove Road and a female Mallard was observed with young in the Mimico Creek. Common Nighthawk is a Special Concern species that nests on open clearings and rooftops. One was observed flying over the study area at the Rathburn Bridge, but the nesting location could not be identified. No buildings will be affected by project activities and areas of open gravel are not present.

Other Wildlife:

Four non-avian wildlife were observed: Grey Squirrel, Eastern Cottontail, Stripe Skunk, and American Toad. Although only four species were observed, Mimico Creek likely functions as a movement corridor for many wildlife such as Raccoon, White-tailed Deer and Coyote. There are no wetlands with potential amphibian breeding pools within the study area, so anuran call counts were not completed. Some amphibians (such as American Toad) may use overflow pools or move through the area, but it is unlikely that they breed within the Mimico Creek itself because of the presence of predatory fish.

Wildlife Habitat:

There is the potential for candidate Waterfowl Stopover and Staging Areas (Aquatic) which is the Mimico Creek itself, where waterfowl may seek refuge during migration and some parts of the winter. This is a flowing creek but very shallow, and is unlikely to provide significant aquatic habitat accessible to waterfowl in the winter. The habitat will not be directly impacted by the proposed development, so was not evaluated for significance in the appropriate season. Candidate Bat Hibernacula habitat may exist in the stormwater management tunnels which drain into the Mimico Creek. The habitat will not be directly impacted by the proposed development, so was not evaluated for significance in the appropriate season. Candidate Bat Maternity Colonies habitat may exist in the woodlands along the Mimico Creek, but no cavity trees will be removed as part of the project therefore the density of cavity trees was not calculated to determine significance.

Wildlife Species at Risk:

No species at risk wildlife were observed in the vicinity of the project works during the field investigations. SAR were only observed outside the area. The potential for SAR and SAR wildlife habitat is low to occur in the project area specific to the potential for trees in the study area to support SAR bat roosting habitat.

Species as Risk Screening

Barn Swallow

Barn Swallow occurs frequently in Southern Ontario, using anthropogenic structures such as buildings, bridges and culverts. During the breeding bird surveys it was not identified within the Mimico Creek under Martin Grove Road,

but it was identified in the bridge where Mimico Creek passes under Rathburn Road, east of the study area. This species was still nesting under the bridge despite ongoing repair work being done on the bridge. If the work is to be conducted during the breeding bird season, it is recommended that the Martin Grove bridge be inspected again for nests of this species. If the breeding bird season is avoided, we do not anticipate any direct impact to this species or its habitat.

Butternut

Butternut was confirmed in the study area, along the riparian corridor of Mimico Creek. Evidence of some Butternut records were found during background review. LGL updated information for all Butternut located on site in the study area that were observed. LGL completed a Butternut Health Assessment (BHA) which is located in Appendix 1.

The results of the BHA indicated the presence of three trees regulated under the ESA in the study area, with a habitat protection zone of 50m considered. Further steps will be determined in consultation with the MECP, if required.

Impact Assessment and Mitigation Recommendations

The most significant environmental impact of the preferred alternative solution will be due to the work being undertaken at the Mimico Creek crossing and adjacent valley lands. The Toronto and Region Conservation Authority and City of Toronto Urban Forestry Department will be involved to ensure the design meets their requirements for erosion and sediment controls, working in proximity to the watercourse, tree protection and restoration of the valley lands and surrounding area.

The proposed project undertaking involves the installation of a new watermain and completion of the associated tie ins and connections at various locations. In the north end of the study area, a proposed drill pit location is required on the east side of Martin Grove Road within the park land. The potential for tree impacts has been noted in all locations and will be addressed through the Arborist Assessment for the preferred alternative provide in Appendix 1. It should be noted that no tree removals are anticipated within the Mimico Creek crossing and adjacent valley lands.

Vegetation and Vegetation Communities

The proposed drill pit locations in the Ravenscrest Park area are within areas of open manicured lawns and manicured trees and avoids the vegetation communities that comprise the Mimico Creek corridor. Notwithstanding, amenity trees are integral to the park setting and warrant consideration for protection. Table 9.1 outlines the potential impacts, proposed mitigation, and monitoring recommendations for vegetation communities in the project area.

Table 9.1 – Impacts, Mitigation and Monitoring Recommendations for Vegetation Communities

Impacts	Mitigation	Monitoring
Potential soil contamination by oils, gasoline, grease and other materials from construction equipment, materials storage and handling.	-Ensure machinery is maintained and free of fluid leaks. -Locate site maintenance, material storage, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features and give consideration to locating these types of facilities outside of the floodplain. -Vehicle refuelling and maintenance should be done on spill collection pads. -Develop a spill response plan and train staff on associated procedures. -Maintain emergency spill kits on site. -Control soil contamination through best management practices. -Dispose of any chemical waste materials generated from construction activities through authorized and approved off-site vendors.	-Conduct daily inspections of construction equipment for leaks/spills. -Implement contingency measures in the event of a spill. <u>Contingency Measures:</u> -In the event of a spill, immediately stop all work until the spill is cleaned up; -Notify MOECC's Spills Action Centre of any leaks or spills; -Assess and remediate affected soils and water by using spill kit kept on site; and, -Monitor daily to ensure proper clean-up is completed.

Impacts	Mitigation	Monitoring
Vegetation Removal	-Minimize vegetation removal to the extent feasible. -Re-vegetate and restore disturbed areas immediately after construction to return to pre- construction condition. -Tree and vegetation removal are subject to the Ravine and Natural Feature Protection By- law and as such restoration plans should include the use of native plant species in order to improve vegetation quality of the area. Tree compensation and restoration plans are addressed in Arborist Report provided in Appendix 1.	-Provide construction monitoring on site by an independent environmental monitor to ensure that demarcation fencing is in place prior to construction and functioning effectively during.

Impacts	Mitigation	Monitoring
Tree Removal	-Select the final alignment of the watermain crossing Mimico Creek and associated valley lands to minimize impact on trees and perform select trimming in accordance with the Arborist Report. -If the detailed design reveals that minor tree loss could not be avoided, the restoration and replanting plan should include provision for planting of native trees and shrubs. -Implement the tree preservation plan. -Tree protection fencing should comply with the City of Toronto's Tree protection Policy and Specification for Construction near Trees. -Ash is a regulated species in the City of Toronto and care should be taken when removing and disposing of these trees. Consult the Canadian Food Inspection Agency and Toronto Urban Forestry for the appropriate protocol for their disposal. -Standing dead trees can be topped but left standing at approximately 6 to 10 metres height and standing dead wood is a wildlife resource. - Root compaction mitigation will be employed for some noteworthy trees (i.e. native specimens, trees supporting potential SAR bat maternal roosting habitat), that will be encroached by the construction disturbance area. This mitigation is outlined further in the Arborist Report provided in Appendix 1.	-Provide construction monitoring on site by an independent environmental monitor to ensure that tree protection fencing is in place prior to construction and functioning effectively during construction.

Impacts	Mitigation	Monitoring
Accidental damage to adjacent vegetation communities and associated wildlife habitat due to unintentional vehicle intrusions.	-Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant wildlife habitat. -Damaged tree roots should be cut clean as soon as possible and exposed roots covered in approved topsoil. This work to be carried out under supervision of a qualified tree professional (Arborist or Forester).	-Provide construction monitoring on site by an independent environmental monitor to ensure that demarcation fencing is in place and functioning effectively.

Wildlife Habitat and Communities

No sensitive wildlife functions or habitat are identified in the proposed drill pit location footprint. As a result, potential impacts are more likely to be the potential for disturbance or incidental take. Table 9.2 outlines the potential impacts, proposed mitigation, and monitoring recommendations for wildlife and habitat in the project area.

Disturbance can be minimized through minimizing the construction footprint in the park area.

Vegetation clearing, including amenity trees ensure compliance with the Migratory Birds Convention Act, whereby vegetation clearing should avoid the breeding bird window April to August. Disturbance and incidental take can be avoided through the delineation of the project area with fencing that serves to isolate construction activities from the park land.

Through the Arborist Report, if any cavity trees are noted for removal, considering for vegetation timing windows for the protection of bats should be applied – where vegetation removals are avoided May to October.

Table 9.2 – Impacts, Mitigation and Monitoring Recommendations for Wildlife Habitat and Communities

Impacts	Mitigation	Monitoring
Removal of natural or semi-natural/cultural vegetation with the potential to provide wildlife habitat.	-Vegetation removal is generally limited to areas of low sensitivity. -Minimize tree removals of 25cm (DBH) or greater trees to the extent possible, in order to protect potential bat maternity roosting trees. -Ensure rehabilitation of vegetation post activity to pre-disturbance condition or better. -Ensure that erosion control blankets used in the area for soil stabilization contain a jute backing, which degrades and less prone to trapping wildlife.	Provide construction monitoring on site by an independent environmental monitor efficacy of protection measures.
Sediment entrainment or entrainment of drilling fluids and other deleterious substances into adjacent areas functioning as habitat for local and resident wildlife.	-Limit duration of exposed soils and stabilize immediately upon completion.	Periodic inspection and maintenance of erosion and sediment control fencing structures will be included as part of the Sediment and Erosion Control Plan for this project.
Accidental damage to adjacent vegetation communities and associated wildlife habitat due to unintentional vehicle intrusions.	-Clearly delineate work area using fencing or flagging, to avoid accidental damage to adjacent vegetation and wildlife habitat.	Provide construction monitoring on site by an independent environmental monitor to ensure that demarcation is in place and functioning effectively.

Impacts	Mitigation	Monitoring
Disturbance (due to equipment operation, workers presence, drilling noise, etc.) to forest and plantation communities functioning as habitat for local and resident wildlife.	-Time project works related to vegetation clearing and in proximity to natural features outside of the breeding bird season (Apr 1 to Aug 31), and outside of sensitive timing windows for Bat Maternity Roosting (May - Oct) and during a period when wildlife is less active generally (November – March).	Ensure availability of an environmental monitor in the event of animal-construction conflicts.

Aquatic Habitat

No direct impact to aquatic habitat is anticipated as the proposed construction methodology to install the watermain across Mimico Creek is via trenchless technology (HDD) for both options. Drill pit locations/tie-in locations are proposed at 30m or more from the watercourse edge.

A contingency plan should be developed in the event that the horizontal directional drilling causes any release of substances to the creek, such as a frac out (i.e. inadvertent release of drilling fluids).

The potential for indirect impacts or the release of deleterious substances that may enter aquatic habitat can be managed through the development of an erosion and sediment control plan.

At this time, a Fisheries Act authorization or screening is not considered required given the avoidance of aquatic habitat through trenchless technologies (HDD).

General mitigation measures proposed for aquatic habitat protection include:

- Isolation of construction area;
- Timing of effective ESC measures, where ESCs shall be installed before starting work to prevent the entry of sediment into the watercourse or adjacent areas. Inspect regularly during the course of construction and conduct regular maintenance and repairs as necessary;
- Clearly identified stockpiling and staging areas;
- A plan to dispose of any water accumulated onsite from dewatering or pooled stormwater;

- Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled off-site, and outside of the wellhead protection area; and,
- Ensure that a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is always on-site for implementation in event of an accidental spill during construction. An emergency spill kit shall be kept on site. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

Potential Impacts to Trees Resources

LGL Limited has undertaken an impact assessment to determine the impacts to tree resources of the proposed watermain works. Refer to Appendix 1. This section summarizes the impact assessment and mitigation measures.

The impact assessment was completed by comparing the extent of tree dripline and tree protection zones with the proposed disturbance limits. Trees recommended for removal include trees within or outside the disturbance limits that would not be able to withstand construction related impacts. Trees identified as injured likely will require root and/or canopy pruning however, impacts will be minor or unavoidable and the trees should be retained by using proper mitigation techniques.

Potential impacts to trees resulting from construction and staging activities typically include:

- Physical injury;
- Severing of roots; and,
- Root compaction.

Physical injury to the main stem or branches of a tree will occur if construction equipment is permitted to operate close to the tree.

Root cutting is a type of injury that can significantly affect the health of a tree. Root systems are responsible for nutrient uptake, carbohydrate storage, and structural anchorage. Excavation for utility installation may tear or break tree roots if the excavation is too close to the trees. A preferred method of mitigating impacts is air-spade excavation which utilizes pressurized air to loosen soil which is then removed from the pit. This method avoids tearing, ripping, or breaking roots typical of traditional bucket excavators, and allows for clean hand-sawn root

pruning, which is less damaging, or preferably avoidance altogether. This method of excavation has been considered for water key locations where trees are in proximity.

Compaction of the soil in which tree roots grow is one of the leading causes of decline for trees. Soil compaction primarily occurs due to vehicle traffic, stock piling and equipment moving across the root zone. Soil compaction causes the reduction of pore space in the soil, which is detrimental for root growth. Without space available for oxygen and water transport, tree roots will suffocate and the decline of the tree will follow. Impacts such as these may not be immediate, and the decline could take up to 5 years to become evident. Mitigation includes applying wood chips/mulch to a depth of 100mm and overlaying steel sheeting to dissipate the weight of machinery driven overtop.

Designation of tree protection measures (TPZ) is imperative for the protection of trees (roots, trunks, branches) adjacent to construction works. The TPZ will restrict construction related machinery and activities from damaging trees identified for retention. Physical protection (plywood hoarding, portable interlinked fencing, or other as approved by the City) shall be considered for all trees in proximity to construction. Refer to the Arborist Report in Appendix 1 for the City of Toronto protection requirements for trees near construction.

The following recommendations should be considered during detail design to prevent or mitigate impacts to trees near construction:

- No trees shall be pruned or removed or impacted without prior approval from the City;
- Prior to the start of any site work, the Contractor shall supply and install tree protection barriers around each tree designated for protection;
- The protective barrier is to comply with City specifications for tree protection;
- No fill, machinery, chemicals, fuel or materials are to be placed within the protective barrier; heavy machinery is not to be operated within the TPZ (including overhead swinging of machine arms);
- No re-grading, including filling or excavation, is to take place within the TPZ unless permitted by the City (Urban Forestry);
- Upon air-spade/hand dig excavation, should tree roots be found an effort to avoid/work-around is strongly encouraged. If avoidance is not feasible, roots shall be cleanly severed with sharp hand tools by or at the supervision of a qualified arborist. Photographic documentation should be conducted during this

activity, specifically to illustrate the excavation near the tree, the physical structure of the exposed roots, and the condition of roots upon severing;
- If roots in a dense mat or 5 cm or greater are found, they are to be left in place and worked around. Additionally, smaller roots are to be retained where possible unless severance is necessary. Urban Forestry must be contacted immediately to advise on next steps if this is not feasible (as per Toronto Urban Forestry, 2020);
- Soil compaction mitigation includes application of wood chips/mulch to a depth of 100mm and overlaying steel sheeting to dissipate the weight of machinery driven overtop.
- All tree and shrub protection must be removed upon completion of construction activities;
- No signs or objects should be displayed or affixed to any retained trees;
- Signs shall be affixed to the TPZ fence to inform workers that entry is not permitted; and,
- Should any additional, incidental or accidental tree injuries occur during construction, a qualified Arborist or City Forester should be consulted to determine additional mitigation measures.

9.4 Archaeological

A Stage 1 Archaeological Assessment (Appendix 2) was undertaken by Archeoworks Inc. A desktop survey was undertaken to identify any archaeological sites within the proposed site, and to assess the archaeological potential of the site. A review of databases that catalogue known sites of archaeological interest was also preferred. This assessment revealed that there was not an archaeological interest that would be impacted by the project.

The Stage 1 Assessment did not recommend that a Stage 2 Assessment be conducted.

However, upon review by the TRCA, they concluded that although the bulk of the area is disturbed, the tree line seems to be intact throughout the series of aerial photographs. Furthermore, the Study Area is actually east of the area covered in the Stage 1 Assessment and therefore not included in the recommendations. Given that the trees appear to be undisturbed, a Stage 2 Assessment was recommended by the TRCA.

A Stage 1-2 Archaeological Assessment (Appendix 3) was undertaken by TRCA Archaeology. The project area was investigated in accordance with the 2011

Standards and Guidelines for Consultant Archaeologists, published by the Ministry of Heritage, Sport, Tourism and Culture Industries. The project area was evaluated for extensive disturbances that have removed archaeological potential. Part of the project area was determined to have been heavily disturbed by previous construction activities associated with the existing watermain, grading, building construction and demolition, and the construction of paved sidewalks. The remainder of the project area was subjected to test pit survey. At the onset of test pit survey, disturbed ground conditions were encountered, therefore these areas were tested according to professional judgement at 5-10-metre intervals to determine the extent and nature of disturbed ground conditions. Disturbances consisted of mottled grey soils within a light to medium brown matrix with concrete inclusions. No areas of natural soils were encountered.

No artifactual material or cultural features were located in the project area during the archaeological investigation. Accordingly, the project area as tested requires no further archaeological assessment.

9.5 Cultural Heritage

Comments received by the Ministry of Heritage, Tourism, Sport and Culture Industries requested that this project be reviewed for Built Heritage Resources and Cultural Heritage Landscapes. The checklist form titled “Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes” completed for this project reveals low potential for built heritage or cultural heritage landscape on the property. Refer to Appendix 5.

9.6 Source Water Protection

The Clean Water Act, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

The project area has been reviewed using resources provided by the Credit Valley – Toronto and Region – Central Lake Ontario (CTC) Source Water Protection Plan. This project falls within the Highly Vulnerable Aquifers (HVA) area.

According to the Approved Source Protection Plan: CTC Source Protection Region, effective December 5, 2019 prepared by the CTC Source Protection Region, an aquifer is an area underground that is highly saturated with water – enough water that it can be withdrawn for human use. A Highly Vulnerable Aquifer is one that is particularly susceptible to contamination because of its location near the ground's surface or where the types of materials in the ground around it are highly permeable.

A drinking water threat is defined in the Clean Water Act, 2006 (Section 2(1)) as:

> *an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water.*

Installing a watermain by horizontal directional drilling is not considered a drinking water threat.

9.7 Climate Change

A proponent considering the potential impacts on climate change of the project (or its alternatives) should assess the expected direct greenhouse gas emissions of the project/alternatives and whether the project/alternatives will positively or negatively affect the storage of carbon or removal of carbon dioxide from the atmosphere.

Several factors were considered in the assessment of the alternative solutions in order to minimize tree removals and disturbances to the watercourse and park. Factors regarding climate change were not directly considered since the potential impacts on climate change is indistinguishable among the alternative solutions.

10.0 Public Involvement

The public participation component of the Environmental Assessment is one of the most important aspects of the Class Environmental Assessment process. It provides opportunities for the public and agencies in the area to review the proposed undertaking, provide their input and mention any concerns they may

have. Information on public and agency involvement can be found in Appendix 5.

The City issued a joint Notice of Study Commencement and Notice of Public Consultation. This notice was distributed door-to-door in the study area via Canada Post on November 19, 2020. The local rate payer groups were also notified of the study and the Public Information Centre (PIC).

A virtual Public Information Centre (PIC) was held on Monday, December 7, 2020 from 6:30 p.m. to 8:30 p.m. See Appendix 5 for all advertising and mailings. The format of the PIC was as a drop-in meeting to where a slide show presentation was done. After the meeting, the public had the opportunity to ask questions, either verbally or through the chat function. All open house material was posted on the City's project website at https://www.toronto.ca/community-people/get-involved/public-consultations/infrastructure-projects/watermain-replacement-on-martin-grove-road-proposed-road-safety-improvements-on-rathburn-road-and-martin-grove-road for public view. Representatives from the City of Toronto and R.V. Anderson Associates Limited attended to address the public. A Question and Answer Summary can be found in Appendix 5.

The PIC was held to present the various alternative solutions, which were evaluated, and presented the technically preferred (at that time) solution for the watermain replacement. The final solution of the watermain could only be selected after public and agency input was considered.

10.1 Public Input Received

Public input was received during the Class Environmental Assessment process (see Appendix 5) and is paraphrased below as follows:

1) **EA Comment No. 1:** Why would the City prefer a route which involves the removal of mature trees? It states up to 5 trees. These trees are huge mature trees which provide shade to people using the park, shelter and food for the park wildlife. Replacement trees would be small and take decades to reach the size of the ones being removed. **Response:** It is an unfortunate but common impact that trees are impacted by construction work needed to replace, maintain or upgrade essential services, especially ones located underground. The current assessment of tree impacts is at a preliminary stage, based on a count of trees that are near the anticipated work area. A certified arborist is carrying out the tree inventory which will be used to assess impacts of the final work area. Until we have confirmed the location

of the work areas it is possible that anywhere between zero and five trees may be impacted by the work. In the following weeks, once the tree inventory is completed, we will review the work activities with our colleagues in Parks to determine if the trees can sustain minor injury or if they require removal. Parks staff may have additional strategies that we can utilize if it is possible to reduce the number of tree removals, mitigate tree injuries, or shift work area towards a tree that is an invasive species (away from non-invasive/local tree species) as well. They will also review and ensure that any tree impacts follow the federal guidelines to protect bird migration and nesting. Finally, we will be developing a replanting plan that will be reviewed by Urban Forestry staff to uphold or exceed the required minimum ratios. Park trees are replaced 1:1 and any trees located within the ravine boundary are replaced 1:3. We will also be speaking with the consultant and Parks staff about any further opportunities to improve the tree canopy. We understand your concerns about how this project impacts this park and in the broader environmental/climate change scope. We will continue to work with our consultants and colleagues to minimize the impacts of this work and mitigate its impacts.

Public input was received after the PIC (see Appendix 5) and is paraphrased below as follows:

1) **PIC Comment No. 1:** Is there a need to increase the diameter of the water main? Could relining of existing mains be a possibility? **Response:** The City has not identified the need to increase the diameter of the watermain. Relining of the existing mains below Mimico Creek would require excavations within the creek area due to the location and number of bends in the existing pipe, and has been ruled out on this basis.

2) **PIC Comment No. 2:** When will the water main replacement be done. There is a history of "promises" to when this will be done? **Response:** The teams are working towards a timeline to start construction in late summer 2021 to December 2021 with site restoration in Spring 2022.

3) **PIC Comment No. 3:** We have had three poorly executed projects recently - the water main on Kipling Avenue, the water main work in Echo Valley Park and the bridge on Rathburn Road. Does the city really have the capability to manage this project so that it comes in on time, on budget? **Response:** Yes, we are working with consultants to complete design and start tendering process for a qualified contractor to carry out the work. The previous work on

the sewer trunk sewer on Kipling in Echo Valley Park required different construction approach to re-line an existing large diameter trunk sewer. In a separate email reply to you, we indicated that the flooding experienced in the park was separate from that construction work and was observed/pre-existing before that construction started. Parks staff have been notified to follow up and review the drainage in that park early next year.

4) **PIC Comment No. 4:** Was the age of the watermain the primary cause of the historical pipe break failures? What did the forensic analysis of the breaks indicate? Were failures mainly in one area? Perhaps relining of a specific stretch of pipeline would be an alternative. **Response:** Age is one of many factors that could contribute to a watermain break. Other possible contributors include soil condition, soil movement due to seasonal temperature changes, and pipe-wall thickness. The watermain breaks on Martin Grove occurred in various, spread-out locations. Toronto Water notes information on the outcome of the breaks, such as whether they were longitudinal, circumferential, or blow-out breaks. The breaks on Martin Grove were diverse. Toronto Water plans watermain projects based on pipe condition, and schedules these projects based on several factors including priority, location, and funding availability. Using current technology, the lifespan of a new watermain would be much longer than that of a relined pipe, making replacement a greater benefit for a similar cost and construction duration.

5) **PIC Comment No. 5:** Has the recent sewer upgrade along Martin Grove Road from Rathburn Road to Lorraine Gardens as-built drawings been shared with R.V. Anderson from CH2M Hill in design perimeters? **Response:** The design teams are aware of CH2M Hill's sewer replacement work in the area and are coordinating to obtain and incorporate pertinent design information accordingly.

6) **PIC Comment No. 6:** What construction approach will be used to install under Mimico Creek? **Response:** The preferred construction method to instal the new watermain under Mimico Creek is horizontal directional drilling.

7) **PIC Comment No. 7:** There are lots of older homes on the street with this inadequate 1/2" size and would it not be advisable to consider this when ripping up the road to have this major line replaced to have this done at the same time. Every time an older home is replaced by a new one the road has to be dug up to upgrade line. Please run this by your committee and give it a

serious look. **Response:** Once construction starts, the contractor will determine the service connection is 13 mm copper, and may consider it to be sub-standard and replaced with 19 mm copper service connection to your property line. If you are interested in upgrading the portion of the water service connection line from the property line to your home, you can coordinate your contractor's work with the City's contractor. There will be a field ambassador contact info provided on the notices as well as 311 who can help you as well.

8) **PIC Comment No. 8:** The waterflow obviously has been reduced which is affecting the beauty of Mimico Creek especially from Martin Grove Road and under the Rathburn Road Bridge. **Response:** To clarify, the watermain work will go below the creek to avoid it and the bridge structure. There are no plans to beautify the creek or the ravine/park area as part of this work to replace aging/breaking watermains. This comment will be passed on to Parks, Forestry and Recreation for any future considerations.

10.2 Agency Input Received

The major agencies that have commented during the Study have been various departments of the Toronto and Region Conservation Authority (TRCA), Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), Ministry of the Environment, Conservation and Parks (MECP) and Mississaugas of the Credit First Nation (MCFN).

Their interest in the study is as follows:

Toronto and Region Conservation Authority (TRCA)
The TRCA is the landowner of Ravenscrest Park and is the approval agency for work to be done with the Regulatory Limits.

Comment: TRCA staff would like to opportunity to review the Class EA document once available and will provide comments on the evaluation completed. Staff noted that permitting was not identified on the presentation slide deck shared or identified during the meeting when timelines were discussed. Slide 48 indicates a construction tender will be obtained following completion of the final report review, however a permit from TRCA for the proposed watermain works will be required.

Response: The issues of concern to TRCA will be appropriately scoped and addressed (include permitting) prior to construction. Details of the proposed construction methodology, sediment and erosion control plans and tree removals and restoration plans will be included in the approvals of the detailed design phase of this project.

Comment: Staff have no objection in principle to the preferred alternative #4. However, please note that TRCA requires the watermain to be a minimum of 2 m below the invert of the creek which must be shown in subsequent submissions as part of detailed design. This is a requirement of the detailed design process and future permit application to TRCA.

Response: A minimum of 2 m depth from the invert of the creek will be provided and shown on the permit submission drawings.

Comment: Please note the proposed work associated with preferred alternative 4 is located within the regulatory floodplain on the north side of Mimico Creek. As part of the detailed design stage, please ensure a flood contingency is developed and provided as part of the permit submission package. The design drawing should also include all TRCA standard flooding notes.

Response: RVA will provide the details in the permit submission drawings

Comment: Please note the proposed watermain and work for the preferred alternative is proposed on TRCA property (under management agreement with the City of Toronto) as is understood by the City of Toronto and identified in the draft EA document. Please be advised of the following.

a) TRCA Property requirements will be required to be finalized prior to permit issuance which includes the requirement for a permanent easement for proposed infrastructure on TRCA property. A permanent easement for infrastructure on TRCA property requires TRCA board approval and lead time prior to construction. Following the filing of the EA, it is requested that City staff continue to consult with TRCA staff regarding the detailed design and permit application submission in addition to TRCA property timelines. Staff request that following the filing of the EA, when available, the City of Toronto provide the permit application for review with the proposed watermain alignment and all necessary information so that technical staff can review and provide comment on the proposed

permanent alignment of the watermain infrastructure on TRCA property to allow the permanent easement process to proceed. TRCA technical, planning and property staff will need to be appropriately satisfied prior to the permanent easement process proceeding and the easement being provided for board approval.

b) For the TRCA permit process, please note that TRCA Archaeology screening will be required for any ground disturbance associated with construction on TRCA property that has not already been previously screened through TRCA archaeology process. Staff note a previous screening for the geotechnical investigation associated with this project. Staff will continue to coordinate with City of Toronto staff for next steps on this requirement.

Response: A pre-consultation meeting will be arranged with the TRCA prior to applying for formal TRCA approval.

Comment: Please advise on any requirement to complete work on the south slopes of Mimico Creek, east of Martin Grove, north of Rathburn Road, within TRCA regulated area. The alternatives and preliminary drawings appear to show that the alignment will pass through this area but it is unclear if there is any work or ground disturbance required at this location. Please confirm and revise the EA document, if there will be any disturbance to the south slope/regulated area associated with Mimico Creek – additional TRCA requirements will apply.

Response: The proposed watermain will be installed by HDD. Excavations and disturbances will be limited to under the road.

Comment: It is noted in the public consultation records that there are road improvements for Martin Grove Road which includes bike lanes, sidewalk improvements filed within the EA document. Please confirm that these proposals are not a part of the proposed EA.

Response: The road improvements are not part of this EA.

Comment: The EA document (as noted in Natural Sciences Report) also indicates that there may be additional watermains proposed south of the Mimico Creek crossing and Rathburn Road extending past Saralou Court (*within Table 6 Project Description Activity Summary Overview*). If this additional area is required

for this watermain scope (particularly near Saralou Court – as this area is also regulated by TRCA), please revise the EA document to better reflect the proposed watermain alignment and the extent. Note that the permit required for this work will also need to account for any watermain proposed within the regulated area near Saralou Court. Please revise the EA document to reflect this, if this is the case.

Response: The Natural Sciences Report has been revised the EA documents. A permit from the TRVA will be applied for for the entire section.

Comment: Throughout the EA document (including the last page – conceptual design drawing) appear to contain additional "options" for the proposed alternative – please see final page in draft EA which appears to be conceptual design, page 5 of LGL's natural sciences report, etc. Please clarify if these options line up with the formally proposed alternatives or are more detailed options for the preferred alternative #4.

Response: The Natural Sciences Report has been revised to match the options in the EA report.

Comment: Please be advised that the subject property appears to fall within the Highly Vulnerable Aquifers (HVA), vulnerable areas under the Credit Valley - Toronto and Region - Central Lake Ontario Source Protection Plan (CTC SPP).

Response: Noted. The EA document has been updated to account for this. It is noted that installing a watermain by HDD is not considered a drinking water threat.

Comment: be advised that TRCA Erosion Risk Management (ERM) staff are currently in the process of implementing the "Mimico Creek behind 2 Kevi Lane and 194 Rathburn Road Slope Stabilization and Erosion Control Project." This project is being planned to undertake remedial works within the subject area and to provide long term erosion protection to the adjacent properties at these specific locations. City coordination may be required with the internal TRCA project depending on timelines. Although the TRCA project is not proposed for implementation until after 2022 please ensure this project is taken into account considering the study areas overlap. Note the TRCA Project Manager is Jaya Soora (jaya.soora@trca.ca Ext. 5533) if additional information is required.

Response: Noted.

Comment: Please engage TRCA staff for additional permitting requirements as part of detailed design, prior to submitting a permit application for the works. Staff will also identify timelines and required fees for the permit application at that time.

Response: A pre-consultation meeting will be arranged with the TRCA prior to applying for formal TRCA approval.

Comment: It appears there may be additional property potentially required for the watermain installation in addition to TRCA property and the City ROW when the watermain will ultimately cross Mimico Creek. Note that as part of detailed design and TRCA permit application, landowner authorization will be required for any work on private property.

Response: No additional properties are required.

Comment: It is noted that the existing watermain is located below Mimico Creek and within the Right of Way (ROW). Please advise on the plan for the existing watermain and whether it will be removed, abandoned, etc. as part of this project.

Response: The existing watermain will be abandoned by capping at the ends.

Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)

MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage.

Identifying Cultural Heritage Resources

Comment:

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also

have knowledge that contributes to the identification of cultural heritage resources.

Response:
The Ministry of Environment, Conservation and Parks provided us with a list of First Nations to contact for this study.

We do not plan to contact local historical societies or heritage organizations as part of this watermain replacement study since there should not be any trigger for a review of this type of resource due to the site not being located on, or adjacent to a listed or designated property nor is it within an identified cultural heritage landscape.

Archaeological Resources
Comment:
This EA project may impact archaeological resources and should be screened using the MHSTCI Criteria for Evaluating Archaeological Potential to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at archaeology@ontario.ca. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the OHA, who is responsible for submitting the report directly to MHSTCI for review.

Response:
Archeoworks Inc. has been retained to carry out the requirements for a Stage 1 Archaeological Assessment (Appendix 2). TRCA Archaeology undertook a Stage 1-2 Archaeological Assessment (Appendix 3).

No artifactual material or cultural features were located in the project area during the archaeological investigation. Accordingly, the project area as tested requires no further archaeological assessment.

Built Heritage Resources and Cultural Heritage Landscapes
Comment:
The MHSTCI Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes should be completed to help determine whether this EA project may impact cultural heritage resources. If potential or known heritage resources exist, MHSTCI recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to

assess potential project impacts. Our Ministry's Info Sheet #5: Heritage Impact Assessments and Conservation Plans outlines the scope of HIAs. Please send the HIA to MHSTCI for review, and make it available to local organizations or individuals who have expressed interest in review.

Response:
The checklist form titled "Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes" has been completed for this project which reveals low potential for built heritage or cultural heritage landscape on the property. Refer to Appendix 5. A Heritage Impact Assessment is not anticipated for this project.

Environmental Assessment Reporting
Comment:
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Response:
As indicated earlier, cultural heritage studies are not anticipated. We will continue to notify stakeholders including the Ministry of Heritage, Tourism, Sport and Culture Industries.

Ministry of the Environment, Conservation and Parks (MECP).
MECP's interest in this Environmental Assessment (EA) project relates to the following:

Consultation with Aboriginal Communities
Comment:
The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to

consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's Constitution Act 1982. Where the Crown's duty to consult is triggered in relation to the proposed project, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter. The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Mississaugas of the Credit First Nation
- Six Nation of the Grand River (Both the Six Nations Elected Council and Haudenosaunee Confederacy Chiefs Council)
- Huron-Wendat Nation (only if archeological impacts)

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process". Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances subsequent to initial discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation with Indigenous communities or other stakeholders has reached an impasse

- A Part II Order request is expected on the basis of impacts to Aboriginal or treaty rights

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

Response:
We have reached out the Mississaugas of the Credit First Nation (MCFN), the Six Nation of the Grand River (SNGR) and the Haudenosaunee Confederacy Chiefs Council (HCCC). To date, we have a response from the MCFN. Refer to the appropriate section in this report.

Species at Risk
Comment:
The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

Response:
We have retained LGL Limited to undertake a Natural Sciences Investigation. Refer to Appendix 1.

Two Species at Risk have been identified within he Study Area: Barn Swallow and Butternut.

1) Barn Swallow:
   During the breeding bird surveys it was not identified within the Mimico Creek under Martin Grove Road, but it was identified in the bridge where Mimico Creek passes under Rathburn Road, east of the study area. This species was still nesting under the bridge despite ongoing repair work being done on the bridge. If the work is to be conducted during the breeding bird season, it is recommended that the Martin Grove bridge be inspected again for nests of this species. If the breeding bird season is avoided, we do not anticipate any direct impact to this species or its habitat.

2) Butternut
   Butternut was confirmed in the study area, along the riparian corridor of Mimico Creek. Evidence of some Butternut records were found during background review. LGL updated information for all Butternut located on site in the study area

that were observed. LGL completed a Butternut Health Assessment (BHA) which is located in Appendix 1.

The results of the BHA indicated the presence of three trees regulated under the ESA in the study area, with a habitat protection zone of 50m considered. Further steps will be determined in consultation with the MECP, if required.

Excess Material Management

Comment:

All waste generated during construction must be disposed of in accordance with ministry requirements. Activities involving the management of excess soil should be completed in accordance with new regulation under the Environmental Protection Act, titled "On-Site and Excess Soil Management" (O. Reg. 406/19) and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014).

Response:

All waste generated during construction will be disposed of in accordance with ministry requirements. The construction contract documents will make reference to the applicable regulations in which the contractor will be required to comply with.

Planning and Policy

Comment:

Parts of the study area may be subject to the A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020), Oak Ridges Moraine Conservation Plan (2017), Niagara Escarpment Plan (2017), Greenbelt Plan (2017) or Lake Simcoe Protection Plan (2014). Applicable policies should be referenced in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.

Response:

This project is not subject to any of these polices.

Provincial Policy Statement

Comment:

The Provincial Policy Statement (2020) contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.

Response:

The applicable policies are Natural Heritage, Water and Cultural Heritage and Archaeology. This project is consistent with these policies as indicated within the applicable sections of this report.

Source Water Protection

Comment:

In October 2015, the Municipal Engineer's Association Parent Class Environmental Assessment document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class Environmental Assessment project must identify whether a project is or could potentially be occurring with a vulnerable area. Given this requirement, please include a section in the report on source water protection.

Response:

The project area has been reviewed using the mapping tools made available by Ministry of the Environment, Conservation and Parks. This project does not impact sources of drinking water since the project is not located in a vulnerable area. Therefore, this project does not pose a threat to sources of drinking water. Refer to the applicable section in this report.

Climate Change

Comment:

The Ministry of the Environment, Conservation and Parks expects proponents to:

1. Consider during the assessment of alternative solutions and alternative designs, the following:
    a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
    b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
2. Include a discrete section in the report detailing how climate change was considered in the EA.

Response:

Several factors were considered in the assessment of the alternative solutions in order to minimize tree removals and disturbances to the watercourse and park. Factors regarding climate change were not directly considered since the potential impacts on climate change is indistinguishable among the alternative solutions.

Air Quality, Dust and Noise

Comment:

Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

The MECP recommends that non-chloride dust-suppressants be applied.

The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Response:

The project will incorporate standard construction mitigation regarding noise, dust, vibration for projects with the City of Toronto. Construction working hours should be restricted (7 a.m. to 7 p.m. Monday to Friday and 9 a.m. to 7 p.m. on Saturdays).

Ecosystem Protection and Restoration

Comment:

Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

All natural heritage features should be identified and described in detail to assess potential. Impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:

- Areas of Natural and Scientific Interest (ANSIs)
- Rare Species of flora or fauna
- Watercourses
- Wetlands
- Woodlots

Response:

The natural heritage features have been identified via the Natural Sciences Report, Arborist Report and Butternut Health Assessment, along with

corresponding mitigation measures. Refer to the applicable sections of this report.

Surface Water

Comment:

The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the report and utilized when designing stormwater control methods. A Stormwater Management Plan should be prepared as part of the Class EA process.

Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – O. Reg. 63/16. These prescribed water-taking activities require registration in the EASR instead of a PTTW.

Response:

Due to the preferred alternative of horizontal directional drilling, there will be minimal to no impact on the natural features and ecological functions of the watercourses in the Study Area.

Stormwater will not be impacted since no new impervious area will be constructed.

A Permit to Take Water (PTTW) is not anticipated for this project.

Ground Water

Comment:

The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.

If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.

Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – O. Reg. 63/16. These prescribed water- taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

Response:

Due to the preferred alternative of horizontal directional drilling, the project will not involve groundwater takings or changes to drainage patterns. Therefore, the quality and quality of groundwater will not be affected.

Monitoring wells were installed in the park as part of the geotechnical investigation. The wells will be decommissioning in accordance with O. Reg. 903.

A Permit to Take Water (PTTW) is not anticipated for this project.

Contaminated Soils

Comment:

Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with Part XV.1 of the Environmental Protection Act (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up.

Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites.

The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

The report should identify any underground transmission lines in the study area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

Response:

Chemical testing was undertaken for select soil samples as part of the geotechnical investigation. An environmental analysis in accordance with Ontario Regulation 153/04 (as amended by Ontario Regulation 511/09) was undertaken for metals and inorganic parameters, Volatile Organic compounds (VOCs), Petroleum Hydrocarbons (BTEX, F1 to F4), Polychlorinated Biphenyl (PCBs) and Polycyclic Aromatic Hydrocarbon (PAHs) parameters. The bulk analysis results were then compared to the Industrial / Commercial / Community property use standards as defined in Table 3.1 – Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition of the O. Reg. 406/19 Standards (hereafter referred to as the MECP Table 3.1 Standards) and Table 1 – Full Depth Background Site Condition Standards for Residential / Parkland / Institutional / Industrial / Commercial / Community property use (hereafter

referred to as the MECP Table 1) Standards. The analysis did not indicate any exceedances of the parameters tested except for Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR) and Petroleum Hydrocarbons.

A composite soil sample from each borehole was tested in accordance with Ontario Regulation 347 as amended by O.Reg.558/00 for metals and inorganics. The TCLP sample results were compared with Ontario Regulation 347 (as amended by O.Reg.558/00) Schedule 4 criteria (Leachate Quality Criteria). There were no exceedances of Schedule 4 Leachate Quality criteria and as such, any excess materials generated at the site would be classified as non-registrable and non-hazardous, for disposal purposes.

Mitigation and Monitoring

Comment:

Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for construction are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project.

Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

Response:

The project will incorporate standard mitigation for construction projects within he City of Toronto.

Mississaugas of the Credit First Nation (MCFN).

Comment:

In 1805, the Crown and MCFN entered into Toronto Purchase Treaty, No. 13 (1805) regarding the lands in which your project is situated.

The Mississaugas of the Credit First Nation are the descendants of the “River Credit” Mississaugas. The undisputed Territory of the MCFN is defined as a Territory commencing at Long Point on Lake Erie thence eastward along the shore of the Lake to the Niagara River. Then down the River to Lake Ontario, northward along the shore of the Lake to the River Rouge east of Toronto then

up that river to the dividing ridges to the head waters of the River Thames then southward to Long Point, the place of the beginning. Their Territory encompasses the lands and waters that were used and occupied by their Ancestors. Territories are usually large tracts of land that reflect the breadth required for seasonal activities and habitation and changes in those movement patterns through time. Through Treaties with the Crown, MCFN agreed to share their Territory with newcomers. However, not all of MCFN's Territory has been dealt with through a Treaty.

With the exception of a small part of the Credit River, their Treaties with the Crown did not deal with the water parts of their Territory. They have not agreed to share any part of their waters with settlers. They formally gave notice to the Crown of this claim in 2016. They note that any lands that have been artificially created on their waters have also not been dealt with by any Treaty.

Like their ancestors before them, they continue to use the lands, waters, and watershed ecosystems within their Territory for a variety of livelihood, harvesting, ceremonial and spiritual purposes. We have always exercised governance functions and stewardship in order to protect their Territory, conserve the fish and wildlife that depend upon it, and ensure its ongoing ability to sustain their people. They assert that their Aboriginal and treaty rights fundamentally entitle them to continue to act as stewards of their Territory, to be involved in decisions that affect it, and to participate in the ongoing, responsible management of the resources it provides.

The Crown has a constitutional duty to consult and accommodate MCFN in respect of any decisions that might affect its asserted or proven Aboriginal and/or Treaty Rights. We expect that, consistent with the Crown's constitutional duty, no approval should be issued to this project until MCFN has been sufficiently consulted and accommodated.

MCFN has the right to free and informed consent prior to the approval of any project or any planning decision adversely impacting its Territory and to benefit economically from resource development within its Territory.

MCFN has formed the Department of Consultation and Accommodation ("DOCA") to represent its interests in consultation and accommodation matters. It is DOCA's mandate to ensure that they are directly involved in all planning and

development that impacts the integrity of their Territory. In this regard, DOCA will assess and help alleviate impacts on their rights, land claims, and ways of life by building relationships with governments and private sector proponents. They share a mutual interest in ensuring that projects in the Territory are planned, reviewed, and developed in a manner which ensures healthy communities, ecological protection, and sustainable development for present and future generations in the Territory.

MCFN is not opposed to development, but MCFN must be involved in development decision making. MCFN has a deep connection to its Territory and we have a stewardship responsibility for their land. By engaging with them, a project proponent can learn their perspective on how to care for this land and they can work together to shape the project to mitigate damaging effects to their land and perhaps even work to improve their environment. MCFN is the only party who shall determine whether there are impacts to their Aboriginal and treaty rights.

One of the ways they require proponents to engage with them is in providing transparency during the environmental survey and archaeological assessment process. The best way to accomplish this is by having Field Liaison Representatives ("FLRs") on location while fieldwork is occurring, who can ensure that the Nation's special interests and concerns are respected and considered during fieldwork. The cultural and natural resources in question are part of MCFN's territory and heritage and it is their responsibility to ensure their protection, on behalf of the Nation. MCFN's stewardship of its territory extends through the life of any development project and beyond.

Request for Missing Information

In order to proceed with their follow-up review, the following information relating to the project should be provided in advance of filing the Project File Report:

- List of documents pertaining to the proposed action / decision that are available for MCFN to review.
- Description of what other information is expected to become available before the proposed action / decision is undertaken.
- Deadlines for filing dates pertaining to the action / decision.
- The Crown or Municipal Review / approval that is required for the project.
- How this action/decision may affect and/or benefit MCFN, its rights and territories

Response:

List of documents for action/decision

This study intends to complete the Municipal Class Environmental Assessment (MCEA) process for a "Schedule B" study and are providing the following documents for review:

1. **Consultation summary** for inquiries, comments and questions to capture and reflect the input from local residents received commencing mid-November (Notice of Commencement).
2. **Project File Report** to provide the required information to complete a Schedule B MCEA project, including a Notice of Commencement and 30-day public comment period.
3. **Stage 1 Archaeological Assessment** reveals that no further archaeological concerns existing and no further work is recommended within the study corridor and it may be considered free of further archaeological concern.
4. **Stage 2 Archaeological Assessment** (as recommended by the TRCA) reveals that no further archaeological concerns existing and no further work is recommended within the study corridor and it may be considered free of further archaeological concern.
5. **Natural Sciences Report** reviewed the proposed project activities for potential impacts to the natural heritage features in the Study Area and revealed that impacts are considered to be minimal.
6. **Arborist Report** reviewed the impact assessment to trees and recommends replacement in accordance with the City by-law.

The above reports are being provided to you to determine if you have any questions, comments or further suggestions on the findings of these reports.

Other information before action/decision

No further information is anticipated.

Deadlines for action/decision

Below is a table that summarizes the anticipated timeline we are working towards:

Mid-November, 2022	• Issue Project File Report for 30-day review • Notice of Completion
Mid-December, 2022	Project File Report 30-day review ends
April, 2023	Finalize tender for construction
Spring-Summer, 2023	Issue and Award Tender
Late Summer, 2023	Construction Starts
Late December, 2023	Construction Ends
Spring 2024	Site Restoration

Required Crown or Municipal Review

As the project proponent, this project to replace the watermains (both the study & administration, as well as construction project management) is being delivered by the City of Toronto Engineering & Construction Services division on behalf of the Toronto Water division with their respective engineering and capital staff. This project has been reviewed by our colleagues in:

- **Transportation Services** division as alternative solutions and construction methods (not the preferred solution) had extensive impacts to the Martin Grove bridge over Mimico Creek in terms of significant structural concerns for the bridges foundation/piles and access concerns for its maintenance and inspection.
- **Parks, Forestry & Recreation** Division to comply with their policies in ravines and creeks, as well as for items such as tree impacts, removals, protection and replacement.
- **Toronto and Region Conservation Authority** – as landowner, the TRCA will provide final clearance at the time of permitting.

We have kept our colleagues in both divisions up to date with the study progress and potential changes – and will continue to do so through to the end of construction.

With regards to the Crown including the various provincial ministries and agencies, we have contacted the following with a Notice of Commencement:

- Ministry of Community Safety and Correction Services
- Ministry of Heritage, Sport, Tourism and Cultural Industries
- Ministry of Municipal Affairs and Housing
- Ministry of Environment, Conservation and Parks
- Metrolinx

From this list, we have received a letter from the Ministry of Heritage, Sport, Tourism and Cultural Industries and have provided our responses to their checklist and inquiries.

Comments from the Ministry of Environment, Conservation and Parks have been addressed in the corresponding sections of this Project File Report.

How this action/decision may affect and/or benefit MCFN, its rights and territories

The following items or areas of interest:

a) MCFN has livelihood, harvesting, ceremonial and/or spiritual purposes for the lands/territories.
b) MCFN exercises governance functions and stewardship role in conserving fish and wildlife environments or ecosystems for ongoing sustainability for future generations.
c) MCFN has the right to benefit economically from resource development.

d) MCFN has the right for free and informed consent, participation in the planning, review, development.
e) MCFN DOCA will be directly involved in decision making, including the assessment and alleviation of impacts on MCFN rights, land claims, ways of life.
f) MCFN has also requested environmental survey and archaeological assessments and participation of Field Liaison Representatives on site to ensure your interests and concerns are respected as part of your cultural and natural heritage and resources.

As noted earlier, we are providing you with the Stage 1 and 2 Archaeological Assessment reports and are be available to discuss your questions or comments on its findings. The Natural Sciences Report and Arborist Report are also being provided to document the information on the environmental and ecological aspects related to the anticipated construction work.

In general, the watermain will cross below the bed of Mimico Creek between 3 to 5 m deep and will connect to existing watermain networks on both sides of the creek located within the road right-of-way. The replacement watermain does not anticipate impact any the fish, flora and fauna habitats, nor permanently impede any use or enjoyment of the lands. Upon construction completion, the operation of the watermains below the creek and roadway will service homes and businesses.

The temporary construction access points to enable contractors during construction has identified the following potential and/or temporary impacts, along with mitigation measures:

Potential Impact	Mitigation
1) Potential impacts to trees – to site the entryway and exit route of the replacement watermain below ground	Currently, between 0 and 5 trees have been identified that could be potentially impacted as they are situated near to the entry or access point for the directional drill to reach underground. Potential impacts can include minor or sustained injury, significant injury requiring removal, protection (Tree Protection Zone – link) or transplant. The species, current health and other factors are also being considered as non-native or invasive tree species are generally preferred by Parks, Forestry & Recreation staff for removal following by replacement tree(s) that are native and support a health ravine environment and habitats. In addition, staff also consider slightly shifting the location of the entry or access point for the drill towards trees that may already be in poor health or are non-native species and away from healthy native species to protect them. The number and type of tree impacts will be determined (when) and we will provide these details.
2) Nuisances and disruption during construction such as noise, vibration, dust	These nuisances are common with any infrastructure construction project and City staff carry out the following measures to reduce their impacts: • Enforcing construction hours within the City's Noise Bylaw (7 a.m. to 7 p.m. Mondays to Fridays and 9 a.m. to 7 p.m. Saturdays, no work on Sundays or holidays) • Offer to carry out pre-condition surveys of nearby homes (interior and/or exterior) and/or properties within the appropriate zone of influence to establish the conditions prior to construction starting. This pre-condition can be used to examine potential damage as a result of construction work and the property owner can submit a claim to the City of Toronto. • The details and schedule of work that may create dust or debris. • A safe work site for both the crews and the public includes the installation of hoarding around the active work zone and typically includes a buffer space to ensure the work is contained within a delineated area. • Pre-Construction Notices and local signage area also issued prior to construction to bring awareness of these details and impacts, which allow for an opportunity for residents to ask questions and staff to address.

3) Potential impacts to existing access routes (trails) from Martin Grove Road into the ravine area / Ravenscrest Park	An existing multi-use trail from Martin Grove Road into the ravine system may be potentially impacted. We are currently reviewing options to temporarily relocate the trail entrance to beside the existing entrance since or if the trail can be shared safely with park users and accommodated by flag person to control traffic.

As indicated in the applicable sections of this report, several options to replace the watermain were considered, with one option was carried forward using the Horizontal Directional Drilling technology as the most feasible and least amount of risk and avoided direct impacts to the watercourse. However, due to the connection points to the existing watermains and curvature required to place the watermain away from the existing abutments of the Martin Grove bridge, construction access and staging areas will be required within the park.

11.0 Design Considerations

11.1 Geotechnical Requirements

A geotechnical investigation was undertaken by Englobe for the technically preferred alternative. Refer to Appendix 4.

The geotechnical report outlines favourable conditions with Alternative #4. The report has not identified any undue problematic conditions with Alternative #4, which cannot be addressed through mitigation normally incorporated into projects of this nature. The report supports the use of Horizontal Directional Drilling for the water crossing, and this will be the construction technique of preference.

11.2 Preliminary Engineering

The City has determined that a 300 mm diameter watermain is sufficient to supply the domestic and fire flow demands within the Study Area.

The Geotechnical Investigation prepared by Englobe has indicated favourable conditions for Horizontal Directional Drilling and this will be the technique given first priority. The presence of the shale bedrock will require the watermain to be installed above the shale bedrock.

There will likely be one construction staging area at each end. These staging areas will generally contain a drilling rig, mud (lubricant) mixing tanks, flat bed trucks, pipe fusing equipment and vacuum trucks. The staging areas would be enclosed with temporary chain link fencing complete with sediment and erosion

controls. All disturbed areas will be restored to the satisfaction of the Urban Forestry Department and the Toronto and Region Conservation Authority.

Appendix 1

Natural Sciences Report
Arborist Report
Butternut Health Assessment

LGL LIMITED environmental research associates

CELEBRATING 50 YEARS

Natural Sciences Report

MARTIN GROVE ROAD

for:

RV ANDERSON ASSOCIATES LIMITED

ON BEHALF OF:

City of Toronto

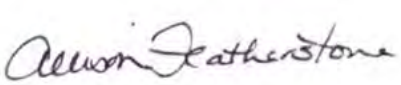
by:

LGL Limited
environmental research associates

APRIL 2021

LGL FILE NO. TA9027-24

prepared by:



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Allison Featherstone, Hons.B.Sc
VICE-PRESIDENT,
SENIOR PLANNING ECOLOGIST

Digital signature

Derek Morningstar, M.Sc., PWS
SENIOR ECOLOGIST,
BAT SPECIALIST

Digital signature

Jen Noël, M.Sc.
SENIOR BOTANIST,
ISA CERTIFIED ARBORIST

Digital signature

Karen Chung, Hons.B.Sc., G.I.S. Cert.
GIS ANALYST

LGL Limited
environmental research associates
445 Thompson Drive, Unit 2
Cambridge, Ontario N1T 2K7
Tel: 519-622-3300 Fax: 519-622-3310
Email: cambridge@lgl.com
URL: www.lgl.com

Version History:

Date:	Version:
20 October 2020	1, First Draft
7 December 2020	2, revised to include assessment of 2 alternatives
21 December 2020	3, revised as per comments received by RVA
9 April 2021	4, revised to include Butternut details.

LGL FILE NO. TA9027-24

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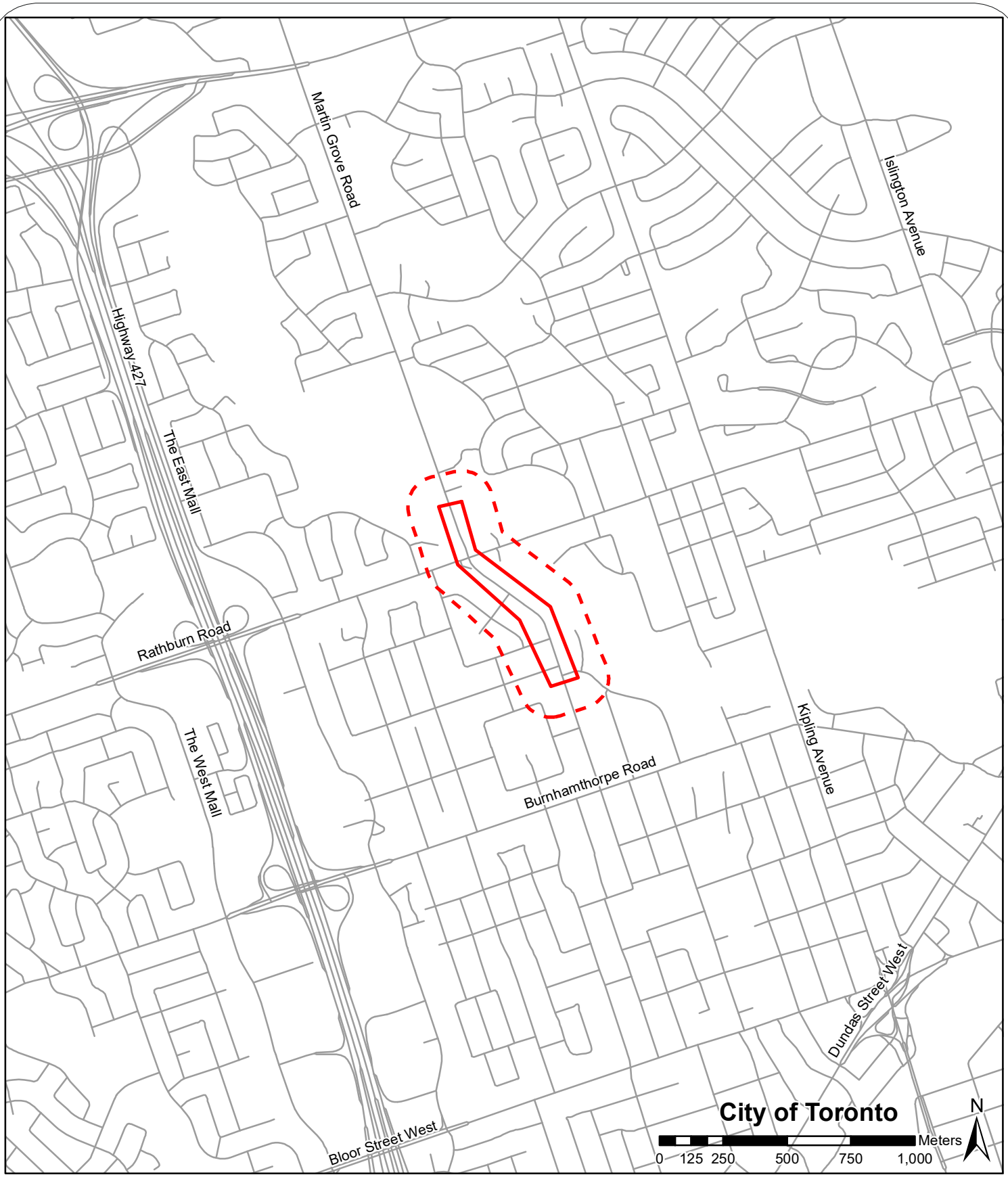
1.0 INTRODUCTION

LGL Limited (LGL) was retained by RV Anderson and Associates Limited to support on the Coordinated Toronto Water and Transportation Service Program (RFP No. 9117-19-7179). Projects under this contract are primarily water and sewer projects, but projects may be bundled to address road resurfacing, sidewalk repair, other utilities etc.

This particular project study area includes Martin Grove Road and the proposed works involve the replacement of a watermain. A Class Environmental Assessment is being undertaken for the watermain crossing of Mimico Creek. As part of that process, LGL was tasked with reviewing the proposed project activities associated with the Martin Grove Road project segment for potential impacts to the natural heritage features in the study area. As part of this scope, LGL has compiled this Natural Sciences Report by completing a background review, field investigations and a species at risk screening to screen for environmental sensitivities, in order to assess the proposed alternatives, to inform project permitting, and provide mitigation recommendations for the preferred alternative.

1.1 PROJECT LOCATION

The Martin Grove study area extends from Savalon Court in the north south to Lorraine Gardens. The study area expands into the West Dean Park at the Mimico Creek crossing. An additional location south also parallels a portion of the Mimico Creek corridor. It was included in part for some field investigations until the location of project infrastructure was better defined. The south section does not propose any infrastructure works on the east side of the road, and as such, the focus of this EIS is the areas associated within West Dean Park and Ravenscrest Park at the Mimico Creek corridor north of Rathburn Road (**Figure 1**).



PM6A2 Martin Grove Road

Key Map

Approximate Study Area

120m from Study Area

LGL LIMITED
environmental research associates

Project	TA9027-24	Figure	1
Date	October 2020	Prepared By	KC
Scale	1:20,000	Verified By	AHF

2.0 BACKGROUND REVIEW

Documentation of existing conditions included a desktop assessment of orthoimagery and a review of background data from secondary sources to establish natural heritage conditions within the area. The review of existing background documentation and data layers, including the following resources:

- Site orthophotography;
- GIS data layers obtained from the Ministry of Natural Resources (MNRF), Lands Information Ontario (LIO), City of Toronto (City) and the Toronto and Region Conservation Authority (TRCA);
- The Natural Heritage Information Centre (NHIC) database;
- City of Toronto Official Plan;
- Background watershed and subwatershed studies;
- Mapping of physiography and soils; and,
- Online wildlife databases (e-bird, Ontario Breeding Bird Atlas).

Secondary source information was compiled and analyzed in order to develop a general description of the terrestrial and aquatic ecosystems, vegetation and wildlife within the project area and to inform the Species at Risk Screening. In addition, MNRF and TRCA were consulted to confirm information collected and/or to provide additional information regarding the natural heritage system and potential species at risk in the project area.

The following subsections summarize the information obtained for the project area pertaining to natural environment.

2.1.1 Parks

A review of the City of Toronto online GIS mapping indicates the study area includes parks; the east side of Martin Grove Road is Ravenscrest Park and the west side is West Dean Park. A trail system exists through the parks and ravine.

2.1.2 City of Toronto Natural Heritage System

The Natural Heritage System is described within the City of Toronto Official Plan (OP) as parks and open spaces and natural areas/features. These consist of areas that are designated for protection, restoration and enhancement of natural features and function within the City. The Natural Heritage System includes:

- provincially significant wetlands (PSW);
- environmentally significant areas (ESA);
- significant habitat of endangered species;
- urban Forests and parks;
- golf courses; and,
- river and valley systems.

Areas associated with the Mimico Creek corridor are part of the City's Natural Heritage System in the study area.

2.1.3 City of Toronto Environmentally Significant Area

Within the City's natural heritage system there are natural areas which are particularly significant or sensitive, and have been identified to warrant additional protection to preserve their environmental qualities. These areas are referred to as Environmentally Significant Areas (ESAs) in the City's Official Plan. The study area does not include any ESAs, as identified on Map 12 of the Official Plan or within the recent ESA report compiled for the City of Toronto (North-South et al. 2012).

2.1.4 Areas of Natural and Scientific Interest (ANSI)

Areas of Natural and Scientific Interest (ANSI) are determined by the MNRF. The agency defines ANSIs as "lands and waters with features that are important for natural heritage protection, appreciation, scientific study or education". Records contained within the MNRF's LIO database did not indicate the presence of any Life Science or Earth Science ANSIs within the study area. The south west corner of the study area is within the limits of the Humber Valley - Lambton Candidate Life Science ANSI (**Figure 1**).

2.1.5 Provincially Significant Wetlands

Wetland features were identified through available GIS data layers provided by MNRF through LIO as shown in **Figure 2**. Three types of wetland features are identified in MNRF data layers: provincially significant wetlands (PSWs), unevaluated wetlands and other wetlands. The status of wetlands is determined through an evaluation according to the Ontario Wetland Evaluation System (OWES). PSWs are those for which an OWES evaluation has resulted in a score sufficient to qualify as a provincially significant feature. Unevaluated wetlands are wetland features that have not undergone an OWES evaluation; while, those presented as evaluated or as 'other' wetlands are features where an OWES evaluation has been completed and the resulting score was insufficient to qualify as a provincially significant feature. Evaluated/other wetlands may be considered locally significant wetlands.

No PSWs are present within the study area. Unevaluated wetlands are associated with Mimico Creek downstream of Rathburn Road. No impacts are anticipated to these wetlands given the proximity to the proposed watermain works.

LEGEND

- Approximate Study Area
- 120m from Study Area
- Fauna (TRCA)
- Flora (TRCA)
- Fisheries Monitoring Location (TRCA)
- Provincially Tracked Species 1x1 km Square (LIO)
- ELC Communities (TRCA)
- TRCA Property
- Unevaluated Wetland (LIO)
- Wooded Area (LIO)
- Natural Heritage Area (City of Toronto)
- Ravine and Natural Feature Protection Area (City of Toronto)
- TRCA Regulation Limit
- Watercourse (LIO)

Aquatic Resources Area Summary (LIO)
Thermal Regime

- Warm

Proposed Design

- Option 2
- Option 4
- Proposed Watermain and Water Service
- Tree Protection Fence
- Test Pit
- Access Road
- Staging Area

PM6A2
Martin Grove Road
Records Review

LGL LIMITED
environmental research associates

Project	TA9027	**Figure**	2
Date	April 2021	**Prepared By:**	KC
Scale	1:4,100	**Verified By:**	AHF

2.1.6 Woodlands and Valleylands

Woodlands and valleylands are considered within the City's Official Plan and governed largely by the Ravine and Natural Feature Protection (RNFP) By-Law. A RNFP area is defined to include features described as discernable land forms with a minimum of 2m change in grade between the highest and lowest points that may contain vegetation cover and either once had, or currently have, water flowing through, adjacent to, or standing on them for some period of the year (City of Toronto By-law 513-2008). The City of Toronto's Ravine and Natural Features By-law encompasses not only ravines within the City but other tableland natural features as well. These protection areas include:

- ravines, treed portions of the Lake Iroquois shoreline and contiguous canopy;
- buffer area beyond the edges of slope features;
- tableland Forests (>0.5ha);
- ESAs;
- Ares of Natural and Scientific Interest (ANSIs); and,
- public golf courses near ravines.

The extent of the RNFP within the project area is fairly similar to the delineation of NHS designated in the City's Official Plan.

2.1.7 Toronto and Region Conservation Authority

The Toronto and Region Conservation Authority (TRCA) administers the Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. This regulation establishes areas where development is subject to approvals by TRCA, to ensure the protection of public safety, property and watershed health. The extend of the project area under TRCA regulation is shown in **Figure 2**.

Data was gathered from the TRCA for the study area and summarized in **Appendix A**. A single species at risk (Butternut (*Juglans cinerea*)) is reported in the TRCA background data which will be discussed further in the following sections. All of the TRCA data for L3 species are outside of the proposed project footprint but occur within the adjacent areas of the Mimico Creek corridor. Locations of the data points are shown on **Figure 2**.

Ravenscrest Park is owned by the Toronto and Region Conservation Authority.

3.0 EXISTING CONDITIONS

3.1 PHYSIOGRAPHY AND SOILS

The study area lies within the lower reaches of the Mimico Creek system. The project area is located within the Iroquois Plain physiographic region (Chapman and Putnam, 1984). It is found within the former Lake Iroquois Shoreline which extended around Lake Ontario from the Niagara River to the Trent River due to glacier ice damming near the St. Lawrence Valley. South of the Queensway, Bevelled Till Plains exist, with Sand Plains present north of the Queensway. The soils in the project area are a combination of modern river deposits (sand, silt, and organic material), with Lake Iroquois shallow water deposits (sand, silty sand) present beyond the creek valley (MNRF 1980).

3.2 VEGETATION AND VEGETATION COMMUNITIES

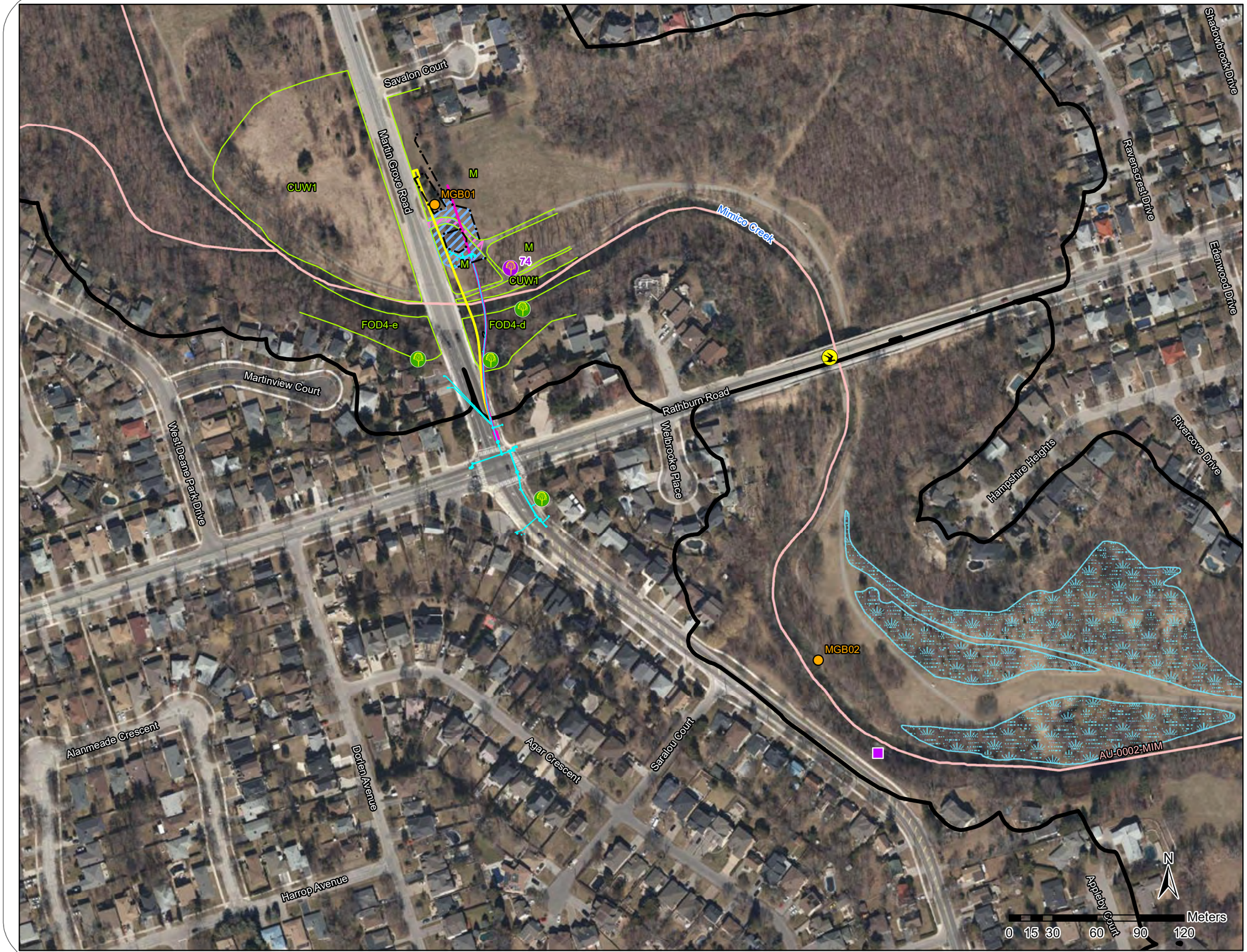
A vegetation survey was conducted on August 20, 2020 to investigate the extent of the vegetation communities occurring within the vicinity of the Martin Grove Road Bridge north of Rathburn Road. Natural and semi-natural vegetation features identified within the study area were classified according the Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al. 1998) with some modification to suite TRCA ELC nomenclature. Plant species status was reviewed for Ontario (Oldham and Brinkner 2009) and for TRCA (2012). Vascular plant nomenclature follows Newmaster and Ragupathy (2012).

Vegetation communities surrounding the bridge and along Martin Grove Road were cleared of their natural forest cover in the past. Vegetation communities have naturalized following disturbance and are dominated by non-native trees species. Vegetation communities include deciduous forest (FOD4-d and FOD4-e) and cultural woodland (CUW1). Vegetation communities identified herein are delineated in **Figures 3 and 3a** and described in further detail in **Table 1**.

Table 1 Summary of Ecological Land Classification Vegetation Communities.

ELC Code	ELC Vegetation Community	Species Association	Community Characteristics
TERRESTRIAL – NATURAL/SEMI-NATURAL			
FOD	**DECIDUOUS MINERAL FOREST**		
FOD4	**Dry Fresh Deciduous Forest**		
FOD4-d	Dry-Fresh Norway Maple Deciduous Forest	**Canopy:** dominated by Norway Maple (*Acer platanoides*)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moderately dry to fresh soils with well to moderate drainage typically occurring in the upper to middle slope (4). Dominated by Norway Maple (d) **SAR** species observed Community on steep slope. Yard waste dumping evident on slope.

ELC Code	ELC Vegetation Community	Species Association	Community Characteristics
FOD4-e	Dry-Fresh Exotic Deciduous Forest	**Canopy:** dominated by Siberian Elm *(Ulmus pumila*), with Manitoba Maple (*Acer negundo*)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moderately dry to fresh soils with well to moderate drainage typically occurring in the upper to middle slope, (4). Dominated by Siberian Elm (e). SAR species observed
TERRESTRIAL – CULTURAL			
CU	**CULTURAL**		
CUW	**CULTURAL WOODLAND**		
CUW1	**Deciduous Cultural Woodland**		
CUW1	Mineral Cultural Woodland	**Canopy:** composed of planted and naturalized tree species which include White Elm (*Ulmus americana*), White Cedar (*Thuja occidentalis*), Black Walnut (*Juglans nigra*), Manitoba Maple, and Red Ash (*Fraxinus pensylvanica*), Oaks (*Quercus* sp.)	Cultural communities (CU). Tree cover between 35 and 60 % (W). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1). Community resulting from, or maintained by, anthropogenic-based influences.



LEGEND

- Breeding Bird Point Count Station

Butternut (*Juglans cinerea*)

- Retainable*
- Non-retainable*
- Hybrid*
- Nesting Barn Swallow & Common Nighthawk Flyover
- Stormwater Discharge Tunnel
- ELC Communities Boundary
  - FOD4-d: Dry-Fresh Norway Maple Deciduous Forest
  - FOD4-e: Dry-Fresh Exotic Deciduous Forest
  - CUW1: Mineral Cultural Woodland
  - M: Manicured
- Ravine and Natural Feature Protection Area
- Unevaluated Wetland (LIO)

Aquatic Resources Area Summary (LIO)
Thermal Regime

- Warm

Proposed Design

- Option 2
- Option 4
- Proposed Watermain and Water Service
- Tree Protection Fence
- Test Pit
- Access Road
- Staging Area

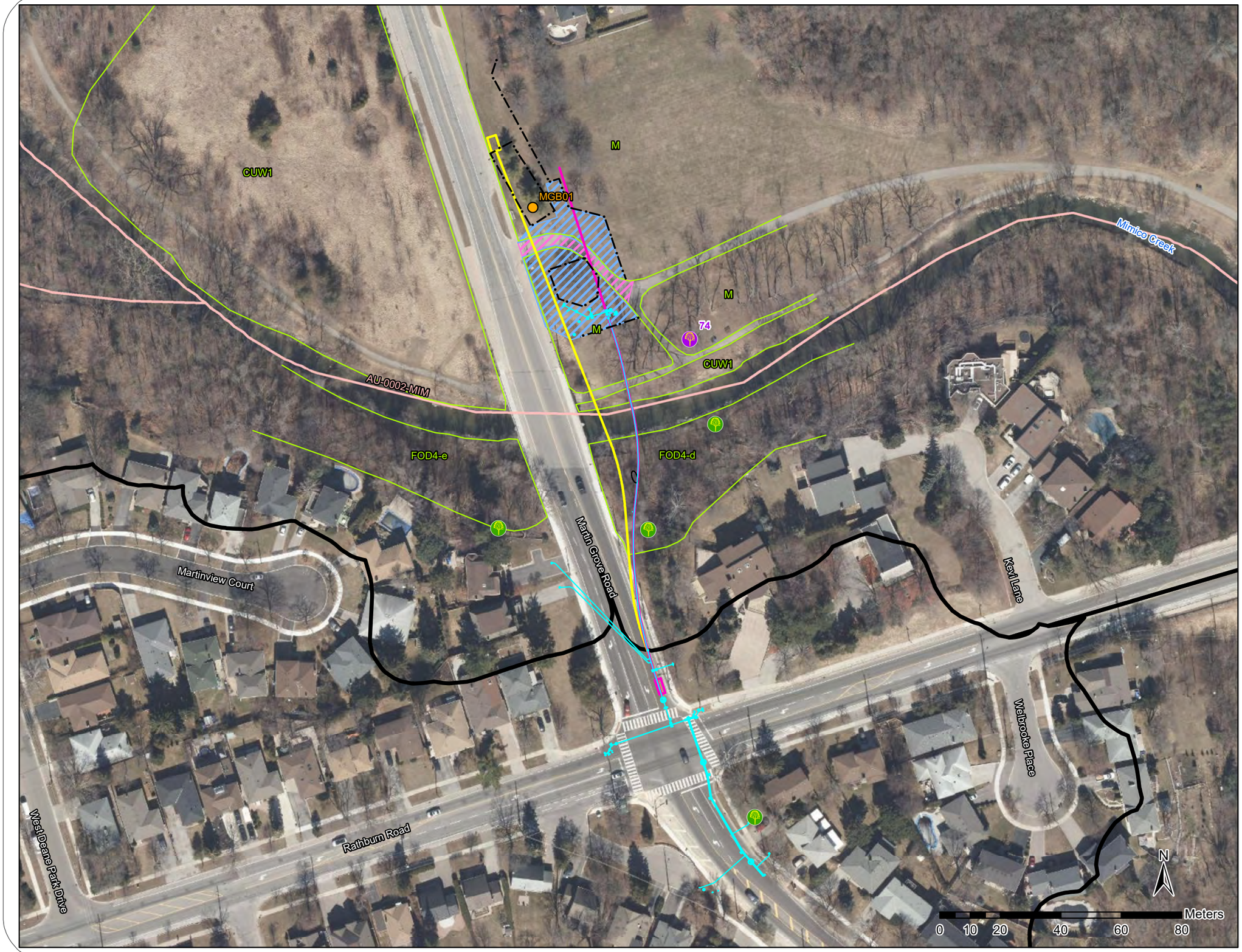
*Butternut categories are preliminary, unvetted by MECP

PM6A2
Martin Grove Road
Existing Conditions

LGL LIMITED
environmental research associates

Project	TA9027-24	**Figure**	3
Date	April 2021	**Prepared By:**	KC
Scale	1:2,500	**Verified By:**	JCN

Figure 3a Existing Conditions Details



LEGEND

- Breeding Bird Point Station

Butternut (*Juglans cinerea*)

- Retainable*
- Non-retainable*
- Hybrid*
- ELC Communities Boundary

FOD4-d Dry-Fresh Norway Maple Deciduous Forest
FOD4-e Dry-Fresh Exotic Deciduous Forest
CUW1 Mineral Cultural Woodland
M Manicured

- Ravine and Natural Feature Protection Area

Aquatic Resources Area Summary (LIO)
Thermal Regime

- Warm

Proposed Design

- Option 2
- Option 4
- Proposed Watermain and Water Service
- Tree Protection Fence
- Test Pit
- Access Road
- Staging Area

*Butternut categories are preliminary, unvetted by MECP

PM6A2
Martin Grove Road
Existing Conditions

LGL LIMITED
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Project	TA9027-24	**Figure**	3a
Date	April 2021	**Prepared By:**	KC
Scale	1:1,200	**Verified By:**	JCN

3.2.1 Flora

A total of 61 vascular plant taxa were observed within the Martin Grove Road study area as shown in **Appendix B**. One of these plants was identified only to genus due to it not being in flower during the field visit and is excluded from further analysis. Twenty-Nine (29) of the total plants which represents 48% of the total flora are considered introduced and non-native to Ontario. These are found throughout the study area as all communities have various degrees of disturbance and are the result of disturbance. Six species of TRCA conservation concern were observed within the study area (**Table 2**). Three species were planted as part of restoring a portion of the park. One species, Creeping Partridge -berry, is an ornamental escape.

Table 2 Locally Significant Species Identified by LGL within the Martin Grove Study Area.

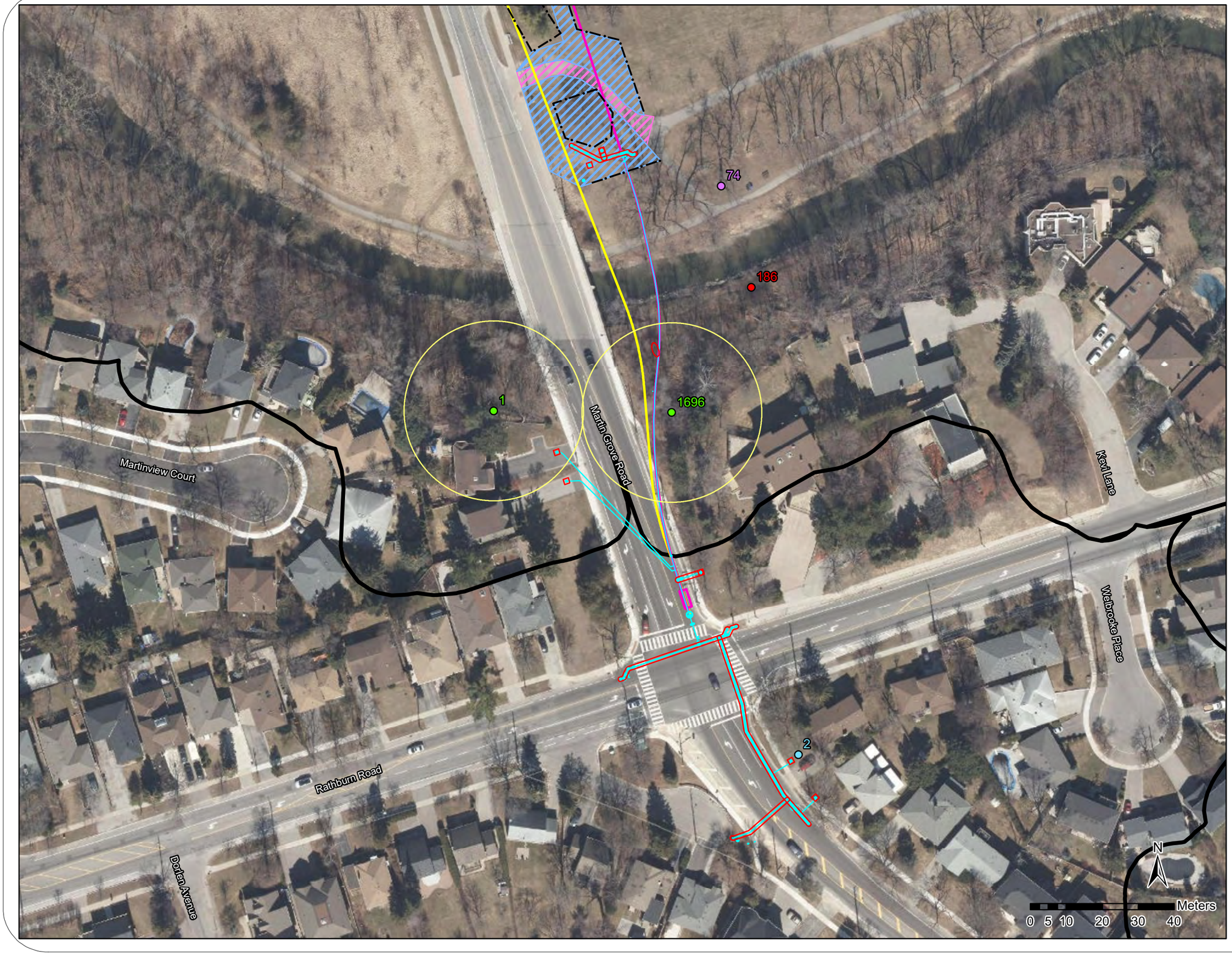
Scientific Name	Common Name	ESA (COSSARO)	SARA (COSEWIC)	TRCA Local Status	ELC Communities			Comments
					CUW1	FOD4-d	FOD4-e	
Quercus alba	white oak			L2	x			Planted in CUW
Juglans cinerea	butternut	END	END	L3		x	x	On slopes both sides of Martin Grove Road and in the Park
Osmorhiza claytonii	woolly sweet-cicely			L3	x		x	
Mitchella repens	creeping partridge-berry			L3			x	Encroaching into community from adjacent residential flower bed.
Thuja occidentalis	eastern white cedar			L4	x			Planted in CUW
Quercus rubra	red oak			L4	x	x		Planted in CUW

(status legend can be found in **Appendix B** Vascular Plant List).

3.2.2 Vegetation Species at Risk

Butternut (*Juglans cinerea*) a species regulated by the Endangered Species Act, 2007 was observed in a few locations throughout the study area. A health assessment was conducted by LGL's Certified Butternut Health Assessor on these trees. Of the five trees all but one are considered healthy and retainable. Documentation is being prepared to be sent to MECP for review. Locations of the trees are in shown in **Figure 4.** One of the trees are planted amenity tree within a front yard and not considered protected under the ESA (tree 2). Tissue samples were collected for two of the trees (74/2309 and 1696/2292 both occur on the east side of Martin Grove) to determine if the trees are true Butternut. Preliminary review of the twigs characteristics suggested that tree 74/2309 is a hybrid based on leaf scar and pith colour which are indicative of a hybrid tree, and this was confirmed with the genetic test (see **Figure 4**for location). Tree 1696/2292 has a flat leaf scar and a dark pitch that characteristic of a true Butternut. Genetic testing confirmed this tree is a true Butternut.

Figure 4 -Butternut Health Assessment



LEGEND

Butternut (*Juglans cinerea*)

- Category 1 (non-retainable)
- Category (retainable)
- Cultivated butternut not protected by the Endangered Species Act, 2007
- Hybrid
- 25m Setback from Retainable Butternut
- Ravine and Natural Feature Protection Area

Proposed Design

- Option 2
- Option 4
- Proposed Watermain and Water Service
- Tree Protection Fence
- Test Pit
- Access Road
- Staging Area
- Construction Impact Footprint

PM6A2
Martin Grove Road
Butternut Health Assessment

LGL LIMITED
environmental research associates

Project	TA9027-24	**Figure**	4
Date	April 2021	**Prepared By:**	KC
Scale	1:1,000	**Verified By:**	JCN

Table 3 Butternut Health Assessment Results.

Tree Number	Ownership	Characteristics	Next Steps
1	Private	True Butternut	Get permission from landowner to submit BHA to MECP
2	Private	Planted amenity tree, not protected under the ESA	Get permission from landowner to submit BHA to MECP
74	TRCA	Hybrid, confirmed with genetic analysis, not protected under the ESA	Get permission from TRCA to submit BHA to MECP
1696	City of Toronto	True Butternut, confirmed with genetic analysis	Get permission from City to submit BHA to MECP
186	City of Toronto	True Butternut, affected by canker, Category 1, not protected under the ESA	Get permission from City to submit BHA to MECP

At this time, the next steps to address the Butternut and Endangered Species Act requirements will be to submit the Butternut Health Assessment and project details to the MECP to determine if a permit is required.

3.3 AQUATIC HABITAT

They study area lies within the Mimico Creek watershed. The Mimico Creek Watershed is a completely urbanized watershed within the TRCA jurisdiction. Over 60% of the channels are artificially channelized. The watershed originates on the south slope of the Oak Ridges Moraine and along with the Etobicoke Creek watershed totals approximately 28, 860 hectares (TRCA 2006).

Information obtained through the Land Information Ontario database indicates the Mimico Creek reach through the project area, supports a warmwater thermal regime. Natural riparian buffers within the lower reaches of the creek are fairly wide, considering the urban surroundings, and extend more than 60m wide from the creek in many areas.

Mimico Creek supports warmwater habitat, based on thermal regime (water temperature) as identified in the Aquatic Resource Area (ARA) information, within the LIO database. A fish inventory list for this ARA (AU-0002-MIM), which covers the middle reach of Mimico Creek is listed in **Table 4**.

The ARA list above outlines 11 possible species inhabiting these reaches of Mimico Creek. The majority of these species are warmwater or coolwater baitfish species that are tolerant to moderately tolerant (Eakins 2016). The anticipated construction timing window from Mimico Creek is July 1- March 31, when work in or near a stream can be conducted with reduced risk to warmwater fish and fish habitat.

At the Martin Grove Road bridge crossing, Mimico Creek is approximately 10m wetted width. Habitat is all runs, with no riffles in this section. Both banks are armoured in sections and entirely beneath the bridge. Substrates in the creek are an equal mix of rubble and fines. Bank erosion and undercutting is present. Depth is estimated at 1m. Flow was moderate and water was clear. No fish were observed but are considered present in this reach. Bank erosion and slumping, and failed armouring, is evident in many areas along Mimico Creek. The aquatic habitat of Mimico Creek will be avoided through the proposed

trenchless crossing (horizontal directional drilling or HDD) of infrastructure, so impacts to the aquatic habitat will be avoided.

Table 4:Fish Species documented in Mimico Creek.

Common Name	Scientific Name	Thermal Regime[1]	Tolerance[1]	TRCA station MM001WM (Islington Golf Club) July 13, 2011	TRCA station MW002WM (north of Lakeshore Blvd. West June 14, 2011	General Species List (LIO Database)
Brook Stickleback	*Culaea inconstans*	coolwater	intermediate	1		x
Western Blacknose Dace	*Rhinichthys obtusus*	coolwater	intermediate			x
Bluntnose Minnow	*Pimephales notatus*	warmwater	intermediate	2		x
Common Shiner	*Luxilus cornutus*	coolwater	intermediate, but tolerant of turbidity			x
Creek Chub	*Semotilus atromaculatus*	coolwater	intermediate	51	1	x
Fathead Minnow	*Pimephales promelas*	warmwater	tolerant, but moderately tolerant of turbidity	5		x
Goldfish*	*Carassius auratus*	warmwater	tolerant			x
Longnose Dace	*Rhinichthys cataractae*	coolwater	intermediate			x
River Chub	*Nocomis micropogon*	coolwater	intermediate			x
Sand Shiner	*Notropis stramineus*	warmwater	intermediate			x
White Sucker	*Catostomus commersonii*	coolwater	tolerant, but moderately tolerant of turbidity	1		x

[1] As documented in the Ontario Freshwater Fishes Life History Database. General reference to tolerance of turbidity, siltation, pollution, higher temperatures and DO fluctuations, (Eakins, R. J. 2014).
* invasive species

3.3.1 Aquatic Species at Risk

No aquatics species at risk is shown on the Fisheries and Oceans Canada Aquatics Species at Risk mapping. No other aquatic SAR were identified through background review or noted through field investigations.

3.4 WILDLIFE HABITAT AND COMMUNITIES

Field investigations were conducted to document wildlife and wildlife habitat and to characterize the nature, extent and significance of wildlife usage within the study area in June, July and November of 2020 (see **Table 4**). Wildlife investigations were focused within and adjacent to the Mimico Creek where it crosses and passes close to Martin Grove Road in Etobicoke, Ontario. Direct observations, calls and tracks were used to record wildlife present within the study area as well as a breeding bird survey. A summary of survey date(s), tasks, weather and personnel for each visit is presented in **Table 5**. The methodology and results of these surveys are described in the following sections. Site photos are provided in **Appendix E**.

Table 5 Summary of Date of Inventory, Task, Weather and Personnel.

Date of Inventory	Task	Weather	LGL Personnel
June 29, 2020	Breeding Bird survey and incidental wildlife survey; wildlife habitat characterization	21.8-22.3°C, 0-5km/hr no clouds, no precipitation	Derek Morningstar
July 7, 2020	Breeding Bird survey and incidental wildlife survey; wildlife habitat characterization	18-19°C, calm wind, clear sky, no precipitation	Derek Morningstar
Nov 4, 2020	Wildlife habitat characterization	15C, clear, sunny, no precipitation	Allison Featherstone

3.4.1 Breeding Birds

3.4.1.1 Methods

Many bird species are known to use the habitat along the Mimico Creek, including both natural and anthropogenic habitat. Breeding bird surveys were conducted on two dates during the 2020 breeding bird season to document breeding bird evidence (BBE) and to characterize the nature, extent and significance of breeding bird usage of the habitats within the study area. This supplemented information is provided by the TRCA for bird records in the area. In all habitat types, survey methodology and breeding bird behaviours used as evidence of breeding success were categorized according to the Ontario Breeding Bird Atlas (Cadman et al., 2007). Locations of the two breeding bird point count stations are shown in **Figures 3 and 3a** .

3.4.1.2 Results

The study area contained a relatively low number of breeding bird species representing several habitat types. A summary of the bird species, species ranks, breeding evidence, and station locations are presented in **Table 2**. The low species diversity may be attributable in part to the ongoing construction in Ravenscrest Park and repairs to the bridge at the Mimico Creek crossing at Rathburn Road.

Twenty-four bird species were observed during the Breeding Bird Surveys along with TRCA records, with varying evidence of breeding success across the study area (see **Appendix C**). Of these 24 species, breeding evidence was confirmed for three species, probable for six species, possible for seven species and six

species were observed with no indication of breeding, outside of the BBS stations or on the TRCA species list only (see **Table 2**). Confirmed breeding was confirmed for Mallard based on the observation of a female with young swimming in the Mimico Creek. Species which were most commonly encountered across the Study area were generally species associated with highly disturbed habitat types.

Of particular interest, there was a nesting Barn Swallow at the Rathburn bridge over the Mimico Creek, despite ongoing repair work. An Eastern Phoebe was also nesting under the bridge of Martin Grove Road and a female Mallard was observed with young in the Mimico Creek. Common Nighthawk is a Special Concern species that nests on open clearings and rooftops. One was observed flying over the study area at the Rathburn Bridge, but the nesting location could not be identified. No buildings will be affected by project activities and areas of open gravel are not present.

3.4.2 Other Wildlife

During the breeding bird and fall surveys, evidence of non-avian wildlife, wildlife sign and habitat were also recorded. The following species were observed:

- Grey Squirrel (*Sciurus carolinensis*);
- Eastern Cottontail (*Sylvilagus floridanus*);
- Striped Skunk (*Mephitis mephitis*); and,
- American Toad (*Anaxyrus americanus*, TRCA record).

Although only 4 species were observed, the Mimico Creek likely functions as a movement corridor for many wildlife such as Raccoon (*Procyon lotor*), White-tailed Deer (*Odocoileus virginianus*) and Coyote (*Canis latrans*). There are no wetlands with potential amphibian breeding pools within the study area, so anuran call counts were not completed. Some amphibians (such as American Toad) may use overflow pools or move through the area, but it is unlikely that they breed within the Mimico Creek itself because of the presence of predatory fish.

3.4.3 Wildlife Habitat

The study area falls within the Ecoregion 7E-4, for which 35 habitat types within five categories are considered significant in the Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 7E (OMNRF, 2015). The criteria schedules provide characteristics of a habitat to be considered candidate SWH and then indicator species or conditions that are determined in an evaluation of significance if potential impacts cannot be mitigated.

Of the category Seasonal Concentration Areas of Animals, there is the potential for candidate Waterfowl Stopover and Staging Areas (Aquatic) which is the Mimico Creek itself, where waterfowl may seek refuge during migration and some parts of the winter. This is a flowing creek but very shallow, and is unlikely to provide significant aquatic habitat accessible to waterfowl in the winter. The habitat will not be directly impacted by the proposed development, so was not evaluated for significance in the appropriate season. Candidate Bat Hibernacula habitat may exist in the stormwater management tunnels which drain into the Mimico Creek. The habitat will not be directly impacted by the proposed development, so was not evaluated

for significance in the appropriate season. Candidate Bat Maternity Colonies habitat may exist in the woodlands along the Mimico Creek, but no cavity trees will be removed as part of the project therefore the density of cavity trees was not calculated to determine significance.

There were no candidate SWH in the category of Rare Vegetation Communities, Specialized Wildlife Habitat, Habitat of Species of Conservation Concern or Animal Movement Corridors identified in the study area.

3.4.4 Wildlife Species at Risk

No species at risk wildlife were observed in the vicinity of the project works by LGL during our field investigations. SAR were only observed outside the area. We did not the potential for SAR and SAR wildlife habitat to occur in the project area specific to the potential for trees in the study area to support SAR bat roosting habitat. This is further discussed in the summary SAR Screening in Section 3.5.

3.5 SPECIES AT RISK SCREENING

Protection for species in Ontario is provided through the Endangered Species Act (ESA). That protection is afforded to species that have been listed as Endangered (END) or Threatened (THR) on the Species at Risk in Ontario (SARO) list, as designated by the Committee on the Status of Species at Risk in Ontario (COSSARO). Species listed as Special Concern (SC) are not afforded protection on the ESA, but are considered to be at risk to become endangered if there is further decline of the species. The federal Species at Risk Act (SARA) generally applies on federal land, for federal projects or on projects where Environment and Climate Change Canada (ECCC) is of the opinion that protection has not been sufficiently provided by the province for a particular species. When the responsibility for SAR was transitioned from the Ministry of Natural Resources and Forestry (MNRF) to the Ministry of Environment, Conservation and Parks (MECP), there was a change in direction for information and permitting requests and the process is still being resolved. Current direction is to rely on available online resources for screening purposes and to contact the MECP later in the process of a project when potential impacts to SAR are better known. Therefore, an information request was not submitted to the MECP for this project.

3.5.1.1 Methods

LGL conducted a desktop-based review of natural heritage constraints for the study area. The databases reviewed to determine these constraints include the following:

- Land Information Ontario (LIO) (natural areas and species);
- Toronto and Region Conservation Authority (TRCA) flora and fauna records;
- Atlas of the Mammals of Ontario;
- Bat Conservation International Species Profiles;
- Atlas of the Breeding Birds of Ontario;
- eBird;
- iNaturalist;

- Aquatic species at Risk Maps (Department of Fisheries and Oceans Canada);
- Butterfly Atlas of Ontario;
- Alvars of Ontario;
- Tallgrass Ontario (Simcoe Lowlands Physiographic region);
- The Vascular Plants of Ontario (Oldham and Brinker, 2009); and,
- Vascular Plants at Risk in Ontario (Leslie, 2018).

A table of the SAR that could occur in the area was developed, in which a ranking was determined for each species on whether it had a low, moderate, high or confirmed potential to occur in the study area based on desktop resources and field surveys completed.

3.5.2 Results

Through a review of the species atlases, NHIC and online resources and field surveys, 23 species were identified as END, THR and SC that require review for potential habitat or species to occur in the study area. Of these, 14 species are listed as END or THR and 8 of these had moderate, high or confirmed potential to occur in the study area. **Appendix D** provides the detailed table summary of the rational for the Species at Risk screening that was undertaken. It provides a habitat description for each of these species. Although SAR may occur in the study area, the potential for a contravention to the Act depends on project construction details which are discussed in the Impact Assessment. Where species have been identified through the matrix evaluation in **Appendix D**, they are further discussed below.

3.5.2.1 Barn Swallow

Barn Swallow (*Hirundo rustica*) occurs frequently in Southern Ontario, using anthropogenic structures such as buildings, bridges and culverts. During the breeding bird surveys it was not identified within the Mimico Creek under Martin Grove Road, but it was identified in the bridge where Mimico Creek passes under Rathburn Road, east of the study area. This species was still nesting under the bridge despite ongoing repair work being done on the bridge. If the work is to be conducted during the breeding bird season, it is recommended that the Martin Grove bridge be inspected again for nests of this species. If the breeding bird season is avoided, we do not anticipate any direct impact to this species or its habitat.

3.5.2.2 Chimney Swift

Chimney Swift (*Chaetura pelagica*) almost entirely uses anthropogenic structures for nesting now, typically chimneys on houses and industrial buildings. There are several houses within the study area, of which some of them have brick chimneys. It was not possible to visually determine if any of these chimneys had unobstructed access (no cage or cover) to be suitable for nesting. Crepuscular surveys were not completed for this project, but we do not anticipate any direct impacts to any chimney structures.

3.5.2.3 Eastern Small-footed Myotis

Eastern Small-footed Myotis (*Myotis leibii*) is a saxicolous (rock-loving) species which typically roosts in rock piles, talus, cliff crevices and similar structure in the summer. There are rock piles along the Mimico Creek, but these are likely flooded regularly and therefore not suitable for this species to roost. The species hibernates in the winter in underground features such as caves, mines, crevices and tunnels including those built by humans. There are underground stormwater management tunnels which discharge into Mimico Creek, one of which is daylights within the study area. However, we do not anticipate any direct impact to this tunnel or disturbance.

3.5.2.4 Little Brown Myotis

Little Brown Myotis (*M. lucifugus*) will frequently use buildings, including houses that people currently live in, of which there are several in the study area, but we do not anticipate any direct impact to buildings. They will also use large trees with cavities, cracks or exfoliating bark for maternity roosts, many of which occur along the Mimico Creek.

The species hibernates in the winter in underground features such as caves, mines, crevices and tunnels including those built by humans. There are underground stormwater management tunnels which discharge into Mimico Creek, one of which is daylights within the study area. However, we do not anticipate any direct impact to this tunnel or disturbance. Impacted trees are anticipated to be open amenity trees on manicured lawn and none removed associated with Mimico Creek. Timing windows for vegetation removals should be considered if park trees proposed for removals have cavities, given the proximity to the natural features. Tree clearing timing windows for bats extends from May to October.

3.5.2.5 Northern Myotis

Northern Myotis (*M. septentrionalis*) roosts within trees in the forest with cavities, cracks or exfoliating bark for maternity roosts, many of which occur along the Mimico Creek. Through the tree inventory, none of the trees to be removed had visible cavities, cracks or exfoliating bark that would be suitable for this species. The species hibernates in the winter in underground features such as caves, mines, crevices and tunnels including those built by humans. There are underground stormwater management tunnels which discharge into Mimico Creek, one of which is daylights within the study area. However, we do not anticipate any direct impact to this tunnel or disturbance. Timing windows for vegetation removals should be considered if park trees proposed for removals have cavities, given the proximity to the natural features. Tree clearing timing windows for bats extends from May to October.

3.5.2.6 Tri-coloured Bat

Tri-coloured Bat (*Perimyotis subflavus*) roosts within squirrel nests, leaf clumps and hanging moss in trees with a particular affinity to water features, which occur along the Mimico Creek. Through the tree inventory, none of the trees to be removed had visible leaf clumps or squirrel nests that would be suitable for this species. The species hibernates in the winter in underground features such as caves, mines, crevices and tunnels including those built by humans. There are underground stormwater management tunnels which discharge into Mimico Creek, one of which is daylights within the study area. However, we do not anticipate

any direct impact to this tunnel or disturbance. Timing windows for vegetation removals should be considered if park trees proposed for removals have cavities, given the proximity to the natural features. Tree clearing timing windows for bats extends from May to October.

3.5.2.7 Bashful Bulrush

Bashful Bulrush (*Trichophorum planifolium*) is a member of the sedge family that tends to grow in deciduous woodlands with limited shrubby understory. It was not documented during LGL surveys. Forest communities will be avoided through tunnelling under Mimico Creek.

3.5.2.8 Butternut

Butternut was confirmed in the study area, along the riparian corridor of Mimico Creek. Evidence of some Butternut records were found during background review. LGL updated information for all Butternut located on site in the study area that were observed. LGL completed a Butternut Health Assessment (BHA) which will be provided under separate cover.

The results of the BHA indicated the presence of three trees regulated under the ESA in the study area, with a habitat protection zone of 25m considered. Further steps will be determined in consultation with the MECP, if required.

3.5.2.9 Dense Blazing Star

Dense Blazing Star (*Liatris spicata*) is species of perennial wildflower of moist prairies, savannahs and wet areas between dunes. It was not observed by LGL in the field. No habitat of this type will be impacted by the proposed watermain.

4.0 IMPACT ASSESSMENT AND MITIGATION RECOMMENDATIONS

The proposed project undertaking involves the installation of a new watermain and completion of the associated tie ins and connections at various locations. In the north end of the study area, a proposed drill pit location is required on the east side of Martin Grove Road within the park land on the east side of the road. Tie-in locations are also noted. The potential for tree impacts has been noted in all locations and will be addressed through the Arborist Assessment for the preferred alternative, under separate cover. It is further noted that the access and staging locations are not defined in this location and that future access should consider the avoidance of tree protection zones in this location.

4.1 ALTERNATIVES

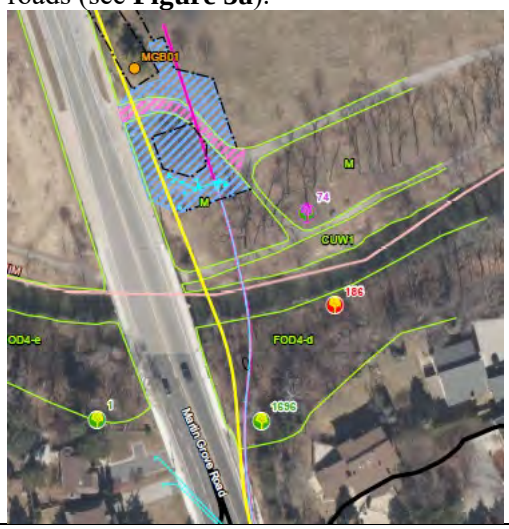
Two options for crossing Mimico Creek are proposed. Option 1 is just north of Martin Grove Road Bridge, with Option 4 further north (see **Figures 3 and 3a**). Both options have the same exitdrill pit location on Martin Grove Road. Entry drill pits will be within the Ravenscrest Park property. **Table 7** below is a summary of the project activities.

Both options are very similar in potential impacts to natural heritage features (**Table 6**), therefore from a natural heritage perspective they are the same.

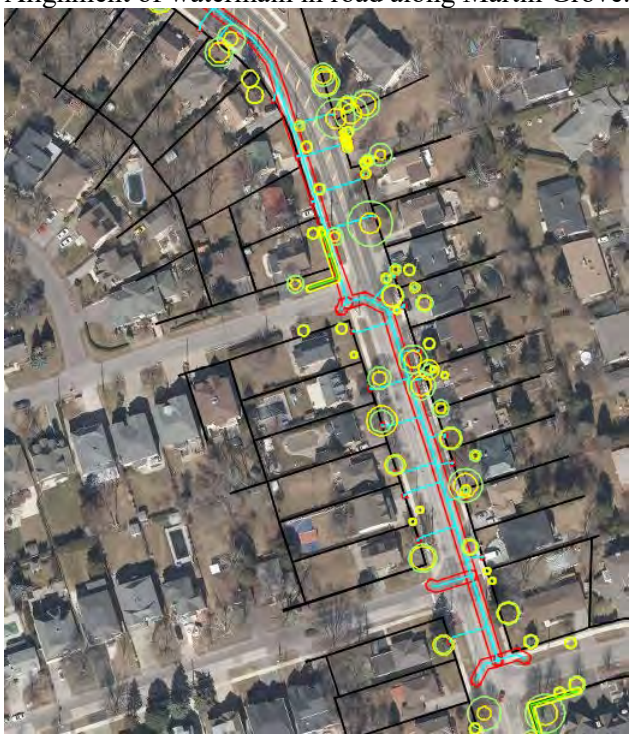
Table 6 Outline of Potential Impacts for Both Options.

Options	2	4
Vegetation Impacts	Few impacts anticipated as construction in a park setting. Some tree removals required.	Few impacts anticipated as construction in a park setting. Some tree removals required.
Wildlife Impacts	Few impacts to wildlife anticipated with appropriate mitigation	Few impacts to wildlife anticipated with appropriate mitigation
Aquatic Impacts	Little to no impacts anticipated as crossing of Mimico Creek to be completed via tunneling	Little to no impacts anticipated as crossing of Mimico Creek to be completed via tunneling
Species at Risk Impacts	Butternut north of the alignment, greater distance than Option 4.	Butternut just north of the alignment, closer than Option 2.

Table 7 Project Description Activity Summary Overview.

Location Description	Proposed Works	Recommendations
Ravenscrest Park	Ravenscrest park will be the location of the launch pit, tie in locations, and construction area and access roads (see **Figure 3a**). 	Confirm access and staging areas; Avoid Tree Protection Zone (TPZ); Avoiding aquatic habitat impacts through trenchless technology (HDD); Ensure ESC measures in place to avoid indirect impacts to aquatic habitat; Restoration at completion of works to existing conditions or better.

Location Description	Proposed Works	Recommendations
Intersection of Martin Grove Road and Rathburn Road	Exit pit at Martin Grove Road just east of Rathburn Road for both Option 2 and 4.	Exit pit roadside on Martin Grove Road approximately 70m south of the watercourse banks; Ensure site access avoids TPZ where feasible.
Approximately 200m south of Rathburn	Alignment of watermain in road Martin Grove. 	Potential impacts to street amenity trees; Recommendations to be provided through the Arborist Report under separate cover.
Approximately 200m to 400m south of Rathburn	Alignment of watermain in road along Martin Grove. 	Watermain is away from the east side of the road, avoiding impacts to the Mimico Creek corridor; Recommendations to be provided through the Arborist Report under separate cover.

Location Description	Proposed Works	Recommendations
400m to 600m south of Rathburn	Alignment of watermain in road along Martin Grove. 	Potential impacts to street amenity trees; Recommendations to be provided through the Arborist Report under separate cover.

4.2 VEGETATION AND VEGETATION COMMUNITIES

The proposed drill pit locations in the Ravenscrest Park area are within areas of open manicured lawns and manicured trees and avoids the vegetation communities that comprise the Mimico Creek corridor. Notwithstanding, amenity trees are integral to the park setting and warrant consideration for protection. Mitigation recommendations for tree protection will be confirmed through the Arborist Assessment. **Table 8** outlines the potential impacts, proposed mitigation, and monitoring recommendations for vegetation communities in the project area.

Table 8 Impacts, Mitigation and Monitoring Recommendations for Vegetation Communities.

Impacts	Mitigation	Monitoring
Potential soil contamination by oils, gasoline, grease and other materials from construction equipment, materials storage and handling.	-Ensure machinery is maintained and free of fluid leaks. -Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled at least 30 m away from natural features and give consideration to locating these types of facilities outside of the floodplain. -Vehicle refuelling and maintenance should be done on spill collection pads. -Develop a spill response plan and train staff on associated procedures. -Maintain emergency spill kits on site. -Control soil contamination through best management practices. -Dispose of any chemical waste materials generated from construction activities through authorized and approved off-site vendors.	-Conduct daily inspections of construction equipment for leaks/spills. -Implement contingency measures in the event of a spill. Contingency Measures: -In the event of a spill, immediately stop all work until the spill is cleaned up; -Notify MOECC's Spills Action Centre of any leaks or spills; -Assess and remediate affected soils and water by using spill kit kept on site; and, -Monitor daily to ensure proper clean-up is completed.
Vegetation Removal	-Minimize vegetation removal to the extent feasible; -Re-vegetate and restore disturbed areas immediately after construction to return to pre-construction condition. -Tree and vegetation removal are subject to the **Ravine and Natural Feature Protection By-law** and as such restoration plans should include the use of native plant species in order to improve vegetation quality of the area. Tree compensation and restoration plans will be addressed in arborist report.	-Provide construction monitoring on site by an independent environmental monitor to ensure that demarcation fencing is in place prior to construction and functioning effectively during.
Tree Removal	-Seek to minimize tree removals to the extent feasible; -Implement the tree preservation plan. -Tree protection fencing should comply with the *City of Toronto's Tree protection Policy and Specification for Construction near Trees (June 2013).* -Ash is a regulated species in the City of Toronto and care should be taken when removing and disposing of these trees. Consult the Canadian Food Inspection Agency and Toronto Urban Forestry for the appropriate protocol for their disposal. -Standing dead trees can be topped but left standing at approximately 6 to 10 metres height and standing dead wood is a wildlife resource. - Root compaction mitigation will be employed for some noteworthy trees (i.e. native specimens, trees supporting potential SAR bat maternal roosting habitat), that will be encroached by the construction disturbance area. This mitigation will be outlined further in the arborist report.	-Provide construction monitoring on site by an independent environmental monitor to ensure that tree protection fencing is in place prior to construction and functioning effectively during.

Impacts	Mitigation	Monitoring
Accidental damage to adjacent vegetation communities and associated wildlife habitat due to unintentional vehicle intrusions.	-Clearly delineate work area using erosion fencing, or similar barrier, to avoid accidental damage to potentially significant wildlife habitat. -Damaged tree roots should be cut clean as soon as possible and exposed roots covered in approved topsoil. This work to be carried out under supervision of a qualified tree professional (Arborist or Forester).	-Provide construction monitoring on site by an independent environmental monitor to ensure that demarcation fencing is in place and functioning effectively.

4.3 WILDLIFE HABITAT AND COMMUNITIES

No sensitive wildlife functions or habitat are identified in the proposed drill pit location footprint. As a result, potential impacts are more likely to be the potential for disturbance or incidental take. **Table 9** outlines the potential impacts, proposed mitigation, and monitoring recommendations for wildlife and habitat in the project area.

Disturbance can be minimized through minimizing the construction footprint in the park area.

Vegetation clearing, including amenity trees ensure compliance with the Migratory Birds Convention Act, whereby vegetation clearing should avoid the breeding bird window April to August. Disturbance and incidental take can be avoided through the delineation of the project area with fencing that serves to isolate construction activities from the park land.

Through the updated Arborist Assessment in the next project steps, if any cavity trees are noted for removal, considering for vegetation timing windows for the protection of bats should be applied – where vegetation removals are avoided May to October.

Table 9 Impacts, Mitigation and Monitoring Recommendations for Wildlife Habitat and Communities.

Impact	Mitigation	Monitoring
Removal of natural or semi-natural/cultural vegetation with the potential to provide wildlife habitat.	-Vegetation removal is generally limited to areas of low sensitivity -Minimize tree removals of 25cm (DBH) or greater trees to the extent possible, in order to protect potential bat maternity roosting trees. -Ensure rehabilitation of vegetation post activity to pre-disturbance condition or better. -Ensure that erosion control blankets used in the area for soil stabilization contain a jute backing, which degrades and less prone to trapping wildlife.	Provide construction monitoring on site by an independent environmental monitor efficacy of protection measures.

Impact	Mitigation	Monitoring
Sediment entrainment or entrainment of drilling fluids and other deleterious substances into adjacent areas functioning as habitat for local and resident wildlife.	-Limit duration of exposed soils and stabilize immediately upon completion.	Periodic inspection and maintenance of erosion and sediment control fencing structures will be included as part of the Sediment and Erosion Control Plan for this project.
Accidental damage to adjacent vegetation communities and associated wildlife habitat due to unintentional vehicle intrusions.	-Clearly delineate work area using fencing or flagging, to avoid accidental damage to adjacent vegetation and wildlife habitat.	Provide construction monitoring on site by an independent environmental monitor to ensure that demarcation is in place and functioning effectively.
Disturbance (due to equipment operation, workers presence, drilling noise, etc.) to forest and plantation communities functioning as habitat for local and resident wildlife.	-Time project works related to vegetation clearing and in proximity to natural features outside of the breeding bird season (**Apr 1 to Aug 31**), and outside of sensitive timing windows for Bat Maternity Roosting (**May - Oct**) and during a period when wildlife is less active generally (**November – March**).	Ensure availability of an environmental monitor in the event of animal-construction conflicts.

4.4 AQUATIC HABITAT

No direct impact to aquatic habitat is anticipated as the proposed construction methodology to install the watermain across Mimico Creek is via trenchless technology (HDD) for both options. Drill pit locations/tie-in locations are proposed at 30m or more from the watercourse edge.

A contingency plan should be developed in the event that the horizontal directional drilling causes any release of substances to the creek, such as a frac out.

The potential for indirect impacts or the release of deleterious substances that may enter aquatic habitat can be managed through the development of an erosion and sediment control plan.

At this time, a Fisheries Act authorization or screening is not considered required given the avoidance of aquatic habitat through trenchless technologies (HDD).

General mitigation measures proposed for aquatic habitat protection include:

- Isolation of construction area;
- Timing of effective ESC measures, where ESCs shall be installed before starting work to prevent the entry of sediment into the watercourse or adjacent areas. Inspect regularly during the course of construction and conduct regular maintenance and repairs as necessary;
- Clearly identified stockpiling and staging areas;
- A plan to dispose of any water accumulated onsite from dewatering or pooled stormwater;

- Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled off-site, and outside of the wellhead protection area; and,
- Ensure that a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is always on-site for implementation in event of an accidental spill during construction. An emergency spill kit shall be kept on site. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.\

4.5 PERMITTING

The following table (**Table 10**) summarizes the permitting and approvals that may be required for this project.

Table 10 Summary of Potential Environmental Permits or Approvals Required.

Legislation	Plan/Regulation/ By-law	Permit/Approval/Authorization	Permit or Approval Required
Fisheries Act		Harmful, Alteration, Disruption, Destruction (HADD). DFO review	Not required as tunneling technology will be employed for creek crossing
Migratory Birds Convention Act	n/a	Not identified.	Not required with appropriate mitigation
Species at Risk Act	n/a	SARA permit	Not required
Ontario Water Resources Act	Permit to Take Water (PTTW)	PTTW required for construction dewatering > 400,000L/day (see below).	Not anticipated, to be confirmed by project hydrogeologist
Environmental Protection Act	Regulation 63/16 Registrations under Part II of the Act- Water Taking	Environmental Activity and Sector Registration EASR (Water taking for Construction Site Dewatering) required for groundwater taking between 50,000- 400,000 Litres on a single day under normal operation.	Potentially required
Conservation Authorities Act	Ontario Regulation (TRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (O.Reg. 166/06).	For project works within a regulated area, a permit under O.Reg 166/06 will be required.	Required
Endangered Species Act	Several Regulations exist.	Ministry of the Environment, Conservation and Parks (MECP) administers the Endangered Species Act, 2007 (ESA) in Ontario. Activities that require harm to a species at risk or its habitat may be permitted through Ontario Regulation 242/08 Section 23.18 that is issued under Section 17(2) of the ESA	Follow up regarding Butternut trees required with MECP in the form of a Butternut Health Assessment submission.

5.0 SUMMARY/CONCLUSION

This report provides a scoped assessment of the environmental impacts associated with the proposed watermain along Martin Grove Road. Given that the features associated with the Mimico Creek corridor are avoided, impacts to natural heritage features are considered to be minimal and limited to the potential for indirect impacts. The impacts can be mitigated through measures outlined herein.

The next steps for this project will be for the finalization of the Arborist Assessment to address tree impacts once details are known for access and staging in Ravenscrest Park.

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Appendix A TRCA Background Data Summary

Appendix A Table 1: Summary of TRCA Flora Background Data

Scientific Name	Common Name	Species Code	TRCA Code
Juglans cinerea	**butternut**	JUGCINE	L3
Carya ovata	shagbark hickory	CAROVAT	L3
Picea glauca	white spruce	PICGLAU	L3
Geranium maculatum	wild geranium	GERMACU	L4
Carya cordiformis	bitternut hickory	CARCORD	L4
Quercus rubra	red oak	QUERUBR	L4
Carex grisea	grey sedge	CARAMPH	L4
Quercus rubra	red oak	QUERUBR	L4
Abies balsamea	balsam fir	ABIBALS	L4
Tsuga canadensis	eastern hemlock	TSUCANA	L4
Pinus strobus	white pine	PINSTRO	L4
Quercus rubra	red oak	QUERUBR	L4
Cornus rugosa	round-leaved dogwood	CORRUGO	L4
Betula papyrifera	paper birch	BETPAPY	L4
Tsuga canadensis	eastern hemlock	TSUCANA	L4
Crataegus macracantha	long-spined hawthorn	CRAMACA	L4
Quercus rubra	red oak	QUERUBR	L4
Tsuga canadensis	eastern hemlock	TSUCANA	L4
Carya cordiformis	bitternut hickory	CARCORD	L4
Salix amygdaloides	peach-leaved willow	SALAMYG	L4
Lilium michiganense	Michigan lily	LILMICH	L4
Carya cordiformis	bitternut hickory	CARCORD	L4
Acer saccharinum	silver maple	ACESACI	L4
Pinus strobus	white pine	PINSTRO	L4
Thuja occidentalis	white cedar	THUOCCI	L4
Pinus strobus	white pine	PINSTRO	L4
Acer saccharinum	silver maple	ACESACI	L4
Diervilla lonicera	bush honeysuckle	DIELONI	L5
Cornus racemosa	grey dogwood	CORFOEM	L5
Apocynum androsaemifolium	spreading dogbane	APOANDR	L5
Diervilla lonicera	bush honeysuckle	DIELONI	L5
Calystegia sepium	hedge bindweed (sensu lato)	CALSEPI	L5
Cornus racemosa	grey dogwood	CORFOEM	L5

Appendix A Table 2: Summary of TRCA Fauna Background Data

Scientific Name	*Common Name*	*TRCA Code*
Dumetella carolinensis	*grey catbird*	*L4*
Tyrannus tyrannus	*eastern kingbird*	*L4*
Anaxyrus americanus	*American toad*	*L4*
Myiarchus crinitus	*great crested flycatcher*	*L4*
Pheucticus ludovicianus	*rose-breasted grosbeak*	*L4*
Tyrannus tyrannus	*eastern kingbird*	*L4*
Melospiza melodia	*song sparrow*	*L5*
Turdus migratorius	*American robin*	*L5*
Parus atricapillus	*black-capped chickadee*	*L5*
Parus atricapillus	*black-capped chickadee*	*L5*
Cyanocitta cristata	*blue jay*	*L5*
Vireo gilvus	*warbling vireo*	*L5*
Molothrus ater	*brown-headed cowbird*	*L5*

Appendix A Tables TRCA Status Ranks

Toronto and Region Conservation's (TRCA) Environmental Monitoring team has a unique approach to the protection of natural heritage within its regional watersheds. All flora and fauna species, as well as vegetation communities, are assigned a local rank from L1 to L5, based on ecological criteria collected by TRCA and other agencies.

L1 to L3 – Regional Species of Conservation Concern

L4 – Species and communities widespread regionally but are vulnerable to long term declines

L5 – Ranked species and communities are not of conservation concern at the present time.

bold = Species at Risk under Endangered Species Act, 2007 and/or Species at Risk Act

Appendix B Vascular Plant List

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status	ELC Communities		
								CUW1	FOD4-d	FOD4-e
	CUPRESSACEAE	**CEDAR FAMILY**								
	Thuja occidentalis	eastern white cedar	G5	S5			L4	x		
	RANUNCULACEAE	**BUTTERCUP FAMILY**								
	Anemone canadensis	Canada anemone	G5	S5			L5		x	
	PLATANACEAE	**PLANE-TREE FAMILY**								
*	*Platanus X acerifolia*	London plane-tree	GU	SE1				x		
	ULMACEAE	**ELM FAMILY**								
	Ulmus americana	white elm	G5?	S5			L5	x	x	
*	*Ulmus pumila*	Siberian elm	G?	SE3			L+	x	x	x
	MORACEAE	**MULBERRY FAMILY**								
*	*Morus alba*	white mulberry	G?	SE5			L+	x	x	x
	JUGLANDACEAE	**WALNUT FAMILY**								
	Juglans cinerea	butternut	G3G4	S3?	END	END	L3		x	x
	Juglans nigra	black walnut	G5	S4			L5	x	x	x
	FAGACEAE	**BEECH FAMILY**								
	Quercus alba	white oak	G5	S5			L2	x		
	Quercus bicolor	swamp white oak	G5	S4				x		
	Quercus rubra	red oak	G5	S5			L4	x	x	
	TILIACEAE	**LINDEN FAMILY**								
	Tilia americana	basswood	G5	S5			L5		x	
	CUCURBITACEAE	**GOURD FAMILY**								
	Echinocystis lobata	prickly cucumber	G5	S5			L5	x		x
	SALICACEAE	**WILLOW FAMILY**								
	Populus tremuloides	trembling aspen	G5	S5			L5		x	
*	*Salix X rubens*	reddish willow	HYB	SE4			L+			x
*	*Salix X sepulcralis*	hybrid willow	HYB	SE2			L+		x	
	BRASSICACEAE	**MUSTARD FAMILY**								
*	*Alliaria petiolata*	garlic mustard	G5	SE5			L+		x	x
*	*Hesperis matronalis*	dame's rocket	G4G5	SE5			L+		x	
	ROSACEAE	**ROSE FAMILY**								
	Geum aleppicum	yellow avens	G5	S5			L5		x	x
*	*Prunus avium*	sweet cherry	G?	SE4			L+		x	
*	*Prunus persica*	common peach	G5	SE1					x	
	Prunus virginiana var. virginiana	choke cherry	G5T?	S5			L5		x	x
*	*Rosa multiflora*	multiflora rose	G?	SE4			L+		x	
	Rubus occidentalis	thimble-berry	G5	S5			L5	x	x	
	FABACEAE	**PEA FAMILY**								
*	*Coronilla varia*	variable crown-vetch	G?	SE5			L+	x		
*	*Robinia pseudo-acacia*	black locust	G5	SE5			L+			x
*	*Trifolium hybridum ssp. elegans*	alsike clover		SE5			L+		x	
*	*Vicia cracca*	tufted vetch	G?	SE5			L+	x		
	LYTHRACEAE	**LOOSESTRIFE FAMILY**								
*	*Lythrum salicaria*	purple loosestrife	G5	SE5			L+	x		
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**								
	Circaea lutetiana ssp. canadensis	yellowish enchanter's nightshade	G5T5	S5			L5		x	
	CORNACEAE	**DOGWOOD FAMILY**								
	Cornus alternifolia	alternate-leaved dogwood	G5	S5			L5		x	
	Cornus sericea ssp. sericea	red-osier dogwood	G5	S5			L5		x	
	CELASTRACEAE	**STAFF-TREE FAMILY**								
*	*Euonymus europaea*	spindle tree	G?	SE2			L+		x	
	RHAMNACEAE	**BUCKTHORN FAMILY**								
*	*Rhamnus cathartica*	common buckthorn	G?	SE5			L+	x		x
	VITACEAE	**GRAPE FAMILY**								
	Parthenocissus quinquefolia	five-leaved Virginia-creeper	G5	S4?			L5		x	
	Vitis riparia	riverbank grape	G5	S5			L5	x	x	x
	ACERACEAE	**MAPLE FAMILY**								
	Acer negundo	Manitoba maple	G5	S5			L+?	x	x	x
*	*Acer platanoides*	Norway maple	G?	SE5			L+		x	x
	Acer saccharum var. saccharum	sugar maple	G5T?	S5			L5		x	
	ANACARDIACEAE	**SUMAC FAMILY**								

1) G-Rank Global Rank

Global ranks are assigned by a consensus of the network of Conservation Data Centres, scientific experts, and the Nature Conservatory to designate a rarity rank based on the range-wide status of a species, subspecies or variety.

The most important factors considered in assigning global ranks are the total number of known, extant sites world-wide, and the degree to which they are potentially or actively threatened with destruction. Other criteria the number of known populations considered to be securely protected, the size of the various populations, and the ability of the taxon to persist at its known sites. The taxonomic distinctness of each taxon has also been considered. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have not been included.

G1= Extremely rare; usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 = Very rare; usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.

G3 = Rare to uncommon; usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

G4 = Common; usually more than 100 occurrences; usually not susceptible to immediate threats.

G5 = Very common; demonstrably secure under present conditions.

GH = Historic, no records in the past 20 years.

GU = Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.

GX = Globally extinct. No recent records despite specific searches.

? = Denotes inexact numeric rank (i.e. G4?).

G" " = A "G" (or "T") followed by a blank space means that the NHIC has not yet obtained the Global Rank from The Nature Conservancy.

G? = Unranked, or, if following a ranking, rank tentatively assigned (e.g. G3?).

Q = Denotes that the taxonomic status of the species, subspecies, or variety is questionable.

T = Denotes that the rank applies to a subspecies or variety.

2) S-Rank Provincial Rank

Provincial (or Sub-national) ranks are used by the Ontario Ministry of Natural Resources Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for the global ranks, but consider only those factors within the political boundaries of Ontario. By comparing the global and provincial ranks, the status, rarity, and the urgency of conservation needs can be ascertained. The NHIC evaluates provincial ranks on a continual basis and produces updated list at least annually.

S1 = Critically imperiled in Ontario because of extreme rarity (often 5 or fewer occurrences) or because of some factor (s) such as very steep declines making it especially vulnerable to extirpation.

S2 = Imperiled in Ontario because of rarity due to very restricted range, very few populations (often 20 or fewer occurrences) steep declines or other factors making it very vulnerable to extirpation.

S3 = Vulnerable in Ontario due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 = Apparently secure - uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 = Secure - common, widespread, and abundant in Ontario.

SX = Presumed Extirpated - specie or community is believed to be extirpated from Ontario.

SNR = Unranked - conservation status in Ontario not yet assessed

SU = Unrankable - currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA = Not applicable - a conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S# = Range rank - a numeric range rank (e.g. S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g. SU is used rather that S1S4).

3) COSEWIC Committee On The Status Of Endangered Wildlife in Canada

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species that are considered to be at risk in Canada.

Extinct (X) A wildlife species that no longer exists.

Extirpated (XT) A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.

Endangered (E) A wildlife species facing imminent extirpation or extinction.

Threatened (T) A wildlife species likely to become endangered if limiting factors are not reversed.

Special Concern (SC) A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Not at Risk (NAR) A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Data Deficient (DD) A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

4) COSSARO/OMNR Committee On The Status Of Species At Risk In Ontario/Ontario Ministry Of Natural Resources

The Committee on the Status of Species at Risk in Ontario (COSSARO)/Ontario Ministry of Natural Resources (OMNR) assess the provincial status of wild species that are considered to be at risk in Ontario.

Extinct (EXT) A species that no longer exists anywhere.

Extirpated (EXP) A species that no longer exist in the wild in Ontario but still occurs elsewhere.

Endangered (Regulated) (END-R) A species facing imminent extinction or extirpation in Ontario which has been regulated under Ontario's Endangered Species Act.

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

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

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

Not at Risk (NAR) A species that has been evaluated and found to be not at risk.

Data Deficient (DD) A species for which there is insufficient information for a provincial status recommendations.

5) Local Status - Toronto

x Species status was cross-referenced with the Ontario status list to determine vascular plant status for the study area.

Plant rarity is based on the number of occurrences within the physiographic region. The following species status was taken from TRCA Flora Species (2012).

Toronto and Region Conservation Authority (TRCA) Regional Species Status

RANK LEVEL OF CONSERVATION CONCERN IN TRCA REGION

L5 Able to withstand high levels of disturbance; generally secure throughout the jurisdiction, including the urban matrix. May be of very localized concern in highly degraded areas.

L4 Able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix.

L3 Able to withstand minor disturbance; generally secure in natural matrix; considered to be of regional concern.

L2 Unable to withstand disturbance; some criteria are very limiting factors; generally occur in high-quality natural areas, in natural matrix; probably rare in the TRCA jurisdiction; of concern regionally.

L1 Unable to withstand disturbance; many criteria are limiting factors; generally occur in high-quality natural areas in natural matrix; almost certainly rare in the TRCA jurisdiction; of concern regionally.

LX Extirpated from our region with remote chance of rediscovery. Presumably highly sensitive.

LH Hybrid between two native species. Usually not scored unless highly stable and behaves like a species (e.g. Equisetum x nelsonii)

L+ Exotic. Not native to TRCA jurisdiction. Includes hybrids between a native species and an exotic

L+? Origin uncertain or disputed, i.e. may or may not be native.

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status	ELC Communities		
								CUW1	FOD4-d	FOD4-e
	Rhus hirta	staghorn sumac	G5	S5			L5	x	x	
	GERANIACEAE	**GERANIUM FAMILY**								
*	*Geranium robertianum*	herb-robert	G5	SE5			L+?		x	
	APIACEAE	**PARSLEY FAMILY**								
*	*Daucus carota*	wild carrot	G?	SE5			L+	x		x
	Osmorhiza claytonii	woolly sweet-cicely	G5	S5			L3	x		x
	SOLANACEAE	**POTATO FAMILY**								
*	*Solanum dulcamara*	bitter nightshade	G?	SE5			L+		x	
	VERBENACEAE	**VERVAIN FAMILY**								
	Verbena urticifolia	white vervain	G5	S5			L5		x	
	PLANTAGINACEAE	**PLANTAIN FAMILY**								
*	*Plantago lanceolata*	ribgrass	G5	SE5			L+	x		
*	*Plantago major*	common plantain	G5	SE5			L+	x	x	
	OLEACEAE	**OLIVE FAMILY**								
	Fraxinus pennsylvanica	red ash	G5	S5			L5	x	x	x
	RUBIACEAE	**MADDER FAMILY**								
	Mitchella repens	creeping partridge-berry	G5	S5			L3			x
	CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**								
*	*Lonicera tatarica*	tartarian honeysuckle	G?	SE5			L+	x		
	ASTERACEAE	**ASTER FAMILY**								
	Ambrosia artemisiifolia	common ragweed	G5	S5			L5	x		
	Ambrosia trifida	giant ragweed	G5	S5			L5		x	x
*	*Arctium minus*	common burdock	G?T?	SE5			L+	x		
	Aster sp.	aster								x
*	*Cirsium arvense*	Canada thistle	G?	SE5			L+	x		
	Solidago canadensis	canada goldenrod	G5	S5			L5	x		
	Symphyotrichum novae-angliae	New England aster	G5	S5			L5	x		
*	*Taraxacum officinale*	common dandelion	G5	SE5			L+	x		x
	POACEAE	**GRASS FAMILY**								
*	*Bromus inermis ssp. inermis*	awnless brome	G4G5T?	SE5			L+	x		x
*	*Dactylis glomerata*	orchard grass	G?	SE5			L+	x	x	x
	Poa compressa	Canada blue grass	G?	S5			L+	x		

Appendix C Breeding Birds List

Appendix C: Table 1: Breeding Birds observed at the Martin Grove Study Area.

COMMON NAME	*SCIENTIFIC NAME*	ESA Status	SARA Status	LGL Breeding Bird Stations and Breeding Bird Status Noted			TRCA Observation
				MGB01	MGB02	Incidental	
Mallard	*Anas platyrhynchos*			CONF-FY	POSS-S		
Ring-billed Gull	*Larus delawarensis*			OBS	OBS		
Common Nighthawk	*Chordeiles minor*	SC	THR			OBS	
Hairy Woodpecker	*Picoides villosus*				POSS-H		
Eastern Phoebe	*Sayornis phoebe*					CONF-NU	
Great Crested Flycatcher	*Myiarchus crinitus*			POSS-H			x
Eastern Kingbird	*Tyrannus tyrannus*						x
Warbling Vireo	*Vireo gilvus*						x
Red-eyed Vireo	*Vireo olivaceus*				PROB-T		
Blue Jay	*Cyanocitta cristata*				POSS-S		x
Barn Swallow	*Hirundo rustica*	THR	THR			CONF-NU	
Black-capped Chickadee	*Poecile atricapilla*						x
American Robin	*Turdus migratorius*			PROB-T	POSS-S		x
Gray Catbird	*Dumetella carolinensis*						x
European Starling	*Sturnus vulgaris*			PROB-T			
Cedar Waxwing	*Bombycilla cedrorum*				POSS-S		
Nashville Warbler	*Oreothlypis ruficapilla*					OBS	
Song Sparrow	*Melospiza melodia*			POSS-H	POSS-H		x
Northern Cardinal	*Cardinalis cardinalis*			PROB-T	POSS-H		
Rose-breasted Grosbeak	*Pheucticus ludovicianus*						x
Red-winged Blackbird	*Agelaius phoeniceus*			POSS-S			
Brown-headed Cowbird	*Molothrus ater*			POSS-H			x
American Goldfinch	*Spinus tristis*			PROB-P	POSS-H		
House Sparrow	*Passer domesticus*			PROB-T			

Status Legend

ESA/SARA Status

SC- Special Concern
THR-Threatened
END- Endangered

BBE - Breeding Bird Evidence (according to Bird Studies Canada):

Observed (OBS):
Species observed, no breeding evidence

Possible Breeding (POSS):
H - Species observed in its breeding season in suitable nesting habitat
S - Singing male present in its breeding season in suitable nesting habitat

Probable Breeding (PROB):
M – At least 7 individuals
P – Pair observed
T - Permanent territory presumed through registration of territorial song on at least two days, a week or so apart, at the same place
C – Courtship display
V – Visiting probable nest site
A - Agitated behaviour or anxiety calls of an adult
B – Brood patch on female or cloacal protuberance on male

Confirmed Breeding (CONF):
NB – Nest building, except by wren or woodpecker
DD – Distraction display
NU - Used nest or egg shell found (occupied or laid within the period of study)
FY - Recently fledged young or downy young, including young incapable of sustained flight
AE – Adult exiting nest site
CF - Adult carrying food for young
NE - Nest containing eggs
NY - Nest with young seen or heard

Appendix D Species at Risk Screening Table

Appendix D: Species at Risk identified through desktop resources and field inventories with potential to occur in the Study Area.

Common Name	Scientific Name	Species at Risk Act (Sch 1)[1]	Endangered Species Act[2]	Habitat Requirements	Potential to Occur on Site	Rationale for Potential to Occur on Site
Monarch	Danaus plexippus	SC	SC	In Ontario, monarch is found throughout the northern and southern regions of the province. This butterfly is found wherever there are milkweed (Asclepius spp.) plants for its caterpillars and wildflowers that supply a nectar source for adults. It is often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes (COSEWIC 2010).	High	Frequently found in parks along grassland edges and roadsides where milkweed exists. Areas proposed for disturbance are limited to manicured lawn and amenity trees. No impacts to milkweed anticipated.
Acadian flycatcher	Empidonax virescens	END	END	In Ontario, the Acadian flycatcher breeds in the understory of large, mature, closed-canopy forests, swamps and forested ravines. This bird prefers forests greater than 40 ha in size, and exhibits edge sensitivity preferring the deep interior of the forest. Its nest is loosely woven and placed near the tip of branch in a small tree or shrub often, but not always, near water (Whitehead and Taylor 2002).	Low	Record from 2011 is several km to the east. Habitat in the study area is suitable, but forest stand is not of typical suitable size.
Bald eagle	Haliaeetus leucocephalus	—	SC	In Ontario, bald eagle nests are typically found near the shorelines of lakes or large rivers, often on forested islands. The large, conspicuous nests are typically found in large super-canopy trees along water bodies (Buehler 2000).	Low	Watercourse likely not large enough to support this species.
Barn owl	Tyto alba	END	END	In Ontario, barn owl breeding habitat consists of open countryside, with a preference for pastures, hayfields, marshes and grassy roadsides. Suitable habitat contains suitable nesting sites and adequate mice and vole populations. Nesting occurs in a wide variety of human made structures including barns and nest boxes, as well as natural sites such as hollow trees and cavities in cliffs and riverbanks (Marti et al. 2005). In Ontario, anthropogenic nest sites such as barns may be preferred (COSEWIC 2010).	Low	No barns within the Study Area that would be suitable for this species.
Barn swallow	Hirundo rustica	THR	THR	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared right-of-ways, and wetlands (COSEWIC 2011). Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused (Brown and Brown 1999).	Confirmed	Barn swallow identified nesting under bridge of Rathburn Road crossing Mimico Creek. No impacts to nesting habitat anticipated.
Canada warbler	Cardellina canadensis	THR	SC	In Ontario, breeding habitat for Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets (McLaren 2007). It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks (Reitsma et al. 2010).	Moderate	Habitat along Mimico creek may be suitable, but this species was not identified in the breeding bird survey.

Common Name	Scientific Name	Species at Risk Act (Sch 1)[1]	Endangered Species Act[2]	Habitat Requirements	Potential to Occur on Site	Rationale for Potential to Occur on Site
Chimney swift	Chaetura pelagica	THR	THR	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used (COSEWIC 2007).	Moderate	Several buildings within the Study Area, but these will not be disturbed directly by the proposed development.
Common nighthawk	Chordeiles minor	THR	SC	These aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bog ferns, prairies, gravel pits and gravel rooftops in cities (Sandilands 2007)	Confirmed	This species was observed flying over the Study Area during the breeding bird surveys, but the nesting location was not identified.
Eastern wood-pewee	Contopus virens	SC	SC	The eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats but is most commonly associated with the mid-canopy of forest clearings, and edge habitat in deciduous and mixed forests. It also occurs in anthropogenic habitats that provide an open forested aspect such as parks and suburban neighborhoods. It prefers intermediate-age mature forest stands with little understory vegetation (COSEWIC 2012).	Moderate	Habitat within the Study Area is suitable, but the species was not identified during the breeding bird surveys.
Golden-winged warbler	Vermivora chrysoptera	THR	SC	In Ontario, golden-winged warbler breeds in regenerating scrub habitat with dense ground cover and a patchwork of shrubs, usually surrounded by forest. Their preferred habitat is characteristic of a successional landscape associated with natural or anthropogenic disturbance such as right-of-ways, and field edges or openings resulting from logging or burning. The nest of the golden-winged warbler is built on the ground at the base of a shrub or leafy plant, often at the shaded edge of the forest or at the edge of a forest opening (Confer et al. 2011).	Moderate	Habitat within the Study Area is suitable, but the species was not identified during the breeding bird surveys.
Henslow's sparrow	Ammodramus henslowii	END	END	In Ontario, Henslow's sparrow breeds in large grasslands with low disturbance, such as lightly grazed and ungrazed pastures, fallow hayfields, grassy swales in open farmland, and wet meadows. Preferred habitat contains tall, dense grass cover, typically over 30 cm high, with a high percentage of ground cover, and a thick mat of dead plant material. Henslow's sparrow generally avoids areas with emergent woody shrubs or trees, and fence lines. Areas of standing water or ephemerally wet patches appear to be important. This species breeds more frequently in patches of habitat greater than 30 ha and preferably greater than 100 ha (COSEWIC 2011).	Low	This is a historic record on NHIC from 1932, before much of the development has occurred and grassland habitat was converted to other uses.
Olive-sided flycatcher	Contopus cooperi	THR	SC	In Ontario, olive-sided flycatcher breeding habitat consists of natural openings in coniferous or mixed forests, including bogs, burns, riparian zones, and cutover areas. They are also found in semi-open forest stands and early successional forest when tall snags and residual live trees are present. In the boreal forest it is often associated with muskeg, bogs, fens and swamps dominated by spruce and tamarack. Open areas with tall trees or snags for perching are used for foraging (COSEWIC 2007). Nests are usually built on horizontal branches of conifers (Peck and James 1987).	Moderate	Habitat within the Study Area is suitable, but the species was not identified during the breeding bird surveys.

Common Name	Scientific Name	Species at Risk Act (Sch 1)[1]	Endangered Species Act[2]	Habitat Requirements	Potential to Occur on Site	Rationale for Potential to Occur on Site
Peregrine falcon	Falco peregrinus	SC	SC	In Ontario, peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and also anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate (COSEWIC 2007).	Low	No cliff faces or similar habitat within the Study Area.
Prothonotary warbler	Protonotaria citrea	END	END	In Ontario, the prothonotary warbler breeds in mature and semi-mature, deciduous swamp forest with a closed canopy, and large expanses of relatively deep, open standing water. Swamps are typically dominated by silver maple, black ash, yellow birch, and black gum. These birds nest in tree cavities, favouring small, shallow holes often situated at low heights in dead or dying trees. Nests are typically situated over standing or slow-moving water. Artificial nest boxes are also readily accepted. This species is area sensitive and is seldom found in forests less than 100 ha in size (COSEWIC 2007).	Low	Record in 2008 is from one male bird that was in Deane Park, but has not been observed since. This species was not observed during the breeding bird surveys.
Wood thrush	Hylocichla mustelina	THR	SC	In Ontario, wood thrush breeds in moist, deciduous hardwood or mixed stands that are often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. This species selects nesting sites with the following characteristics: lower elevations with trees less than 16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (COSEWIC 2012).	Moderate	Habitat within the Study Area is suitable, but the species was not identified during the breeding bird surveys.
Redside dace	Clinostomus elongatus	END	END	In Ontario, the Redside Dace are found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (which flows into Lake Simcoe), Irvine Creek of the Grand River system (which flows into Lake Erie) and on St. Joseph's Island in northeastern Ontario. They are found in pools and slow-moving areas of small headwater streams with clear to turbid water. Overhanging grasses, shrubs, and undercut banks, are an important part of their habitat, as are instream boulders and large woody debris. Preferred substrates are variable and include silt, sand, gravel and boulders. Spawning occurs in shallow riffle areas (Redside Dace Recovery Team 2010).	Low	Historic occurrence in this reach of Mimico Creek. Considered extirpated from the creek and the creek habitat is not currently identified as SAR habitat by Department of Fisheries and Oceans.
Eastern small-footed myotis	Myotis leibii	—	END	This species is not known to roost within trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing (Humphrey 2017).	Moderate	Rock piles associated with Mimico creek likely flood and therefore are unsuitable, but the open stormwater tunnels may serve as hibernation sites but will not be disturbed

Common Name	Scientific Name	Species at Risk Act (Sch 1)[1]	Endangered Species Act[2]	Habitat Requirements	Potential to Occur on Site	Rationale for Potential to Occur on Site
Little brown myotis	Myotis lucifugus	END	END	In Ontario, this species range is extensive and covers much of the province. It will roost in both natural and man-made structures. They require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas (Lacki, 2007). May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required.	Moderate	Numerous large trees within the Study Area which could provide roosting habitat in addition to the many buildings in the area that could be roosts. Open stormwater tunnels may serve as hibernation sites but will not be disturbed.
Tri-colored bat	Perimyotis subflavus	END	END	In Ontario, tri-colored bat may roost in foliage, in clumps of old leaves, hanging moss or squirrel nests. They are occasionally found in buildings although there are no records of this in Canada (Poissant et al, 2010). They typically feed over aquatic areas with an affinity to large-bodied water and will likely roost in close proximity to these. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year.	Moderate	Numerous large trees within the Study Area, many of which have squirrel nests and could leave leaf clumps. Open stormwater tunnels may serve as hibernation sites but will not be disturbed.
Northern myotis	Myotis septentrionalis	END	END	In Ontario, this species range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required (COSSARO 2012).	Moderate	Numerous large trees within the Study Area which could provide roosting habitat. Open stormwater tunnels may serve as hibernation sites but will not be disturbed.
Bashful bulrush or Few-flowered club-rush	Trichophorum planifolium	END	END	In Ontario, bashful bulrush grows in open deciduous forests, especially dry oak woodlands, with an open understory. This plant requires warmth and good drainage, and occurs on steep slopes with neutral to slightly acidic soils (Smith and Rothfels 2010; Crins 1989).	Moderate	Some habitat may be present in Mimico Creek corridor. Not observed during LGL field investigations or in background TRCA data for TRCA owned properties and adjacent valleylands. Areas of disturbance limited to manicured lawn and amenity trees.
Butternut	Juglans cinerea	END	END	In Ontario, butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory (Voss and Reznicek 2012). Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant (Farrar 1995).	Confirmed	Trees identified within the Study Area. Butternut Health Assessment completed, but at the time of this report, not yet submitted to or vetted by MECP.
Dense Blazing star	Liatris spicata	THR	THR	In Ontario, dense blazing star is found mainly in moist tall-grass prairies, oak savannahs, wet meadows and along roadsides in full sun in open areas (COSEWIC 2010). It grows in moist to wet, sandy calcareous soils (WDNR 2013). It is primarily restricted to southwestern Ontario.	Moderate	Record of this species east of the Study Area, but there is uncertainty in whether it is naturally occurring or planted. Not observed by LGL during field investigations.

1 Species at Risk Act (SARA), 2002. Schedule 1 (Last amended 17 Dec 2014); Part 1 (Extirpated), Part 2 (Endangered), Part 3 (Threatened), Part 4 (Special Concern)

2 Endangered Species Act (ESA), 2007 (O.Reg 242/08 last amended 14 Sept 2016 as O.Reg 308/16). Species at Risk in Ontario List, 2007 (O.Reg 230/08 last amended 15 June 2016 as O. Reg 200/16, s. 1.); Schedule 1 (Extirpated - EXP), Schedule 2 (Endangered - END), Schedule 3 (Threatened - THR), Schedule 4 (Special Concern - SC)

Appendix E Photos

Project #TA9027-24

Photo Appendix

Photo 1: View of 2020 construction activity in Ravenscrest Park near Breeding Bird Station 1.

Photo 2: Eastern Phoebe Nest on Martin Grove Bridge

Photo 3: 2020 Bridge Repairs at Rathburn Bridge.

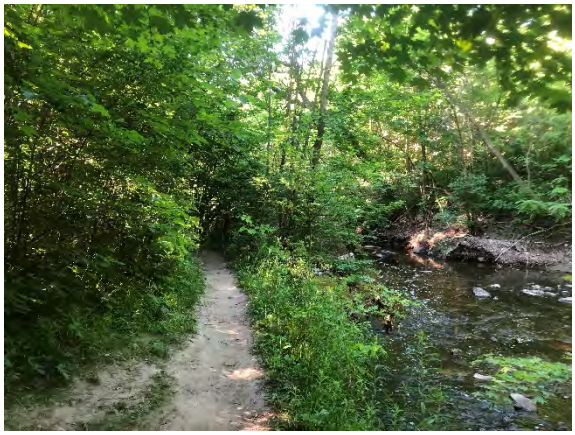

Photo 4: Creek at Breeding Bird Station 2 (Hampshire Heights Park).

Photo 5: Stormwater Outflow Downstream from Breeding Bird Station 2 (Hampshire Heights Park).

Photo 6: Martin Grove Road across from Saralou Ct.

Photo Appendix

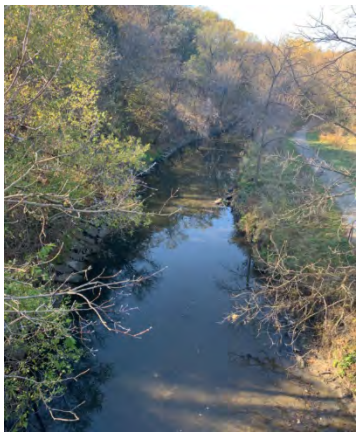

Photo 7: Facing west along Mimico Creek from Martin Grove Road, November 4, 2020.

Photo 8: Facing east along Mimico Creek from Martin Grove Road, November 4, 2020.

Photo 9: Facing northeast towards Ravenscrest Park on the north side of Mimico Creek in Ravenscrest Park, from Martin Grove Road, November 4, 2020.

Photo 10: Facing north in Ravenscrest Park towards the proposed HDD pit location, November 4, 2020. Note watering bag on young planted memorial tree.

Photo 12: Facing north in Ravenscrest Park towards HDD pit location and open manicured lawn areas, November 4, 2020. Note the photo is panoramic setting, and two memorial trees with green watering bags.

Photo 13: Facing northwest in Ravenscrest Park, November 4, 2020, along the pathway into the park.

Photo Appendix

Photo 14: Tree 47 Hybrid Butternut Ravenscrest Park, November 4, 2020.

Photo 15: View facing south along the north side of Martin Grove Road, on the south side of the Mimico Creek Valley (section to be tunneled), November 4, 2020.

Photo 16: Similar view to Photo 15, November 4, 2020.

Photo 17: Facing north along Martin Grove towards the edge of the Mimico Creek valley crossing on the east side of the road, November 4, 2020.

LGL LIMITED
environmental research associates
CELEBRATING 50 YEARS

Arborist Report

PM6A
CITY OF TORONTO
MARTIN GROVE RD

for:

R.V. ANDERSON ASSOCIATES LIMITED

by:

LGL Limited
environmental research associates

JULY 2021

LGL FILE TA9027-24

PM6A CITY OF TORONTO MARTIN GROVE RD

TREE INVENTORY, PRUNING AND PROTECTION PLAN

prepared by:

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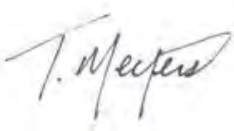
Lisa Catcher, Hons. BA.
BOTANIST, ISA CERTIFIED ARBORIST



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Trent Meyers, Dipl
ISA CERTIFIED ARBORIST

Digital signature

Karen Chung, Hons.B.Sc., GIS Cert.
GIS ANALYST

reviewed by:

Digital signature

Allison Featherstone, Hons.B.Sc.
VICE-PRESIDENT, SENIOR PLANNING ECOLOGIST

LGL Limited
environmental research associates
445 Thompson Drive, Unit 2
Cambridge, Ontario N1T 2K7
Tel: 519-622-3300 Fax: 519-622-3310
Email: cambridge@lgl.com
URL: www.lgl.com

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Date:	January 14, 2021	Version:	1
	July 12, 2021		2, Final

July 2021
LGL PROJECT TA9027-24

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

LGL Limited has been retained by R.V. Anderson Associates Limited (RVA) to conduct a site investigation and tree impact assessment as the City of Toronto is undertaking water service improvements along Martin Grove Rd from [45m South] Savalon Court to [30m South] Lorraine Gardens. Refer to Figure 1 for a map of the project location.

2.0 METHODOLOGY

An ISA Certified Arborist conducted an inventory of tree resources on July 28th, 2020 to identify potential tree constraints within the study area. The inventory focused on streetscape and amenity feature trees in the Martin Grove Rd right-of-way and beyond, to the extent possible. Tree locations were captured by an Ontario Land Surveyor and matched in the field where feasible. Attention was paid to canopy size and shape where tree canopies overhang the access roads and workspace and may conflict with machinery manoeuvring.

The extent of arborist inventory was provided to LGL for data collection prior to the design, and prior to the impact area being defined. As a result, tree resources may occur well away from project works based on this design phase presented. Where tree data was collected in support of the project, it is presented herein.

Each tree was surveyed, and the following information was collected: tree species, diameter at breast height (DBH), tree condition assessed in a matrix of trunk integrity, crown structure, and crown vigour, and general comments as warranted.

Surveyed trees have been screened for rare species as referenced by the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC), which includes classification of Endangered, Threatened, and Special Concern species both at a provincial and federal scale.

3.0 RESULTS

A total of 227 trees were identified and assessed during the tree inventory. Trees within the study area range in size from 1 to 88 cm DBH and are generally in good to fair condition. The majority of trees within the study area were planted as streetscape and amenity features on residential properties. A detailed summary of all trees surveyed are presented in the **Appendix A Tree Inventory** and the locations of each tree (by identifier number) are presented in **Figure 2**.

3.1 SPECIES AT RISK

Two tree species regulated under the Ontario Endangered Species Act, 2007 were identified within the study area.

Kentucky coffee tree (*Gymnocladus diocus*) is regulated as Threatened under the Ontario Endangered Species Act, 2007 was noted within the study area. Two (2) Kentucky coffee trees were noted as planted amenity trees. Consultation with Ministry of Environment, Conservation and Parks (MECP) Management Biologists have advised that streetscape Kentucky coffee-trees within the city of Toronto, and likely to be cultivars, do not require *Endangered Species Act* authorizations.

Butternut (*Juglans cinerea*) is regulated as Endangered under the Ontario Endangered Species Act, 2007 and was identified within the ravine system adjacent to Mimico Creek. Consultation will be undertaken with MECP to determine the next steps regarding to the Butternut trees.

4.0 PROPOSED PLANS

The proposed works will include various construction methods to install the new services within and adjacent to the road. Details regarding construction methods have been defined by the project team and are described below.

- Watermain replacement, 4m wide impact footprint (1.2m wide open cut trench + machine path) open cut within the curb road right-of-way;
- Connections from the watermain to hydrants will be open cut trench 1.5m in width;
- Fire hydrant installations and removals (1.5x1.5m pit) ;
- Small water service lines (less than or equal to 50mm) - define cut (e.g. Installed via directional drilling 1.8-2.1m below ground surface); and,
- The connections at the water keys will require an open pit, generally these pits will be 1.5 x 1.5m and 2.1m below ground. As requested by City of Toronto staff and RV Anderson the extent of the water key pits on the tree protection plan are only shown within the City owned property and does not extend onto private property. However, as directed by City of Toronto staff and RV Anderson for the purposes of the impact assessment it has been assumed that the water key pits will extend 0.5 m onto private property. In addition, the pits will be field fit to minimize disturbance to trees in the study area and in some instances the shape/size of the pit will be adjusted to promote tree preservation.

5.0 IMPACT ASSESSMENT

An impact assessment was completed to determine impacts to tree resources as a result of the proposed improvements to Martin Grove Rd. This assessment was conducted using the design provided to LGL by RV Anderson Associates in July 2021. The impact assessment was completed by comparing the extent of tree dripline and tree protection zones with the proposed disturbance limits. Trees recommended for removal include trees within or outside the disturbance limits that would not be able to withstand construction related impacts. Trees identified as injured likely will require root and/or canopy pruning however, impacts will be minor or unavoidable and the trees should be retained by using proper mitigation techniques. Note that this impact assessment is an estimate based on the information available at the time of report preparation and some assumptions have been made since the exact machine type and dimension, limits of disturbance, and roots zones are not known.

A summary of the results of the impact assessment per City of Toronto Tree Category is provided in **Table 1.** Additionally, the results of the impact assessment are summarized in **Appendix A** per tree and presented on **Figure 2**.

Table 1 Summary of Impact Assessment.

City of Toronto Tree Category	Removed	Injured	Retained
Category 1: Trees with a diameter of 30 cm or more on private property on the subject site.			
Category 2: Trees with a diameter of 30 cm or more on private property, within 6 metres of the study area.		11	39
Category 3: Trees of all diameters on City owned parkland.			
Category 4: Trees of all diameters within the Ravine and Natural Feature Protection Limit.		5	28
Category 5: Trees of all diameters within the City road allowance, adjacent to the study area.		13	58
Trees 30 cm DBH or less on private property*		6	64
Shared Boundary Trees		2	1
Dead tree*			
Total		37	190

*trees do not meet the requirements of a Toronto Tree Category and/or permit exempt.

6.0 COMMON AND POTENTIAL IMPACTS

Potential Impacts to trees resulting from construction and staging activities typically include:

- Physical injury;
- Severing of roots; and,
- Root compaction.

Physical injury to the main stem or branches of a tree will occur if construction equipment is permitted to operate close to the tree.

Root cutting is a type of injury that can significantly affect the health of a tree. Root systems are responsible for nutrient uptake, carbohydrate storage, and structural anchorage. Excavation for utility installation may tear or break tree roots if the excavation is too close to the trees. The majority of tree roots are found in the upper 30 to 60 cm of soil. Trees can also become destabilized and may fall if structural root supports are severed. A preferred method of mitigating impacts is air-spade excavation which utilizes pressurized air to loosen soil which is then removed from the pit. This method avoids tearing, ripping, or breaking roots typical of traditional bucket excavators, and allows for clean hand-sawn root pruning, which is less damaging, or preferably avoidance altogether. This method of excavation has been considered for water key locations where trees are in proximity.

Compaction of the soil in which tree roots grow is one of the leading causes of decline for trees. Soil compaction primarily occurs due to vehicle traffic, stock piling and equipment moving across the root zone. Soil compaction causes the reduction of pore space in the soil, which is detrimental for root growth. Without space available for oxygen and water transport, tree roots will suffocate and the decline of the tree

will follow. Impacts such as these may not be immediate, and the decline could take up to 5 years to become evident. Mitigation includes applying wood chips/mulch to a depth of 100mm and overlaying steel sheeting to dissipate the weight of machinery driven overtop.

Designation of tree protection measures (TPZ) is imperative for the protection of trees (roots, trunks, branches) adjacent to construction works. The TPZ will restrict construction related machinery and activities from damaging trees identified for retention. Physical protection (plywood hoarding, Fast Fence, or other as approved by the City) shall be considered for all trees in proximity to construction. **Table 2** lists City of Toronto protection requirements for trees near construction. These protection distances are depicted on **Figure 2** and have been provided to the design team. Protection distances are also listed in **Appendix A Tree Inventory**. Note that site specific deviations from the City's standards are required, particularly to alleviate conflicts with pedestrian and vehicle traffic and private property.

Table 2: City of Toronto Tree Protection Zone Requirements.

Tree Protection Zones:

Trunk Diameter (DBH)[1]	Minimum Protection Distances Required[2] **City-owned and Private Trees**	Minimum Protection Distances Required **Trees in Areas Protected by the Ravine and Natural Feature Protection By-law**
		Whichever of the two is greater:
< 10 cm	1.2 m	The drip line[4] or 1.2 m
10 – 29 cm	1.8 m	The drip line or 3.6 m
30[3] – 40 cm	2.4 m	The drip line or 4.8 m
41 – 50 cm	3.0 m	The drip line or 6.0 m
51 – 60 cm	3.6 m	The drip line or 7.2 m
61 – 70 cm	4.2 m	The drip line or 8.4 m
71 – 80 cm	4.8 m	The drip line or 9.6 m
81 – 90 cm	5.4 m	The drip line or 10.8 m
91 – 100 cm	6.0 m	The drip line or 12.0 m
> 100 cm	6 cm protection for each 1 cm diameter	12 cm protection for each 1 cm diameter or the drip line[5]

(Source: City of Toronto Tree Protection Specifications http://www.toronto.ca/trees/pdfs/TreeProtSpecs.pdf)

Tree removals may also be subject to the requirements and provisions of other legislation, regulations or bylaws, such as the Migratory Birds Convention Act (MBCA), Conservation Authorities Act, Endangered Species Act, or the Fisheries Act. With respect to the MBCA, it is recommended that vegetation removals be avoided during the breeding bird season (mid-March to late August). If construction during this timing window is deemed necessary a nest survey is required and the results may dictate consultation with Environment Canada. Other approvals or due diligence with respect to tree removals are outside of the scope of this assessment.

7.0 MITIGATION

The following recommendations should be considered during detail design to prevent or mitigate impacts to trees near construction:

- No trees shall be pruned or removed or impacted without prior approval from the City;
- It is the responsibility of the project team to become directly acquainted with the site, to carefully

examine the location of the proposed work, and to notify the City of any discrepancies in the site conditions;

- Prior to the start of any site work, the Contractor shall supply and install tree protection barriers around each tree designated for protection;
- The protective barrier is to comply with City specifications for tree protection;
- No fill, machinery, chemicals, fuel or materials are to be placed within the protective barrier; heavy machinery is not to be operated within the TPZ (including overhead swinging of machine arms);
- No re-grading, including filling or excavation, is to take place within the TPZ unless permitted by the City (Urban Forestry);
- Upon air-spade/hand dig excavation, should tree roots be found an effort to avoid/work-around is strongly encouraged. If avoidance is not feasible, roots shall be cleanly severed with sharp hand tools by or at the supervision of a qualified arborist. Photographic documentation should be conducted during this activity, specifically to illustrate the excavation near the tree, the physical structure of the exposed roots, and the condition of roots upon severing. Refer to Figure 3 which coarsely illustrates a preferred approach to excavation within the dripline to minimize damage to roots;
- If roots in a dense mat or 5 cm or greater are found, they are to be left in place and worked around or incorporated into the new base of the sidewalk. Additionally, smaller roots are to be retained where possible unless severance is necessary. Urban Forestry must be contacted immediately to advise on next steps if this is not feasible (as per Toronto Urban Forestry, 2020)
- Soil compaction mitigation includes application of wood chips/mulch to a depth of 100mm and overlaying steel sheeting to dissipate the weight of machinery driven overtop.
- All tree and shrub protection must be removed upon completion of construction activities;
- No signs or objects should be displayed or affixed to any retained trees;
- Signs shall be affixed to the TPZ fence to inform workers that entry is not permitted (see Appendix B); and,
- Should any additional, incidental or accidental tree injuries occur during construction, a qualified Arborist or City Forester should be consulted to determine additional mitigation measures.

8.0 COMPENSATION

In accordance with the City of Toronto Urban Forestry policies any tree removal or injury to trees will require replacement or site restoration following construction activities. Compensation rates vary depending on the governing by-law. Compensation rates are as follows (City of Toronto Urban Forestry, 2020).

- Removal of ravine tree – 3 replacement trees: 1 removal
- Removal of City/Park tree – 3 replacement tree : 1 removal
- Removal of Private tree (>30cm) – 3 replacement trees: 1 removal if the tree is in good condition
  – 1 replacement trees: 1 removal if the tree is in poor condition

If replacement plantings based on ratios provided cannot be met due to site constraints, cash in lieu of planting may be accepted. Cash in lieu is calculated as the City of Toronto's installed cost for planting and maintaining a tree for two years at a value of $583 a tree. It is anticipated that trees located on City Streets will be replaced on site, and the balance of trees not planted would form the basis for the cash in lieu replacement value.

9.0 SUMMARY AND CONCLUSION

An evaluation of tree resources within the study area was conducted in July 2020. An impact assessment (**Section 5.0**) has been undertaken based on the design and has identified the following potential concerns regarding construction near trees in the study area include:

- Removals – No trees have been identified for removal;
- Injure – Thirty-seven (37) trees have been identified as injured;
- Retained – One Hundred and Ninety (190) trees have been identified for retention without injury.

A detailed summary of the impact assessment is provided in **Section 5.0, Table 1**.

Landowner contact is encouraged to discuss and obtain agreement on construction near trees, access, and compensation, if required.

10.0 DISCLAIMER

10.1 LIMITATIONS OF THIS ASSESSMENT

This Assessment is based on the circumstances and observations as they existed at the time of the site inspection of the Client's Property and the trees situate thereon and upon information provided by the Client to LGL Limited. The opinions in this Assessment are given based on observations made and using generally accepted professional judgment, however, because trees and plants are living organisms and subject to change, damage and disease, the results, observations, recommendations, and analysis as set out in this Assessment are valid only as at the date any such testing, observations and analysis took place and no guarantee, warranty, representation or opinion is offered or made as to the length of the validity of the results, observations, recommendations and analysis contained within this Assessment. As a result, the Client shall not rely upon this Assessment, save and except for representing the circumstances and observations, analysis and recommendations that were made as at the date of such inspections. It is recommended that the trees discussed in this Assessment should be re-assessed periodically.

10.2 RESTRICTION OF ASSESSMENT

The Assessment carried out was restricted to the Property. No assessment of any other trees or plants has been undertaken by LGL. LGL is not legally liable for any other trees or plants on the Property except those expressly discussed herein. The conclusions of this Assessment do not apply to any areas, trees, plants or any other property not within the study area or referenced in this Assessment.

10.3 PROFESSIONAL RESPONSIBILITY

In carrying out this Assessment, LGL Limited and any Assessor appointed for and on behalf of LGL Limited to perform and carry out the Assessment has exercised a reasonable standard of care, skill and diligence as would be customarily and normally provided in carrying out this Assessment. The Assessment has been made using accepted arboricultural techniques. These include a visual examination of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the current or planned proximity of property and people. Except where specifically noted in the Assessment, none of the trees examined on the property were dissected, cored, probed, or climbed and detailed root crown examinations involving excavation were not undertaken.

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy, no guarantees are offered, or implied, that these trees, or all parts of them will remain standing. It is professionally impossible to predict with absolute certainty the behaviour of any single tree or group of trees, or all their component parts, in all given circumstances. Inevitably, a standing tree will always pose some risk. Most trees have the potential to fall, lean, or otherwise pose a danger to property and persons in the event of adverse weather conditions, and this risk can only be eliminated if the tree is removed.

Without limiting the foregoing, no liability is assumed by LGL or its directors, officers, employers, contractors, agents or Assessors for:

a) any legal description provided with respect to the Property;

b) issues of title and or ownership respect to the Property;

c) the accuracy of the Property line locations or boundaries with respect to the Property;

d) the accuracy of any other information provided to LGL by the Client or third parties;

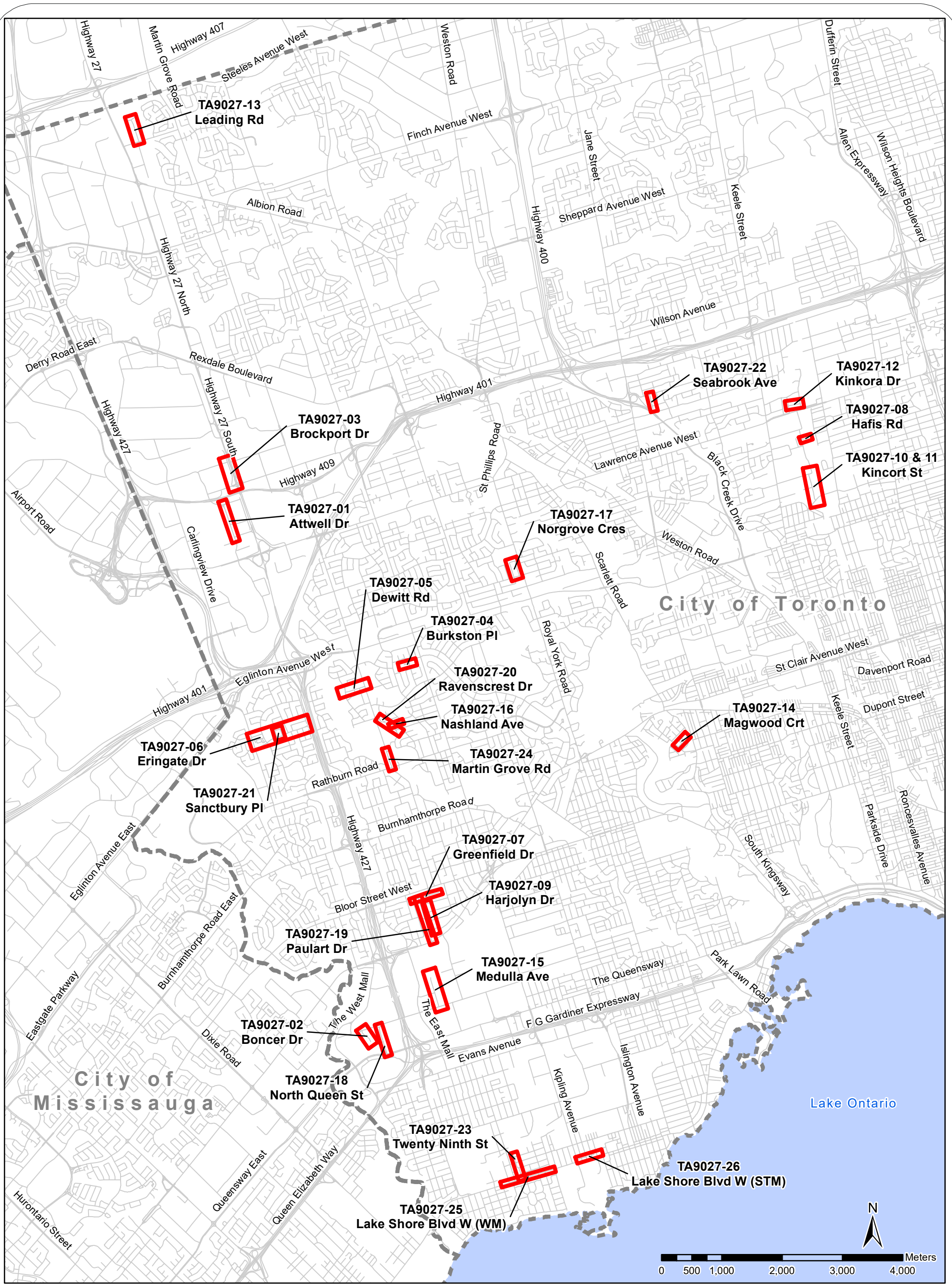
e) any consequential loss, injury or damages suffered by the Client or any third parties, including but not limited to replacement costs, loss of use, earnings and business interruption; and,

f) the unauthorized distribution of the Assessment.

10.4 GENERAL

Any plans and/or illustrations in this Assessment are included only to help the Client visualize the issues in this Assessment and shall not be relied upon for any other purpose.

Figures



PM6A2 Arborist Report

Key Map

Study Area

Municipal Boundary

LGL LIMITED
environmental research associates

Project	TA9027	**Figure**	1
Date	November 2020	**Prepared By**	KC
Scale	1:60,000	**Verified By**	AHF

MARTIN GROVE ROAD

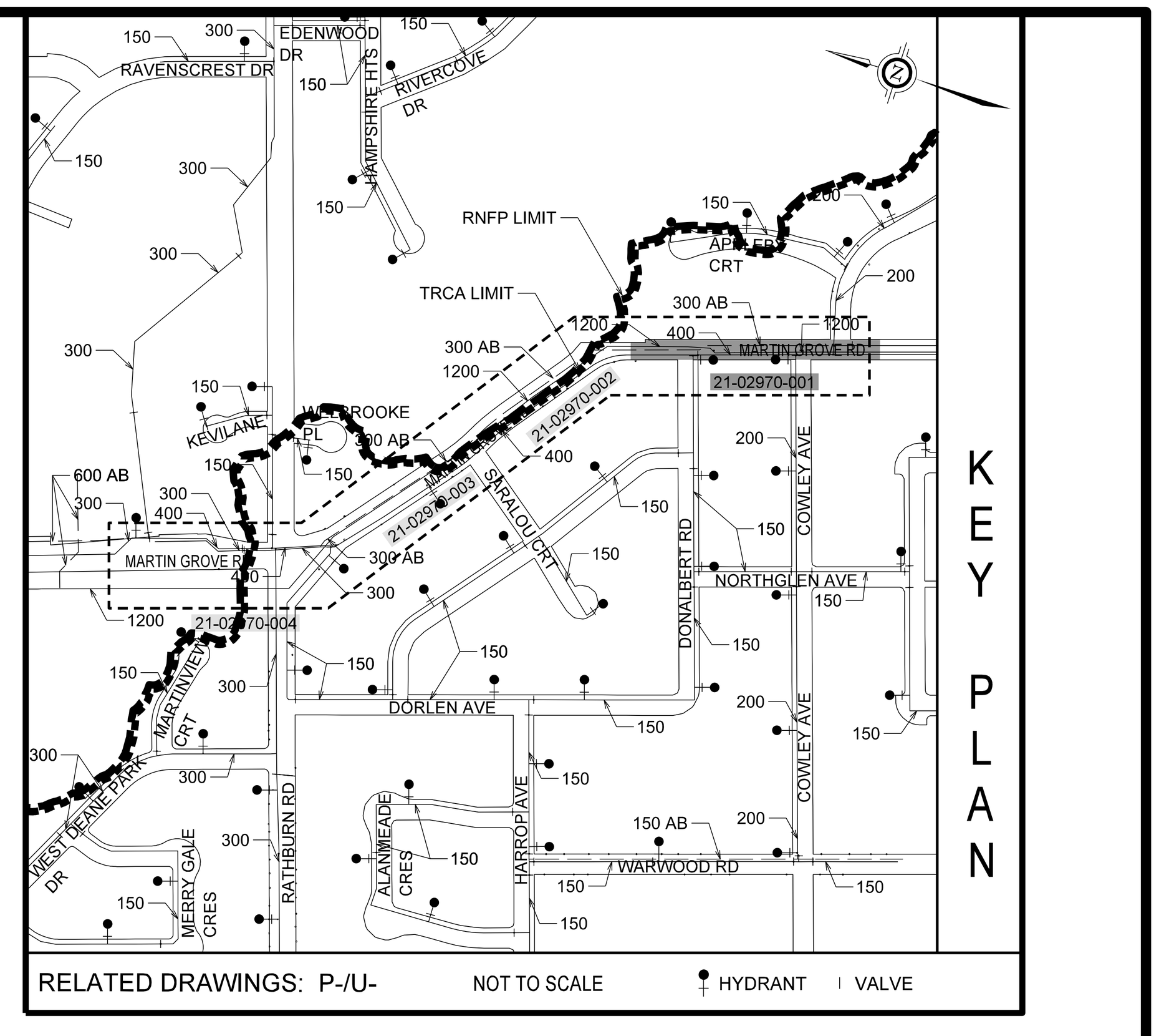
THE REVIEWER OF THE FOLLOWING DOCUMENT SHALL BE AWARE THAT THE PROPOSED EXCAVATION AREAS SHOWN IN THE CONTRACT DRAWINGS CONTAINED HEREIN ARE STRICTLY WITHIN CITY RIGHT-OF-WAY (ROW). HOWEVER, DURING CONSTRUCTION, SOME OF THESE EXCAVATION AREAS MAY REQUIRE AN ADDITIONAL 0.5M OF ENCROACHMENT INTO THE PRIVATE PROPERTY SIDE TO FACILITATE THE INSTALLATION OF THE PROPOSED WORK. AS SUCH, FOR THE PURPOSES OF THE ARBORIST'S IMPACT ASSESSMENT, THIS ADDITIONAL 0.5M ENCROACHMENT, ALTHOUGH NOT SHOWN, HAS ALREADY BEEN CONSIDERED WHEN ASSESSING FOR TREE IMPACTS.

PLEASE NOTE THE PITS SHOWN IN DRAWING WILL BE FIELD FIT TO MINIMIZE DISTURBANCE TO TREES IN THE STUDY AREA AND IN SOME INSTANCES THE SHAPE/SIZE OF THE PIT WILL BE ADJUSTED TO PROMOTE TREE PRESERVATION

LEGEND:

(thin line)	MINIMUM TREE PROTECTION ZONE
(scalloped line)	DRIPLINE
XXX	TREE ID
XXX	TREE REMOVAL
XXX	TREE INJURY
— — —	TREE PROTECTION FENCE
- - - - -	IMPACT AREA

NOTE A: ONLY HYDRO-VAC OR HAND EXCAVATION METHODS ARE PERMITTED TO DAYLIGHT THE EXISTING TRANSMISSION MAIN. THE CONTRACTOR SHALL CONTACT TORONTO WATER AT TRUNKWATER@TORONTO.CA, 235 COTTINGHAM STREET, TORONTO, ON, M4V 1C7, TEL. 416-397-0187, FAX. 416-397-1433 AND SEND AN E-MAIL MESSAGE TO TRUNKWATER@TORONTO.CA WITH THE COMPLETED FORM "EXCAVATION MONITORING FOR TRANSMISSION MAINS" AT LEAST TWO (2) WEEKS PRIOR TO EXCAVATION TO CO-ORDINATE THE WORK AND DE-PRESSURIZE THE TRUNK WATERMAIN. ALL SHORING ADJACENT TO THE TRANSMISSION WATERMAIN AT THE CROSSING SHALL BE LEFT IN PLACE.



NOTES:

1. THE LOCATION OF ALL UNDER/ABOVE GROUND MUNICIPAL SERVICES, UTILITIES AND STRUCTURES ARE APPROXIMATE ONLY. NOT ALL MUNICIPAL SERVICES AND UTILITIES ARE SHOWN AND, WHERE SHOWN ON THE DRAWING(S), THE COMPLETENESS AND ACCURACY OF THE LOCATION OF SUCH SERVICES, UTILITIES AND STRUCTURES ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL SUCH SERVICES, UTILITIES AND STRUCTURES BY CONSULTING THE APPROPRIATE AUTHORITIES OR UTILITY COMPANIES CONCERNED BEFORE COMMENCEMENT OF THE WORK. THE CONTRACTOR SHALL PROVE THE LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE OR RESTORATION TO SAME.
2. EXISTING WATERMAIN DEPTH AND MATERIAL TYPES AT ALL CONNECTION POINTS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES AND CONFLICTS WITH EXISTING SERVICES.
3. THE CONTRACTOR SHALL LOCATE ALL WATER SERVICES WITHIN THE LIMITS OF CONSTRUCTION.
4. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING WITHIN 2.5 METERS OF COMPRESSION COUPLINGS OF EXISTING GAS MAINS. THE EXISTING COMPRESSION COUPLINGS ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL LOCATE THESE COUPLINGS PRIOR TO EXCAVATION.
5. SEWER LATERALS ARE NOT SHOWN. CONTRACTOR SHALL LOCATE LATERALS WHERE THEY CROSS PROPOSED WATERMAIN TO DETERMINE DEPTH AND PROFILE OF PROPOSED WATERMAIN. WATERMAIN SHALL BE DEFLECTED OR LOOPED AS PER NOTE 24.
6. THE CONTRACTOR SHALL VERIFY LOCATION, SIZE AND MATERIAL OF THE ACTIVE AND NON-ACTIVE LARGER WATER SERVICES PRIOR TO INSTALLING TEE.
7. STAND PIPE FOR SWABBING AND BACK FLOW PREVENTER SHALL BE INSTALLED AWAY FROM THE ROAD TO MINIMIZE TRAFFIC IMPACT.
8. WHEN INSTALLING CURB STOPS, THE STANDARD MINIMUM CLEARANCE SHOULD BE MAINTAINED TO THE EXISTING GAS MAIN. IF APPARENT CONFLICT EXISTS BETWEEN THE EXISTING GAS MAIN AND THE PROPOSED CURB STOPS, THE LOCATION OF THE CURB STOPS SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER.
9. THE CONTRACTOR SHALL REFER TO ARBORIST REPORT FOR THE GUIDELINES OF CONSTRUCTION NEAR TREES.
10. THE CONTRACTOR SHALL REPLACE ALL SUBSTANDARD CATCH BASINS FRAMES AND GRATES WITHIN THE PROJECT LIMIT TO RAISED SQUARE FRAMES AND CIRCULAR GRATES AS PER OPSD 400.070
11. THE CONTRACTOR SHALL INSTALL "TACTILE WALKING SURFACE INDICATORS" AS PER THE CITY'S STANDARDS T-310.030-7 , T-310.030-8, T-310.030-9, T-310.030-10 AND T-310.030-11, ON PEDESTRIAN CROSSINGS IMPACTED BY THE PROPOSED WORK. ADDITIONAL SIDEWALK EXTENSIONS AND CURB/ CURB AND GUTTER REPLACEMENT MAY BE REQUIRED TO ACCOMMODATE THE MINIMUM REQUIRED LENGTH OF THE "TACTILE WALKING SURFACE INDICATORS" AS PER CITY'S STANDARD.
12. THE CONTRACTOR SHALL INSTALL "CATCH BASIN INDICATOR ARROW MARKINGS" AS PER THE CITY'S STANDARD T-216.02-25
13. WATER SERVICES THAT ARE FOUND TO BE SMALLER THAN 19 mm OR LEAD OR GALVANIZED MATERIAL SHALL BE REPLACED WITH COPPER SERVICES. NEW WATER SERVICES SHALL BE 19 mm IN DIAMETER OR MATCH THE EXISTING, WHICHEVER IS GREATER, UNLESS OTHERWISE SHOWN IN THE PLAN.

LEGEND:

(solid line)	PROPOSED WATER SERVICE CONNECTION
(dashed line)	EXISTING WATER SERVICE CONNECTION
]	INSTALL PROPOSED WATERMAIN CAP
VB ⊗	GATE VALVE AND VALVE BOX
CUT-IN VB ⊗	CUT-IN VALVE AND VALVE BOX - TO BE INSTALLED BY OTHERS
TVB ⊗	TEMPORARY VALVE AND VALVE BOX
⊗	CURB STOP
VC	PROPOSED 1.5m VALVE CHAMBER
(hatched bar)	INSULATE AS PER STANDARD No. T-708.01-4
(triangle)	THRUST BLOCK
TSV	TAPPING SLEEVE, VALVE AND VALVE BOX (TSV)
(shaded box)	PAVEMENT TO BE REINSTATED WITH SP 12.5B (40 mm)
(shaded box)	PAVEMENT TO BE REINSTATED WITH SP 12.5B (50 mm)
(shaded box)	PAVEMENT TO BE REINSTATED WITH SP FC1C (50 mm)

arva R.V. Anderson Associates Limited
engineering • environment • infrastructure

DIGITAL INFORMATION	
SURVEY(2020)	20-02970 (SVY).dgn
DESIGN	20-02970 (WAT).dgn, 20-02970 (WATPF).dgn
UTILITY	20-02970 (UGS).dgn
MAPPING	20-02970 (TOP).dgn
STREETLINE	20-02970 (PSL).dgn

No.	DATE	REVISIONS	INITIAL	SIGNED
1	07-09-2021	ISSUED FOR URBAN FORESTRY APPROVAL	V.S.	

TORONTO Engineering & Construction Services

MIKA RAISANEN, P.ENG.
Director, Design & Construction
Linear Underground Infrastructure

MICHAEL D'ANDREA, P.ENG
CHIEF ENGINEER and EXECUTIVE DIRECTOR
Engineering & Construction Services

MICHAEL POPIK, P.ENG.
Manager, Design & Construction
Linear Underground Infrastructure
Standalone Undergrounds

MARTIN GROVE ROAD
FROM LORRAINE GARDENS TO 150 m NORTH OF RATHBURN ROAD
WATERMAIN REPLACEMENT

DESIGN	V.S.	DRAWN	A.D.	CHECKED	V.S.	CONTRACT No. 21ECS-LU-05SU
SCALE	HORIZONTAL 1:200 VERTICAL 1:100			DRAWING NUMBER	21-02970-001	SHEET 1 OF 7
DATE	JULY 09, 2021					

MARTIN GROVE ROAD

NO STAGING AND STOCKPILING IS ALLOWED WITHIN TRCA REGULATED AREAS

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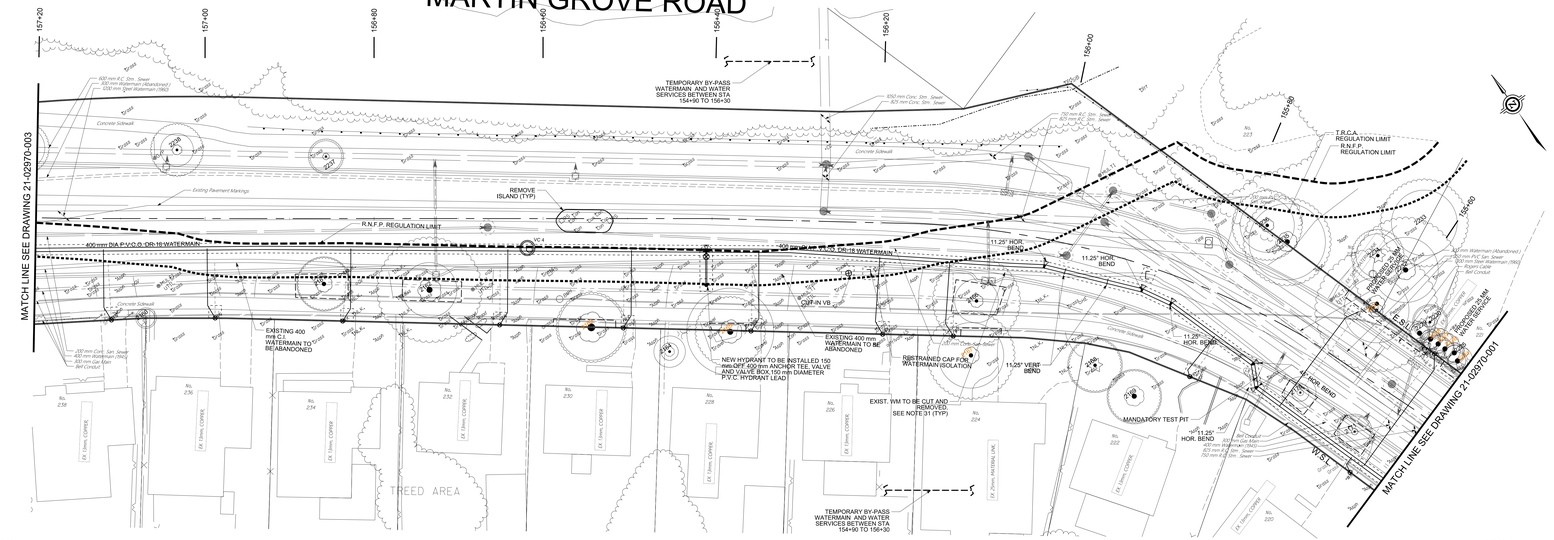
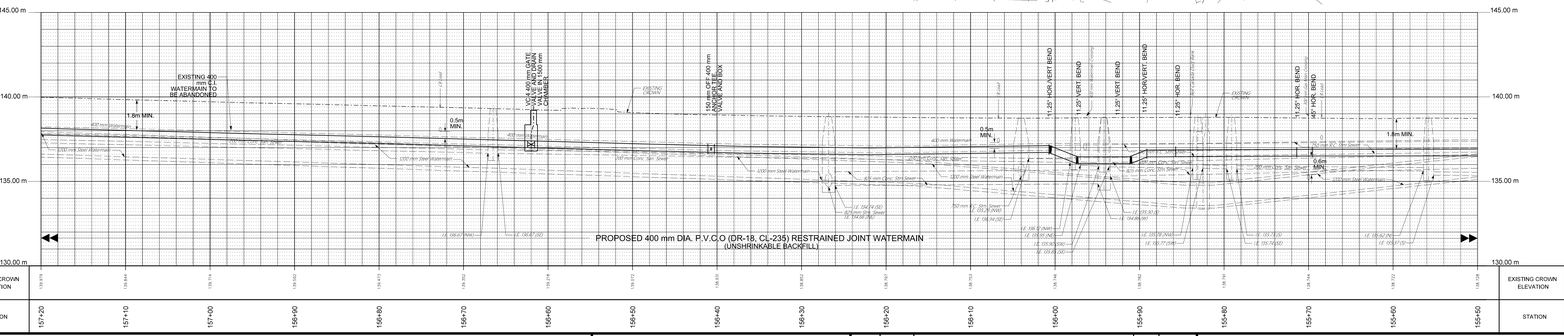
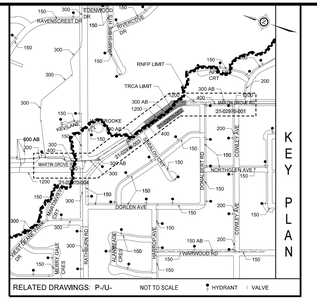
LEGEND:

- MINIMUM TREE PROTECTION ZONE
- DRIPLINE
- XXX TREE RELOCATE
- XXX TREE REMOVAL
- XXX TREE INJURY
- TREE PROTECTION FENCE
- IMPACT AREA







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3. THE CONTRACTOR SHALL LOCATE ALL WATER SERVICES WITHIN THE LIMITS OF CONSTRUCTION.
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LEGEND:

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- EXISTING WATER SERVICE CONNECTION
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- VB — GATE VALVE AND VALVE BOX
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- PROPOSED 1.5m VALVE CHAMBER
- INSULATE AS PER STANDARD No. T-708.01-4
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SURVEY(2020)	20-02970 (SVY).dgn
DESIGN	20-02970 (WAT)-dgn, 20-02970 (WATPF).dgn
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FROM LORRAINE GARDENS TO 150 m NORTH OF RATHBURN ROAD
WATERMAIN REPLACEMENT

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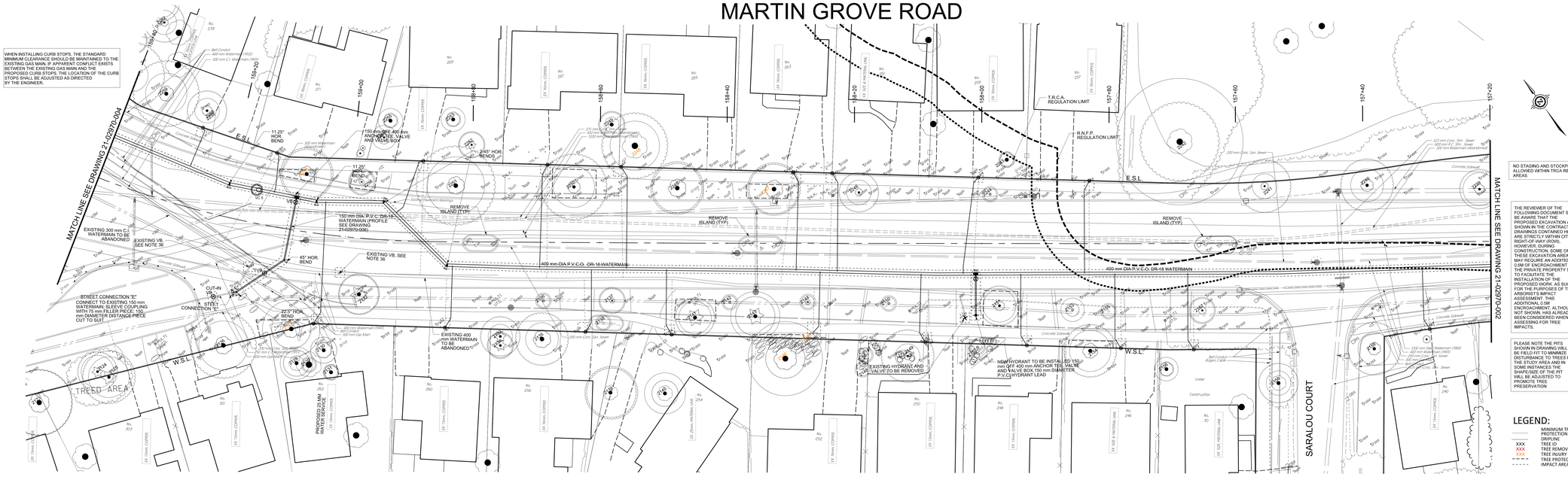
SCALE	HORIZONTAL 1:200 VERTICAL 1:100			DRAWING NUMBER	21-02970-002
DATE	JULY 09, 2021				

CONTRACT No. 21ECS-LU-055U

SHEET 2 OF 7

MARTIN GROVE ROAD



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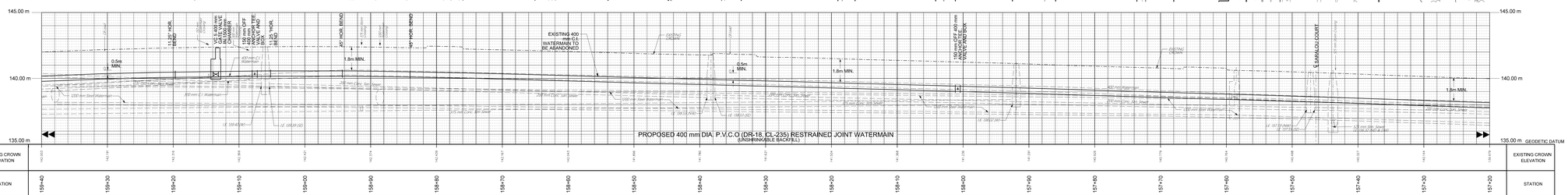

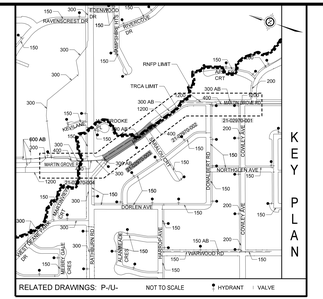

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SURVEY(2020)	20-02970 (SVY).dgn
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WATERMAIN REPLACEMENT

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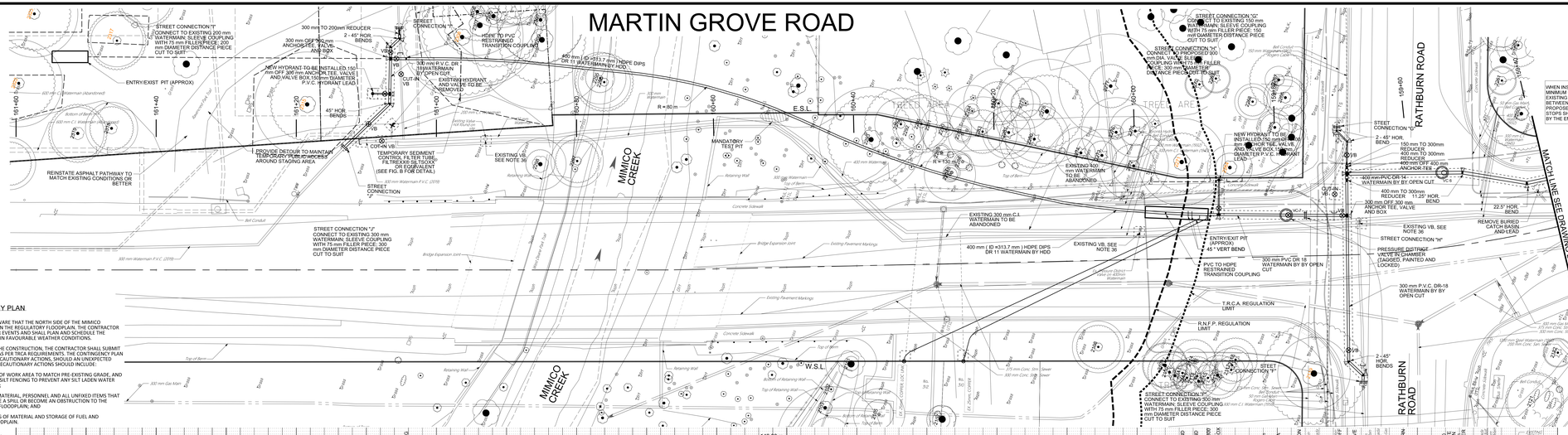
SCALE	HORIZONTAL 1:200 VERTICAL 1:100				
DATE	JULY 09, 2021				

CONTRACT No. 21ECS-LU-055U

DRAWING NUMBER 21-02970-003

SHEET 3 OF 7

MARTIN GROVE ROAD



FLOOD CONTINGENCY PLAN

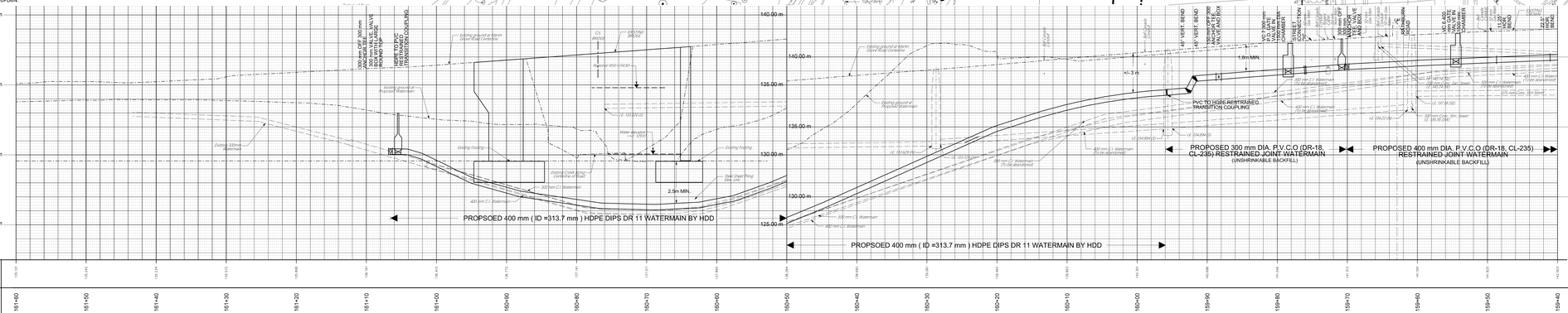
THE CONTRACTOR SHALL BE AWARE THAT THE NORTH SIDE OF THE MIMICO CREEK/PARK IS LOCATED WITHIN THE REGULATORY FLOODPLAIN. THE CONTRACTOR SHALL MONITOR THE WEATHER EVENTS AND SHALL PLAN AND SCHEDULE THE PROPOSED WORK PREFERABLY IN FAVOURABLE WEATHER CONDITIONS.

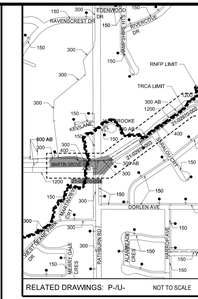
AT LEAST 4 WEEKS PRIOR TO THE CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A FLOOD CONTINGENCY PLAN AS PER TRCA REQUIREMENTS. THE CONTINGENCY PLAN SHALL INCLUDE PROPOSED PRECAUTIONARY ACTIONS, SHOULD AN UNEXPECTED STORM EVENT OCCURS. THE PRECAUTIONARY ACTIONS SHOULD INCLUDE:

1) TEMPORARY RESTORATION OF WORK AREA TO MATCH PRE-EXISTING GRADE, AND INSTALLATION OF ADDITIONAL SILT FENCING TO PREVENT ANY SILT LADEN WATER ENTERING THE WATER COURSE;

2) REMOVAL OF EQUIPMENT, MATERIAL, PERSONNEL AND ALL UNFIXED ITEMS THAT HAVE THE POTENTIAL TO CAUSE A SPILL OR BECOME AN OBSTRUCTION TO THE OVERLAND FLOW WITHIN THE FLOODPLAIN; AND

3) AVOIDANCE OF STOCKPILING OF MATERIAL AND STORAGE OF FUEL AND RE-FUELLING WITHIN THE FLOODPLAIN.





SEE DRAWING NO. 20-02970-005 FOR RATHBURN ROAD WATERMAIN DESIGN

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SCALE	HORIZONTAL 1:200 VERTICAL 1:100			DRAWING NUMBER	21-02970-004	SHEET	4 OF 7
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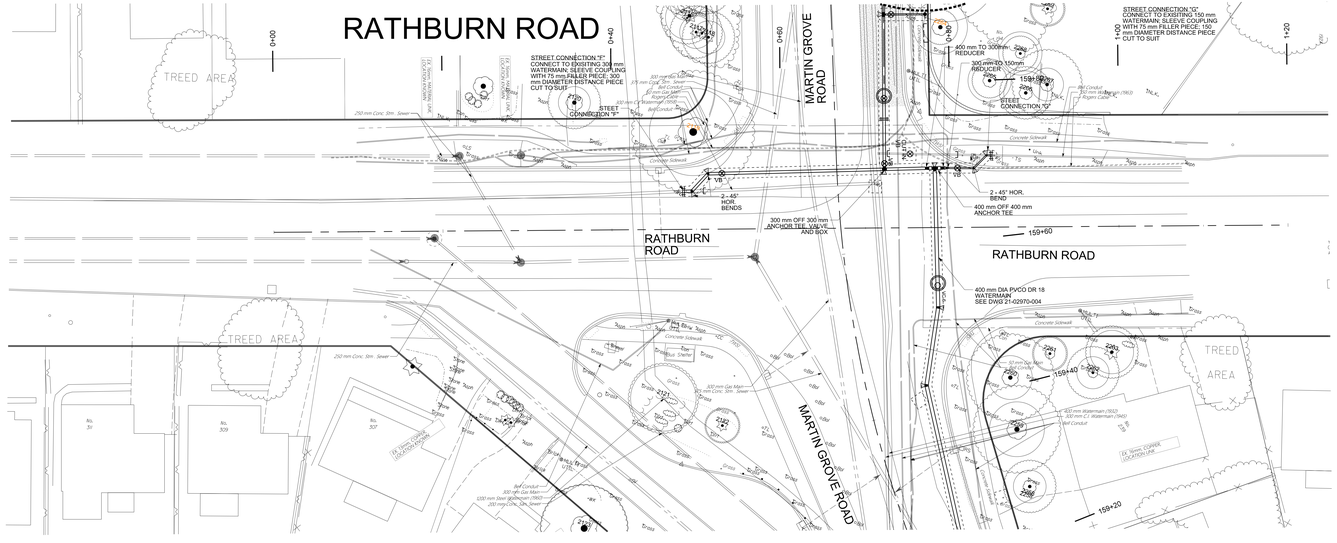
RATHBURN ROAD



SEE DRAWING NO. 21-02970-004 FOR MARTIN GROVE WATERMAIN DESIGN

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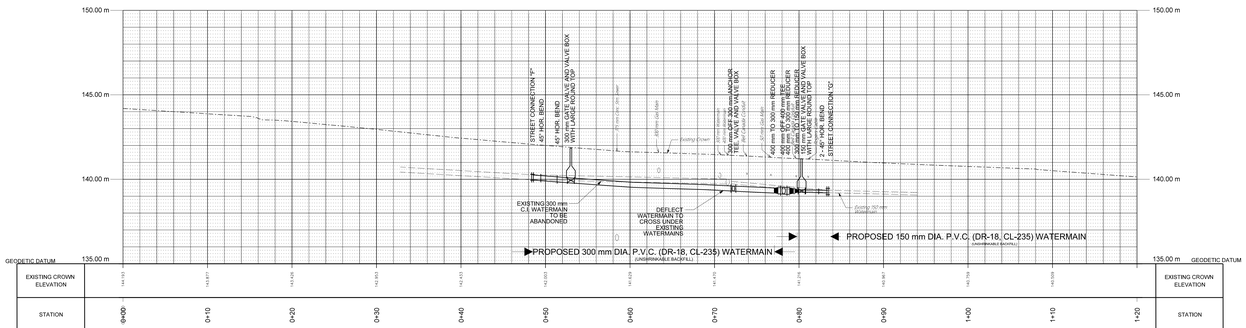
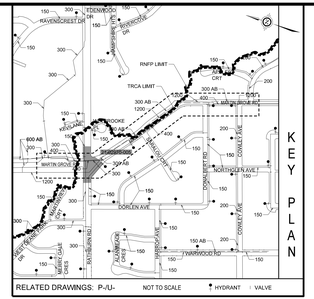
	IMPACT AREA





RELATED DRAWINGS: P-U- NOT TO SCALE HYDRANT VALVE

NOTES:

1. THE LOCATION OF ALL UNDER/ABOVE GROUND MUNICIPAL SERVICES, UTILITIES AND STRUCTURES ARE APPROXIMATE ONLY. NOT ALL MUNICIPAL SERVICES AND UTILITIES ARE SHOWN AND, WHERE SHOWN ON THE DRAWING(S), THE COMPLETENESS AND ACCURACY OF THE LOCATION OF SUCH SERVICES, UTILITIES AND STRUCTURES ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATION OF ALL SUCH SERVICES, UTILITIES AND STRUCTURES BY CONSULTING THE APPROPRIATE AUTHORITIES OR UTILITY COMPANIES CONCERNED BEFORE COMMENCEMENT OF THE WORK. THE CONTRACTOR SHALL PROVE THE LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE OR RESTORATION TO SAME.
2. EXISTING WATERMAIN DEPTH AND MATERIAL TYPES AT ALL CONNECTION POINTS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES AND CONFLICTS WITH EXISTING SERVICES.
3. THE CONTRACTOR SHALL LOCATE ALL WATER SERVICES WITHIN THE LIMITS OF CONSTRUCTION.
4. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING WITHIN 2.5 METERS OF COMPRESSION COUPLINGS OF EXISTING GAS MAINS. THE EXISTING COMPRESSION COUPLINGS ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL LOCATE THESE COUPLINGS PRIOR TO EXCAVATION.
5. SEWER LATERALS ARE NOT SHOWN. CONTRACTOR SHALL LOCATE LATERALS WHERE THEY CROSS PROPOSED WATERMAIN TO DETERMINE DEPTH AND PROFILE OF PROPOSED WATERMAIN. WATERMAIN SHALL BE DEFLECTED OR LOOPED AS PER NOTE 24.
6. THE CONTRACTOR SHALL VERIFY LOCATION, SIZE AND MATERIAL OF THE ACTIVE AND NON-ACTIVE LARGER WATER SERVICES PRIOR TO INSTALLING TEE.
7. STAND PIPE FOR SWABBING AND BACK FLOW PREVENTER SHALL BE INSTALLED AWAY FROM THE ROAD TO MINIMIZE TRAFFIC IMPACT.
8. WHEN INSTALLING CURB STOPS, THE STANDARD MINIMUM CLEARANCE SHOULD BE MAINTAINED TO THE EXISTING GAS MAIN. IF APPARENT CONFLICT EXISTS BETWEEN THE EXISTING GAS MAIN AND THE PROPOSED CURB STOPS, THE LOCATION OF THE CURB STOPS SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER.
9. THE CONTRACTOR SHALL REFER TO ARBORIST REPORT FOR THE GUIDELINES OF CONSTRUCTION NEAR TREES.
10. THE CONTRACTOR SHALL REPLACE ALL SUBSTANDARD CATCH BASINS FRAMES AND GRATES WITHIN THE PROJECT LIMIT TO RAISED SQUARE FRAMES AND CIRCULAR GRATES AS PER OPSD 400.070
11. THE CONTRACTOR SHALL INSTALL "TACTILE WALKING SURFACE INDICATORS" AS PER THE CITY'S STANDARDS T-310.030-7, T-310.030-8, T-310.030-9, T-310.030-10 AND T-310.030-11, ON PEDESTRIAN CROSSINGS IMPACTED BY THE PROPOSED WORK. ADDITIONAL SIDEWALK EXTENSIONS AND CURB/ GUTTER REPLACEMENT MAY BE REQUIRED TO ACCOMMODATE THE MINIMUM REQUIRED LENGTH OF THE "TACTILE WALKING SURFACE INDICATORS" AS PER CITY'S STANDARD.
12. THE CONTRACTOR SHALL INSTALL "CATCH BASIN INDICATOR ARROW MARKINGS" AS PER THE CITY'S STANDARD T-216.02-25
13. WATER SERVICES THAT ARE FOUND TO BE SMALLER THAN 19 mm OR LEAD OR GALVANIZED MATERIAL SHALL BE REPLACED WITH COPPER SERVICES. NEW WATER SERVICES SHALL BE 19 mm IN DIAMETER OR MATCH THE EXISTING, WHICHEVER IS GREATER, UNLESS OTHERWISE SHOWN IN THE PLAN.

LEGEND:

	PROPOSED WATER SERVICE CONNECTION
	EXISTING WATER SERVICE CONNECTION
	INSTALL PROPOSED WATERMAIN CAP
VB	GATE VALVE AND VALVE BOX
CUT-IN VB	CUT-IN VALVE AND VALVE BOX - TO BE INSTALLED BY OTHERS
TVB	TEMPORARY VALVE AND VALVE BOX
VC	CURB STOP
	PROPOSED 1.5m VALVE CHAMBER
	INSULATE AS PER STANDARD No. T-708.01-4 THRUST BLOCK
TSV	TAPPING SLEEVE, VALVE AND VALVE BOX (TSV)
	PAVEMENT TO BE REINSTATED WITH SP 12.5B (40 mm)
	PAVEMENT TO BE REINSTATED WITH SP 12.5B (50 mm)
	PAVEMENT TO BE REINSTATED WITH SP FC1C (50 mm)

arva R.V. Anderson Associates Limited
engineering • environment • infrastructure

SURVEY(2020)	20-02970 (SVY).dgn
DESIGN	20-02970 (WAT)..dgn, 20-02970 (WATPF).dgn
UTILITY	20-02970 (UGS).dgn
MAPPING	20-02970 (TOP).dgn
STREETLINE	20-02970 (PSL).dgn

DIGITAL INFORMATION

No.	DATE	REVISIONS	INITIAL	SIGNED
1	07-09-2021	ISSUED FOR URBAN FORESTRY APPROVAL	V.S.	

TORONTO Engineering & Construction Services

MIKA RAISANEN, P.ENG.
Director, Design & Construction
Linear Underground Infrastructure

MICHAEL D'ANDREA, P.ENG
CHIEF ENGINEER and EXECUTIVE DIRECTOR
Engineering & Construction Services

MICHAEL POPIK, P.ENG.
Manager, Design & Construction
Linear Underground Infrastructure
Standalone Undergrounds

MARTIN GROVE ROAD

FROM LORRAINE GARDENS TO 150 m NORTH OF RATHBURN ROAD
WATERMAIN REPLACEMENT

DESIGN	V.S.	DRAWN	A.D.	CHECKED	V.S.
SCALE	HORIZONTAL 1:200 VERTICAL 1:100				
DATE	JULY 09, 2021				

CONTRACT No. 21ECS-LU-055U

DRAWING NUMBER 21-02970-005

SHEET 5 OF 7

Figure 3a: Preferred access angle (example) on <u>private property</u> to avoid tree roots (to the extent possible).

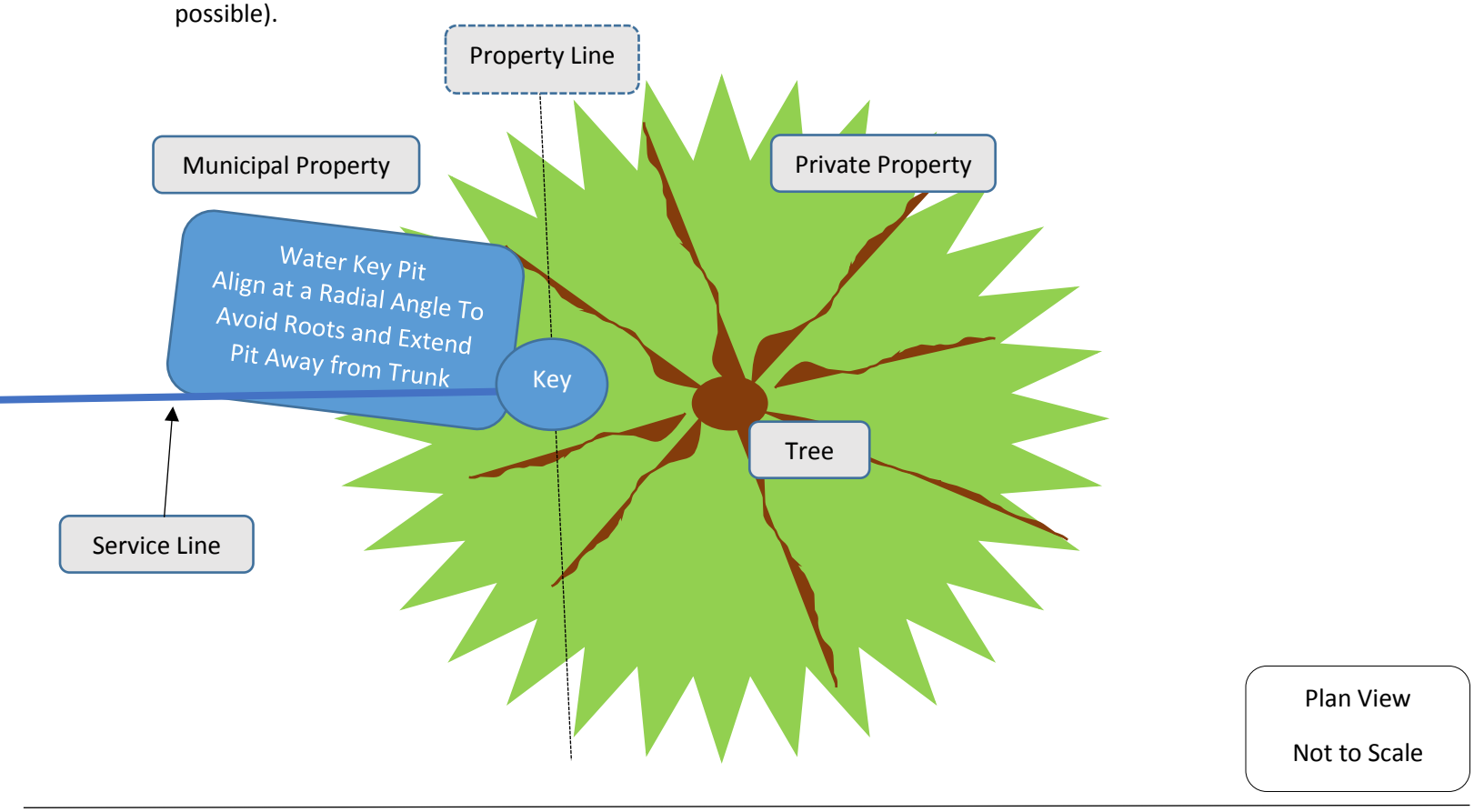
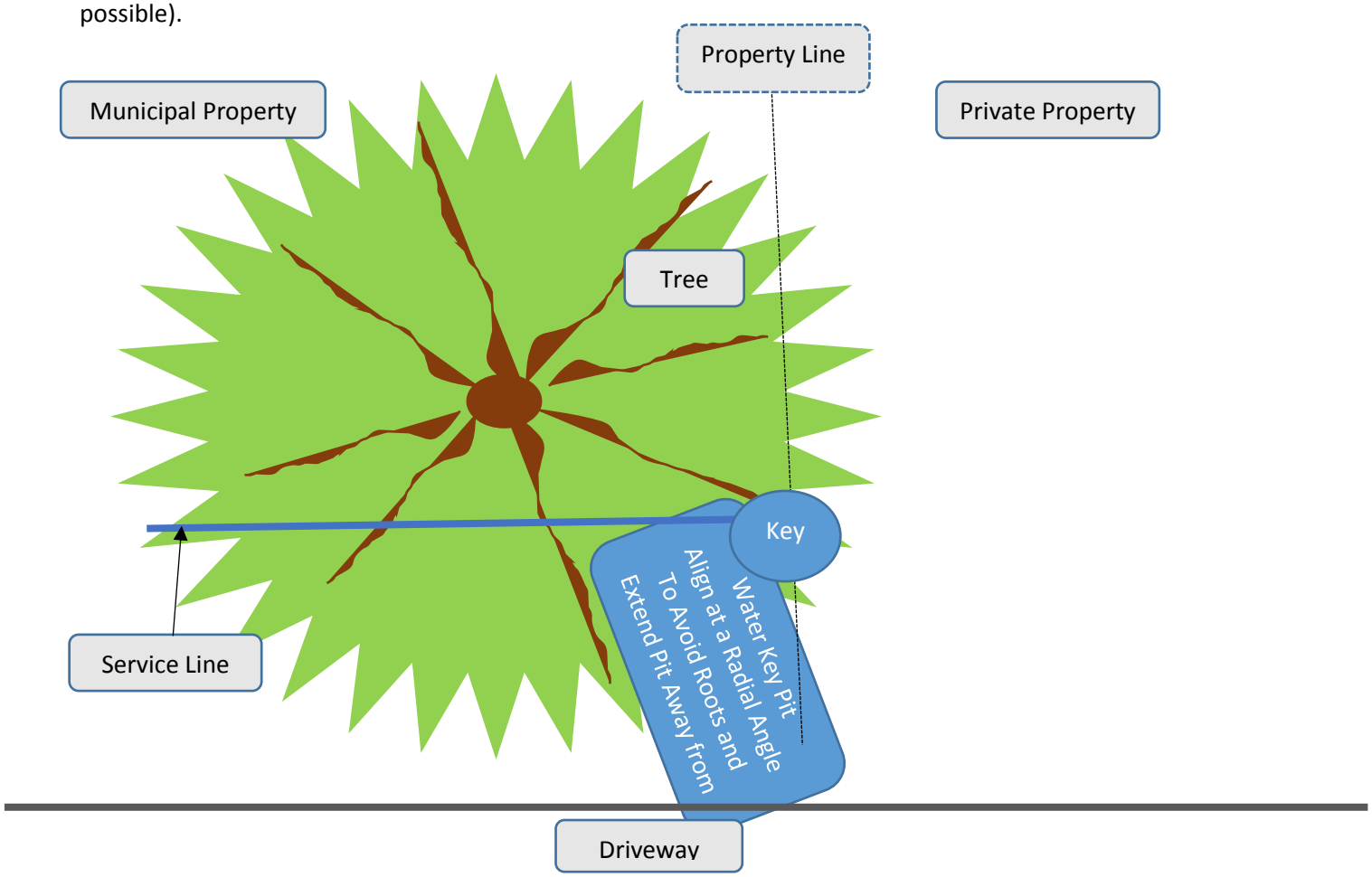


Figure 3b: Preferred access angle (example) on <u>municipal property</u> to avoid tree roots (to the extent possible).



Appendix A Tree Inventory

Appendix A Tree Inventory

Project: TA9027 PM6A
Client: RV Anderson
Collectors: JNO
Date: July 28, 2020
Street Segment: Martin Grove

Tree #	Scientific Name	Common Name	DBH (cm)	Additional Stems	Estimation of DBH	CONDITION				Location		City of Toronto Tree Category	RNFP	Minimum City of Toronto TPZ (m)	TPZ (m) Ravine/Natural Feature Tree	Impact Assessment				Tree Preservation Measures						Comments
						TI	CS	CV	Radial Dripline (m)	Number	Street					Remove	Injure	Retain	Rationale	Canopy Pruning	Protect with Hoarding	Root Pruning	Air-spade/hand dig	Open Trench Excavation	Trenchless Excavation	
2,101	*Picea pungens*	blue spruce	11.0			g	g	g	1	312	Martin Grove Road				3.60			x								
2,102	*Ulmus americana*	White elm	42.0			d	d	d		312	Martin Grove Road	2						x								
2,103	*Ulmus americana*	White elm	42.0			d	d	d		312	Martin Grove Road	2						x								
2,104	*Pinus nigra*	Austrian pine	57.0			g	g	g	3	312	Martin Grove Road	2			7.20			x								
2,105	*Acer x freemanii*	Freeman's maple	12.0			g	g	g	2	312	Martin Grove Road				3.60			x								
2,106	*Juglans cinerea*	butternut	25.0			g	g	g	3	312	Martin Grove Road				3.60			x								Next to fence
2,107	*Syringa sp.*	lilac	6.0	3,3		g	g	g	2	310	Martin Grove Road				1.20			x								
2,108	*Platanus x acerifolia*	London plane tree	21.0			g	g	g	3	308	Rathburn Road	5			3.60			x								
2,109	*Thuja occidentalis*	Eastern white cedar	42.0			g	g	g	3	308	Rathburn Road	2		3.00				x								
2,110	*Thuja occidentalis*	Eastern white cedar	35.0	32		g	g	g	3	308	Rathburn Road	2		2.40				x								
2,111	*Thuja occidentalis*	Eastern white cedar	22.0			g	g	g	1	308	Rathburn Road			1.80				x								
2,112	*Thuja occidentalis*	Eastern white cedar	20.0	14		g	g	g	2	308	Rathburn Road			1.80				x								
2,113	*Thuja occidentalis*	Eastern white cedar	32.0	20,8		g	g	g	3	308	Rathburn Road	2		2.40				x								
2,114	*Thuja occidentalis*	Eastern white cedar	16.0	16		g	g	g	3	308	Rathburn Road			1.80				x								
2,115	*Thuja occidentalis*	Eastern white cedar	17.0			g	g	g	1	308	Rathburn Road			1.80				x								
2,116	*Thuja occidentalis*	Eastern white cedar	35.0	14		g	g	g	3	308	Rathburn Road	2		2.40				x								
2,117	*Thuja occidentalis*	Eastern white cedar	28.0	24		g	g	g	3	308	Rathburn Road			1.80				x								
2,118	*Thuja occidentalis*	Eastern white cedar	27.0			g	g	g	3	308	Rathburn Road	5		1.80				x								
2,119	*Quercus rubra*	red oak	75.0			g	g	g	7	308	Rathburn Road	5		4.80			x		watermain open trench within 15% TPZ		x	x				pruned for overhead wires
2,120	*Acer negundo*	Manitoba maple	18.0	15,14		g	g	f	3	302	Rathburn Road			1.80				x								
2,121	*Acer platanoides*	Norway maple	56.0			g	g	g	4		Rathburn Road	5		3.60				x								
2,122	*Abies concolor*	white fir	28.0			g	g	g	2		Rathburn Road	5		1.80				x								
2,123	*Acer platanoides*	Norway maple	71.0			g	g	g	5	305	Rathburn Road	2		4.80				x								
2,124	*Picea pungens*	blue spruce	34.0			g	g	g	3	303	Rathburn Road	5		2.40				x								
2,125	*Picea pungens*	blue spruce	42.0			g	g	g	4	303	Rathburn Road	2		3.00				x								
2,126	*Acer platanoides*	Norway maple	51.0			g	g	g	5	301	Rathburn Road	5/2.		3.60				x								
2,127	*Ulmus pumila*	Siberian elm	63.0			g	f	g	3	262	Martin Grove Road	5/2.		4.20			x		Water key pit within 5% TPZ. Water key pit to be located 3.2 m from tree.		x	x	x		x	pruned for overhead wires
2,128	*Picea glauca*	white spruce	33.0			g	g	g	2	252	Martin Grove Road	2		2.40				x								
2,129	*Thuja occidentalis*	Eastern white cedar	1.0			g	g	g	1	262	Martin Grove Road			1.20				x								
2,130	*Picea pungens*	blue spruce	8.0			g	g	g	2	262	Martin Grove Road			1.20				x								
2,131	*Picea glauca*	white spruce	7.0			g	g	g	1	262	Martin Grove Road			1.20				x								
2,132	*Pinus sylvestris*	Scots pine	43.0			g	f	g	3	262	Martin Grove Road	5		3.00				x								pruned for overhead wires
2,133	*Thuja occidentalis*	Eastern white cedar	21.0	18		g	g	g	3	256	Martin Grove Road			1.80				x								
2,134	*Thuja occidentalis*	Eastern white cedar	23.0	17		g	g	g	2	256	Martin Grove Road			1.80				x								
2,135	*Betula papyrifera*	white birch	34.0	22,22		g	g	g	4	256	Martin Grove Road	2		2.40				x								
2,136	*Gleditsia triacanthos*	honey locust	4.0			g	g	g	1	256	Martin Grove Road	5		1.20				x								
2,137	*Prunus avium*	sweet cherry	19.0			g	g	g	2	256	Martin Grove Road	5		1.80				x								
2,138	*Thuja occidentalis*	Eastern White Cedar Hedge	3.0	1,2,2,3		g	g	g	1	256	Martin Grove Road	5		1.20				x								
2,139	*Picea abies*	Norway spruce	55.0			g	g	g	4	256	Martin Grove Road	2		3.60				x								
2,140	*Picea pungens*	blue spruce	46.0			g	g	g	2	254	Martin Grove Road	2		3.00				x								
2,141	*Picea abies*	Norway spruce	32.0			f	f	g	3	254	Martin Grove Road	5		2.40				x								pruned for overhead wires, 15% dieback
2,142	*Acer campestre*	hedge maple	5.0			g	g	g	1	254	Martin Grove Road	5		1.20				x								
2,143	*Picea abies*	Norway spruce	53.0			g	f	g	3	254	Martin Grove Road	5		3.60				x								pruned for overhead wires
2,144	*Laburnum anagyroides*	golden chain tree	9.0	5		g	g	g	1	252	Martin Grove Road	5		1.20				x								
2,145	*Picea pungens*	blue spruce	3.0			g	g	g	1	252	Martin Grove Road			1.20			x		Water key pit within 15% TPZ. Water key to 0.9 m from the tree.		x	x	x			
2,146	*Catalpa speciosa*	catalpa	88.0			g	g	g	3	252	Martin Grove Road	2		5.40			x		water key pit within 5% TPZ		x	x	x		x	
2,147	*Gymnocladus dioicus*	Kentucky coffee tree	2.0			g	g	g	1	252	Martin Grove Road			1.20				x								
2,148	*Picea glauca*	white spruce	2.0			g	g	g	1	252	Martin Grove Road			1.20				x								
2,149	*Gymnocladus dioicus*	Kentucky coffee tree	27.0			g	g	g	4	250	Martin Grove Road			1.80				x		x						
2,150	*Platanus x acerifolia*	London plane tree	5.0			g	g	g	1	250	Martin Grove Road	5		1.20				x								
2,151	*Prunus avium*	sweet cherry	37.0			g	g	g	3	248	Martin Grove Road	5		2.40				x		x						pruned for overhead wires, pollarding
2,152	*Acer platanoides*	Norway maple	2.0			g	g	g	1	248	Martin Grove Road			1.20				x								
2,153	*Ulmus americana*	American elm	10.0			g	g	g	1	246	Martin Grove Road	5		1.80				x								
2,154	*Betula pendula*	European birch	49.0			f	g	g	4	248	Martin Grove Road	2		3.00				x		x						wound on trunk, and branches
2,155	*Amelanchier sp.*	serviceberry	5.0			g	g	g	1	248	Martin Grove Road	5		1.20				x								
2,156	*Thuja occidentalis*	Eastern white cedar	11.0	10, 10		g	g	g	1	30	Saralou Crt			1.80				x								
2,157	*Acer rubrum*	red maple	18.0		x	g	g	g	2	30	Saralou Crt	5		1.80				x								
2,158	*Picea pungens*	blue spruce	25.0		x	g	g	g	3	30	Saralou Crt	5		1.80				x								
2,159	*Malus baccata c.v.*	Crabapple	31.0	27,27,22		f	g	g	4	240	Martin Grove Road	5		2.40				x								
2,160	*Thuja occidentalis*	Eastern white cedar	4.0	4		g	g	g	1	238	Martin Grove Road			1.20				x								
2,161	*Acer campestre*	hedge maple	41.0			g	f	g	3	234	Martin Grove Road	5		3.00				x		x						pruned for overhead wires
2,162	*Acer platanoides*	Norway maple	47.0			g	f	g	6	232	Martin Grove Road	5		3.00				x		x						pruned for overhead wires
2,163	*Acer platanoides*	Norway maple	60.0			f	f	g	4	230	Martin Grove Road	5/2.		3.60			x		Water key pit within 10% TPZ. Water key pit to be located 3.5 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x		x	pruned for overhead wires
2,164	*Picea glauca*	white spruce	13.0			g	g	g	1	228	Martin Grove Road			1.80				x								
2,165	*Acer platanoides*	Norway maple	71.0			g	f	g	4	228	Martin Grove Road	2		4.80			x		Water key pit and hydrant replacement within 15% TPZ. Water key pit to be located 2.1 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x		x	pruned for overhead wires
2,166	*Acer saccharum ssp. saccharum*	sugar maple	37.0			g	f	g	5	224	Martin Grove Road	5		2.40				x		x						pruned for overhead wires
2,167	*Acer saccharinum*	silver maple	56.0			g	g	g	5	224	Martin Grove Road	2		3.60			x		water key pit within 10% TPZ		x	x	x		x	
2,168	*Acer platanoides*	Norway maple	47.0			g	g	g	3	222	Martin Grove Road	2		3.00				x								
2,169	*Picea pungens*	blue spruce	45.0			g	g	g	3	222	Martin Grove Road	2		3.00				x								Canopy elevated
2,170	*Tilia cordata*	little leaf linden	12.0			g	g	g	1	220	Martin Grove Road	5		1.80				x		x						
2,171	*Tilia cordata*	little leaf linden	13.0			g	g	g	2	220	Martin Grove Road	5		1.80				x		x						
2,172	*Ulmus japonica x wilsoniana*	Accolade Elm	22.0			g	f	g	2	218	Martin Grove Road	5		1.80			x		watermain open trench within 15% TPZ		x	x				
2,173	*Malus baccata c.v.*	Crabapple	12.0			g	g	g	2	2	Donalbert Road			1.80				x								
2,174	*Thuja occidentalis*	Eastern White Cedar Hedge	7.0	6,5		g	g	g	1	2	Donalbert Road	5		1.20			x									
2,175	*Ulmus japonica x wilsoniana*	Accolade Elm	20.0			g	g	g	3	2	Donalbert Road	5		1.80			x		watermain open trench within %5 TPZ		x					
2,176	*Betula pendula*	European birch	24.0	23,18		g	g	g	3	2	Donalbert Road	5		1.80				x								
2,177	*Malus baccata c.v.*	Crabapple	28.0			g	g	g	2	1	Donalbert Road	5		1.80				x								
2,178	*Betula pendula*	European birch	10.0	8,6		g	g	g	2	1	Donalbert Road			1.80				x		x						
2,179	*Betula pendula*	European birch	3.0			g	g	g	1	1	Donalbert Road			1.20				x								
2,180	*Acer campestre*	hedge maple	31.0			g	g	g	4	210	Donalbert Road	5		2.40				x		x						
2,181	*Acer platanoides*	Norway maple	85.0			g	g	g	4	208	Donalbert Road	5		5.40			x		Proposed water key pit within 15% minimum TPZ. Water key pit to be located 2.60 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x		x	
2,182	*Corylus colurna*	Turkish hazel	58.0			g	f	g	3	206	Martin Grove Road	5		3.60			x		Proposed water key pit within 10% minimum TPZ. Water key pit to be located 2.45 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x			pruned for overhead wires

Tree #	Scientific Name	Common Name	DBH (cm)	Additional Stems	Estimation of DBH	CONDITION				Location		City of Toronto Tree Category	RNFP	Minimum City of Toronto TPZ (m)	TPZ (m) Ravine/Natural Feature Tree	Impact Assessment				Tree Preservation Measures						Comments
						TI	CS	CV	Radial Dripline (m)	Number	Street					Remove	Injure	Retain	Rationale	Canopy Pruning	Protect with Hoarding	Root Pruning	Air-spade/hand dig	Open Trench Excavation	Trenchless Excavation	
2,183	*Syringa reticulata*	Japanese Lilac	9.0			g	g	g	1	204	Martin Grove Road	5		1.20				x								
2,184	*Acer palmatum*	Japanese maple	4.0			g	g	g	1	204	Martin Grove Road			1.20				x								
2,185	*Platanus x acerifolia*	London plane tree	67.0			g	g	g	5	2	Cowley Avenue	2		4.20				x								
2,186	*Picea pungens*	blue spruce	60.0			g	g	g	3	1	Cowley Avenue	2		3.60			x		Proposed water key pit within 10% minimum TPZ. Water key pit to be located 2.20 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x			
2,187	*Acer campestre*	hedge maple	39.0			g	f	g	6	192	Martin Grove Road	5		2.40			x		Pit to be located 2.30 m from tree.		x					
2,188	*Picea glauca*	white spruce	24.0			g	g	g	2	192	Martin Grove Road			1.80				x								
2,189	*Acer platanoides*	Norway maple	20.0			g	g	g	3	42	Lorraine Gait	5		1.80				x								
2,190	*Thuja occidentalis*	Eastern White Cedar Hedge	2.0			g	g	g	1	42	Lorraine Gait			1.20				x								
2,191	*Acer saccharinum*	silver maple	65.0		x	g	g	g	7	42	Lorraine Gait	2		4.20				x								
2,192	*Acer rubrum*	red maple	18.0			g	g	g	2	42	Lorraine Gait	5		1.80				x								
2,193	*Acer x freemanii*	Freeman's maple	31.0			g	g	g	3	42	Lorraine Gait	5		2.40				x								
2,194	*Ginkgo biloba*	ginkgo	28.0			g	g	g	2	43	Lorraine Gait	5		1.80				x								
2,195	*Picea pungens*	blue spruce	38.0			g	g	g	2	43	Lorraine Gait	2		2.40				x								
2,196	*Pinus nigra*	Austrian pine	60.0		x	g	g	g	4	43	Lorraine Gait	2		3.60				x								
2,197	*Thuja occidentalis*	Eastern white cedar	3.0		x	g	g	g	1	43	Lorraine Gait			1.20				x								
2,198	*Taxus cuspidata*	Japanese yew	5.0	5,5	x	g	g	g	1	43	Lorraine Gait			1.20				x								
2,199	*Corylus colurna*	Turkish hazel	35.0			g	g	g	3	193	Martin Grove Road	5		2.40			x		Watermain open trench within 10% TPZ. Mainline trench 2.16 m from tree.		x	x		x		
2,200	*Juniperus virginiana*	Eastern red cedar	10.0			g	g	g	1	193	Martin Grove Road			1.80				x			x					
2,201	*Gleditsia triacanthos*	honey locust	68.0			g	g	g	6	197	Martin Grove Road	2		4.20			x		Proposed water key pit within minimum TPZ. Water key pit to be located 3.8 m from tree, pit will remain outside of private property to minimize injury to tree.		x					Canopy elevated
2,202	*Acer palmatum*	Japanese maple	5.0	5,3		g	g	g	2	197	Martin Grove Road			1.20				x								
2,203	*Acer platanoides*	Norway maple	53.0			g	g	g	4	199	Martin Grove Road	2		3.60			x		Proposed water key pit impacting 6% of TPZ. Water key pit to be located 2.0 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x			Sidewalk construction this summer near tree
2,204	*Acer platanoides*	Norway maple	28.0			f	g	g	3	199	Martin Grove Road			1.80				x								Sidewalk construction this summer near tree
2,205	*Acer platanoides*	Norway maple	55.0			f	g	g	5	201	Martin Grove Road	5		3.60			x		Proposed watermain trench and water key pit impacting 15% of TPZ. Pit will be 2.5 m from tree.		x	x	x	x	x	
2,206	*Pinus nigra*	Austrian pine	54.0			g	g	g	2	201	Martin Grove Road	2		3.60			x		Proposed water key pit impacting 6% of TPZ. Water key pit will be located 2.1 m from tree.		x	x	x			
2,207	*Acer palmatum*	Japanese maple	5.0	4		g	g	g	1	201	Martin Grove Road			1.20				x								
2,208	*Juniperus virginiana*	Eastern red cedar	4.0			g	g	g	1	201	Martin Grove Road			1.20				x								
2,209	*Acer platanoides*	Norway maple	45.0			g	g	g	5	203	Martin Grove Road	5		3.00			x		Proposed watermain trench and waterkey pit impacting 10% of TPZ. Water key pit to be located 2.3 m from tree.		x	x	x	x		Sidewalk construction this summer near tree
2,210	*Picea glauca*	white spruce	17.0	12		g	g	g	2	203	Martin Grove Road			1.80				x								
2,211	*Robinia pseudoacacia*	black locust	31.0			g	g	g	3	205	Martin Grove Road	2		2.40				x								
2,212	*Prunus sp.*	cherry	10.0			g	g	g	1	205	Martin Grove Road			1.80				x								
2,213	*Syringa reticulata*	Japanese Lilac	4.0			g	g	g	1	205	Martin Grove Road	5		1.20				x								
2,214	*Tilia cordata*	little leaf linden	52.0			g	g	g	4	205	Martin Grove Road	5		3.60				x		x						Sidewalk construction this summer near tree
2,215	*Acer saccharum ssp. saccharum*	sugar maple	10.0			g	g	g	1	207	Martin Grove Road	5		1.80				x		x						
2,216	*Tamarix sp.*	salt cedar	4.0	4,2		g	g	g	2	207	Martin Grove Road			1.20				x		x						
2,217	*Picea glauca*	white spruce	26.0			g	g	g	2	207	Martin Grove Road			1.80				x								
2,218	*Acer platanoides*	Norway maple	60.0			g	g	g	8	217	Martin Grove Road	5		3.60			x		Proposed water key pit within minimum TPZ. Water key pit to be located 2.18 m from tree, pit will be located 0.5 m into private property to minimize injury to tree.		x	x	x		x	
2,219	*Chamaecyparis nootkatensis*	Weeping False Cypress	12.0			g	g	g	1	219	Martin Grove Road			1.80			x		Proposed water key pit within minimum TPZ. Water key pit to be located 0.8 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x		x	
2,220	*Pinus resinosa*	red pine	24.0			g	g	g	2	221	Martin Grove Road			1.80				x								
2,221	*Prunus virginiana cv. "Schubert"*	Schubert choke cherry	9.0	4		f	g	g	2	221	Martin Grove Road			1.20				x								Black knot
2,222	*Prunus virginiana cv. "Schubert"*	Schubert choke cherry	7.0	2, 5		g	g	g	2	221	Martin Grove Road			1.20				x								
2,223	*Acer platanoides*	Norway maple	27.0	23		g	g	g	4	221	Martin Grove Road			1.80				x								
2,224	*Juniperus virginiana*	Eastern red cedar	13.0			g	g	g	1	221	Martin Grove Road			1.80			x		Water key pit to be located 1.89 m from tree.							
2,225	*Juniperus virginiana*	Eastern red cedar	8.0			g	g	g	1	221	Martin Grove Road			1.20				x								
2,226	*Juniperus virginiana*	Eastern red cedar	10.0			g	g	g	1	221	Martin Grove Road			1.80			x		Proposed water key pit within minimum TPZ. Water key pit to be located 0.7 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x		x	
2,227	*Juniperus virginiana*	Eastern red cedar	10.0			g	g	g	1	221	Martin Grove Road			1.80			x		Proposed water key pit within minimum TPZ. Water key pit to be located 0.7 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x		x	
2,228	*Juniperus virginiana*	Eastern red cedar	7.0			g	g	g	1	221	Martin Grove Road			1.20			x		Proposed water key pit within minimum TPZ. Water key pit to be located 0.8 m from tree, pit will remain outside of private property to minimize injury to tree.		x	x	x			
2,229	*Juniperus virginiana*	Eastern red cedar	7.0			g	g	g	1	221	Martin Grove Road			1.20				x								
2,230	*Betula pendula*	European birch	20.0			g	g	g	2	221	Martin Grove Road			1.80				x								
2,231	*Tilia cordata*	little leaf linden	51.0	43,30		g	g	g	7	223	Martin Grove Road	2		3.60			x		Proposed water key pit within 12% TPZ. Water key connection will be cut short to minimize injury to tree.		x	x	x		x	
2,232	*Tilia cordata*	little leaf linden	51.0			g	g	g	6	223	Martin Grove Road	2		3.60				x								
2,233	*Tilia cordata*	little leaf linden	57.0			g	g	g	5	223	Martin Grove Road	2		3.60				x								
2,234	*Pseudotsuga menziesii*	Douglas fir	37.0			g	g	g	3	223	Martin Grove Road	2		2.40				x								
2,235	*Tilia cordata*	little leaf linden	64.0			g	g	g	5	223	Martin Grove Road	2		4.20				x								
2,236	*Tilia cordata*	little leaf linden	41.0			f	g	g	4	223	Martin Grove Road	2		3.00				x								
2,237	*Acer rubrum*	red maple	14.0			g	g	g	2	231	Mountain Grove Road	5		1.80				x								Wound at base
2,238	*Acer rubrum*	red maple	29.0			g	g	g	3	231	Mountain Grove Road	5		1.80				x								Wound at base
2,239	*Acer rubrum*	red maple	39.0			g	g	g	3	231	Mountain Grove Road	5		2.40				x								
2,240	*Acer rubrum*	red maple	36.0			g	g	g	4	231	Mountain Grove Road	5		2.40				x								
2,241	*Acer rubrum*	red maple	29.0			g	g	g	4	231	Mountain Grove Road	5		1.80				x								
2,242	*Salix sp.*	willow	71.0	34,61		g	g	g	6	231	Mountain Grove Road	4			9.60			x								
2,243	*Quercus rubra*	red oak	7.0			g	g	g	1	259	Mountain Grove Road			1.20				x								
2,244	*Tilia cordata*	little leaf linden	5.0			g	g	g	1	259	Mountain Grove Road	5		1.20				x								
2,246	*Quercus rubra*	red oak	27.0			g	g	g	3	261	Mountain Grove Road	5		1.80				x								
2,245	*Acer platanoides*	Norway maple	52.0			g	g	g	4	265	Mountain Grove Road	5		3.60				x								
2,247	*Acer platanoides*	Norway maple	59.0			g	g	g	4	263	Mountain Grove Road	5		3.60			x		Proposed water key pit within minimum TPZ. Water key pit to be located 3,1 m from tree.		x	x	x			
2,248	*Acer saccharum ssp. saccharum*	sugar maple	58.0			g	g	g	5	265	Mountain Grove Road	2		3.60			x		Proposed water key pit within minimum TPZ. Water key pit to be located 3.3 m from tree.		x	x	x			
2,249	*Betula pendula*	European birch	20.0	20		f	g	g	2	267	Mountain Grove Road			1.80				x								
2,250	*Acer platanoides*	Norway maple	46.0			g	f	g	5	267	Mountain Grove Road	5		3.00				x								
2,251	*Acer platanoides*	Norway maple	67.0			g	g	g	6	269	Mountain Grove Road	5		4.20				x								
2,252	*Picea pungens*	blue spruce	25.0			g	g	g	2	269	Mountain Grove Road			1.80				x								
2,253	*Picea pungens*	blue spruce	17.0			g	g	g	1	269	Mountain Grove Road			1.80				x								
2,254	*Picea glauca*	white spruce	19.0			g	g	g	1	269	Mountain Grove Road			1.80				x								
2,255	*Picea glauca*	white spruce	24.0			g	g	g	1	269	Mountain Grove Road			1.80				x								
2,256	*Acer platanoides*	Norway maple	17.0			g	g	g	2	271	Mountain Grove Road	5		1.80				x		x						

Tree #	Scientific Name	Common Name	DBH (cm)	Additional Stems	Estimation of DBH	CONDITION				Location		City of Toronto Tree Category	RNFP	Minimum City of Toronto TPZ (m)	TPZ (m) Ravine/Natural Feature Tree	Impact Assessment				Tree Preservation Measures						Comments
						TI	CS	CV	Radial Dripline (m)	Number	Street					Remove	Injure	Retain	Rationale	Canopy Pruning	Protect with Hoarding	Root Pruning	Air-spade/hand dig	Open Trench Excavation	Trenchless Excavation	
2,257	*Acer platanoides*	Norway maple	52.0			g	f	g	4	271	Mountain Grove Road	5		3.60			x		Watermain open trench with 5% TPZ.		x					
2,258	*Juglans cinerea*	butternut	27.0	13		g	g	g	3	239	Rathburn Road			1.80				x			x					
2,259	*Gleditsia triacanthos*	honey locust	49.0			g	g	g	5	239	Rathburn Road	2		3.00				x								
2,260	*Gleditsia triacanthos*	honey locust	39.0			g	g	g	5	239	Rathburn Road	2		2.40				x								
2,261	*Acer saccharinum*	silver maple	24.0			g	f	g	2	239	Rathburn Road			1.80				x								
2,262	*Acer platanoides*	Norway maple	21.0			g	g	g	3	239	Rathburn Road			1.80				x								
2,263	*Picea abies*	Norway spruce	34.0			g	g	g	3	239	Rathburn Road	2		2.40				x								
2,264	*Acer platanoides*	Norway maple	41.0			g	g	g	2	194	Rathburn Road	2		3.00			x		proposed hydrant within 16% TPZ.		x	x				pruned for overhead wires
2,265	*Tilia cordata*	little leaf linden	31.0			g	g	g	2	194	Rathburn Road	2		2.40				x								
2,266	*Acer platanoides*	Norway maple	40.0			g	g	g	3	194	Rathburn Road	2		2.40				x								
2,267	*Acer platanoides*	Norway maple	29.0			g	g	g	4	194	Rathburn Road			1.80				x								
2,268	*Tilia cordata*	little leaf linden	33.0			g	g	g	2	194	Rathburn Road	2		2.40				x								
2,269	*Picea pungens*	blue spruce	25.0			g	g	g	2	194	Rathburn Road			1.80				x								
2,270	*Picea pungens*	blue spruce	25.0			g	g	g	2	194	Rathburn Road			1.80				x								
2,271	*Acer platanoides*	Norway maple	46.0			g	g	g	4	194	Rathburn Road	2		3.00	6.00		x									Up slope
2,272	*Acer platanoides*	Norway maple	34.0			g	g	g	3	194	Rathburn Road	2		2.40	4.80			x								
2,273	*Pinus nigra*	Austrian pine	26.0			g	g	g	2	194	Rathburn Road			1.80	3.60			x								
2,274	*Pinus nigra*	Austrian pine	28.0			g	g	g	2	194	Rathburn Road			1.80	3.60			x								
2,275	*Abies concolor*	white fir	27.0			g	g	g	2	194	Rathburn Road			1.80	3.60			x								Canopy elevated
2,276	*Abies concolor*	white fir	30.0			g	g	g	1	194	Rathburn Road	2		2.40	4.80			x								
2,277	*Catalpa speciosa*	catalpa	51.0			g	g	g	3	194	Rathburn Road	2		3.60	7.20			x								
2,278	*Acer saccharinum*	silver maple	55.0			g	g	g	5	194	Rathburn Road	2		3.60	7.20			x								
2,279	*Picea pungens*	blue spruce	19.0			g	g	g	2	194	Rathburn Road			1.80	3.60			x								
2,280	*Pinus nigra*	Austrian pine	40.0			g	g	g	4	194	Rathburn Road	2		2.40	4.80			x								
2,281	*Pinus nigra*	Austrian pine	29.0			g	g	g	3	194	Rathburn Road			1.80	3.60			x								
2,282	*Acer saccharinum*	silver maple	33.0			g	g	g	3	194	Rathburn Road	2		2.40	4.80			x								
2,283	*Pinus nigra*	Austrian pine	32.0			g	g	g	3	194	Rathburn Road	2		2.40	4.80			x								
2,284	*Pinus nigra*	Austrian pine	12.0			g	g	g	1	194	Rathburn Road			1.80	3.60			x								
2,285	*Pinus nigra*	Austrian pine	6.0			g	g	g	1	194	Rathburn Road	5		1.20	1.20			x								
2,286	*Acer campestre*	hedge maple	9.0			g	g	g	1	194	Rathburn Road	5		1.20	1.20			x								
2,287	*Acer platanoides*	Norway maple	11.0			g	g	g	1	194	Rathburn Road	5		1.80	3.60			x								
2,289	*Ulmus pumila*	Siberian elm	6.0	3		g	g	g	1	194	Rathburn Road	5		1.20	1.20			x								
2,288	*Acer pseudoplatnus*	sycamore maple	8.0	2		g	g	g	1	194	Rathburn Road	5		1.20	1.20			x								
2,290	*Pinus nigra*	Austrian pine	14.0			g	g	g	1	194	Rathburn Road	5		1.80	3.60			x								
2,291	*Acer platanoides*	Norway maple	23.0			g	g	g	4	194	Rathburn Road	5		1.80	3.60			x								
2,292	*Juglans cinerea*	butternut	27.0			g	g	g	5	194	Rathburn Road	5		1.80	3.60			x								
2,293	*Ulmus pumila*	Siberian elm	59.0			g	g	g	6	194	Rathburn Road	5		3.60	7.20			x								
2,294	*Juglans cinerea*	butternut	20.0			g	g	g	4	170	Rathburn Road	4		1.80	3.60			x								
2,295	*Acer negundo*	Manitoba maple	21.0	4		g	g	g	2	170	Rathburn Road	4		1.80	3.60			x								
2,296	*Juglans nigra*	black walnut	29.0			g	g	g	4	170	Rathburn Road	4		1.80	3.60			x								
2,297	*Ulmus pumila*	Siberian elm	28.0			g	g	g	3	170	Rathburn Road	5		1.80	3.60			x								
2,298	*Acer negundo*	Manitoba maple	17.0			g	f	g	2	170	Rathburn Road	5		1.80	3.60			x								Suppressed by vine
2,299	*Acer saccharinum*	silver maple	71.0			g	g	g	6	170	Rathburn Road	4		4.80	9.60			x								
2,300	*Acer saccharinum*	silver maple	45.0			g	g	g	6	170	Rathburn Road	4		3.00	6.00			x								
2,301	*Acer saccharinum*	silver maple	36.0			g	f	g	4	170	Rathburn Road	4		2.40	4.80			x								
2,302	*Acer saccharinum*	silver maple	37.0			g	g	g	6	170	Rathburn Road	4		2.40	4.80			x								
2,303	*Acer saccharinum*	silver maple	53.0			g	g	g	7	170	Rathburn Road	4		3.60	7.20			x								
2,304	*Acer saccharinum*	silver maple	43.0			g	g	g	5	170	Rathburn Road	4		3.00	6.00			x								
2,305	*Acer saccharinum*	silver maple	47.0			g	g	g	7	170	Rathburn Road	4		3.00	6.00			x								
2,306	*Acer saccharinum*	silver maple	46.0			g	g	g	4	170	Rathburn Road	4		3.00	6.00			x								
2,307	*Acer saccharinum*	silver maple	66.0			g	g	g	8	170	Rathburn Road	4		4.20	8.40			x								
2,308	*Acer saccharinum*	silver maple	61.0	35		g	g	g	8	170	Rathburn Road	4		4.20	8.40		x		laydown area within minimum TPZ		x					
2,309	*Juglans cinerea*	butternut	57.0			g	g	g	5	170	Rathburn Road	4		3.60	7.20			x								
2,310	*Juglans nigra*	black walnut	64.0			g	g	g	6	170	Rathburn Road	4		4.20	8.40			x								
2,311	*Acer saccharinum*	silver maple	61.0			g	g	g	5	170	Rathburn Road	4		4.20	8.40			x								
2,312	*Quercus bicolor*	swamp white oak	6.0			g	g	g	1	170	Rathburn Road	4		1.20	1.20			x								
2,313	*Quercus rubra*	red oak	12.0			g	g	g	2	170	Rathburn Road	4		1.80	1.80			x								
2,314	*Acer x freemanii*	Freeman's maple	5.0			g	g	g	1	170	Rathburn Road	4		1.20	1.20			x								
2,315	*Gleditsia triacanthos*	honey locust	58.0			g	g	g	5	170	Rathburn Road	4		3.60	7.20		x		laydown area within minimum TPZ		x					
2,317	*Acer platanoides*	Norway maple	27.0			g	g	g	4	170	Rathburn Road	4		1.80	3.60		x		shaft entry/exit within 10% TPZ		x	x				
2,316	*Acer platanoides*	Norway maple	27.0			g	g	g	4	170	Rathburn Road	4		1.80	3.60			x								
2,318	*Pinus strobus*	white pine	26.0			g	g	g	3	170	Rathburn Road	4		1.80	3.60			x								
2,319	*Pinus strobus*	white pine	29.0			g	g	g	4	170	Rathburn Road	4		1.80	3.60			x								
2,320	*Pinus strobus*	white pine	26.0			g	g	g	3	170	Rathburn Road	4		1.80	3.60			x								
2,321	*Pinus strobus*	white pine	22.0			g	g	g	3	170	Rathburn Road	4		1.80	3.60			x								
2,322	*Gleditsia triacanthos*	honey locust	46.0			g	g	g	5	170	Rathburn Road	4		3.00	6.00		x		shaft entry/exit within 13% TPZ		x	x				
2,323	*Gleditsia triacanthos*	honey locust	42.0			g	g	g	5	170	Rathburn Road	4		3.00	6.00		x		shaft entry/exit within 8% TPZ		x	x				
2,324	*Gleditsia triacanthos*	honey locust	41.0			g	g	g	5	170	Rathburn Road	4		3.00	6.00			x								
2,325	*Gleditsia triacanthos*	honey locust	54.0			g	g	g	5	170	Rathburn Road	4		3.60	7.20			x								
2,326	*Acer saccharinum*	silver maple	24.0			g	g	g	3	170	Rathburn Road	4		1.80	3.60			x								
2,327	*Acer platanoides*	Norway maple	36.0			g	g	g	5	170	Rathburn Road	4		2.40	4.80			x								

Legend

DBH (cm)	Diameter at breast height
TI	Trunk Integrity
CS	Crown Structure
CV	Crown Vigour
DL (m)	Drip Line
CDB	Crown Dieback
EAB	Emerald Ash Borer
ESA/SARA	Species at Risk
TPZ	Tree Protection Zone
Lean Dir.	Lean Direction
	Memorial Tree
	Dead Tree
	Tree Recommended for Protection
	Kentucky Coffee Tree
	identification number not used

Condition

G	Good
F	Fair
P	Poor
D	Dead
L	Light
M	Moderate
H	Heavy
E	East
W	West
N	North
S	South
F	Frost
C	Compression
T	Tension
S	Shear Plane

Total

Category **City of Toronto By-law Code**

1 Trees with diameters of 30 cm or more, situated on private property on the subject site.
2 Trees with diameters of 30 cm or more, situated on private property, within 6 m of the subject site
3 Trees of all diameters situated on City owned parkland within 6 m of the subject site.
4 On lands designated under the City of Toronto Municipal Code, Chapter 658, Ravine and Natural Feature Protection, trees of all diameters situated within 10 meters of ay construction activity
5 Trees of all diameters situated within the City road allowance adjacent to the subject site.

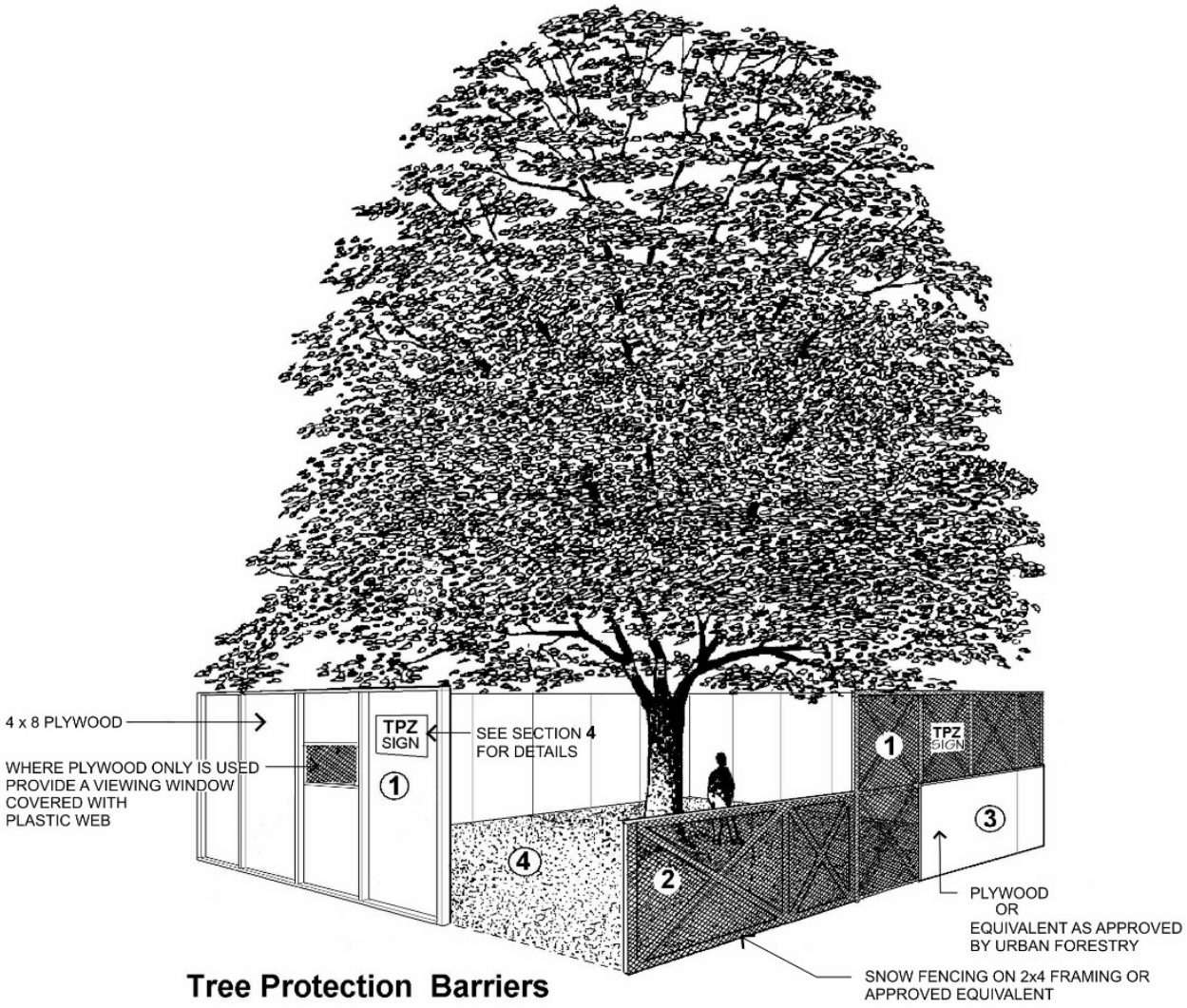
Reason for Removal

1 Trees interfere with proposed development (100%)

Tree #	Scientific Name	Common Name	DBH (cm)	Additional Stems	Estimation of DBH	CONDITION				Location		City of Toronto Tree Category	RNFP	Minimum City of Toronto TPZ (m)	TPZ (m) Ravine/Natural Feature Tree	Impact Assessment				Tree Preservation Measures						Comments
						TI	CS	CV	Radial Dripline (m)	Number	Street					Remove	Injure	Retain	Rationale	Canopy Pruning	Protect with Hoarding	Root Pruning	Air-spade/hand dig	Open Trench Excavation	Trenchless Excavation	

2 greater than 25% of canopy or roots are in conflict with development
3 trees are dead, dying or hazardous

Appendix B City of Toronto Tree Protection Specifications



Tree Protection Barriers

(1) **Tree protection barriers must be constructed with a solid wood frame clad with plywood or approved equivalent. Height of hoarding may be less than 8 ft. to accomodate any branches that may be lower.**

(2) **Tree protection barriers for trees situated on the City road allowance where visibility must be maintained can be 1.2m (4ft.) high and consist of orange plastic web snow fencing on a wood frame made of 2 x 4s .**

(3) **Where some excavate or fill has to be temporarily located near a tree protection barrier, plywood must be used to ensure no material enters the Tree Protection Zone.**

(4) **No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the Tree Protection Zone.**

Note:
Sediment control fencing shall be installed in locations indicated in an Urban Forestry approved Tree Protection Plan. The sediment control fencing must be installed to Ontario Provicial Standards (OPSD-219.130) heavy duty silt fence barrier and to the satisfaction of Urban Forestry. See Detail TP- 2

TORONTO

Parks, Forestry and Recreation

Urban Forestry

February 2016

Detail TP-1

LGL LIMITED
environmental research associates

445 Thompson Drive, Unit 2
Cambridge, Ontario CANADA N1T 2K7
: 519-622-3300 : 519-622-3310
: cambridge@lgl.com : www.lgl.com

Head Office 22 Fisher St., P.O. Box 280, King City, ON CANADA L7B 1A6 905-833-1244 905-833-1255 kingcity@lgl.com www.lgl.com

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

[redacted]
312 Martin Grove Road,
Toronto, Ontario
M9B 4L5

December 18, 2020

RE: 312 Martin Grove Road Butternut Health Assessment
BHA Report Number: [040- 055]
Date(s) of Butternut health assessment: August 20, 2020

Dear [redacted],

This letter is in regard to my assessment of the Butternut trees on your property along Martin Grove Road on behalf of the City of Toronto and is being copied to the MECP. The tree is within 25m of the proposed construction and therefore is required to be assessed for health according to provincial regulations.

As a designated Butternut Health Assessor (BHA), I am providing the following Butternut Health Assessor's Report for the tree located at the above noted property, for which I completed an assessment during the site visit on the above noted date. If there are other Butternut trees at the site that may be affected by the activity and they are not identified in this report, they too must be assessed by a BHA. Please read this letter carefully as it contains important information about the Endangered Species Act, 2007 (ESA).

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the ESA from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: http://www.ontario.ca/environment-and-energy/butternut-trees-your-property.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local

MECP District Manager. Note that the MECP will not accept photocopies. The BHA Report must be submitted at least 30 days prior to registering to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MECP may contact you for an opportunity to examine the tree. If MECP chooses to examine the tree, a representative of the MECP will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the "Notice of Butternut Impact" form on the MECP Registry **after the 30 day period has elapsed**.

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local Ministry of Environment, Conservation and Parks (MECP) office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MECP offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this letter and a copy of the BHA Report for your records, along with any other documentation you may receive from the MECP should an examination of the trees occur. If you have any questions, please contact your local MECP district office.

Links:

Endangered Species Act, 2007:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

Summary of changes related to Butternut:
http://www.ontario.ca/environment-and-energy/butternut-trees-your-property

MECP office locations:
https://www.ontario.ca/environment-and-energy/ministry-environment-district-locator

Sincerely,

Jennifer Noel

Enclosures:

1. Butternut Health Assessor's Report
2. Original data forms
3. Electronic and printed copies of the Excel data spreadsheet (BHA Tree Analysis)
4. Butternut Figure
5. Photo Appendix

Butternut Health Assessor's Report Number 040-055

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

[redacted]
312 Martin Grove Road,
Toronto, Ontario
M9B 4L5

Site Location: 312 Martin Grove Road

Date(s) of Butternut health assessment: August 20, 2020
Date BHA Report prepared: December 18, 2020

Map datum used: x NAD83 ☐ WGS84

Total number of trees assessed in this BHA Report: 1

The assessed tree was numbered on site using black sharpie. The number at the site correspond to the tree numbers used in this report. The first number is the one given to the Butternut for the BHA and the number in parentheses is related to the arborist report completed for this project.

This BHA Report includes the following tables:

- Table 1: Butternut trees proposed to be killed, harmed, or taken
- Table 2: Summary of Assessment Results

Table 1: Butternut trees proposed to be killed, harmed, or taken

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
1	616446E 4834871N	2	16	n	NOT Harmed	Water key replacement within the driveway and 25 m setback. Tree is within the second-tier flowerbed/retaining wall of the property. No roots will be impacted by this temporary construction as the tree is 1 m below grade.

[1] The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.
[2] The rules in regulation under section 23.7 of O. Reg. 242/08 are not applicable to Category 3 trees.
[3] dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)

Table 2: Summary of Assessment Results

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
Category 1	0	• A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered "non-retainable". • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Category 1 trees may be killed, harmed or taken **after** the 30 day period that follows submission of this BHA Report to the MECP District Manager, unless the results of an MECP examination indicate that the assessment has not been conducted in accordance with the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*".
Category 2	1	• A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered "retainable". • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a maximum of ten (10) Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm
Category 3	0	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Visit the MECP website using the link below for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees: http://www.MECP.gov.on.ca/en/Business/Species/2ColumnSubPage/MECP_SAR_HOW_DO_GET_PER_EN.html
Cultivated	0	• An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. • Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MECP district office: http://www.MECP.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

Tree is located within the second-tier flowerbed/retaining wall north of the residence. The City of Toronto will be replacing the water services along Martin Grove Road including a watermain replacement (within the road) and associated connections and waterkeys/waterboxes to private properties. Construction of the waterkey and service connection at 312 Martin Grove Road will be located within the existing hard service of the driveway. Construction on this property will be restricted to a small excavation pit at the waterkey within the driveway where no tree roots are anticipated. The local service connection between the watermain and the residential property will be installed through tunneling. The tree is located within a depressed flowerbed/retaining wall which is approximately 0.5-1 m below grade which makes it very unlikely that the tree's root system will be impacted from the construction. The dripline of the tree is 3m and well outside of the disturbance limit and will not require pruning. Driveways are usually constructed with compact granular and asphalt which is not typically an area where roots are found. As such, from an arborist perspective, although construction is within the 25m protection setback, no portion of the tree is considered to be harmed or injured during construction.

NOTE: This concludes the summary of the BHA Report. A complete BHA Report must include the original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), an electronic copy of the Excel data analysis spreadsheet, and one printed copy of the Excel data analysis spreadsheet.

0cm 3cm 15cm

Butternut Data Collection Form 1 - 2010 Edition

Surveyor ID or BHA # 0040

(PLEASE USE BLOCK LETTERS)

Date (dd/mm/yyyy) 20 - 08 - 2020

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
First JENNIFER Last NOEL
Email JNOEL@LGL.COM
Telephone (519) 622-3300 Telephone Other ( ) - x

Property Owner (check if same as surveyor) ☐
First [redacted] Last [redacted]
or Company
Email
Telephone ([redacted] Telephone Other ( ) - x

Property Owner's Mailing address
Address 312 MARTIN GROVE ROAD
City ETOBICOKE
Postal Code M9B4L5 Prov. ON

Tree Location (if different from mailing address)
Address/(911#)
Township Lot Con
City

Directions
TREE IN FLOWERBED/RETAINING WALL
NORTH SIDE OF PROPERTY

☐ Yes ☐ No Can Share Location Information with other Butternut Recovery Organizations?
☐ Yes ☐ No Site visits OK? (prior arrangments will always be made for a site vist)

> (Greater than)
< (Less than)

Butternut Trees Tally by Diameter Class

(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers			1	
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem				
Dead				

Historically, do some trees produce seeds? ☐ Y ☐ N ☒ Unkown

Estimated area containing butternut for properties > 1 acre (0.4 hectares): ☐ Acres ☐ Hectares

Overall Property Description (area(s) containing Butternut)
☐ Rolling Upland ☐ Bottomland
☐ Valley Slope ☐ Variable
☒ Tableland ☐ Unknown

Vegetation Community/ies
☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☐ DeciduousForest ☐ Quary
☐ ConiferForest ☒ UrbanYard
☐ MixedForest ☐ UrbanPark

Other

Soil Drainage
☒ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☐ Unknown

Soil Texture
☐ Clay ☐ Sand
☐ Clay Loam ☐ Variable
☐ Loam ☒ Unknown
☐ Loamy Sand

Soil Depth
☒ > 1metre
☐ 30 - 99cm
☐ < 30cm
☐ Variable
☐ Unknown

Please enter matching numerical page link code on forms 1 and 2

Page Link 616532

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

Shaded fields are mandatory for Butternut Health Assessments

Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Site Code(A,B,...Z, AA...): 312

Surveyor ID or BHA #: 0040

Date (dd/mm/yyyy): 20-08-2020

Surveyor Last Name: NOEL

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree #	Zone	Easting	Northing
001	17	616446	4834871

- Crown Class: 2
- Live Crown %: 100
- Main Stem Length(m) Below crown: 04
- ☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration
- #Stems: 1
- DBH(cm): 016
- Butternut Origin: ☐ Natural ☒ Planted ☐ Unknown
- Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☒ None

Assess below live crown

- #Epic-Live: 00
- #Epic-Dead: 00
- Bark Type: S
- # Callused Wounds: 00

	#Open	#Sooty
Root	00	00
=<2m	01	01
>2m	00	00

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species: ULMPUMI / ACENEGU / PINSYLV

TREE IN FLOWERBED/ RETAINING WALL ON PRIVATE PROPERTY

Tree #	Zone	Easting	Northing
	1		

Crown Class ☐ Live Crown % ☐ Main Stem Length(m) Below crown ☐
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration #Stems DBH(cm)
Butternut Origin ☐ Natural ☐ Planted ☐ Unknown
Seed Signs ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None
Assess below live crown: #Epic-Live #Epic-Dead Bark Type # Callused Wounds
#Open #Sooty: Root =<2m >2m
Metres from badly cankered tree ☐ < 40 ☐ > 40 ☐ None Found
Competing Species

Tree #	Zone	Easting	Northing
	1		

Crown Class ☐ Live Crown % ☐ Main Stem Length(m) Below crown ☐
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration #Stems DBH(cm)
Butternut Origin ☐ Natural ☐ Planted ☐ Unknown
Seed Signs ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None
Assess below live crown: #Epic-Live #Epic-Dead Bark Type # Callused Wounds
#Open #Sooty: Root =<2m >2m
Metres from badly cankered tree ☐ < 40 ☐ > 40 ☐ None Found
Competing Species

Tree #	Zone	Easting	Northing
	1		

Crown Class ☐ Live Crown % ☐ Main Stem Length(m) Below crown ☐
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration #Stems DBH(cm)
Butternut Origin ☐ Natural ☐ Planted ☐ Unknown
Seed Signs ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None
Assess below live crown: #Epic-Live #Epic-Dead Bark Type # Callused Wounds
#Open #Sooty: Root =<2m >2m
Metres from badly cankered tree ☐ < 40 ☐ > 40 ☐ None Found
Competing Species

Tree #	Zone	Easting	Northing
	1		

Crown Class ☐ Live Crown % ☐ Main Stem Length(m) Below crown ☐
☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration #Stems DBH(cm)
Butternut Origin ☐ Natural ☐ Planted ☐ Unknown
Seed Signs ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None
Assess below live crown: #Epic-Live #Epic-Dead Bark Type # Callused Wounds
#Open #Sooty: Root =<2m >2m
Metres from badly cankered tree ☐ < 40 ☐ > 40 ☐ None Found
Competing Species

Please enter matching page link code on forms 1 and 2

Page Link: 616446

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

2013 ESA 2007 Butternut retainable tree analysis

using data collected by a designated BHA (ESA 2007)

Contact the OMNR Provincial SAR Branch for a more detailed explanation of its derivation (June 2009/2013).

BHA #	40	Assessment Date(s)	20-Aug-20	Total # trees	1
Landowner name	TRCA, Private owner				
Property Location	ravine north of Martin Grove Road and Rathburn Road				

input field data										automatic calculations from field data						Categories: 1=non retainable (NR), 2=retainable (R), 3= Archivable (A)				
			# bole cankers				# root flare (RF) cankers									'2' cases				'3' cases
Tree #	Live Crown %	tree dbh (cm)	sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)				< 40 m from cankered tree	Circ. (cm) = Pi x dbh	total bole canker width (sooty x 2.5 + open x 5)	total RF canker width (sooty x 2.5 + openx5)	bole canker % of circ.	RF canker % of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 and BC% = 0	LC% >70 & BRC %<20	LC% >70 & BC %< 20	Final R Tree Call	FINAL TREE CALL R, dbh>20cm <40m from NR
	LC %	dbh (cm)	S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O	y or n	Circ (cm)	BC (cm)	RC (cm)	BC%	RC%	BRC%					
1	100	16	1	0	1	0	0	0	n	50.24	7.5	0	15	0	7	1	2	2	2	2

LEGEND

Butternut (*Juglans cinerea*)

- Category 1 (non-retainable)
- Category (retainable)
- Cultivated butternut not protected by the Endangered Species Act, 2007
- Hybrid
- 25m Setback from Retainable Butternut
- Proposed Watermain and Water Service
- Construction Impact Footprint
- Ravine and Natural Feature Protection Area

PM6A2
Martin Grove Road

Butternut Health Assessment

LGL LIMITED
environmental research associates

Project	TA9027-24	**Figure**	
Date	January 2021	**Prepared By:**	KC
Scale	1:1,000	**Verified By:**	JCN

PROJECT #
August 2020

PHOTO APPENDIX
312 Martin Grove Road

Photo 1: Canopy of Butternut Tree within the flowerbed/retaining wall of 312 Martin Gove Road.

Photo 2: Full view of the tree within the flowerbed.

This is Butternut Tree #1 from the BHA. Tree 2106 from LGL's Arborist Report

LGL LIMITED
environmental research associates

445 Thompson Drive, Unit 2
Cambridge, Ontario CANADA N1T 2K7
: 519-622-3300 : 519-622-3310
: cambridge@lgl.com : www.lgl.com

Head Office 22 Fisher St., P.O. Box 280, King City, ON CANADA L7B 1A6 905-833-1244 905-833-1255 kingcity@lgl.com www.lgl.com

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

[redacted]
239 Rathburn Road,
Toronto, Ontario
M9B 2L6

December 18, 2020

RE: 312 Martin Grove Road Butternut Health Assessment
BHA Report Number: [040- 056]
Date(s) of Butternut health assessment: August 20, 2020

Dear [redacted]

This letter is in regard to my assessment of the Butternut trees on your property along Martin Grove Road on behalf of the City of Toronto and is being copied to the MECP. The tree is within 25m of the proposed construction for the watermain and local service connection and therefore is required to be assessed for health.

As a designated Butternut Health Assessor (BHA), I am providing the following Butternut Health Assessor's Report for the tree located at the above noted property, for which I completed an assessment during the site visit on the above noted date. Please read this letter carefully as it contains important information about the Endangered Species Act, 2007 (ESA).

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the ESA from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: http://www.ontario.ca/environment-and-energy/butternut-trees-your-property.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local MECP District Manager. Note that the MECP will not accept photocopies. The BHA Report must be submitted at least 30 days prior to registering to kill, harm, or remove a Butternut tree. During

this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MECP may contact you for an opportunity to examine the tree. If MECP chooses to examine the tree, a representative of the MECP will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the "Notice of Butternut Impact" form on the MECP Registry **after the 30 day period has elapsed**.

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local Ministry of Environment, Conservation and Parks (MECP) office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MECP offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this letter and a copy of the BHA Report for your records, along with any other documentation you may receive from the MECP should an examination of the trees occur. If you have any questions, please contact your local MECP district office.

Links:

Endangered Species Act, 2007:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

Summary of changes related to Butternut:
http://www.ontario.ca/environment-and-energy/butternut-trees-your-property

MECP office locations:
https://www.ontario.ca/environment-and-energy/ministry-environment-district-locator

Sincerely,

Jennifer Noel

Enclosures:

1. Butternut Health Assessor's Report
2. Original data forms
3. Electronic and printed copies of the Excel data spreadsheet (BHA Tree Analysis)
4. Photo Appendix

Butternut Health Assessor's Report Number 040-056

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

[redacted]
239 Rathburn Road,
Toronto, Ontario
M9B 2L6

Site Location: 239 Rathburn Road

Date(s) of Butternut health assessment: August 20, 2020
Date BHA Report prepared: December 18, 2020

Map datum used: x NAD83 ☐ WGS84

Total number of trees assessed in this BHA Report: 1

The assessed tree was not numbered on site as it is a residential tree. The number on the map corresponds to the tree number used in this report. The first number is the one given to the Butternut for this BHA and the other number in parentheses is related to the arborist report completed for this project.

This BHA Report includes the following tables:

- Table 1: Butternut trees proposed to be killed, harmed, or taken
- Table 2: Summary of Assessment Results
- Table 3: Butternut Health Assessment Tree Analysis

Table 1: Butternut trees proposed to be killed, harmed, or taken

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
2 (2258)	616532E 4834777N	2	27	y	NOT Harmed	This is a planted tree in the front yard of a residence at the intersection of Mountain Grove Road and Rathburn Road as an ornamental tree and as such, does not receive protection under

[1] The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.
[2] The rules in regulation under section 23.7 of O. Reg. 242/08 are not applicable to Category 3 trees.
[3] dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
						the Endangered Species Act. Disturbance for the waterkey will occur across the driveway and in to the neighbours yard.

Table 2: Summary of Assessment Results

Result:	**Total #:**	**Important information for persons planning activities that may affect Butternut:**
Category 1	0	• A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered "non-retainable". • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Category 1 trees may be killed, harmed or taken **after** the 30 day period that follows submission of this BHA Report to the MECP District Manager, unless the results of an MECP examination indicate that the assessment has not been conducted in accordance with the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007"*.
Category 2	0	• A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered "retainable". • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a maximum of ten (10) Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm
Category 3	0	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Visit the MECP website using the link below for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees: http://www.MECP.gov.on.ca/en/Business/Species/2ColumnSubPage/MECP_SAR_HOW_DO_GET_PER_EN.html
Cultivated	1	• An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. • Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		the ESA. This information can be accessed by contacting the local MECP district office: http://www.MECP.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

The tree is an ornamental tree planted within the front yard and is not considered a natural occurrence and as such, does not receive protection under the Endangered Species Act (2007).

The tree is located in within the front year of the residence at the south east intersection of Rathburn Road and Mountain Grove Road. The City of Toronto will be replacing the water services along Martin Grove Road. Construction of the waterkey/waterbox and service connection will not occur within the 239 Rathburn Road property however on the adjacent lawn of 271 Martin Grove Road across the driveway from the tree. Construction on this neighbouring property will be restricted to a small excavation pit at the waterkey. The local service connection between the watermain and the waterkey will be installed through tunnel to a depth outside of the depth typical of tree roots. Construction of the watermain will be restricted to the curbs of the road and will not impact the root system of this tree. As such from an arborist perspective, although construction is within the dripline of the tree, no portion of the tree is considered to be harmed or injured during construction.

NOTE: This concludes the summary of the BHA Report. A complete BHA Report must include the original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), an electronic copy of the Excel data analysis spreadsheet, and one printed copy of the Excel data analysis spreadsheet.

0cm 3cm 15cm

Butternut Data Collection Form 1 - 2010 Edition

(PLEASE USE BLOCK LETTERS)

Surveyor ID or BHA # 0040

Date (dd/mm/yyyy) 20 - 08 - 2020

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact

First JENNIFER Last NOEL

Email JNOEL@LGL.COM

Telephone (519) 622-3300 Telephone Other ( ) - x

Property Owner (check if same as surveyor) ☐

First [redacted] Last [redacted]

or Company

Email

Telephone [redacted] Telephone Other ( ) - x

Property Owner's Mailing address

Address 239 RATHBURN ROAD

City ETOBICOKE

Postal Code M9B 2L6 Prov. ON

Tree Location *(if different from mailing address)*

Address/(911#)

Township Lot Con

City

Directions

TREE PLANTED IN FRONT YARD

☐ Yes ☐ No Can Share Location Information with other Butternut Recovery Organizations?

☐ Yes ☐ No Site visits OK? (prior arrangments will always be made for a site vist)

> (Greater than)
< (Less than)

Butternut Trees Tally by Diameter Class

(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers			01	
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem				
Dead				

Historically, do some trees produce seeds? ☐ Y ☐ N ☐ Unkown

Estimated area containing butternut for properties > 1 acre (0.4 hectares): ☐ Acres ☐ Hectares

Overall Property Description (area(s) containing Butternut)

☐ Rolling Upland ☐ Bottomland
☐ Valley Slope ☐ Variable
☒ Tableland ☐ Unknown

Vegetation Community/ies

☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☐ DeciduousForest ☐ Quary
☐ ConiferForest ☒ UrbanYard
☐ MixedForest ☐ UrbanPark

Other

Soil Drainage

☒ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☐ Unknown

Soil Texture

☐ Clay ☐ Sand
☐ Clay Loam ☐ Variable
☐ Loam ☒ Unknown
☐ Loamy Sand

Soil Depth

☒ > 1metre
☐ 30 - 99cm
☐ < 30cm
☐ Variable
☐ Unknown

Please enter matching numerical page link code on forms 1 and 2

Page Link 615532

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE BLOCK LETTERS)

Shaded fields are mandatory for Butternut Health Assessments

Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Site Code(A,B,...Z, AA...): 239

Surveyor ID or BHA #: 0040

Surveyor Last Name: NOEL

Date (dd/mm/yyyy): 20-08-2020

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree 1

Tree #: 002 | Zone: 17 | Easting: 616532 | Northing: 4834777

Crown Class: 1 | Live Crown %: 080 | Main Stem Length(m) Below crown: 03 | Seed Signs: None

Twig Dieback ☐ | Branch Dieback ☐ | Defoliation ☐ | Discolouration ☐ | #Stems: 1 | DBH(cm): 027

Butternut Origin: Natural ☐ | Planted ☑ | Unknown ☐

Male Flowers ☐ | Female Flowers ☐ | Seed Set ☐ | None ☒

Assess below live crown:

	#Open	#Sooty
#Epic-Live: 00		
#Epic-Dead: 00		
Bark Type: R		
# Callused Wounds: 00		
Root	00	00
=<2m	00	00
>2m	00	00

Metres from badly cankered tree: < 40 ☐ | > 40 ☐ | None Found ☐

Competing Species: GLETRIA / ACEPLAT / PICABIE

PLANTED TREE IN FRONT YARD LGL ARBORIST REPORT #2258

Tree 2

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown: | Seed Signs:

Twig Dieback ☐ | Branch Dieback ☐ | Defoliation ☐ | Discolouration ☐ | #Stems: | DBH(cm):

Butternut Origin: Natural ☐ | Planted ☐ | Unknown ☐

Male Flowers ☐ | Female Flowers ☐ | Seed Set ☐ | None ☐

Assess below live crown:

	#Open	#Sooty
#Epic-Live:		
#Epic-Dead:		
Bark Type:		
# Callused Wounds:		
Root		
=<2m		
>2m		

Metres from badly cankered tree: < 40 ☐ | > 40 ☐ | None Found ☐

Competing Species:

Tree 3

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown: | Seed Signs:

Twig Dieback ☐ | Branch Dieback ☐ | Defoliation ☐ | Discolouration ☐ | #Stems: | DBH(cm):

Butternut Origin: Natural ☐ | Planted ☐ | Unknown ☐

Male Flowers ☐ | Female Flowers ☐ | Seed Set ☐ | None ☐

Assess below live crown:

	#Open	#Sooty
#Epic-Live:		
#Epic-Dead:		
Bark Type:		
# Callused Wounds:		
Root		
=<2m		
>2m		

Metres from badly cankered tree: < 40 ☐ | > 40 ☐ | None Found ☐

Competing Species:

Tree 4

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown: | Seed Signs:

Twig Dieback ☐ | Branch Dieback ☐ | Defoliation ☐ | Discolouration ☐ | #Stems: | DBH(cm):

Butternut Origin: Natural ☐ | Planted ☐ | Unknown ☐

Male Flowers ☐ | Female Flowers ☐ | Seed Set ☐ | None ☐

Assess below live crown:

	#Open	#Sooty
#Epic-Live:		
#Epic-Dead:		
Bark Type:		
# Callused Wounds:		
Root		
=<2m		
>2m		

Metres from badly cankered tree: < 40 ☐ | > 40 ☐ | None Found ☐

Competing Species:

Tree 5

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown: | Seed Signs:

Twig Dieback ☐ | Branch Dieback ☐ | Defoliation ☐ | Discolouration ☐ | #Stems: | DBH(cm):

Butternut Origin: Natural ☐ | Planted ☐ | Unknown ☐

Male Flowers ☐ | Female Flowers ☐ | Seed Set ☐ | None ☐

Assess below live crown:

	#Open	#Sooty
#Epic-Live:		
#Epic-Dead:		
Bark Type:		
# Callused Wounds:		
Root		
=<2m		
>2m		

Metres from badly cankered tree: < 40 ☐ | > 40 ☐ | None Found ☐

Competing Species:

Please enter matching page link code on forms 1 and 2

Page Link: 616532

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

2013 ESA 2007 Butternut retainable tree analysis

using data collected by a designated BHA (ESA 2007)

Contact the OMNR Provincial SAR Branch for a more detailed explanation of its derivation (June 2009/2013).

BHA #	40	Assessment Date(s)	20-Aug-20	Total # trees	1
Landowner name		TRCA, Private owner			
Property Location		ravine north of Martin Grove Road and Rathburn Road			

input field data										automatic calculations from field data						Categories: 1=non retainable (NR), 2=retainable (R), 3= Archivable (A)				
			# bole cankers				# root flare (RF) cankers									'2' cases				'3' cases
Tree #	Live Crown %	tree dbh (cm)	sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)				< 40 m from cankered tree	**Circ.** (cm) = Pi x dbh	total **bole canker width** (sooty x 2.5 + open x 5)	total RF **canker width** (sooty x 2.5 + openx5)	bole canker **%** of circ.	RF canker **%** of circ.	total bole & root canker % of 2xCirc	LC% >/= 50 and BC% = 0	LC% >70 & BRC %<20	LC% >70 & BC %< 20	Final R Tree Call	**FINAL TREE CALL** R, dbh>20cm <40m from NR
	LC %	dbh (cm)	S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O	y or n	Circ (cm)	BC (cm)	RC (cm)	BC%	RC%	BRC%					
2	80	27	0	0	0	0	0	0	n	84.78	0	0	0	0	0	2	2	2	2	2

LEGEND

Butternut (*Juglans cinerea*)

- Category 1 (non-retainable)
- Category (retainable)
- Cultivated butternut not protected by the Endangered Species Act, 2007
- Hybrid
- 25m Setback from Retainable Butternut
- Proposed Watermain and Water Service
- Construction Impact Footprint
- Ravine and Natural Feature Protection Area

PM6A2
Martin Grove Road
Butternut Health Assessment

LGL LIMITED
environmental research associates

Project	TA9027-24	**Figure**	
Date	January 2021	**Prepared By:**	KC
Scale	1:1,000	**Verified By:**	JCN

PROJECT #9027-24
August 2020

PHOTO APPENDIX
239 Rathburn Road

Photo 1: Full view of planted butternut. Source: Google earth.

Tree 2 (LGL Arborist Report 2258)

LGL LIMITED
environmental research associates

445 Thompson Drive, Unit 2
Cambridge, Ontario CANADA N1T 2K7
: 519-622-3300 : 519-622-3310
: cambridge@lgl.com : www.lgl.com

Head Office 22 Fisher St., P.O. Box 280, King City, ON CANADA L7B 1A6 905-833-1244 905-833-1255 kingcity@lgl.com www.lgl.com

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

Toronto and Region Conservation Authority
101 Exchange Avenue
Concord, ON
L4K 5R6

December 18, 2020

RE: 305 Martin Grove Road (Ravencrest Park) Butternut Health Assessment
BHA Report Number: [040- 058]
Date(s) of Butternut health assessment: August 20, 2020

Dear Sir/Madame,

This letter is in regard to my assessment of the Butternut tree on your property along Martin Grove Road on behalf of the City of Toronto and is being copied to the MECP. The tree is within 25m of the proposed construction and therefore is required to be assessed for health.

As a designated Butternut Health Assessor (BHA), I am providing the following Butternut Health Assessor's Report for the tree located at the above noted property, for which I completed an assessment during the site visit on the above noted date. Physical inspection of twigs collected for genetic analysis indicated that your tree within Ravencrest Park west of Martin Grove Road showed signs of hybridity which was confirmed as such on December 16, 2020 (report attached). Hybrid butternut trees are not protected under the Endangered Species Act, 2007 (ESA) however would be subject to local municipal tree by-laws.

Please retain this letter and a copy of the BHA Report for your records, along with any other documentation you may receive from the MECP should an examination of the trees occur. If you have any questions, please contact your local MECP district office.

Links:

Endangered Species Act, 2007:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

Summary of changes related to Butternut:

http://www.ontario.ca/environment-and-energy/butternut-trees-your-property

MECP office locations:
https://www.ontario.ca/environment-and-energy/ministry-environment-district-locator

Sincerely,

Jennifer Noel

Enclosures:

1. Butternut Health Assessor's Report
2. Photo Appendix
3. Butternut Figure
4. Genetic Analysis

Butternut Health Assessor's Report Number 040-058

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

Toronto and Region Conservation Authority
101 Exchange Avenue
Concord, ON
L4K 5R6

Site Location: 305 Martin Grove Road

Date(s) of Butternut health assessment: August 20, 2020
Date BHA Report prepared: December 18, 2020

Map datum used: x NAD83 ☐ WGS84

Total number of trees assessed in this BHA Report: 1

The assessed tree was numbered on site using tree tag and blue paint. The number at the site correspond to the tree numbers used in this report. The first number is the one given to the Butternut for the BHA and the number in parentheses is related to the arborist report completed for this project. It is identified as tree 74 in this report and 2309 in LGL's Arborist Report.

This BHA Report includes the following tables:

- Table 1: Summary of Assessment Results

Table 1: Summary of Assessment Results

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
Category 1	0	• A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered "non-retainable". • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Category 1 trees may be killed, harmed or taken **after** the 30 day period that follows submission of this BHA Report to the MECP District Manager, unless the results of an MECP examination indicate that the assessment has not been conducted in accordance with the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007"*.
Category 2	0	• A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered "retainable".

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		• During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a maximum of ten (10) Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm
Category 3	0	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Visit the MECP website using the link below for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees: http://www.MECP.gov.on.ca/en/Business/Species/2ColumnSubPage/MECP_SAR_HOW_DO_GET_PER_EN.html
Cultivated	0	• An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. • Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MECP district office: http://www.MECP.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	1	• Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

Tree is located in the within the Ravencrest Park east of Martin Grove Road. Twig samples were collected and sent for analysis which confirmed this tree is a hybrid. Photos 8 and 9 in the Photo Appendix show a twig that was collected from the tree which displays characteristics of hybridity including: a notched leaf scar, and the pith is light brown.

NOTE: This concludes the summary of the BHA Report. A complete BHA Report must include the original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), an electronic copy of the Excel data analysis spreadsheet, and one printed copy of the Excel data analysis spreadsheet.

PROJECT #9027-24
August 2020

PHOTO APPENDIX
TRCA Ravencrest Park

Photo 1: Tree markings from a previous assessment.

Photo 2: Wounds on the root flare of the tree.

Photo 3: Sooty canker on lower trunk of the tree

Tree 74 (LGL Arborist Report 2309)

PROJECT #TA9027-24
August 2020

PHOTO APPENDIX
TRCA Ravencrest Park

Photo 4: Canopy view of the Butternut Tree.

Photo 5: Sooty canker on lower trunk.

Photo 6: North view of Butternut tree (red circle) withinn the park. Black line is the proposed water service.

Photo 7: Canker on root flare.

Tree 74 (LGL Arborist Report 2309)

PROJECT #TA9027-24
August 2020

PHOTO APPENDIX
TRCA Ravencrest Park

Photo 8: View of the notched leaf scar characteristic of a hybrid Butternut.

Photo 9: Light brown pith of the tree. Light brown pith is an indication of a hybrid Butternut tree.

Tree 74 (LGL Arborist Report 2309)

Precision Biomonitoring Inc.
361 Southgate Drive
Guelph, ON, N1G 3M5

Butternut Hybridization Report

Report Contents

Report Issued:

Prepared By: Steve Crookes	Date: 15/12/2020	Email: steve.crookes@precisionbiomonitoring.com
Validated by: Jay Cashubec	Date: 15/12/2020	Email: jay.cashubec@precisionbiomonitoring.com

Prepared for

LGL Limited

22 Fisher St. PO Box 280, King City, Ontario, L7B 1A6, Canada

Contact Name	Email Address	Phone
Trent Meyers	Tmeyers@lgl.com	(647) 500-5570

Background and Methodology

Nine bud samples of putative butternut tree (*Juglans cinerea* L.) were submitted by LGL to determine if there has been potential hybridization with other congeneric species. To test for the signal of potential hybridization, a series of microsatellite (or 'simple-sequence repeat' (SSR) markers) were selected (Ross-Davis & Woeste, 2008) to identify any alleles (DNA sequence length variants of the same genetic locus) that are representative of alleles derived from non-purebred butternut, and thus categorize potential individuals of butternut *x* non-*Juglans cinerea* hybrid ancestry.

The method used to identify putative butternut and hybrids analyzes the size distribution of SSR alleles derived from the extracted DNA of each sample and compares this data to size class distributions published in the literature for each *Juglans* species. Thus, one can determine the size class of allele for each of the ten SSR marker loci, and for each genotyped individual, that is characteristic of either the butternut genome or other *Juglans* species' genomes, with the caveat than many alleles may be shared within the *Juglans* genus.

Genomic DNA was extracted using a commercial kit and SSR PCR amplification was performed with fluorescently labelled primers (VIC dye). Amplicons were run on an ABI 3500 genetic analyzer to determine both amplicon (allele) number and size at each marker. This analysis allows for the genotyping of the sample at these ten SSR markers, according to the size of the alleles (they vary in DNA base pair length), allowing for a comparison to published allelic size classes documented in purebred butternut and other *Juglans* species.

Results

A total of ten SSR markers were analyzed from genomic DNA extracted from the submitted sample BN1: WGA 004, WGA 033, WGA 082, WGA 090, WGA 142, WGA 147, WGA 148, WGA 204, WGA 221 and WGA 256. A summary of the results of genotyping across all loci, as pertaining to the identification of putative non-purebred Butternut alleles, is shown in Table 1.

Table 1: Results from genotyping using the ten SSRs as published by Ross-Davis & Woeste (2008). Based on the SSR data, a putative butternut sample is assessed for the possession of alleles associated with true-breeding butternut or potential parental hybrid species. The "Putative Hybrid" column indicates the presence of non-butternut alleles, and thus confers upon the sample the status of an individual with a putative history of ancestral hybridization in its pedigree. If no non-butternut alleles are identified across all ten SSR loci, then the genetic constituency of each sample is consistent with expectations of purebred butternut.

Sample	Putative Hybrid	Comment
LGL Tree 001	No	
LGL Tree 003	No	
LGL Tree 17	No	
LGL Tree 24	No	
LGL Tree 25	No	
LGL Tree 30	No	
LGL Tree 31	No	
LGL Tree 74	Yes	Locus: WGA 090, 'Hybrid' allele '178' found in Japanese walnut;
LGL Tree 1696	No	

All samples successfully yielded high quality DNA from which SSR genotype data were derived, indicating that usable DNA could be extracted from the buds. Following genotyping the extract at ten SSR loci, for one individual (LGL Tree 74), one locus exhibited an allelic variant that is hitherto only found in Japanese walnut (*J. ailanthifolia*) (Locus WGA 090, Table 1) and not in purebred butternut.

Conclusion

All bud samples were successfully genotyped at ten SSR loci, revealing that most of the genetic variation held within the sample is characteristic of pure butternut, or is shared with other *Juglans* species. However, for Tree 74, one SSR locus – WGA 090 – indicated some evidence of past hybridization. Thus, this individual tree may constitute an extant hybrid of butternut and Japanese walnut.

Due to the limitation of having no reference samples available (i.e., 100% known purebred samples of both butternut and other sympatric *Juglans* species) for the area in which these buds were taken, the rationale used to determine hybrid status was based on researching SSR allele size ranges reported in *Juglans cinerea* L. and congenerics with which it may hybridize. In the future, known pure butternuts and sympatric *Juglans* species should be genotyped to build a local genetic reference database of *Juglans* species (and identified hybrids) in southern Ontario. Such a reference database would increase power to infer the degree and extent of hybridization of butternut with other *Juglans* species. This approach would also identify genetically divergent populations - and provide information on standing genetic variation and levels of gene flow within the butternut and between butternut and other congeneric species - which may better inform the conservation and management of this endangered species.

References Cited

Ross-Davis, A. & Woeste, K. E. (2008). Microsatellite markers for *Juglans cinerea* L. and their utility in other Juglandaceae species. *Conservation Genetics*, **9**, 465-469.

LGL LIMITED
environmental research associates

445 Thompson Drive, Unit 2
Cambridge, Ontario CANADA N1T 2K7
: 519-622-3300 : 519-622-3310
: cambridge@lgl.com : www.lgl.com

Head Office 22 Fisher St., P.O. Box 280, King City, ON CANADA L7B 1A6 905-833-1244 905-833-1255 kingcity@lgl.com www.lgl.com

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

Tomas Ycas
City of Toronto Project Managers
55 John Street,
Toronto, Ontario
M5V 3C6
Tomas.ycas@toronto.ca

December 18, 2020

RE: Behind 305 Martin Grove Road (Ravencrest Park) Butternut Health Assessment
BHA Report Number: [040- 057]
Date(s) of Butternut health assessment: August 20, 2020

Dear Mr, Ycas,

This letter is in regard to my assessment of the Butternut trees within the Martin Grove Road watermain and water services project from Lorraine Gardens to Ravencrest Park. A total of 5 butternut trees were observed throughout the study area. The trees are within 25m of the proposed construction and therefore are required to be assessed for health. The following table provides a list of the properties along Martin Grove Road which contained butternut trees Separate BHA reports have been prepared for each property as directed by the MECP Butternut Health Assessment Protocol. A summary of all trees within the study area are included in this Report (Table 1). Only the trees within the City of Toronto Property are described in further details in the BHA report below.

Table 1: Property Information

Property	Landowner	Report number	No. of Trees	Butternut Tree No.	Notes
312 Martin Grove Road	Atthilgvoda and Elaine Gunarathne	040-055	1	#1 / 2106 (LGL Arborist Report)	Tree found in flower bed/retaining wall.
239 Rathburn Road	Victor and Tania Parikian	040-056	1	#2 / 2258 (LGL Arborist Report)	Ornamental Planted Trees. Not considered a tree protected under the ESA.
City of Toronto ROW/Ravencrest Park	Tomas Ycas City of Toronto Project Manager	040-057	2	#1696 (tagged)/ 2292 (LGL Arborist Report) #186 (tagged) / 2294 (LGL Arborist Report)	Etobicoke Creek Valley and floodplain. Trees not considered injured. City is tunneling the watermain under the road to Ravencrest Park. Pit within

					road and located 40 m from trunk.
305 Mountain Grove Road	Toronto and Region Conservation Authority	040-058	1	#74 (tagged)/ 2309 (LGL Arborist Report)	Evidence of previous assessment was observed on the tree. Could not locate the original report. Twig assessment indicates it is a hybrid Butternut and not protected under the ESA. Genetic analysis of twigs indicates that this tree is a hydrid tree (Report attached).

As a designated Butternut Health Assessor (BHA), I am providing the following Butternut Health Assessor's Report for the trees located within the City of Toronto properties (ROW and 305 Martin Grove Road), for which I completed an assessment during the site visit on the above noted date. If there are other Butternut trees at the site that may be affected by the activity and they are not identified in this report, they too must be assessed by a BHA. Please read this letter carefully as it contains important information about the Endangered Species Act, 2007 (ESA).

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the ESA from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: http://www.ontario.ca/environment-and-energy/butternut-trees-your-property.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local MECP District Manager. Note that the MECP will not accept photocopies. The BHA Report must be submitted at least 30 days prior to registering to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MECP may contact you for an opportunity to examine the trees. If MECP chooses to examine the trees, a representative of the MECP will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the "Notice of Butternut Impact" form on the MECP Registry **after the 30 day period has elapsed**.

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local Ministry of Environment, Conservation and Parks (MECP) office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MECP offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this letter and a copy of the BHA Report for your records, along with any other documentation you may receive from the MECP should an examination of the trees occur. If you have any questions, please contact your local MECP district office.

Links:

Endangered Species Act, 2007:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

Summary of changes related to Butternut:
http://www.ontario.ca/environment-and-energy/butternut-trees-your-property

MECP office locations:
https://www.ontario.ca/environment-and-energy/ministry-environment-district-locator

Sincerely,

Jennifer Noël

Enclosures:

1. Butternut Health Assessor's Report
2. Original data forms
3. Electronic and printed copies of the Excel data spreadsheet (BHA Tree Analysis)
4. Photo Appendix
5. Genetic Analysis

Butternut Health Assessor's Report Number 040-057

Jennifer Noël BHA# 40
LGL Limited
445 Thompson Drive, Unit 2
Cambridge, Ontario
N1T 2K7
519-622-3300
jnoel@lgl.com

Tomas Ycas
City of Toronto Project Managers
55 John Street,
Toronto, Ontario
M5V 3C6
Tomas.ycas@toronto.ca

Site Location: ROW and 305 Martin Grove Road

Date(s) of Butternut health assessment: August 20, 2020
Date BHA Report prepared: December 18, 2020

Map datum used: x NAD83 ☐ WGS84

Total number of trees assessed in this BHA Report: 2

The assessed tree was numbered on site using tree tags. The number at the site correspond to the tree numbers used in this report. The first number is the one given to the Butternut for the BHA and the number in parentheses is related to the arborist report completed for this project. Tissue samples were collected of tree 1696 (2292) and sent for genetic confirmation of purity. On December 16th the results indicated that the tree is indeed a pure butternut tree.

This BHA Report includes the following tables:

- Table 2: Butternut trees within the Study Area
- Table 3: Summary of Assessment Results

Table 2: Butternut trees within the Study Area

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
1696 (2292)	616495E 4834872N	2	27	n	NOT Harmed	Construction is restricted to a pit within the curb of the road close to Rathburn Road. Tree is

[1] The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.
[2] The rules in regulation under section 23.7 of O. Reg. 242/08 are not applicable to Category 3 trees.
[3] dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)

Tree #	UTM coordinates	Category[1] *(1, 2, or 3[2])*	dbh[3] (cm)	Cultivated? *(Y/N)*	Proposed to be: *(enter one: killed, harmed or taken)*	Reason tree is proposed to be killed, harmed or taken:
						upslope and down the valley away from proposed disturbance. NO roots will be impacted by this temporary construction.
186 (2294)	616517E 4834907N	1	20	n	NOT Harmed	Construction is restricted to a pit within the curb of the road close to Rathburn Road. Tree is 76 m away from pit. NO roots or branches will be impacted by the construction.

Table 3: Summary of Assessment Results

Result:	**Total #:**	**Important information for persons planning activities that may affect Butternut:**
Category 1	1	• A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered “non-retainable”. • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Category 1 trees may be killed, harmed or taken **after** the 30 day period that follows submission of this BHA Report to the MECP District Manager, unless the results of an MECP examination indicate that the assessment has not been conducted in accordance with the document entitled “Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007”*.
Category 2	1	• A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered “retainable”. • During the 30 day period that follows your submission of this BHA Report to the MECP District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MECP may contact you for an opportunity to examine the trees. • Activities that may kill, harm or take up to a maximum of ten (10) Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. • Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm
Category 3	0	• A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered “archivable”. • Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. • Visit the MECP website using the link below for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees:

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		http://www.MECP.gov.on.ca/en/Business/Species/2ColumnSubPage/MECP_SAR_HOW_DO_GET_PER_EN.html
Cultivated	0	• An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. • Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MECP district office: http://www.MECP.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html • The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

Two butternut trees are located within the Martin Grove Road right of way and valley slope of Etobicoke Creek north of 194 Rathburn Road. Tree 1696 located on the valley slope is identified as a Category 2 tree which is considered retainable whereas,Tree 186 is identified as a Category 1 tree which is considered non-retainable. The City of Toronto will be replacing the water services along Martin Grove Road including a watermain replacement and associated connections and waterkeys/waterboxes to private properties. The watermain will be tunneled under the creek with the shaft being located near the intersection of Martin Grove Road and Rathburn and the exit shaft will be located within Ravencrest Park on the other side of Etobicoke Creek. These construction shafts are greater than 40 m from the butternuts and within the hard paved surface of the road and within manicured lawn of the park. As such from an arborist perspective, no portion of these trees are considered to be harmed or injured during construction. The retaining wall from the sidewalk, the valley slope and trees surrounding these trees are all providing protection for the trees.

NOTE: This concludes the summary of the BHA Report. A complete BHA Report must include the original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2), an electronic copy of the Excel data analysis spreadsheet, and one printed copy of the Excel data analysis spreadsheet.

0cm 3cm 15cm

Butternut Data Collection Form 1 - 2010 Edition

Surveyor ID or BHA # 0040

(PLEASE USE BLOCK LETTERS)

Date (dd/mm/yyyy) 20 - 08 - 2020

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
First JENNIFER Last NOEL
Email JNOEL@LGL.COM
Telephone (519) 622-3300 Telephone Other ( ) - x

Property Owner (check if same as surveyor) ☐
First THOMAS Last YCAS
or Company CITY OF TORONTO
Email THOMAS.YCAS@TORONTO.CA
Telephone (416) 392-4956 Telephone Other ( ) - x

Property Owner's Mailing address
Address 55 JOHN STREET Postal Code M5V3C6 Prov. ON
City TORONTO

Tree Location (if different from mailing address)
Address/(911#) 305 MARTIN GROVE ROAD
Township Lot Con
City ETOBICOKE

Directions
TREES ARE WITH THE RAVINE ON THE SLOPE AND NEXT TO CREEK (F) IN THE FLOODPLAIN

☒ Yes ☐ No Can Share Location Information with other Butternut Recovery Organizations?
☒ Yes ☐ No Site visits OK? (prior arrangments will always be made for a site vist)

> (Greater than)
< (Less than)

Butternut Trees Tally by Diameter Class

(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers			01	
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem			01	
Dead				

Historically, do some trees produce seeds? ☐ Y ☐ N ☐ Unkown

Estimated area containing butternut for properties > 1 acre (0.4 hectares): ☐ Acres ☐ Hectares

TREES TAGGED - TREE 169 IS 1696 = ROW
TREE 186 IS 186 = PARK
CITY PROPERTY NEAR 305 MARTIN GROVE RD
RAVENCREST PARK

Overall Property Description (area(s) containing Butternut)
☐ Rolling Upland ☒ Bottomland
☒ Valley Slope ☐ Variable
☐ Tableland ☐ Unknown

Vegetation Community/ies
☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☒ DeciduousForest ☐ Quary
☐ ConiferForest ☐ UrbanYard
☐ MixedForest ☐ UrbanPark

Other

Soil Drainage
☒ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☐ Unknown

Soil Texture
☐ Clay ☐ Sand
☐ Clay Loam ☐ Variable
☐ Loam ☒ Unknown
☐ Loamy Sand

Soil Depth
☒ > 1metre
☐ 30 - 99cm
☐ < 30cm
☐ Variable
☐ Unknown

Please enter matching numerical page link code on forms 1 and 2

Page Link 616495

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

Butternut Data Collection FORM 2 (2010 Edition) (PLEASE USE BLOCK LETTERS)

Shaded fields are mandatory for Butternut Health Assessments

Fill when Form 1 indicates canker is well established. The information opn Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Site Code(A,B,...Z, AA...): 305

Surveyor ID or BHA #: 0040

Date (dd/mm/yyyy): 20-08-2020

Surveyor Last Name: NOEL

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree #: 169 | Zone: 17 | Easting: 616495 | Northing: 4834872

Crown Class: 2 | Live Crown %: 100 | Main Stem Length(m) Below crown: 08

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 027

Butternut Origin: ☐ Natural ☐ Planted ☒ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☒ None

Assess below live crown: #Epic-Live: 00 | #Epic-Dead: 00 | Bark Type: S | # Callused Wounds: 00

	#Open	#Sooty
Root	00	00
=<2m	00	00
>2m	00	00

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species: ACEPLAT, ULMPUMI, FRAAMER

TAG 1696 GIRDLED BY OLD FENCE, DEBRIS AT BASE

LGL Arborist Report ID 2292

Tree #: 186 | Zone: 17 | Easting: 616517 | Northing: 4834907

Crown Class: 3 | Live Crown %: 100 | Main Stem Length(m) Below crown: 03

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: 1 | DBH(cm): 020

Butternut Origin: ☒ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☒ None

Assess below live crown: #Epic-Live: 00 | #Epic-Dead: 00 | Bark Type: S | # Callused Wounds: 00

	#Open	#Sooty
Root	03	00
=<2m	03	00
>2m	00	00

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species: VITRIPA, ULMAMER, JUGNIGR

TREE NEXT TO PATH NEAR CREEK

LGL Arborist Report ID 2294

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

Tree #: | Zone: 1 | Easting: | Northing:

Crown Class: | Live Crown %: | Main Stem Length(m) Below crown:

☐ Twig Dieback ☐ Branch Dieback ☐ Defoliation ☐ Discolouration

#Stems: | DBH(cm):

Butternut Origin: ☐ Natural ☐ Planted ☐ Unknown

Seed Signs: ☐ Male Flowers ☐ Female Flowers ☐ Seed Set ☐ None

Assess below live crown: #Epic-Live | #Epic-Dead | Bark Type | # Callused Wounds

	#Open	#Sooty
Root		
=<2m		
>2m		

Metres from badly cankered tree: ☐ < 40 ☐ > 40 ☐ None Found

Competing Species:

Please enter matching page link code on forms 1 and 2

Page Link: 616495

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

2013 ESA 2007 Butternut retainable tree analysis

using data collected by a designated BHA (ESA 2007)

Contact the OMNR Provincial SAR Branch for a more detailed explanation of its derivation (June 2009/2013).

BHA #	40	Assessment Date(s)	20-Aug-20	Total # trees	5
Landowner name		TRCA, Private owner			
Property Location		ravine north of Martin Grove Road and Rathburn Road			

input field data										automatic calculations from field data						Categories: 1=non retainable (NR), 2=retainable (R), 3= Archivable (A)				
			# bole cankers				# root flare (RF) cankers										'2' cases				'3' cases
Tree #	Live Crown %	tree dbh (cm)	sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)				< 40 m from cankered tree	**Circ.** (cm) = Pi x dbh	total **bole canker width** (sooty x 2.5 + open x 5)	total RF **canker width** (sooty x 2.5 + openx5)	bole canker **%** of circ.	RF canker **%** of circ.	total bole & root canker % of 2xCirc					
	LC %	dbh (cm)	S <2 m	S >2 m	O <2 m	O >2 m	RF S	RF O	**y or n**	**Circ** (cm)	**BC** (cm)	**RC** (cm)	**BC%**	**RC%**	**BRC%**	LC% >/= 50 and BC% = 0	LC% >70 & BRC %<20	LC% >70 & BC %< 20	**Final R Tree Call**	**FINAL TREE CALL** R, dbh>20cm <40m from NR
1696	100	27	0	0	0	0	0	0	n	84.78	0	0	**0**	**0**	**0**	2	2	2	**2**	**2**
186	100	20	0	0	3	0	0	3	n	62.8	15	15	**24**	**24**	**24**	1	1	1	**1**	**1**

LEGEND

Butternut (*Juglans cinerea*)

- Category 1 (non-retainable)
- Category (retainable)
- Cultivated butternut not protected by the Endangered Species Act, 2007
- Hybrid
- 25m Setback from Retainable Butternut
- Proposed Watermain and Water Service
- Construction Impact Footprint
- Ravine and Natural Feature Protection Area

PM6A2
Martin Grove Road
Butternut Health Assessment

LGL LIMITED
environmental research associates

Project	TA9027-24	**Figure**	
Date	January 2021	**Prepared By:**	KC
Scale	1:1,000	**Verified By:**	JCN

PROJECT #TA9027-24
August 2020

PHOTO APPENDIX
305 Martin Grove Road

Photo 1: View of the upper trunk of tree.

Photo 2: Lower trunk girdled by fence.

Photo 3: View of tableland from lower slope.

Tree# 1696 (LGL Arborist Report ID 2292)

PROJECT #TA9027-24
August 2020

PHOTO APPENDIX
305 Martin Grove Road

Photo 4: View of the straight angel of the leaf scar. Characteristic of a true Butternut.

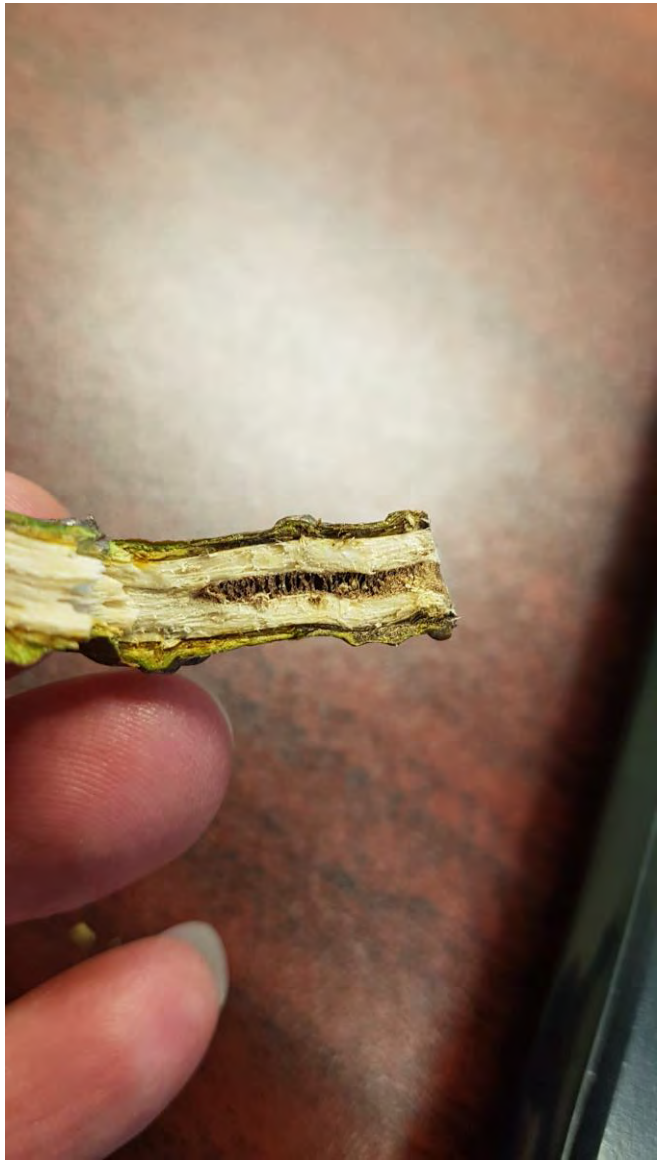


Photo 5: Dark colour of the pith of the tree. Characteristic of a true Butternut.

Tree# 1696 (LGL Arborist Report ID 2292)

PROJECT #TA9027-24
August 2020

PHOTO APPENDIX
305 Martin Grove Road

Photo 6: Canopy view of the butternut tree.

Photo 7: View of the upper trunk of tree.

Photo 8: Open canker on lower trunk.

Photo 9: Open canker on lower trunk.

Tree# 186 (LGL Arborist Report ID 2294)

Appendix 2

Stage 1 Archaeological Assessment Supplementary Document

ARCHEOWORKS INC.

Stage 1 Archaeological Assessment for the Proposed Martin Grove Watermain Replacement Within the Road Allowance between Concession 1 and 2 Fronting on the Humber River and Within Part of Lot 12, Concession 1 Fronting on the Humber River Geographic Township of Etobicoke Historical County of York Now the City of Toronto Ontario

Project #: 008-TO2817-20
Licensee (#): Kassandra Aldridge (P439)
PIF#: P439-0132-2020

Original Report

January 19, 2021

Presented to:
R.V. Anderson Associates Limited
2001 Sheppard Avenue East
Suite 300
Toronto, Ontario
M2J 4Z8
T: 416.497.8600

Prepared by:
Archeoworks Inc.
16715-12 Yonge Street, Suite 1029
Newmarket, Ontario
L3X 1X4
T: 416.676.5597
F: 647.436.1938

EXECUTIVE SUMMARY

The *City of Toronto* initiated a 'Schedule B' Municipal Class Environmental Assessment (EA) study to evaluate alternative alignments for the replacement of ageing watermains along Martin Grove Road, from Lorraine Gardens to approximately 180 metres north of Rathburn Road. To facilitate this study, *Archeoworks Inc*. was retained by *R.V. Anderson Associates Limited* to conduct a Stage 1 Archaeological Assessment (AA) in support of the proposed watermain replacement. The alignment under investigation (herein referred to as the "study corridor") is encompassed within the road allowance between Concessions 1 and 2 Fronting on the Humber River, and within part of Lot 12, Concession 1 Fronting on the Humber River, all in the Geographic Township of Etobicoke, Historic County of York, now in the City of Toronto, Ontario. The study corridor encompasses the existing watermain and land extending 2.5 metres (m) from the existing watermain. Additionally, the proposed construction method includes trenchless technology (tunnelling) with pits and tie-ins to connect to the existing watermains.

Stage 1 AA background research established elevated potential for the recovery of archaeologically significant materials within the study corridor due to the proximity of a watercourse (Mimico Creek) and documented pre-ca.1900 Euro-Canadian settlement. This research further revealed a cemetery (the Bigham Family Cemetery) was formerly located within 300 metres of the study corridor and, thus, does not constitute archaeological concerns for this current study[1]. Finally, background research identified previous archaeological assessments that encompassed portions of the study corridor (TMHC, 2017; TRCA, 2018a); these assessments recommending that their project areas be cleared of any further archaeological concern.

Outside of the previously assessed and former cemetery locations, to determine if the archaeological potential classification of the remainder of the study corridor was relevant, a desktop review of ground conditions was undertaken using current and historical aerial imagery and orthophotographs. This review revealed the study corridor to have been subjected to significant land disturbances from the mid-20th century to the present. To substantiate this information, a property inspection was carried out under ideal weather and lighting conditions. The property inspection confirmed the study corridor to be deeply and extensively disturbed. As such, the study corridor is considered free of archaeological concern and no further work is recommended.

No construction activities shall take place within the study corridor prior to the *Ministry of Heritage, Sport, Tourism and Culture Industries* (Archaeology Programs Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

[1] Due to road widening activities, all seven individuals buried within the Bigham Family Cemetery were relocated to Riverside Cemetery in 1973.

TABLE OF CONTENTS

LIST OF TABLES

PROJECT PERSONNEL

Project Director.....Kassandra Aldridge – MHSTCI licence P439

Field Director (Property Inspection) .....Diana Hutsulak-Alonso – MHSTCI licence R1202

Report Preparation .....Ian Boyce – MHSTCI licence P1059
Jay Allen Villapando
Kassandra Aldridge
Lee Templeton – MHSTCI licence R454

Historical Research..... Lee Templeton
Jay Allen Villapando

Graphics .....Cassandra Lamoureux
Lee Templeton

Report Review..... Kim Slocki – MHSTCI licence P029

1.0 PROJECT CONTEXT

1.1 Objective

The objectives of a Stage 1 Archaeological Assessment (AA), as outlined by the 2011 *Standards and Guidelines for Consultant Archaeologists* (‘*2011 S&G’*) published by the *Ministry of Heritage, Sport, Tourism and Culture Industries* (*MHSTCI*) (2011), are as follows:

- To provide information about the property’s geography, history, previous archaeological fieldwork and current land condition;
- To evaluate in detail, the property’s archaeological potential, which will support recommendations for a Stage 2 survey for all parts of the property; and
- To recommend appropriate strategies for a Stage 2 survey.

1.2 Development Context

The *City of Toronto* initiated a ‘Schedule B’ Municipal Class Environmental Assessment (EA) study to evaluate alternative alignments for the replacement of the ageing watermains along Martin Grove Road, from Lorraine Gardens to approximately 180 metres north of Rathburn Road, with a new 300 mm diameter watermain. To facilitate this study, *Archeoworks Inc*. was retained by *R.V. Anderson Associates Limited* to conduct a Stage 1 AA in support of the proposed watermain replacement. The alignment under investigation (herein referred to as the “study corridor”) is encompassed within the road allowance between Concessions 1 and 2 Fronting on the Humber River, and within part of Lot 12, Concession 1 Fronting on the Humber River, all in the Geographic Township of Etobicoke, Historic County of York, now in the City of Toronto, Ontario (***see Appendix A - Maps 1-2***). The study corridor encompasses the existing watermain and land extending 2.5 metres (m) from the existing watermain. Additionally, the proposed construction method includes trenchless technology (tunnelling) with pits and tie-ins to connect to the existing watermains.

This study was triggered by the *Ontario Environmental Assessment Act* in support of the Municipal Class Environmental Assessment (EA) regulatory process. It was conducted under the project direction of Ms. Kassandra Aldridge under the archaeological consultant licence number P439, in accordance with the *Ontario Heritage Act* (1990; amended 2019). Permission to investigate the study corridor was granted by *R.V. Anderson Associates Limited* on December 18th, 2020.

1.3 Historical Context

To establish the historical context and archaeological potential of the study corridor, *Archeoworks Inc.* conducted a review of Indigenous and Euro-Canadian settlement history, and a

review of available historic mapping. The results of this background research are documented below and summarized in **Appendix B – Summary of Background Research**.

1.3.1 Pre-Contact Period

The pre-contact period of Southern Ontario includes numerous Indigenous groups that continually progressed and developed within the environment they inhabited (Ferris, 2013, p.13). **Table 1** includes a brief overview and summary of the pre-contact Indigenous history of Southern Ontario.

Table 1: Pre-Contact Period

Period	Date Range	Overview and Attributes
PALEO-INDIAN (Early)		
Early	ca. 11000 to 8500 BC	Small groups of nomadic hunter-gathers who utilized seasonal and naturally available resources; sites are rare; hunted in small family groups who periodically gathered into larger groups/bands during favourable periods in the hunting cycle; campsites used during travel episodes and found in well-drained soils in elevated situations; sites found primarily along glacial strandlines due to current understanding of regional geological history; artifacts include fluted and lanceolate stone points, scrapers and dart heads. - Gainey, Barnes, Crowfield Fluted Points (Early Paleo-Indian) - Holcombe, Hi-Lo, Lanceolates (Late Paleo-Indian) (Ellis and Deller, 1990, pp.37-64; Ellis, 2013, p.37; Wright, 1994, p.25).
Late	ca. 8500 to 7500 BC	
ARCHAIC (Middle)		
Early	ca. 7800 to 6000 BC	Descendants of Paleo-Indian ancestors; lithic scatters are the most commonly encountered site type; trade networks appear; artifacts include reformed fluted and lanceolate stone points with notched bases to attach to wooden shaft; ground-stone tools shaped by grinding and polishing; stone axes, adzes and bow and arrow; Shield Archaic in Northern Ontario introduced copper tools. - Side-notched, corner-notched, bifurcate projectile points (Early Archaic) - Stemmed, Otter Creek/Other Side-notched, Brewerton side and corner-notched projectile points (Middle Archaic) - Narrow Point, Broad Point, Small Point projectile points (Late Archaic) (Dawson, 1983, pp.8-14; Ellis et al., 1990, pp.65-124; Ellis, 2013, pp.41-46; Wright, 1994, pp.26-28).
Middle	ca. 6000 to 2000 BC	
Late	ca. 2500 to 500 BC	
WOODLAND (Late)		
Early	ca. 800 BC to AD 1	Evolved out of the Late Archaic Period; introduction of pottery (ceramic) where the earliest were coil-formed, under fired and likely utility usage; two primary cultural complexes: Meadowood (broad extent of occupation in southern Ontario) and Middlesex (restricted to Eastern Ontario); poorly understood settlement-subsistence patterns; artifacts include cache blades, and side-notched points that were often recycled into other tool forms; primarily Onondaga chert; intensive exploitation of quarries in southeastern Ontario; commonly associated with Saugeen and Point Peninsula complexes; oral traditions of the Algonquian-speaking *Michi Saagiig* (Mississauga) claim that they, “are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo-Indian periods” (Gitiga Migizi and Kapyrka, 2015, p.1). - Meadowood side-notched projectile points (Dawson, 1983, pp.15-19; Ferris and Spence, 1995, pp.89-97; Gagné, 2015; Spence et al., 1990, pp.125-142; Williamson, 2013, pp.48-61; Wright, 1994, pp.29-30).

Period	Date Range	Overview and Attributes
Middle	ca. 200 BC to AD 700	Three primary cultural complexes in Southern Ontario: Point Peninsula (generally located throughout south-central and eastern Southern Ontario), Saugeen (generally located southwestern Southern Ontario), and Couture (generally located in southwestern-most part of Ontario); "given the dynamics of hunter-gatherer societies, with high levels of interaction and intermarriage among neighbouring groups, one would not expect the existence of discrete cultures" and the "homogeneity of these complexes have been challenged" (Ferris and Spence, 1995, p.98); introduction of large "house" structures and substantial middens; settlements have dense debris cover indicating increased degree of sedentism; incipient horticulture; burial mounds present; shared preference for stamped, scallop-edged or tooth-like decoration, but each cultural complex had distinct pottery forms; Laurel Culture (ca. 500 BC to AD 1000) established in boreal forests of Northern Ontario. - Saugeen Point projectile points (Saugeen) - Vanport Point projectile points (Couture) - Snyder Point projectile points - Laurel stemmed and corner-notched projectile points (Dawson, 1983, pp.15-19; Ferris and Spence, 1995, pp.97-102; Gagné, 2015; Hessel, 1993, pp.8-9; Spence et al., 1990, pp.142-170; Williamson, 2013, pp.48-61; Wright, 1994, pp.28-33; Wright, 1999, pp.629-649).
Late (Transitional)	ca. AD 600 to 1000	The north shore of Lake Ontario in Southern Ontario was occupied throughout the entire Late Woodland Period by the *Michi Saagiig* (Mississauga); their territory extended north where they would hunt and trap during the winter months, followed by a return to Lake Ontario in the spring and summer; "the traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands" (Gitiga Migizi and Kapyrka, 2015, p.1); oral traditions speak of people (the Iroquois) coming into their territory between AD 500-1000 who wished to establish villages and grow corn; treaties were made allowing the Iroquois to stay in their traditional territories; the Mississaugas of the Credit First Nation state they, "were the original owners of the territory embraced in the following description, namely commencing at Long Point on Lake Erie thence eastward along the shore of the Lake to the Niagara River. Then down the River to Lake Ontario, then northward along the shore of the Lake to the River Rouge east of Toronto then up that river to the dividing ridge to the head waters of the River Thames then southward to Long Point the place of the beginning" (MCFN, 2017a); originally the Mississaugas of the Credit First Nation "occupied the lands north of Lake Superior and the area around Georgian Bay" and "migrated into Southern Ontario by means of military conquest" at the end of the 17th century (MCFN, 2017a). Earliest Iroquoian development in Southern Ontario is Princess Point which exhibits few continuities from earlier developments with no apparent predecessors; hypothesized to have migrated into Ontario; the settlement data is limited, but oval houses are present; introduction of maize/corn horticulture; artifacts include 'Princess Point Ware' vessels that are cord roughened, with horizontal lines and exterior punctation; smoking pipes and ground stone tools are rare; continuity of Princess Point and Late Woodland Iroquoian groups. - Triangular projectile points (Ferris and Spence, 1995, pp.102-106; Fox, 1990, pp.171-188; Gitiga Migizi and Kapyrka, 2015, pp.1-3).

Period	Date Range	Overview and Attributes
Early Late	ca. AD 900 to 1300	Two primary Iroquoian cultures in Southern Ontario: Glen Meyer (located primarily in southwestern Ontario from Long Point on Lake Erie to southwestern shore of Lake Huron) and Pickering (encompassed north of Lake Ontario to Georgian Bay and Lake Nipissing); early houses were small and elliptical; developed into multi-family longhouses and some small, semi-permanent palisade villages; adoption of greater variety of harvest goods; increase in corn-yielding sites; well-made and thin-walled clay vessels with stamping, incising and punctation; crudely made smoking pipes, and worked bone/antler present; evolution of ossuary burials; grave goods are rare and not usually associated with a specific individual. - Triangular-shaped, basally concave projectile points with downward projecting corners or spurs (Ferris and Spence, 1995, pp.106-109; Williamson, 1990, pp.291-320).
Middle Late	ca. AD 1300 to 1400	Two primary Iroquoian cultures in Southern Ontario: Uren and Middleport; increase in village sizes (0.5 to 1.7 hectares) and campsites (0.1 to 0.6 hectares) appear with some palisades; classic longhouse takes form; increasing reliance on maize and other cultigens such as beans and squash; intensive exploitation of locally available land and water resources; decorated clay vessels decrease; well-developed clay pipe complex that includes effigy pipes; from Middleport emerged the Huron-Wendat, Petun, Neutral Natives and the Erie. - Triangular and (side of corner or corner removed) notched projectile points - Middleport Triangular and Middleport Notched projectile points (Dodd el al., 1990, pp.321-360; Ferris and Spence, 1995, pp.109-115).
Late Late	ca. AD 1400 to 1600	Algonquian-speaking groups (e.g., Mississauga, Odawa) maintained stable relations with Iroquoian-speaking groups (e.g., Huron-Wendat, Neutral, Petun) who continued to establish settlements in southern Ontario, according to *Michi Saagig* oral tradition (Gitiga Migizi and Kapyrka, 2015, p.1). Two major Iroquoian groups: the Neutral Natives to the west of the Niagara Escarpment and the Huron-Wendat to the east; Huron-Wendat "villages are distributed in clusters along the north shore of Lake Ontario from just west of Toronto to Belleville and north in a triangular area bounded on the Northeast by the Trent River system, and on the west roughly by the Niagara escarpment" (Ramsden, 1990, p.363); within this large area, Huron-Wendat "concentrations of sites occur in the areas of the Humber River valley, the Rouge and Duffin Creek valleys, the lower Trent valley, Lake Scugog, the upper Trent River and Simcoe County" (Ramsden, 1990, p.363); Toronto Carrying Place Trail connecting Lake Ontario to Lake Simcoe by way of the Humber River, overland to the Holland River; longhouses; villages enlarged to 100 longhouses clustered together as horticulture (maize, squash and beans) gained importance in subsistence patterns; villages chosen for proximity to water, arable soils, available fire wood and defendable position; diet supplemented with fish; tribe/band formation; gradual relocation to north of Lake Simcoe. - Huron-Wendat points are limited but change from predominantly side-notched to unnotched triangular. (Ferris and Spence, 1995, pp.115-122; Gitiga Migizi and Kapyrka, 2015, pp.1-3; Heidenreich, 1978, pp.368-388; Ramsden, 1990, pp.361-384; TRCA, 2007, p.9; Warrick, 2000, p.446; Warrick, 2008, p.15).

1.3.2 Contact Period

The contact period of Southern Ontario concerns the two centuries following the arrival of the first Europeans to the region and is defined by European arrival, interaction and influence with

the established Indigenous communities of Southern Ontario. **Table 2** provides a summary of some of the main developments that occurred during this time.

Table 2: Contact Period

Period	Date Range	Overview and Attributes
European Contact	ca. AD 1600s	Algonquian-speaking groups such as the Anishinaabeg (e.g., Mississauga, Chippewa, Ojibway, Odawa, etc.) continue to inhabit Ontario, alongside Iroquoian-speaking groups such as the Huron-Wendat north of Lake Simcoe and the Neutral (*Attiewandaron*) in the Niagara Peninsula; inter-marriage between Algonquian- and Iroquoian-speaking groups; *Michi Saagig* oral traditions tell of Algonquian-speaking groups wintering with Iroquoian neighbours, resulting in a complex archaeological record; oral traditions also speak of Anishinaabeg "paddling away" to their northern hunting territories to escape disease and warfare in southern Ontario at this time (Gitiga Migizi and Kapyrka, 2015); French arrival into Ontario; trade relationship between the Huron-Wendat and the French established; trade goods begin to replace traditional tools/items; Jesuit and Récollets missionaries; epidemics (Fox and Garrad, 2004, p.124; Gitiga Migizi and Kapyrka, 2015, pp.1-3; Heidenreich, 1978, pp.368-388; McMillan and Yellowhorn, 2004, pp.110-111; Trigger, 1994, pp.47-55).
Five Nations of Iroquois (Haudenosaunee)	ca. AD 1650s	The Five (later Six) Nations of Iroquois (or Haudenosaunee), originally residing south of the Great Lakes, engaged in warfare with other Iroquois groups as their territory no longer yielded enough furs; the Five Nations, armed with Dutch firearms, attacked and destroyed numerous Huron-Wendat villages in 1649-50; the small groups that remained became widely dispersed throughout the Great Lakes region, ultimately resettling in Quebec, in southwestern Ontario and in America; the Five Nations, particularly the Seneca, established settlements along the northern shoreline of Lake Ontario at strategic locations along canoe-and-portage routes and used territory for extensive fur trade; villages included Ganatsekwyagon at the mouth of the Rouge River, and Teiaiagon at a bend near the mouth of the Humber River; European fur trade and exploration continues (Abler and Tooker, 1978, p.506; Gitiga Migizi and Kapyrka, 2015, p.2; Robinson, 1965, pp.15-16; Schmalz, 1991, pp.12-34; Trigger, 1994, pp.53-59; Williamson, 2013, p.60).
Anishinaabeg Return (and Arrival)	ca. AD 1650s to 1700	Some narratives tell of Anishinaabeg groups either returning (Gitiga Migizi and Kapyrka, 2015, p.2) or moving by military conquest (MCFN, 2017a) to southern Ontario in the 1690s; battles fought throughout, ultimately resulting in most of the Five Nations being driven out of Southern Ontario and returning to their lands south of the Great Lakes (and some remained in parts of Southern Ontario); '*Mississauga*' term applied to Anishinaabe bands living on the north shore of Lake Ontario; they were focused on hunting/fishing/gathering with little emphasis on agriculture; temporary and moveable houses (wigwam) left little archaeological material behind; settlement near abandoned Teiaiagon; the word 'Mimico' for Mimico Creek is a "derivation of Algonkian words or phrases thought to mean…'resting place of wild pigeons'" (TRCA, 1998, p.18); the flat land along the mouth of Mimico Creek would have been a resource-rich area utilities by the Mississauga; resources included the passenger pigeon (Gibson, 2006, pp.35-41; Hathaway, 1930, p.433; Johnston, 2004, pp.9-10; McMillan and Yellowhorn, 2004, pp.110-111; Skeoch, 2000, pp.20-21; Smith, 2013, pp.16-20; Trigger, 1994, pp.57-59; Williamson, 2013, p.60).

Period	Date Range	Overview and Attributes
Trade, Peace and Conflict	ca. AD 1700 to 1770s	Great Peace of 1701 in Montreal established peace among First Nations groups around the Great Lakes, as well as their neutrality in case of conflict between France and Britain; European commerce and exploration resumed; the Anishinaabeg continued to trade with both the English and the French; genesis of the Métis; skirmishes between France and Britain as well as their respective First Nations allies erupt in 1754 ("French and Indian Wars") and forms part of the larger Seven Years' War; French defeat transferred the territory of New France to British control; Treaty of Paris signed in 1763; Royal Proclamation of 1763 established framework for negotiation of treaties with First Nations and administration of North American territories ceded by France to Britain; uprising by several First Nations groups against British ("Pontiac's War"); fur trade continued until Euro-Canadian settlement (Hall, 2015; Jaenen, 2013; Johnston, 2004, pp.13-14; Schmalz, 1991, pp.35-62, 81; Surtees, 1994, pp.92-97).
Early British Administration and early Euro-Canadian Settlement	ca. AD 1770s to 1800s	American Revolutionary War (1775-1783) drove large numbers of United Empire Loyalists, military claimants, and groups who faced persecution in the United States to re-settle Upper Canada; Treaty of Paris signed in 1783/1784 and formally recognized the independence of the United States; Province of Quebec divided in 1791 into sparsely populated Upper Canada (now southern Ontario) and culturally French Lower Canada (now southern Quebec); Jay's Treaty of 1795 establishes American/Canadian border along the Great Lakes; large parts of Upper Canada opened to settlement from the British Isles and continental Europe after land cession treaties were negotiated by the British Crown with various First Nations groups (Department of Indian Affairs, 1891; Government of Ontario, 2020; Hall, 2019; Jaenen, 2014; Surtees, 1994, p.110; Sutherland, 2014).
British Land Treaties	ca. AD 1780s to 1805	In 1787, senior officials from the Indian Department met with representatives of certain Anishinaabeg groups to acquire land along the northern shores of Lake Ontario extending northward to Lake Simcoe; sometimes referred to as the "Gunshot Treaty"; the documentation which formalized the 1787 transaction did not include a description of the area surrendered and these irregularities resulted in Lieutenant-Governor John Graves Simcoe invalidating the surrender; in 1805, William Claus, the Deputy Superintendent of Indian Affairs, entered into negotiations with the Mississaugas to purchase a greater tract of land consisting of 100,000 hectares in and around the Town of York that included part of the Township of Etobicoke, known as the Toronto Purchase, or Treaty 13; Williams Treaty of 1923 (Department of Indian Affairs, 1891, p.xxiv; Surtees, 1986, p.19; Surtees, 1994, p.107; Government of Ontario, 2014; Government of Ontario, 2020; MCFN, 2017b).

1.3.3 Euro-Canadian Settlement Period (AD 1800s to present)

1.3.3.1 Township of Etobicoke

The Township of Etobicoke is irregular in shape and laid out in a fragmentary and unsystematic fashion resulting from numerous surveys beginning in 1795 and ending in 1838, with some concession and block names referencing distance from water (e.g., 2nd Concession from the Lake, Northern Division; or Concession B fronting the Humber) (Mulvany and Adams, 1885a, p.98; Miles & Co., 1878, p.xxi; Heyes, 1974, p.15). Roughly bounded by the Humber River to the east, the Etobicoke Creek to the west, Lake Ontario to the south and Steeles Avenue in the north, the Township of Etobicoke is comprised of 29,540 acres, with major concession roads running both north and south and west to east (Mulvany and Adams, 1885a, p.98). The first survey was laid out by Surveyor Abraham Iredell in 1795 to denote 4,150 acres designated 'Militia Lands'

bounded by Lake Ontario, Royal York Road, Bloor Street and the Etobicoke Creek (Heyes, 1974, p.17). The Queen's Rangers, soldiers with special qualifications who fought for the British in the American Revolutionary War, were granted these lands by Lieutenant-Governor John Graves Simcoe as a means to "settle the veteran soldiers on the outlying colonial frontiers to establish communities of loyal able and valiant citizens" (Heyes, 1974, p.17; Locke, 1923, p.14). Of these 4,150 acres, 1,530 acres were granted to Samuel Smith, the Major-in-Command of the second corps of the Queen's Rangers, for his services for the crown during the American Civil War (Heyes, 1974, p.17). These lands became known as the Colonel Smith Tract. Other officers were granted the remaining unpatented lands, but many quickly sold their privately-held militia lands to other individuals (Heyes, 1974, p.20).

The remaining lands within the Township of Etobicoke were subjected to continual surveys by Surveyors Hambly, Wilmot, Ridout, Hawkins and Castle until the entire township was completed in 1838 (Mulvany and Adams, 1885a, p.98). By 1824, about 24,801 acres were occupied, and 12,516 acres had been cleared of forest and were under cultivation (Heyes, 1974, p.56). Timber resources were abundant in the Township of Etobicoke along the Humber River and much of the forest was clear cut to create cultivatable farmland for new settlers. By 1850, the Township of Etobicoke forests had been depleted by 65% (Heyes, 1974, p.27). Early settlers in the northern portion of the township focused on wheat cultivation, while those in the south adapted to fruit growing. The Township of Etobicoke quickly became a profitable township with many farmers only having to travel short, safe distances to have their flour ground down (Miles & Co., 1878, p.xxi; Heyes, 1974, p.33).

In 1842, a total of 2,467 individuals resided in the township, and 12,516 of the 24,934 acres of land were under cultivation. There were five grist and nine saw mills in the township at this time (Smith, 1846, p.57). By 1850, the total number of individuals residing in the township had grown to 2,904 (Smith, 1851, p.18). The 1850s were a period of prosperity for Canadian farmers with the Crimean War preventing Russian wheat from entering British markets and Britain relying on its colonies to cultivate wheat (Heyes, 1974, p.57). By 1857, all arable land in the Township of Etobicoke was occupied as the second wave of settlers from the British Isles immigrated to Canada to start anew, as an economic depression in Britain worsened and the potato famine in Ireland continued (Heyes, 1974, p.56). Between 1855 and 1879, the Grand Trunk Railway, the Credit Valley Railway and the Great Western Railway constructed rail lines through the township as a means to provide freight and commuter trails to father destinations (Heyes, 1974, p.57). Into the early years of the 20th century, farms still covered most of the Township of Etobicoke (Heyes, 1974, p.138).

1.3.3.2 Village of Islington

The community of Islington, located at the intersection of Dundas Street, Burnhamthorpe Street, Islington Avenue and Mimico Creek, was initially known as Mimico. The community was officially named Islington in 1858 after a village near London, England. Early settlement began along Dundas Street. Among the first to settle was Thomas Montgomery, who built an inn at the southeast corner of Islington Avenue and Dundas Street in 1830. The inn was favoured by officers of the York Garrison. It had a large ballroom where the first trials of the 1837 rebels were held. A

second inn, the Islington Inn, was constructed by Thomas Smith at the southwest corner of Dundas Street and Islington Avenue in 1839, and served as a post office and general store before it burnt down in 1930. By 1846, Islington had 150 residents, "as well as 2 churches (Methodist & Anglican); a sawmill on Mimico Creek; 1 general store; 1 doctor; 2 taverns; 1 blacksmith; 1 butcher; 1 baker; 1 tailor; 1 shoemaker; 2 wheelwrights; and 2 carpenters" (Harris, 2015a; Mika and Mika, 1981, pp.363-364).

The growth and decline of the village of Islington was primarily due to the development of transportation: it used to greatly benefit from its location along Dundas Street, where a regular winter stagecoach service began in 1835 to serve travellers between Toronto and Hamilton. However, the use of Dundas Street for overland travel declined when the Credit Valley Railway opened in 1877, running south and parallel to Dundas Street. In 1879, a new railway station was built west of present-day Canning Street, which connected Bloor and Dundas streets. Later, a suburban railway from Toronto was extended and Islington became the western terminus of the line (Mika and Mika, 1981, pp.363-364; Harris, 2015a).

1.3.4 Past Euro-Canadian Land Use

1.3.4.1 Pre-1900 Land Use – Land Use Data from Archival Documents

A review of available archival data, specifically the *Abstract Land Index*, *Land Petitions for Upper Canada, Census Records* and *County Directories* for the Township of Etobicoke, in the County of York were consulted for land occupancy data, from the earliest available records up to 1914. The study corridor lies in the west part, measuring 64 acres, of Lot 12, Concession 1 [L12C1] Fronting on the Humber River, in the Township of Etobicoke, County of York.

The land patent for the west 64 acres of Lot 12 was granted to Andrew Bigham in May 1802. Andrew Bigham is credited with being one of the first settlers in the Township of Etobicoke who had completed the construction of his log house on the west part of L12C1 by 1811. By 1840, he built a new house on his property, a house built of local river stones, located at present-day 190 Rathburn Road. The study corridor is located northwest of the house, along the road allowance between Concessions 1 and 2 Fronting on the Humber River. Andrew Bigham resided in his river stone house until his death in 1843. His sons, Samuel and Jonathan Bigham were bequeathed the 64 acres; Jonathan released his claim to the east 64 acres in 1851.

From 1843 to 1889, Samuel and his wife Eliza (née Ash) were listed on L12C1; they increased their land holdings to include all 100 acres of L12C1 by purchasing the east 36 acres in 1870, and added 50 additional acres in Lot 18, Concession 2. They occupied the river stone house throughout this time. Samuel and Eliza did not have any children of their own but numerous members of the Bigham and Ash families resided with them over the years, including their niece Mary Anne and his brother Andrew. In 1889, Samuel Bigham sold the 100 acres of L12C1 to George Agar, his niece, Mary Ann's, husband. George and Mary Anne lived in the river stone house until after the death of George in 1914.

The timeline of recorded occupation of the study corridor to the year 1916 is presented in **Table 3**.

Table 3: Timeline of Recorded Occupation of the Study Corridor up to 1916

Date	Owner(s) / Occupant(s)	
West part of Lot 12, Concession 1 Fronting on the Humber River, Township of Etobicoke, County of York – 64 acres		
1802-ca.1843	Andrew Bigham	Log cabin (ca.1811-ca.1840) Riverstone house (ca.1840)
	* According to the *Abstract Land Indexes*, the west 64 acres of Lot 12, Concession 1 Fronting on the Humber River was granted to Andrew Bigham on the 2nd of May 1802. - the remaining 36 acres of the 100-acre lot, consisting of the east part, was granted to the Honorable Robert Hamilton. * Andrew Bigham was an Irish settler from County Down, who initially settled in America in 1798. Andrew Bigham is believed to be one of the first settlers to arrive in the Township of Etobicoke before 1800. When he arrived in the Township of Etobicoke, "it was so sparsely populated that he remained four years without a neighbour to the north and west of his lot" (Mulvany, C.P. and Adams, 1885b, p.246). Andrew Bigham was married twice: with his first wife, Mary Copeland, he had seven children, and with his second wife, Mary Cleveland, he had nine children (Mulvany, C.P. and Adams, 1885b, p.246; ancestry.ca, 2021; Harris, 2015b). * According to D. Harris for the *Etobicoke Historical Society,* he married his second wife in 1811 and together they "lived in a log cabin on the property, but ca.1840 they built a large 1½ storey house of riverstone on a hill overlooking the Mimico Creek valley" (Harris, 2015b). The house was a "saltbox" style that had an open verandah running the length of the front of the house which was "covered by a bell cant [sic] roof" (Harris, 2015b). * Two individuals are listed on L12C1 in the Township of York in Walton's 1837 *Toronto & Home District Commercial Directory:* Andrew Bigham and James Fry (pp.76-77). - it should be noted that this resource does not identify if the lot/concession was Fronting on the Humber River. * Andrew Bigham died on April 6, 1843. He registered his one month before his death which bequeathed the 64 acres of L12C1 to two of his sons, Samuel and Jonathan Bigham (Instrument and Deed, No.31439). - Samuel was born on the property in ca.1827 (Harris, 2015b).	
ca.1843-1889	Samuel Bigham	Riverstone house (1½ storeys) (ca.1840)
	* Two individuals are listed on L12C1 in Brown's 1846 *Toronto City and Home District Directory* (pp.116). Hugh Brown and Thomas Cross (p.24). - like the 1837 *Directory,* this resource does not identify if the lot/concession was Fronting on the Humber River. - Samuel Bigham is not listed in the Township of Etobicoke in this resource. * On the 28th of June 1849, Samuel Bigham married Eliza Ash (Harris, 2015b; Mulvany, C.P. and Adams, 1885b, p.246; District Marriage Registers, 1801-1858: microfilm 2). * In 1851, Jonathan Bigham issued a bond and agreement with his brother in the amount of £600.00 (Instrument and Deed, no.72912). This transaction is likely an agreement over the title of the property from Jonathan to Samuel resulting from Andrew Bigham's will. * Only Samuel and J[onathan] Bigham are listed on L12C1 in Rowsell's 1850-1 *City of Toronto and County of York Directory* (p.27)	

Date	Owner(s) / Occupant(s)	
	* All 100 acres of L12C1 is accounted for in the 1851 *Census Record*: Samuel Bigham was listed on 61 acres of the west part and the Hon. P. Howland was listed on 39 acres in the east part. Samuel Bigham was listed as the head of household and he was a 23-year-old farmer that was born in Ontario who was married to 24-year-old Eliza Bigham. He was also listed with his sibling, 38-year-old Andrew Bigham and his mother, Mary. Samuel Bigham held 61 acres where 60 acres were under cultivation (37 acres were under crops, 22 acres were under pasture and one acre was in gardens/orchards) and one acre was wooded/wild (1851 Census Record, Etobicoke Township, Agricultural Census, Enumeration District No.2, p.158, line 11, and p.154, line 33: microfilm c-11761). - Samuel Bigham also owned 50 acres of Lot 18, Concession 2. * Review of C. Unwin's 1856 *Map of the Township of Etobicoke* (***see Map 3***) depicts the study corridor within land owned by Samuel Bigham (spelled Bingham) and within the road allowance between Concession 1 and Concession 2 Fronting on the Humber River. No structures are depicted in the study corridor while Mimico Creek is depicted traveling through the study corridor. Two historic structures, the homestead of Samuel Bigham and a saw mill are located within 300 metres of the study corridor. * Review of G.R. Tremaine's 1860 *Tremaine's Map of the County of York – Township of Etobicoke* (***see Map 4***) depicts the study corridor within lands owned by Samuel Bigham and along the road allowance. One structure, a historic homestead, is depicted within 300 metres of the study corridor. * Only Samuel Bigham is listed on L12C1 in the 1861 *Census Record*: he was listed on 114 acres (64 acres of L12C1 and 50 acres of Lot 18, Concession 2. Samuel Bigham was listed as a 36-year-old farmer from Upper Canada who lived with his 37-year-old wife, Eliza. Also listed with Samuel and Eliza were the following individuals: Joshua Rose, F. Lougheed, John Ash and Andrew Bigham, all labourers and Mary Ann Bigham, a servant. Together, they were listed as occupying a 1½ storey stone house. Of the 114 acres held, 15 acres were under cultivation, 26 acres were in crops, four acres were in pasture, one acre was under orchards/gardens and 68 acres were wood/wild. The total cash value of the farm was $6,000 (1861 Census Record, Township of Etobicoke, Enumeration District No.3, Agricultural Census, p.125, line 35, microfilm c-1060; Personal Census, p.41, line 39, microfilm c-1087). * Only one individual was listed on L12C1 in Mitchell & Co.'s 1866 *General Directory for the City of Toronto and Gazetteer of the Counties of York and Peel*: James Moore (pp.291). It is not clear if James Moore was a tenant of Samuel Bigham. - Samuel Bigham was not listed in the Township of Etobicoke.	
All of Lot 12, Concession 1 Fronting on the Humber River, Township of Etobicoke, County of York – 100 acres		
ca.1843 -1889	Samuel Bigham	Riverstone house (1½ storeys) (ca.1840)
	* In 1870, Samuel Bigham purchased the east 36 acres of L12C1, increasing his total land holdings to 100 acres in L12C1. (Instrument and Deed, No.284). * One individual was enumerated on L12C1 in the 1871 *Census Record*: Samuel Bigham on 150 acres where 100 acres included L12C1 and 50 acres was in Lot 18, Concession 2. Samuel Bigham was listed as a 43-year-old farmer who was born in Ontario and lived his 43-year-old wife, [E]liza, his brother, Andrew and sister Mary J. Three additional individuals were also listed with Samuel Bigham: 12-year-old Lisa Ann Ash, nine-year-old Alice Cron and 78-year-old Betsie Ash. Of the 150 acres owned, 20 acres were in pasture and two and a half acres was in gardens/orchards. Samuel Bigham was listed as an owner of a grand total of 150 acres, three dwelling houses and five barns/stables (1871 Census Record, Etobicoke Township, Division No.2, page 13, line 6, microfilm c-9966). * Two individuals were listed on L12C1 in McEvoy & Co.'s 1870-71 *County of York Gazetteer and Directory*: Samuel W. Bigham and James Moore (pp.33, 35). No post offices are listed with these individuals, so it is unclear where James Moore resided. Furthermore, this resource does not identify if the lot/concession was Fronting on the Humber River.	

<table>
<tr><th>Date</th><th colspan="2">Owner(s) / Occupant(s)</th></tr>
<tr><td></td><td colspan="2">* Review of Miles & Co.'s 1878 Illustrated Historical Atlas of the County of York (see Map 5) depicts the study corridor within land owned by Samuel W. Bigham (spelled Bingham) and within the road allowance between Concession 1 and Concession 2 Fronting on the Humber River. No structures are depicted within the study corridor, while the homestead of the Bingham's was depicted immediately adjacent to the southeast portion of the study corridor.

* Samuel Bigham was listed in the 1881 Census Record as a 53-year-old farmer from Ontario who lived with his wife Eliza and three additional individuals: 19-year-old Alice, 16-year-old Ester and 68-year-old Andrew (1881 Census Record, Etobicoke Township, Division No.1, page 18, line 30, microfilm c-13248).

* Two individuals were listed on L12C1 with the nearest associated post office listed as Islington in Union Publishing Co.'s 1886-7 Farmer's and Business Directory for the Counties of Ontario, Peel and York: Robert Bell and Mrs. J. Moore (pp.199-200). Is it not clear if these were tenants of Samuel Bigham, but it is likely that Mrs. J. Moore resided on the east part of L12C1.

* Two individuals were listed on L12C1 with the nearest associated post office listed as Islington in Union Publishing Co.'s 1888 Farmer's and Business Directory for the Counties of Dufferin, Peel and York: A.W.B Moore and Wm. Moore (pp.47). Is it not clear if these were tenants of Samuel Bigham, but it is likely that A.W.B Moore and Wm. Moore resided on the east part of L12C1.

* In February 1889, Samuel Bigham and his wife sold all 64 acres in the west part of L12C1 to George Agar for $13,000 (Instrument and Deed, No.3916). George Agar was the husband of Mary Ann Bigham, the niece of Samuel and Eliza Bigham. Since Samuel and Eliza "had no natural children, the house was inherited by their niece, Mary Ann Bigham Agar" (Harris, 2015b).</td></tr>
<tr><td>1889-1916</td><td>George Agar</td><td>Riverstone house (1½ storeys) (ca.1840)</td></tr>
<tr><td></td><td colspan="2">* George Agar is listed in the 1891 Census Record as a 48-year-old farmer born in Ontario who lived with his 46-year-old wife, Mary Ann, and their six children (Richard J., Ellen, Margaret, William John and Almer) in a two-storey, ten-room stone house (1891 Census Record, Township of Etobicoke, page 29, line 25, microfilm t-6380).

* Two individuals were listed on L12C1 with the nearest associated post office listed as Islington in Union Publishing Co.'s 1893 Farmer's and Business Directory for the Counties of Ontario, Peel and York: George Agar and A.W.B. Moore (pp.140, 149). It is likely that A.W.B. Moore was as tenant on the east part of L12C1.

* Two individuals were listed on L12C1 with the nearest associated post office listed as Islington in Union Publishing Co.'s 1896 Farmer's and Business Directory for the Counties of Dufferin, Peel and York: George Agar and A.W.B. Moore (pp.97, 106). It is likely that A.W.B. Moore was as tenant on the east part of L12C1.

* Two individuals were listed on L12C1 with the nearest associated post office listed as Islington in Union Publishing Co.'s 1900 Farmer's and Business Directory for the Counties of Dufferin, Ontario, Peel and York: George Agar and A.W.B. Moore (pp.A189, A198). It is likely that A.W.B. Moore is as tenant on the east part of L12C1.

* Only George Agar is listed on L12C1 in the 1901 Census Record. He was listed as a 58-year-old farmer who lived with his wife Mary A. their four children (Margaret, William J., Earnest and Norman) and their domestic help, Ethel Faithful in a one-storey stone house. George Agar was listed as owning 150 acres (including 100 acres in L12C1 and 50 acres in Lot 18, Concession), one dwelling house and six barn/stables/outbuildings (1901 Census Record, Township of Etobicoke, page 4, line 9, microfilm t-6508).
- Samuel Bigham and his wife Eliza were listed on Lot 8, Concession A and on Lot 22, Concession 2.

* Review of a 1909 Topographic Map depicts the study corridor traveling along Martin Grove Road and passing through Mimico Creek (see Map 7). No structures are depicted in the study corridor while one, a [river] stone house is depicted within 300 metres. A bridge is also depicted in the study corridor providing an accessible route north along Martin Grove Road.</td></tr>
</table>

Date	Owner(s) / Occupant(s)
	* George Agar is listed in the 1911 *Census Record* as a 69-year-old farmer who lived in Etobicoke with his 67-year-old wife, Mary Ann, their son William John and John E. Bishop, a labourer (1911 Census Record, Township of Etobicoke, page 1, line 1, microfilm t-20410). * On the 21st of September 1914, George Agar died (Deaths and Deaths Overseas, 1869-1948, MS935, microfilm 203). He registered his will on the 10th of October 1913, which bequeathed the 64 acres of the west part of L12C1 to William J[ohn], his son (Instrument and Deed, No.13510). * Review of the C.H. MacDonald's 1916 *Map of the Townships, York, Scarboro, and Etobicoke* (***see Map 6***) depicts the study corridor within land owned by George Agar (measuring 100 acres) and within the road allowance between Concession 1 and Concession 2 Fronting on the Humber River. No structures are depicted within the study corridor; however, this resource does not depict privately owned structures. Although George Agar had died, it is likely his estate was not resolved by the time the map was published.

1.3.4.2 Post-1900 Land Use History

After George Agar's death, William John Agar continued to live in the river stone house on the west 64 acres of Lot 12, Concession 1 Fronting on the Humber River. He lived in the house with his wife Ida and their children (Harris, 2015b). In the 1930s, the Township of Etobicoke purchased two small parcels of land, likely for the construction of the Martin Grove Pumping Station, transformer and reservoir and the associated easement for a pipeline along Martin Grove Road (Instrument and Deed, No.43019 and 51300). From 1918 to 1933, no structures are depicted in the study corridor in the *Topographic Maps* (***see Map 7***). The study corridor encompasses a portion of Martin Grove Road and Mimico Creek. Where the study corridor extends beyond the road allowance, it falls within land that is covered in trees. Furthermore, a bridge over Mimico Creek is partially found within the study corridor. It appears that while the Martin Grove Pumping Station, transformer and reservoir were likely under construction in 1933, they were not included in the topographic maps until they were complete by 1942 (***see Map 7***).

The next occupant of the 64-acre parcel of Lot 12, Concession 1 Fronting on the Humber River was Irene Agar McIlwain (Harris, 2015b). However, according to the *Abstract Land Indexes*, it appears that her brother, Norman E. Agar, was the owner (Harris, 2015b). In 1954, Norman E. Agar registered a plan of subdivision, Plan 4532, and the former 64-acre Bigham/Agar farmland was developed into the Glen Agar subdivision (Harris, 2015b).

1.3.5 Present Land Use

As of February 2019, the study corridor falls within land designated in the City of Toronto's Official Plan as Streets/Highway, Neighbourhood and Natural Areas (City of Toronto, 2019).

1.4 Archaeological Context

To establish the archaeological context and further establish the archaeological potential of the study corridor, *Archeoworks Inc*. conducted a comprehensive review of the municipal AMP, designated and listed heritage properties, commemorative markers and pioneer churches and early cemeteries in relation to the study corridor. Furthermore, an examination of registered archaeological sites and previous AAs in proximity to the study corridor limits, and a review of

the physiography of the study corridor were performed. The results of this background research are documented below and summarized in **Appendix B – Summary of Background Research**.

1.4.1 Archaeological Management Plan

Per *Section 1.1, Standard 1* of the *2011 S&G*, when available, an archaeological management plan (AMP) or other archaeological potential mapping must be reviewed. The City of Toronto has an AMP that is founded on the principles of archaeological potential modeling. Archaeological site potential modeling incorporates a variety of sources, such as history, human geography, settlement archaeology, ecological archaeology, and paleoecology, in an attempt to reconstruct past land use patterns (ASI, 2004). Per the City of Toronto's AMP, the portion of the study corridor that lies beyond the Martin Grove Road ROW contains archaeological potential (City of Toronto, 2021a).

1.4.2 Designated and Listed Cultural Heritage Resources

Per *Section 1.3.1* of the *2011 S&G*, properties listed on a municipal register or designated under the *Ontario Heritage Act*, or that is a federal, provincial, or municipal historic landmark or site are considered features or characteristics that indicate archaeological potential. One designated cultural heritage resource is located within 300 metres of the study corridor (City of Toronto, 2021b; ***see Table 4***). Therefore, this feature contributes to establishing the archaeological potential of the study corridor.

Table 4: Heritage Resources within 300 metres of the Study Corridor

Address	Description	Status
190 Rathburn Road	ca.1840. Bigham-Agar Homestead. 1½ storey river stone house in the "saltbox" style, overlooking the Mimico Creek valley.	Designated Part IV (by-law 4181-1977)

1.4.3 Heritage Conservation Districts

Per *Section 1.3.1* of the *2011 S&G*, heritage resources listed on a municipal register or designated under the *Ontario Heritage Act*, are considered features or characteristics that indicate archaeological potential. The study corridor is not located in or within 300 metres of a Heritage Conservation District (City of Toronto, 2021c). Therefore, this feature does not contribute to establishing the archaeological potential of the study corridor.

1.4.4 Commemorative Plaques or Monuments

Per *Section 1.3.1* of the *2011 S&G,* commemorative markers of Indigenous and Euro-Canadian settlements and history, which may include local, provincial, or federal monuments, cairns or plaques, or heritage parks, are considered features or characteristics that indicate archaeological potential. The study corridor is not located in or within 300 metres of a commemorative plaque or monument (OHT, 2021). Therefore, this feature does not contribute to establishing the archaeological potential of the study corridor.

1.4.5 Pioneer/Historic Cemeteries

Per *Section 1.3.1* of the *2011 S&G,* pioneer churches and early cemeteries are considered features or characteristics that indicate archaeological potential. The study corridor is located within 300 metres of the Bigham (spelled Bingham) Family Cemetery, formerly at the north-east corner of Rathburn Road and Martin Grove Road, south of Mimico Creek, likely within municipal address 190 Rathburn Road (OGS, 1994; OGS, 2021a; ***see Section 2.0 of Supplementary Document***). This family burial ground was established in 1843, after the death of Andrew Bigham, and closed in 1973 due to road widening construction activities. There were only seven persons recovered, and those graves were moved to Riverside Cemetery, at 2300 Lawrence Avenue West, City of Toronto (OGS, 1994; OGS, 2021b).

The Bigham Family Cemetery is currently unregistered and inactive (OGS, 2021b). Despite the removal of the graves, the former proximity of the cemetery contributes to establishing archaeological potential of the study corridor. Further discussion of the Bigham Family Cemetery can be found in **Section 3.1.4**.

1.4.6 Registered Archaeological Sites

Per *Section 1.1, Standard 1* and *Section 7.5.8, Standard 1* of the *2011 S&G*, the *Ontario Archaeological Sites Database* (OASD) maintained by the *MHSTCI* was consulted in order to provide a summary of registered or known archaeological sites within a minimum one-kilometre distance of the study corridor limits. According to the OASD there are no archaeological sites that lie within one kilometre of the study corridor (MHSTCI, 2020). Therefore, this feature does not contribute to establishing the archaeological potential of the study corridor.

It must be noted, however, that the paucity of archaeological sites in proximity to the study corridor is not necessarily reflective of the scale of previous habitation, but more likely a lack of detailed archaeological surveys within the immediate area.

1.4.7 Previous Archaeological Assessments

Per *Section 1.1, Standard 1* and *Section 7.5.8, Standards 4-5* of the *2011 S&G*, to further establish the archaeological context of the study corridor, a review of previous AAs carried out within the limits of, or immediately adjacent (i.e., within 50 metres) to the study corridor (as documented by all available reports) was undertaken. Five reports were identified (***see Table 5***):

Table 5: Previous Archaeological Assessments

Company, Year	Stage of Work	Relation to Current Study Corridor	Details & Recommendations
TMHC, 2017	Stage 1 AA	Encompassing part of the study corridor	Associated with the Martin Grove Replacement Project of approximately 4.3 kilometres (km) of nominal pipe size 12 inch High Pressure (XHP) steel pipeline located on Martin Grove Road from Burnhamthorpe to Enterprise Road (updated to only include section from Clement Road to Lavington Drive). A property inspection was completed and the portion of the subject corridor that falls within the current study corridor limits

Company, Year	Stage of Work	Relation to Current Study Corridor	Details & Recommendations
			was determined to have low archaeological potential due to disturbed conditions (road, building footprint), steeply sloping and low lying and wet areas. Within the project corridor, few small areas (approximately 0.26 hectares) retaining archaeological potential that requires Stage 2 AA; the east side of Martin Grove Road adjacent to the Stonehouse Burying Ground requires Stage 2 construction monitoring.
TRCA, 2018a	Stage 1-2 AA	Encompassing part of the study corridor	Associated with the proposed slope stabilization and erosion control works on TRCA, City of Toronto and private properties along the valley slope and base of slope behind municipal addresses 2 Kevi Lane and 194 Rathburn Road, measuring 4,093 square metres. During the Stage 2 AA, a portion of the subject area was determined to be sloped and the remaining balance was subjected to test pit survey; no archaeological material or cultural features were encountered. No further archaeological assessment is required.
TRCA, 2018b	Stage 1 AA	Encompassing part of the study corridor	Associated with the proposed study to stabilize the slope and reduce short- and long-term risks to private property along Mimico Creek behind municipal address 2 Kevi Lane. Stage 2 AA recommended on portions holding archaeological potential.
Archeoworks Inc., 2007	Stage 1 AA	Located within 50 metres of the study corridor	Once the preferred watermain alignment has been finalized, Stage 2 archaeological field assessment of the undisturbed areas should be undertaken prior to construction activities.
Archeoworks Inc., 2019	Stage 1 AA	Encompassing the study corridor	Associated with Basement Flooding Study Area 41. A proposed STM upgrade and a Proposed SAN upgrade was located within 50 metres of the current study corridor limits. This upgrade was determined to be previously assessed by TMHC (2017) and consisted of land that was both disturbed (e.g., road) and required AA. The remaining balance of the subject area that does not exhibit deep and extensive disturbances, is recommended for Stage 2 AA.

1.4.8 Physical Features

1.4.8.1 Physiographic Region

The study corridor is located within the South Slope physiographic region of Southern Ontario. The South Slope is the southern slope of the Oak Ridges Moraine, but also includes a strip south of the Peel Plain. This region covers approximately 2,400 square kilometres from the Niagara Escarpment to the Trent River. The South Slope contains a variety of soils that have been conducive to agricultural use. The soils in the west are developed upon more clayey than sandy tills, and the slopes are less steep than in the east. Portions of the South Slope region that lay in the interior, away from the lakeshore, were mainly colonized by the “second wave” of largely British immigrants after the Napoleonic Wars. Early settlers practiced mixed subsistence

agriculture, although grain exportation did confer a measure of prosperity across the region, as evidenced by the construction of many fine fieldstone houses, the building of railroads and the improvement of main haulage roads. The decline of wheat growing, however, resulted in the replacement with commercial mixed farming in which beef cattle, hogs, and dairy butter were the primary income sources. The eastern portion of the South Slope region has preserved less of its rural character compared to the western portion, as large areas around Toronto have become more urbanized (Chapman and Putnam, 1984, pp. 172-174).

1.4.8.2 Soil Types and Topography

Two native soil types are found within the study corridor: Oneida clay loam and Bottom Lands. Most of the study corridor is located in Oneida clay loam while the northern corner of the study corridor is located within Bottom Lands located along Mimico Creek. A description of their characteristics may be found in **Table 6** (Ontario Agricultural College, 1977). However, due to the expansion of the urban area of the City of Toronto since 1954, most of this area is built-up affecting soil integrity and the soil information is unreliable for urban-related uses.

Table 6: Study Corridor Soil Types

Soil Series and Type	Great Soil Group	Parent Materials	Drainage	Topography and Stoniness
Oneida clay loam	Grey Brown Podzolic	Medium textured grey, stony, strongly calcareous till	Good	Smooth, very gently sloping and few stones
Bottom Lands	Alluvial	Irregularly stratified alluvial deposits	Variable	Variable and stone-free

The topography within the study corridor is gently rolling with a slight decrease in elevation at Mimico Creek, with the elevation ranging between 135 to 142 metres above sea level.

1.4.8.3 Water Sources

Hydrological features such as primary water sources (e.g., lakes, rivers, creeks, streams) and secondary water sources (e.g., intermittent streams and creeks, springs, marshes, swamps) would have helped supply plant and food resources to the surrounding area and are indicators of archaeological potential (per *Section 1.3.1* of the *2011 S&G*). The Mimico Creek travels through the study corridor. Therefore, this feature contributes to establishing the archaeological potential of the study corridor.

1.4.9 Current Land Conditions

The study corridor is situated within an urban area of Etobicoke, within the road allowance of Martin Grove Road, its right-of-way (ROW) and partially within Ravenscrest Park, at 305 Martin Grove Road. The study corridor encompasses paved roadways (Martin Grove Road and Rathburn Road), concrete/asphalt sidewalks, Mimico Creek, areas of overgrown vegetation flanking Mimico Creek, and manicured lawns.

1.4.10 Date of Desktop and Field Reviews

A desktop review of field conditions using current and historical aerial imagery was undertaken on January 15-17th, 2021.

A property inspection was carried out on December 22nd, 2020 (***see Sections 2.0 for further details***). The purpose of the property inspection is to identify and describe areas of high potential requiring additional archaeological research; identify and describe areas of no/low potential not warranting further archaeological concern; and to help gather information to formulate appropriate Stage 2 AA strategies.

1.5 Confirmation of Archaeological Potential

Based on the information gathered from the background research documented in the preceding sections, elevated archaeological potential has been established within the study corridor limits. Features contributing to archaeological potential are summarized in **Appendix B**. However, it must be noted that post-1900 developments can negate the possibility of encountering intact archaeological deposits due to deep and extensive soil disturbances. Further assessment of conditions within the study corridor will be addressed in **Section 3.0**.

2.0 PROPERTY INSPECTION

Given the time of year the property inspection was set to take place and the potential for adverse weather conditions, a winter archaeology strategy was discussed with the *MHSTCI* upon submission of the Project Information Form (PIF) (***see attached Supplementary Document***). Per *Winter Archaeology: A Technical Bulletin for Consultant Archaeologists in Ontario* (MHSTCI, 2013), winter conditions, characterized by low temperatures, snow cover, frozen ground and altered drainage, are considered adverse for archaeological fieldwork.

The property inspection was subsequently carried out on December 22nd, 2020 and conducted in compliance with the standards set forth in *Section 1.2* of the *2011 S&G* and the 2013 *Winter Archaeology: A Technical Bulletin for Consultant Archaeologists in Ontario*. In accordance with *Section 1.2, Standard 2* of the *2011 S&G*, weather and lighting conditions (average of 3°C and overcast) during the Stage 1 property inspection permitted good visibility of all parts of the study corridor and were conducive to the identification of features of archaeological potential. Temperatures remained above 0°C with no snow cover or excessive rain and the ground remained unfrozen.

The property inspection involved a visual inspection only and did not include excavation or collection of archaeological resources. The inspection was carried out by random spot-checking the entire study corridor and its periphery to gain first-hand knowledge of the property's geography, topography, and current condition, and to evaluate and map archaeological potential (per *Section 1.2, Standard 1* of the *2011 S&G*). In accordance with *Section 1.2, Standards 3-6* of the *2011 S&G*, the property inspection involved visual confirmation of the presence/absence of previously identified features of archaeological potential, identification of additional features of archaeological potential not visible on mapping, and the identification and documentation of features that would affect archaeological assessment strategies (e.g., recent land disturbances, overgrown vegetation, wet areas, steep slope, heavy soils, structures and built features, etc.).

The results of the property inspection are illustrated within **Map 13** and will be further discussed in **Section 3.0**. A selection of photographic images documenting field conditions within the study corridor are presented within **Appendix C**, and location and orientation information is provided within **Map 14**. An inventory of the documentary record generated in the field can be found within **Appendix D**.

3.0 ANALYSIS AND CONCLUSIONS

In combination with data gathered from the background research (***see Sections 1.3 and 1.4***), a desktop review of aerial imagery, orthophotographs, and the property inspection, an evaluation of the established archaeological potential of the study corridor was performed. The results of this evaluation are presented in **Maps 13-14**.

3.1 Aerial Photographs and Orthophotograph Review

To facilitate the evaluation of the established archaeological potential within the study corridor, a detailed review of aerial photographs from 1947, 1950, 1953, 1957, 1959, 1960, 1961, 1962, 1963, 1965, 1967, 1975, 1977, 1981, 1983 and 1991 (***see Maps 8-11***), and orthophotographs from 2002, 2007, 2013 and 2019 (***see Map 12***) was undertaken.

The 1949 aerial photograph depicts the study corridor encompassing a portion of Martin Grove Road, a gravel roadway, along its northern and southern limits, the Martin Grove Pumping Station and transformer, a gravel access route extending from the Martin Grove Pumping Station eastward, the natural riverbed of Mimico Creek and overgrown vegetation flanking Mimico Creek. Between 1950 and 1953, major construction grading occurred at the northern limit of the study corridor associated with the installation of the reservoir at the Martin Grove Pumping Station. The gravel access route heading eastward was also widened. Beginning in 1957, Mimico Creek, east of the study corridor, was rerouted and channeled to its present configuration, likely to prevent flooding. By 1961, the former bridge over Mimico Creek had been demolished, and Mimico Creek where it crosses Martin Grove Road was channelled. Martin Grove Road was also under construction at this time, likely part of road widening activities. Both the new bridge, (accommodating for the construction of future 4-lanes) and the channelling of Mimico Creek was completed by 1962.

By 1963, Martin Grove Road was widened and paved to accommodate 4-lanes of traffic and included a gravel shoulder. Rathburn Road was also extending east of Martin Grove Road and consisted of a 4-lane paved roadway. By 1975, the Martin Grove Pumping Station and transformer had been demolished, subjecting the northern limits of the study corridor to additional construction grading. By 1981, Ravenscrest Park was established in the former location of the Martin Grove Pumping Station and transformer. An asphalt walking path was also installed. Between 1891 and 1991, concrete sidewalks flanking Martin Grove Road and Rathburn Road were installed. After this time, the study corridor remained relatively unchanged.

3.2 Previous Archaeological Assessments

Four previous archaeological assessment were identified encompassing portions of the study corridor. TMHC (2017) conducted a Stage 1 AA property inspection along Martin Grove Road for a pipeline replacement. TRCA (2018a) conducted a Stage 1-2 AA for the slope stabilization and

control of Mimico Creek. Although two other reports encompass the current study corridor (TRCA 2018b, Archeoworks Inc., 2019) these assessments did not eliminate any areas from further archaeological assessment.

Lands encompasses within the study corridor that have already been subjected previous archaeological assessment (TMHC, 2017; TRCA, 2018a) and deemed free of further archaeological concern, are recommended to be exempt from further assessment (***see Section 1.4.7; Maps 13 and 14***). Previously assessed areas amounted to approximately 0.11 hectares or 68.7% of the study corridor.

3.3 Identified Deep and Extensive Disturbances

Features indicating that archaeological potential has been removed include deep and extensive land alterations – commonly referred to as disturbances – that have severely impacted the integrity of any archaeological resources. Per *Section 1.3.2* of the *2011 S&G*, disturbances include, but are not limited to: quarrying, major landscaping involving grading below topsoil, building footprints, or sewage and infrastructure development.

It is evident from a detailed review of past and current aerial imagery and orthophotographs that the study corridor had been subjected to previous and recent land alterations involving grading and filling activities (particularly north of Mimico Creek where a structure was present from 1947-1969; demolished by 1975), as well as the road and bridge installation and widening activities along both Martin Grove Road and Rathburn Road (***Maps 8-12***). Aerial imagery also revealed Mimico Creek had been artificially modified from its natural course along its riverbed likely to control flooding. Such activities would have resulted in severe damage to the integrity of any archaeological resources which may have been present within their footprints. These disturbances were further highlighted during the property inspection which noted evidence of aggregate fill across the entire study corridor (***see Images 1-11; Map 14***).

Disturbances amounted to approximately 0.05 hectares or 31.3% of the study corridor. No areas retaining archaeological potential were identified within the study corridor. As such, the study corridor is considered free of archaeological concern and does not require further archaeological assessment.

3.4 Bigham Family Cemetery

The Bigham Family Cemetery (established in 1843) was originally located at the north-east corner of Rathburn Road and Martin Grove Road, likely located within municipal address 190 Rathburn Road; although its exact location is unknown (OGS 1994; OGS 2021b; ***see Supplementary Document – Section 2.0***). In 1973, due to road widening construction activities, the burials were moved to Riverside Cemetery, at 2300 Lawrence Avenue West, City of Toronto, approximately five kilometres away. The cemetery is no longer active.

It is recommended by the *MHSTCI* and the *Bereavement Authority of Ontario (BAO)* that a cemetery investigation begin at least 20 metres from the current cemetery property limits. However, as the burials related to the family plot have been relocated to Riverside Cemetery, no archaeological concerns for the cemetery within the study corridor limits exists.

4.0 RECOMMENDATIONS

Considering the findings outlined within this report, the following recommendations are presented:

1. With archaeological potential having been entirely removed within the study corridor, per *Section 1.3.2* and *Section 1.4.1, Standard 1.f.* of the *2011 S&G,* no further archaeological concerns exist. No further work is recommended within the study corridor and it may be considered free of further archaeological concern.

2. Should construction activities extend beyond the assessed limits of the study corridor, further archaeological investigation will be required to assess the archaeological potential of these lands.

No construction activities shall take place within the study corridor prior to the *MHSTCI* (Archaeology Programs Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

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

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

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

4. The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the *Ministry of Consumer Services*.

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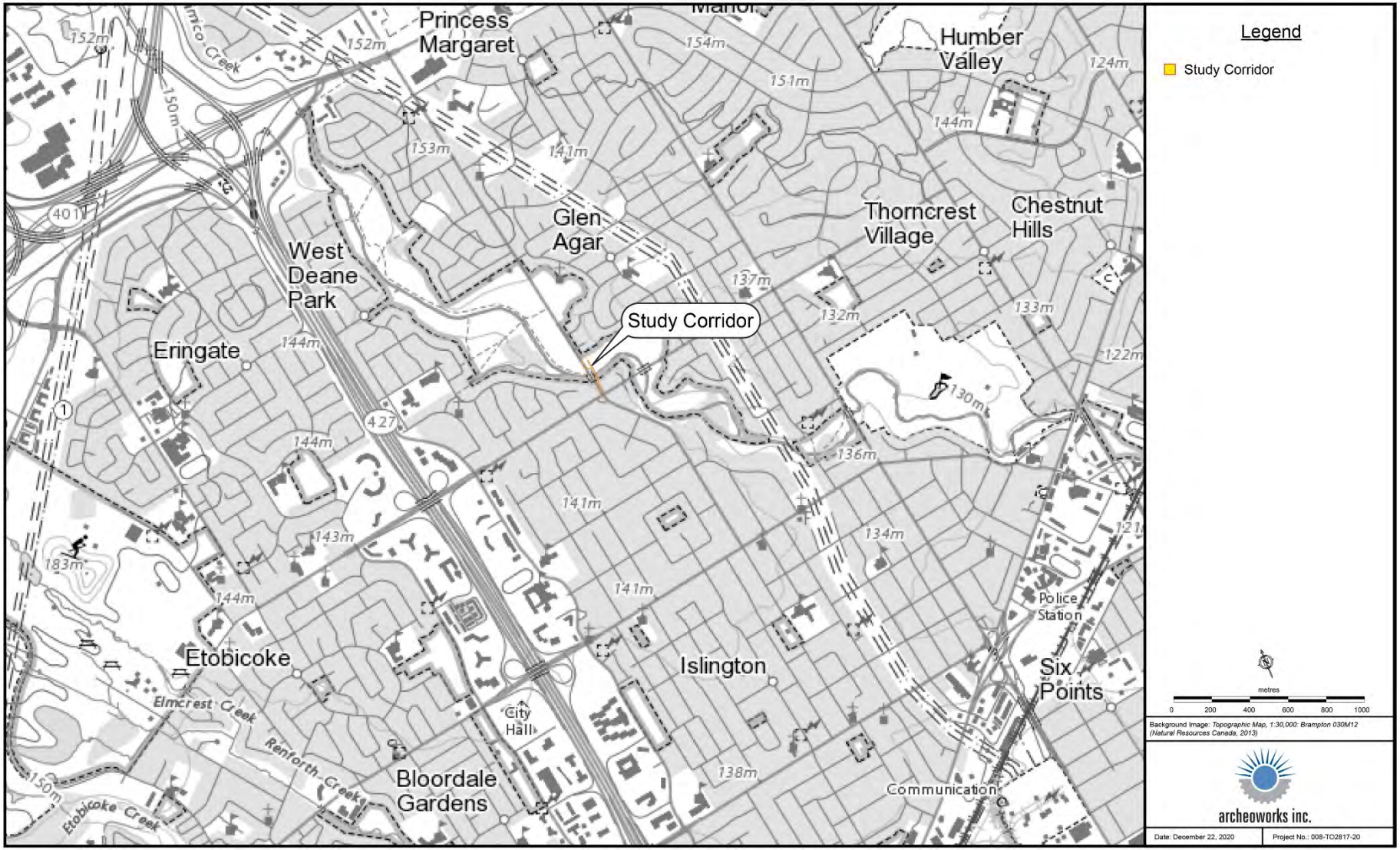
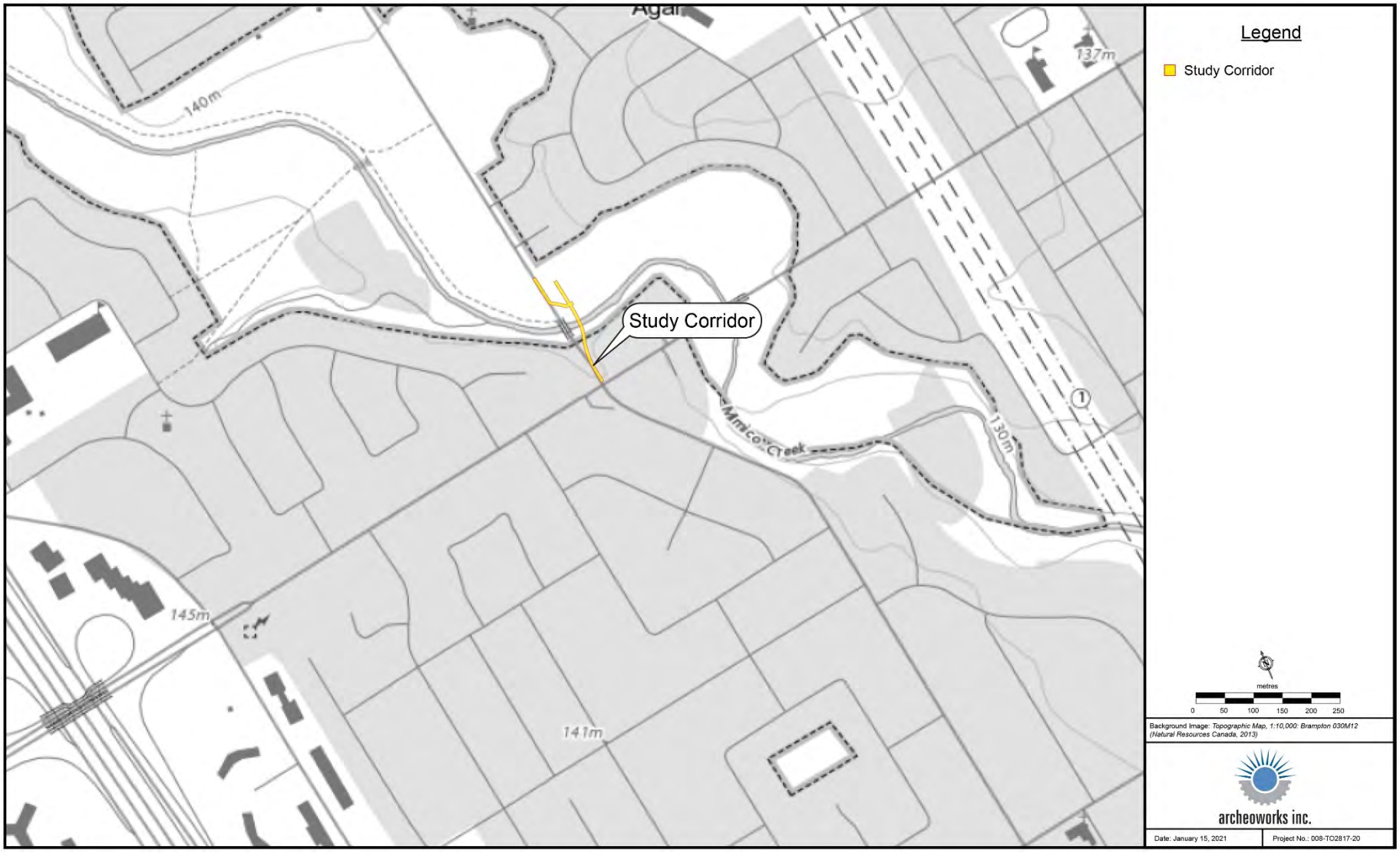
APPENDICES

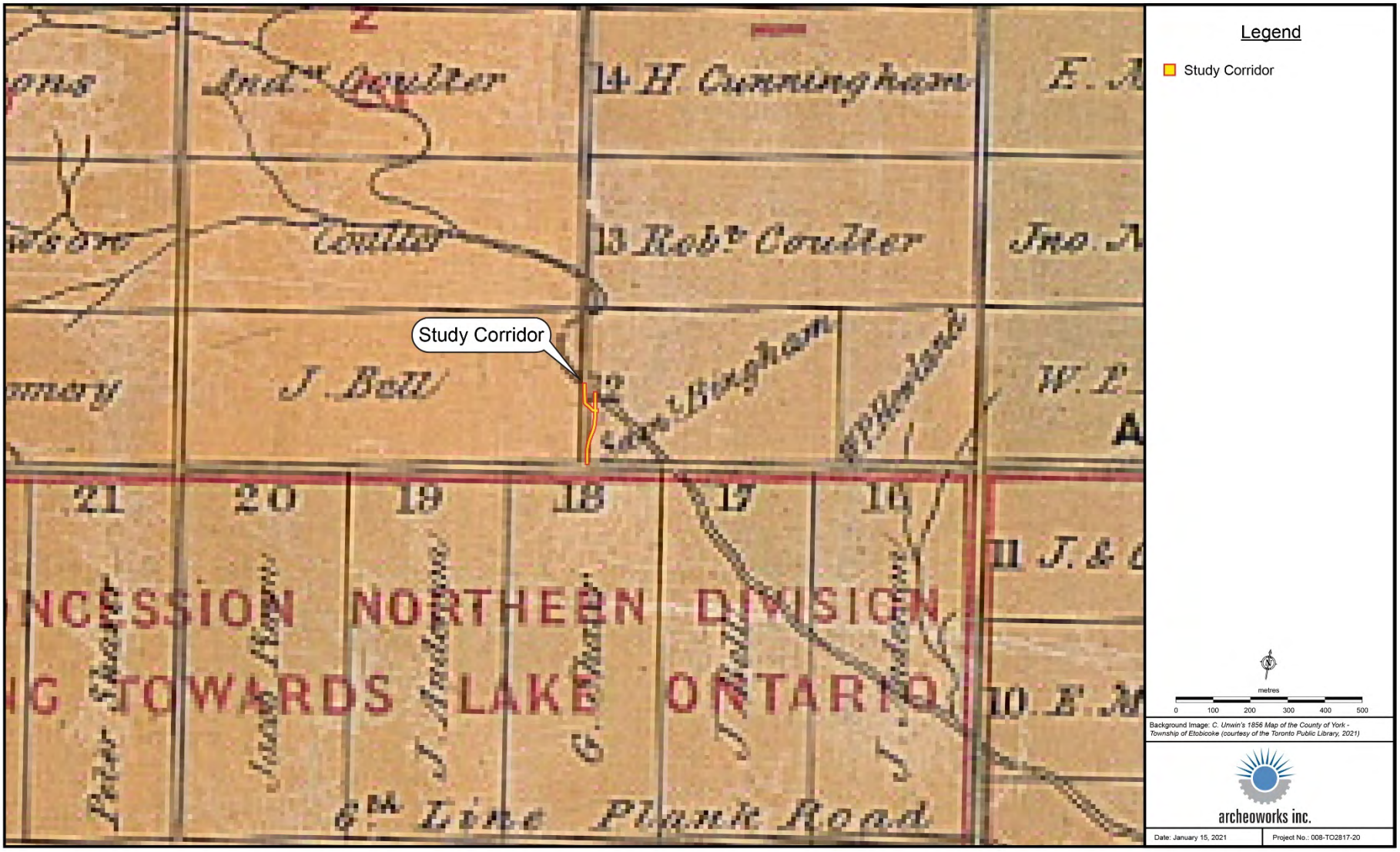
APPENDIX A: MAPS



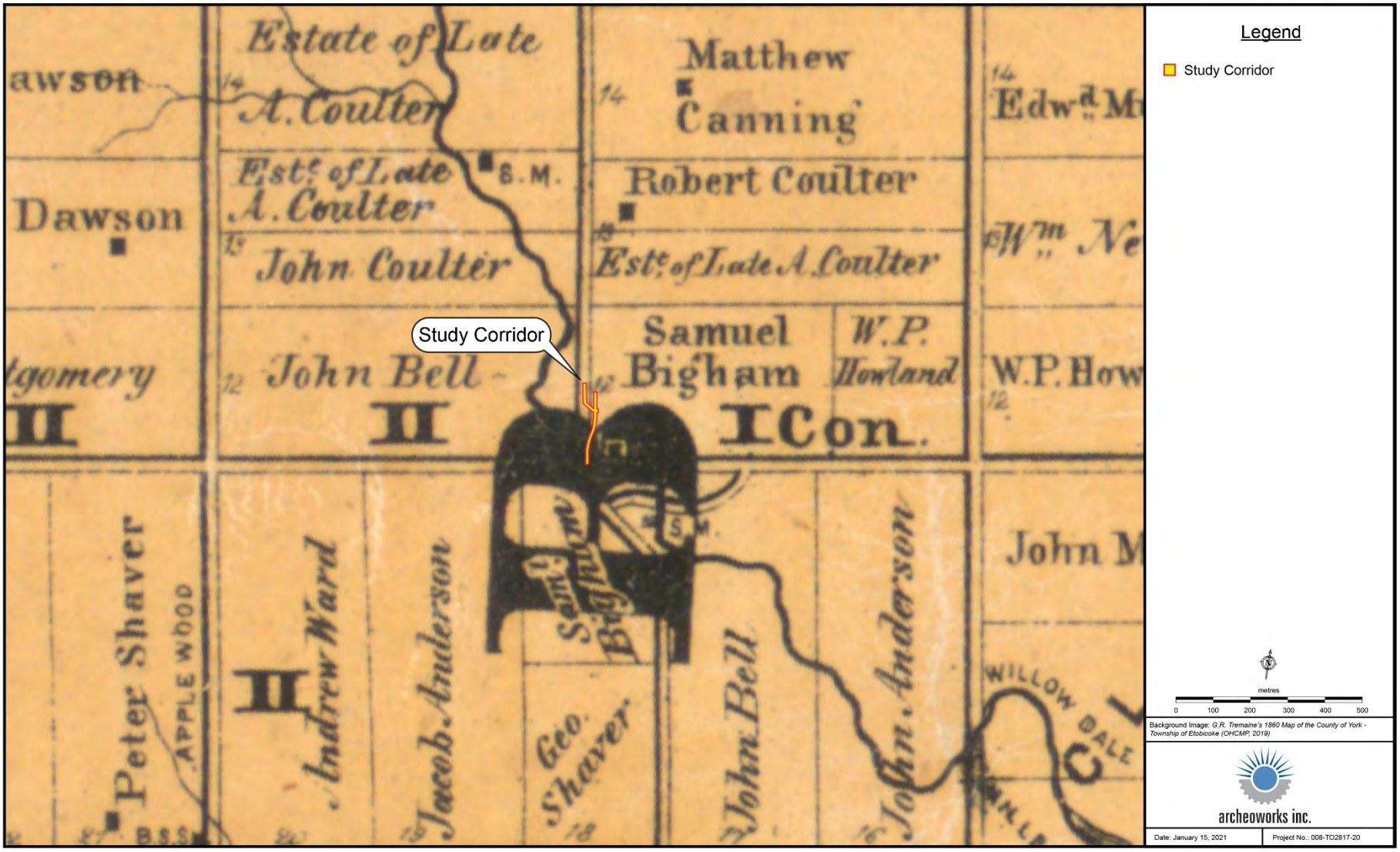
Map 1: National Topographic Map, 1:30,000, Brampton 030M12 (Natural Resources Canada, 2013) identifying the Stage 1 AA study corridor.



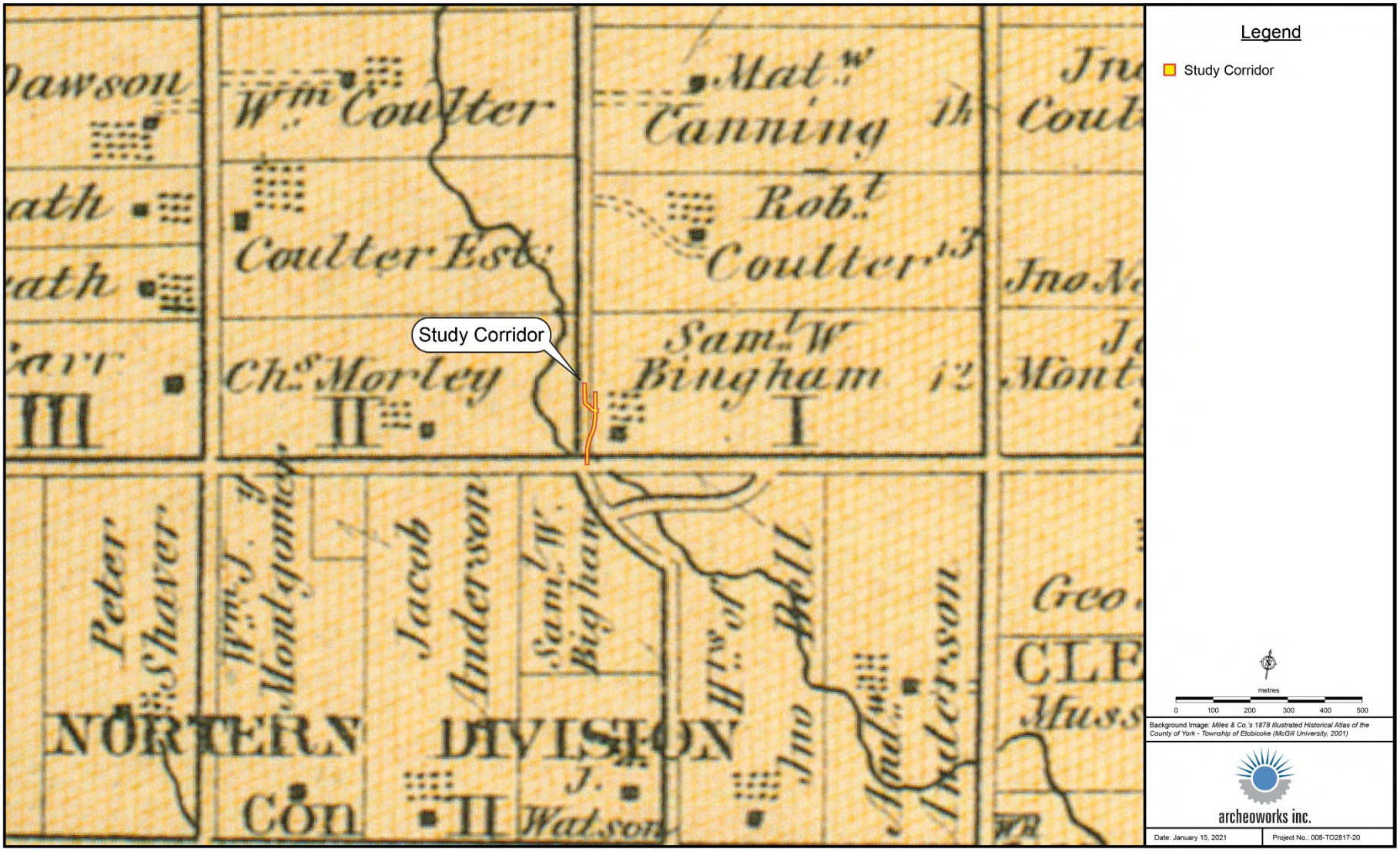
Map 2: National Topographic Map, 1:10,000, Brampton 030M12 (Natural Resources Canada, 2013) identifying the Stage 1 AA study corridor.



Map 3: Stage 1 AA study corridor within C. Unwin's 1856 Map of the County of York – Township of Etobicoke (courtesy of Toronto Public Library, 2021).

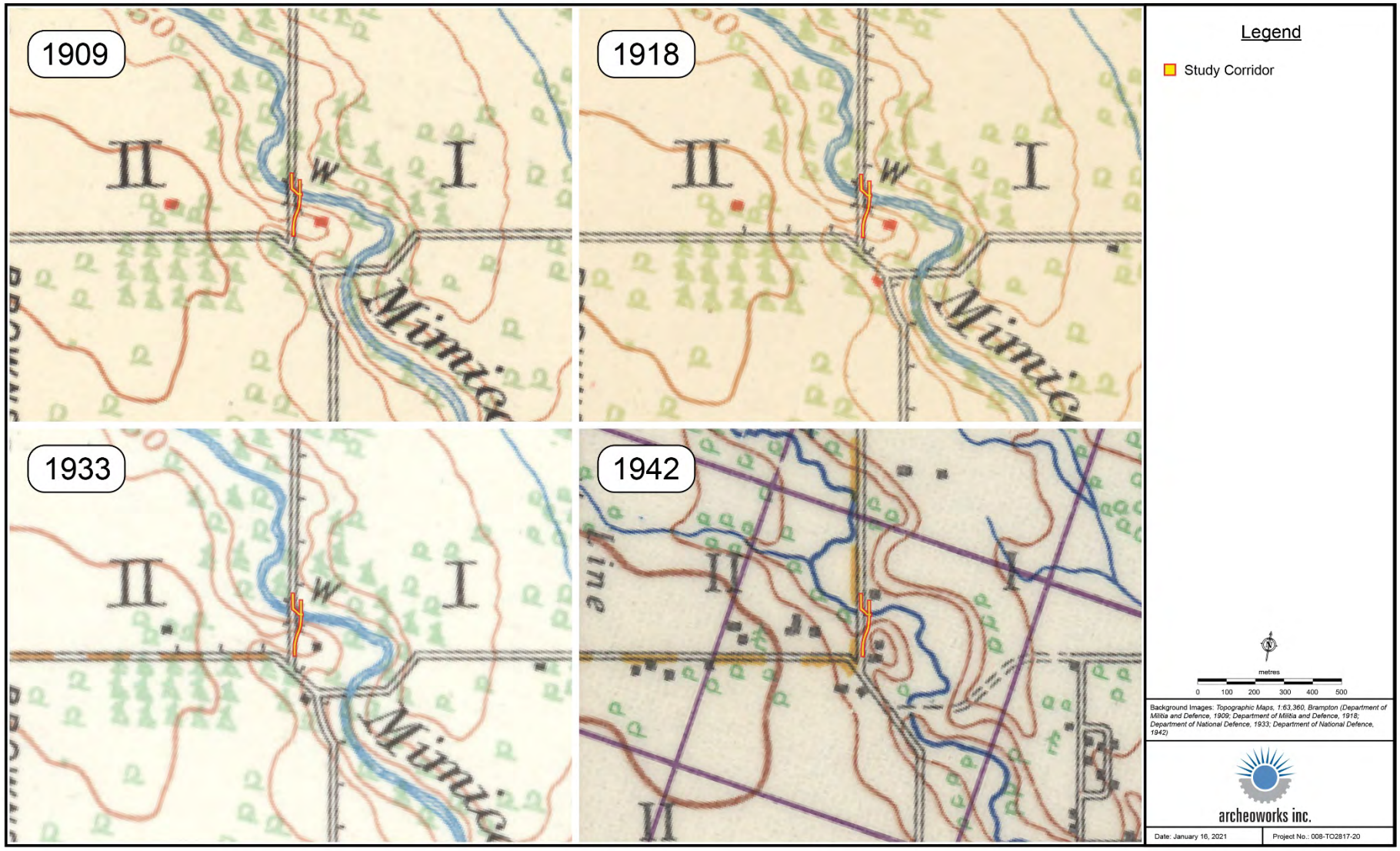


Map 4: Stage 1 AA study corridor within G.R. Tremaine's 1860 Map of the County of York – Township of Etobicoke (OHCMP, 2019).



Map 5: Stage 1 AA study corridor within Miles & Co.'s 1878 Illustrated Historical Atlas of the County of York – Township of Etobicoke (McGill University, 2021).

Map 6: Stage 1 AA study corridor within C.H. MacDonald's 1916 Map of the County of York – Township of Etobicoke (courtesy of the University of Toronto Map and Data Library, 2021).



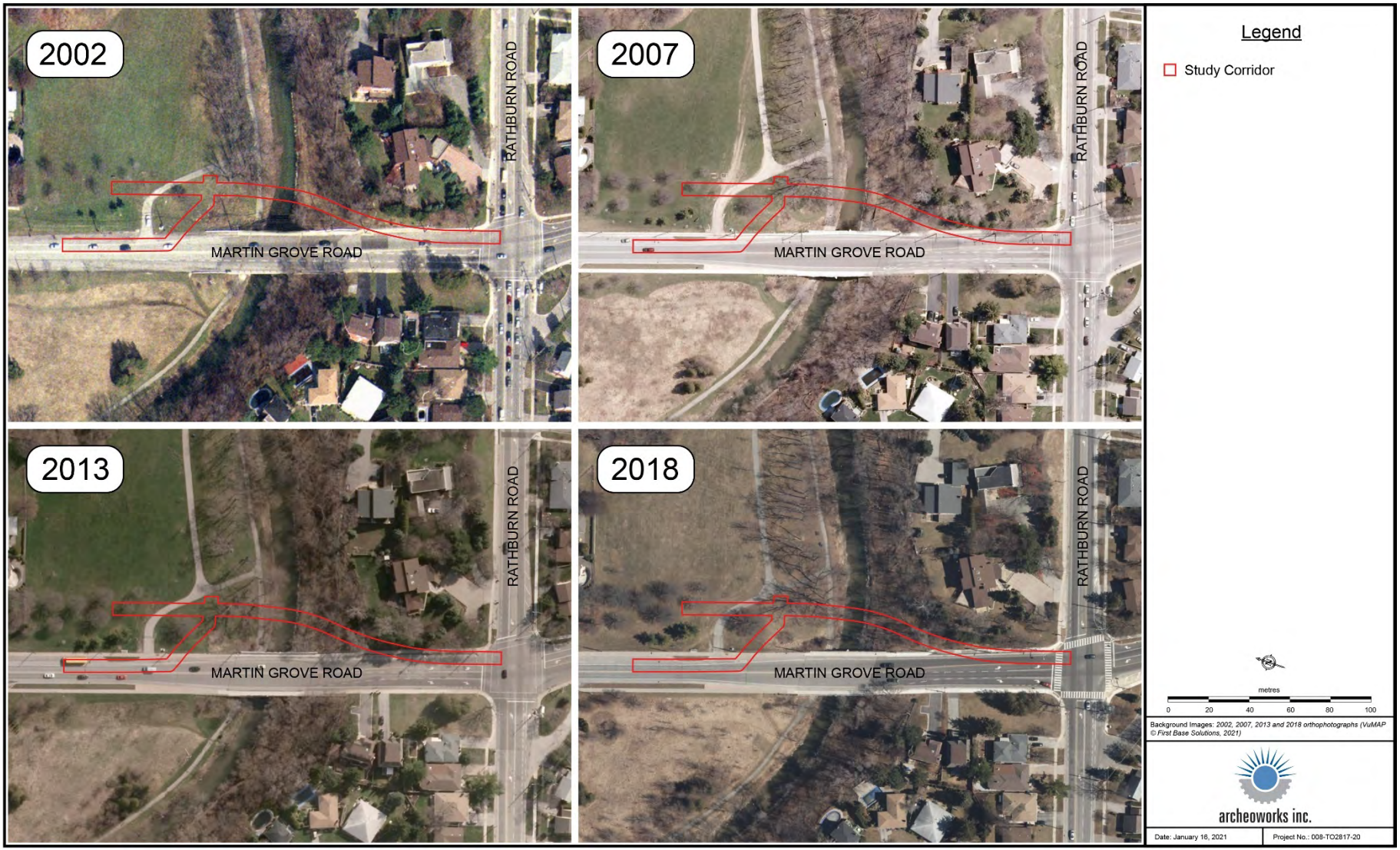
Map 7: Stage 1 AA study corridor within 1909, 1918, 1933 and 1942 topographic maps (Department of Militia and Defence; Department of National Defence).

Map 8: Stage 1 AA study corridor within a series of aerial photographs from 1947, 1950, 1953 and 1957 (courtesy of Northway/Photomap/Remote Sensing Ltd.).

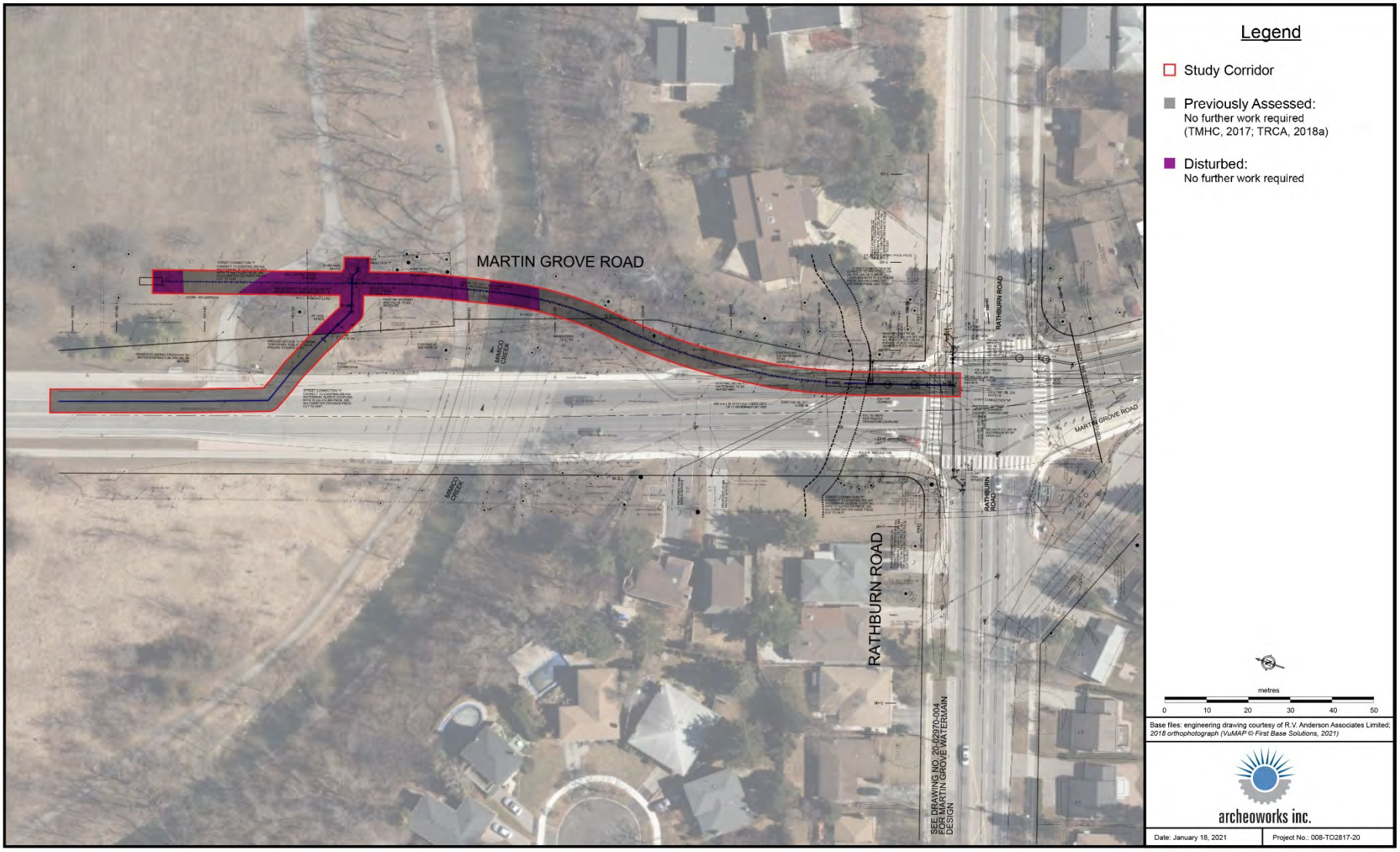
Map 9: Stage 1 AA study corridor within a series of aerial photographs from 1959, 1960, 1961 and 1962 (courtesy of Northway/Photomap/Remote Sensing Ltd.).

Map 10: Stage 1 AA study corridor within a series of aerial photographs from 1963, 1965, 1969 and 1975 (courtesy of Northway/Photomap/Remote Sensing Ltd.).

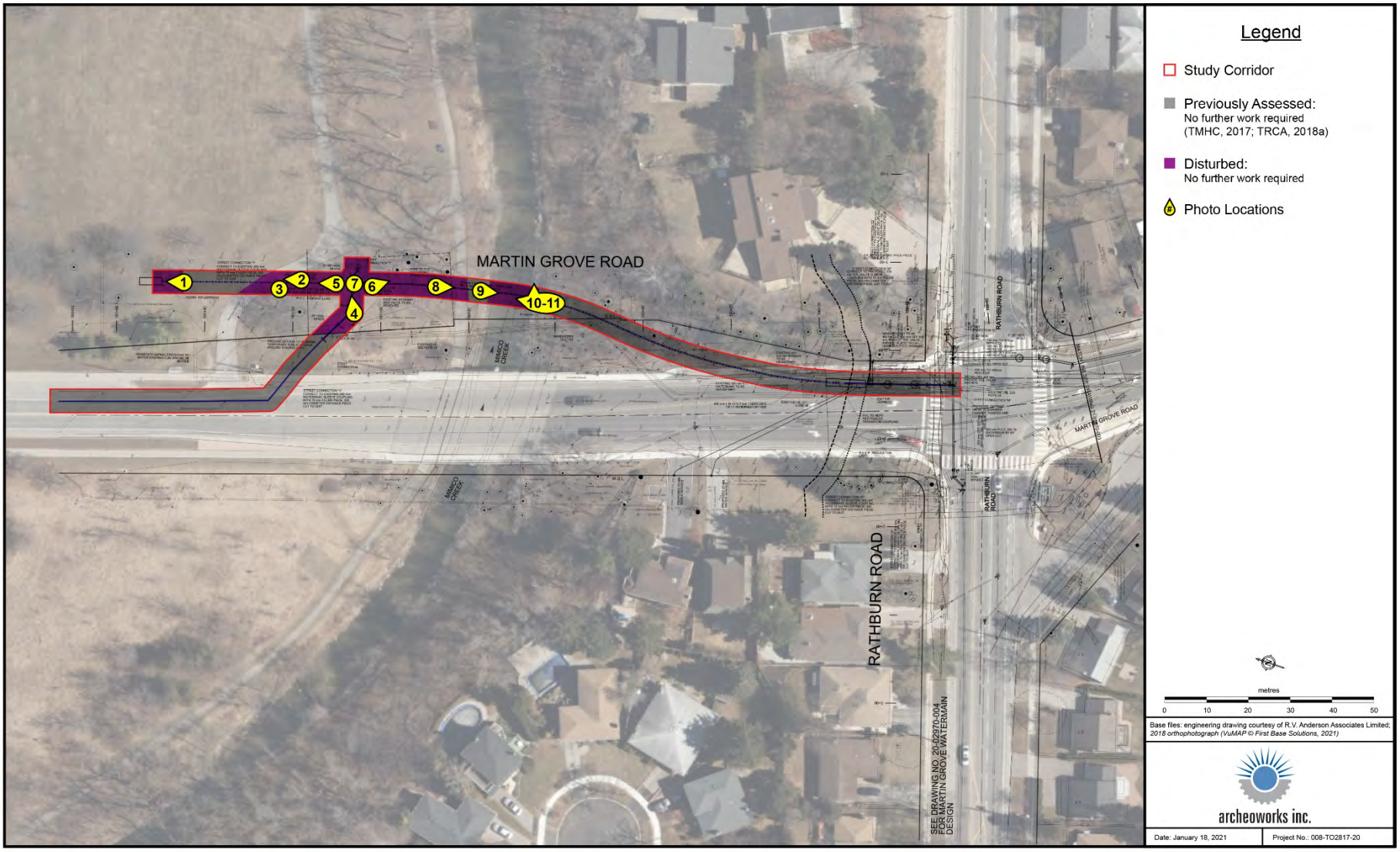
Map 11: Stage 1 AA study corridor within a series of aerial photographs from 1977, 1981, 1983 and 1991 (courtesy of Northway/Photomap/Remote Sensing Ltd.).



Map 12: Stage 1 AA study corridor within 2002, 2007, 2013 and 2018 orthophotographs (VuMap © First Base Solutions).



Map 13: Stage 1 AA results.



Map 14: Stage 1 AA results, with photo locations indicated.

APPENDIX B: SUMMARY OF BACKGROUND RESEARCH

Feature of Archaeological Potential		Yes	No	Unknown	Comment
1	Known archaeological sites within 300 m?		X		If Yes, potential confirmed
Physical Features		**Yes**	**No**	**Unknown**	**Comment**
2	Is there water on or adjacent to the property?	X			If Yes, potential confirmed
2a	Presence of primary water source within 300 metres of the study corridor (lakes, rivers, streams, creeks)	X			If Yes, potential confirmed
2b	Presence of secondary water source within 300 metres of the study corridor (intermittent creeks and streams, springs, marshes, swamps)		X		If Yes, potential confirmed
2c	Features indicating past presence of water source within 300 metres (former shorelines, relic water channels, beach ridges)		X		If Yes, potential confirmed
2d	Accessible or inaccessible shoreline (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh)		X		If Yes, potential confirmed
3	Elevated topography (knolls, drumlins, eskers, plateaus, etc.)		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
4	Pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
5	Distinctive land formations (mounds, caverns, waterfalls, peninsulas, etc.)		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
Cultural Features		**Yes**	**No**	**Unknown**	**Comment**
6	Is there a known burial site or cemetery that is registered with the Cemeteries Regulation Unit on or directly adjacent to the property?		X		If Yes, potential confirmed
7	Associated with food or scarce resource harvest areas (traditional fishing locations, food extraction areas, raw material outcrops, etc.)		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
8	Indications of early Euro-Canadian settlement (monuments, cemeteries, structures, etc.) within 300 metres	X			If Yes to two or more of 3-5 or 7-10, potential confirmed
9	Associated with historic transportation route (historic road, trail, portage, rail corridor, etc.) within 100 metres of the property	X			If Yes to two or more of 3-5 or 7-10, potential confirmed
Property-specific Information		**Yes**	**No**	**Unknown**	**Comment**
10	Contains property designated under the Ontario Heritage Act		X		If Yes, potential confirmed
11	Local knowledge (Indigenous communities, heritage organizations, municipal heritage committees, etc.)		X		If Yes, potential confirmed
12	Recent ground disturbance, not including agricultural cultivation (post-1960, extensive and deep land alterations)	X - all			If Yes, low archaeological potential is determined

APPENDIX C: IMAGES

Image 1: View of field conditions during the property inspection. Note the presence of a water monitoring well.

Image 2: View of field conditions during the property inspection. Note the presence of the asphalt pathway.

Image 3: View of ground conditions during the property inspection. Note utility markings.

Image 4: View of ground conditions during the property inspection. Note the presence of the asphalt pathway.

Image 1: View of ground conditions during the property inspection. Note the presence of the asphalt pathway.

Image 2: View of field conditions during the property inspection. Note presence of the asphalt pathway.

Image 3: View of field conditions during the property inspection. Note the disturbed ground conditions.

Image 4: View of field conditions during the property inspection. Note the asphalt pathway and channelled Mimico Creek.

Image 5: View of ground conditions during the property inspection. Note the channelled Mimico Creek.

Image 6: View of ground conditions during the property inspection. Note the channelled Mimico Creek and utility markings.

Image 7: View of ground conditions during the property inspection. Note the channelled Mimico Creek.

APPENDIX D: INVENTORY OF DOCUMENTARY AND MATERIAL RECORD

Project Information:				
Project Number:	008-TO2817-20			
Licensee:	Kassandra Aldridge (P439)			
MHSTCI PIF:	P439-0132-2020			
Document/Material			**Location**	**Comments**
1.	Research/ Analysis/ Reporting Material	Digital files stored in: /2020/ 008-TO2817-20 - Martin Grove Road WM Replacement-Toronto/Stage 1/	Archeoworks Inc., 16715-12 Yonge Street Suite 1029 Newmarket, ON L3X 1X4	Stored on Archeoworks network servers
2.	Written Field Notes/Annotated Field Maps/Images	Field Maps/Field Notes: two (2) pages Digital Images: 68 digital photos	Archeoworks Inc., 16715-12 Yonge Street Suite 1029 Newmarket, ON L3X 1X4	Stored on Archeoworks network servers: 70 digital files

Under the Section 14 of the Terms and Conditions for Archaeological Licences issued under the *Ontario Heritage Act*, "the licensee shall hold in safekeeping all artifacts and records of archaeological fieldwork carried out under this licence, except where those artifacts and records are transferred by the licensee to Her Majesty the Queen in right of Ontario or the licensee is directed to deposit them in a public institution in accordance with subsection 66(1) of the Act." The collections are being stored at Archeoworks Inc. on the licensee's behalf.

ARCHEOWORKS INC.

Stage 1 Archaeological Assessment for the Proposed Martin Grove Watermain Replacement Within the Road Allowance between Concession 1 and 2 Fronting on the Humber River and Within Part of Lot 12, Concession 1 Fronting on the Humber River Geographic Township of Etobicoke Historical County of York Now the City of Toronto Ontario

Project #: 008-TO2817-20
Licensee (#): Kassandra Aldridge (P439)
PIF#: P439-0132-2020

Supplementary Document

January 19, 2021

Presented to:
R.V. Anderson Associates Limited
2001 Sheppard Avenue East
Suite 300
Toronto, Ontario
M2J 4Z8
T: 416.497.8600

Prepared by:
Archeoworks Inc.
16715-12 Yonge Street, Suite 1029
Newmarket, Ontario
L3X 1X4
T: 416.676.5597
F: 647.436.1938

TABLE OF CONTENTS

1.0 Winter Fieldwork Strategy

From: Hadlari, Wai (MHSTCI) <Wai.Hadlari@Ontario.ca>
Sent: December 22, 2020 8:44 AM
To: ltempleton@archeoworks.com
Cc: Archaeology (MHSTCI) <archaeology@ontario.ca>; kslocki@archeoworks.com; blawson@archeoworks.com
Subject: RE: Winter Strategy - 008-TO2817-20 - Martin Grove Road Watermain Replacement - Toronto

Hello Lee,

Happy Holidays!

This is to confirm that a Stage 1 PIF can be issued for 008-TO2817-20 - Martin Grove Road Watermain Replacement – Toronto project

As you mentioned below, please note that it carried out under winter conditions (e.g. Snow cover, frozen ground, excessive rain) as it may reduce the chances of observing features of archaeological potential. The report must provide photo documentation to confirm that the property inspection was conducted in accordance to Standard 1.2, Standard 2 in the S&Gs, including the weather and lighting conditions.

Please review our Winter Archaeology Bulletin here for additional information on reporting requirements, excavation conditions, and strategies to consider when conducting archaeological assessment around the winter months.

Please provide a copy of this correspondence when you submit the PIF request.

Please include a PDF copy of this advice as supplementary documentation to your project report package.

As a standard part of all advice provided to licensees, please note that this advice has been provided by this ministry under the assumption that the information submitted by the licensed archaeologist is complete and accurate. The advice provided applies only to the project in question and is not to be used as a precedent for future projects. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or if the information provided by the licensed archaeologist is otherwise found to be inaccurate, incomplete, misleading, or fraudulent.'

Thanks,

Wai

Wai Hadlari | Archaeology Review Officer
Archaeology Program Unit | Ministry of Heritage, Sport, Tourism and Culture Industries
401 Bay Street, Suite 1700
Toronto, Ontario
M7A 0A7
E: wai.hadlari@ontario.ca
Mobile: 437-339-9145

From: ltempleton@archeoworks.com <ltempleton@archeoworks.com>
Sent: Monday, December 21, 2020 4:58 PM
To: Hadlari, Wai (MHSTCI) <Wai.Hadlari@Ontario.ca>
Cc: Archaeology (MHSTCI) <archaeology@ontario.ca>; kslocki@archeoworks.com; blawson@archeoworks.com
Subject: Winter Strategy - 008-TO2817-20 - Martin Grove Road Watermain Replacement - Toronto

Hi Wai,

re. Stage 1 PIF request: 008-TO2817-20 - Martin Grove Road Watermain Replacement - Toronto

The property survey will be undertaken in accordance to Section 1.2, Standard 2 of the 2011 S&G. Given this project is located in Etobicoke, we will monitor the temperature/weather forecast prior to scheduled property inspection. Per the S&G, should ground conditions not be adequate to complete the Stage 1 property inspection, we will not undertake the assessment.

Please kindly advise if further details are required,

Kind regards,

Lee

Lee Templeton, H.B.A.

archeoworks inc.

16715-12 Yonge St., Suite 1029, Newmarket, ON, L3X 1X4
T: 416-948-6896 | F: 647-436-1938

2.0 Bigham (Bingham) Family Cemetery Transcript

MUNICIPALITY OF METROPOLITAN TORONTO / ETOBICOKE (CITY OF) / BINGHAM FAMILY CEMETERY / ETB-013

Bingham Family Cemetery (Etobicoke)

Etobicoke, Ontario

Part of Lot 12, Concession 1
City of Etobicoke, Ontario

A GENEALOGICAL REFERENCE LISTING

Bingham Family Cemetery, Etobicoke, Ontario

Transcribed by
Ontario Genealogical Society
Toronto Branch

(This cemetery is listed as **ETB-013** in the *Directory of Cemeteries in the Municipality of Metropolitan Toronto and the Regional Municipality of York* published by the Ontario Genealogical Society, Toronto Branch, 1989)

ISBN 0-7779-0344-X

This publication was produced entirely by volunteers.
Funds generated from its sale are used for future publishing ventures.

Additional copies of this publication may be purchased from:
Ontario Genealogical Society, Toronto Branch
Box 518, Station K, Toronto, Ontario, Canada M4P 2G9

ETB-013

Introduction

BINGHAM FAMILY CEMETERY
/Agar Family Cemetery

This cemetery was located on the north-east corner of Rathburn and Martingrove Roads, south of Mimico Creek. The municipal designation is part of Lot 12, Concession 1, fronting the Humber River, City of Etobicoke, (formerly Borough of Etobicoke).

This was a family burial ground established in 1843. It was closed in 1973 due to road widening and the graves were moved to Riverside Cemetery (ETB-008), 2300 Lawrence Avenue West at Royal York Road. The graves are situated at the fence on Royal York Road, in line with Row #22, Section "E" (Bethany).

There were only seven persons transferred to Riverside Cemetery: Mary and Andrew Bingham, Elizabeth Bingham, three children and an unknown adult, who might have been a hired man. Descendants of Andrew Bingham include Agars, but there is no record of any Agars in the Bingham Cemetery.

This transcription is part of an ongoing project of the Ontario Genealogical Society to record all the gravemarkers in Ontario. The stones were transcribed and proofed by Edith Collison and Fran Holmes in August 1992. The information was entered into computer by Cathy Hamilton and the history was compiled by Edith Collison who also took the photographs.

Researchers should report errors or omissions to: Cemetery Committee, Toronto Branch, Ontario Genealogical Society, Box 518, Station K, Toronto, ON, M4P 2G9.

Sources:

1. Etobicoke Press, ("Etobicoke In Pictures", column by James V. Salmon and Robert A. Given, Etobicoke, 24 July 1958; and date unknown).

2. Ontario Gazette, (O.Reg.199/53; O.Reg.764/73; R.R.O. 1970, reg.79, Sched.2; O.Reg.527/72,S.1.).

ETB-013

2

ETB-013

BINGHAM FAMILY CEMETERY
/Agar Family Cemetery

1. Andrew **BINGHAM**
died
Apr. 6. 1843.
75 y's. & 7 mo.
Mary
his wife
died Feb. 27. 1853.
Æ 64 y's.
(illegible verse)
(2 footstones) - AB/(?)B, EB/JB

2. Elizabeth
wife of
(?) **BINGHAM**
died Aug. 12 1851
aged 25 y'rs.
& 11 mo.
Weep not for me my husband dear
I am not dead but sleeping here
My debt is paid my grave you see
Prepare in time to follow me.

Eight long years we lived in love, three
infant babes Elizabeth bore which
with her doth lie till Christ shall say
arise and come to heaven.

3

Appendix 3

Stage 1-2 Archaeological Assessment

STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT

Watermain Replacement on Martin Grove Road (Schedule B EA)

Lot 12, Concession Fronting the Humber I,
Geographic Township of Etobicoke,
Historic York County in the
City of Toronto

ORIGINAL REPORT
August 05, 2022
MC21-04 | PIF P303-0632-2021
Licensee: **Alistair Jolly (P303)**

Executive Summary

The City of Toronto is requesting that TRCA provide lands for a temporary and permanent easement ahead of proposed watermain replacement works. The temporary easement will be employed for laydown of piping to be installed. Construction activities will be located within the permanent easement, which includes the location of an existing watermain. Accordingly, a Stage 1 and 2 archaeological assessment was triggered by internal Toronto and Region Conservation Authority (TRCA) policy outlined in the *Archaeology Resource Management Services Guidelines and Procedures,* prior to any construction activities. The project area is located on Lot 12, Concession Fronting the Humber I, in the Geographic Township of Etobicoke, Historic York County on lands owned by TRCA in the City of Toronto.

Permission for this assessment and the right to remove artifacts was granted to TRCA Archaeology by TRCA.

The assessment was conducted in the fall of 2021. The project area was thoroughly investigated in accordance with the 2011 Standards and Guidelines for Consultant Archaeologists, published by the Ministry of Heritage, Sport, Tourism and Culture Industries The project area was evaluated for extensive disturbances that have removed archaeological potential. Part of the project area was determined to have been heavily disturbed by previous construction activities associated with the existing watermain, grading, building construction and demolition, and the construction of paved sidewalks. The remainder of the project area was subjected to test pit survey. At the onset of test pit survey, disturbed ground conditions were encountered, therefore these areas were tested according to professional judgement at 5-10-metre intervals to determine the extent and nature of disturbed ground conditions. Disturbances consisted of mottled grey soils within a light to medium brown matrix with concrete inclusions. No areas of natural soils were encountered.

Despite careful scrutiny, no artifactual material or cultural features were located in the project area during the archaeological investigation. Accordingly, the project area as tested requires no further archaeological assessment.

If there is any deviation from the agreed upon project area, additional assessment may be necessary. Furthermore, if any deeply buried deposits or human remains are encountered, all activities will cease and TRCA Archaeology as well as the proper authorities will be contacted immediately.

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Tables

Maps

Images

Project Personnel

Project and Field Direction:

Alistair Jolly (P303)

Field Archaeologist:

Scott Eckford (R1057)

Report Preparation:

Scott Eckford

Graphics:

Alvina Tam (P1016)

Edited By:

Alvina Tam

1.0 Project Context

1.1 Development Context

The City of Toronto is requesting that TRCA provide lands for a temporary and permanent easement ahead of proposed watermain replacement works. The temporary easement will be employed for laydown of piping to be installed. Construction activities will be located within the permanent easement, which includes the location of an existing watermain. Accordingly, a Stage 1 and 2 archaeological assessment was triggered by internal Toronto and Region Conservation Authority (TRCA) policy outlined in the *Archaeology Resource Management Services Guidelines and Procedures,* prior to any construction activities. The project area is located on Lot 12, Concession Fronting the Humber I, in the Geographic Township of Etobicoke, Historic York County on lands owned by TRCA in the City of Toronto (**Maps 3 and 4**).

Permission for this assessment and the right to remove artifacts was granted to TRCA Archaeology by TRCA.

We acknowledge that the archaeological assessment reported here was undertaken within Traditional Territories and Treaty Lands, in particular those of the Mississaugas of the Credit First Nation, as well as the Huron-Wendat, the Anishinaabeg of the Williams Treaty First Nations, and the Haudenosaunee. As stewards of land and water resources within the greater Toronto region TRCA appreciates and respects the history and diversity of the land, recognizes our shared values and interests, and is grateful to have the opportunity to work in this territory.

1.2 Historical Context

Archival research into historic and modern heritage documents was conducted as a component of this study and a detailed historical overview of the local area is provided.

The subsequent Indigenous chronology was constructed from Ellis and Ferris (1990). Euro-Canadian settlement is presented from a broad regional scale and narrowing down to individual properties. That is, the discussion reviews the history of Etobicoke Township, the County of York, and the industries and structural improvements located within the vicinity of the project area.

Paleo Period – 12,000 to 10,000 BP

Twelve thousand years ago, as the glaciers retreated from southern Ontario, nomadic peoples gradually moved into areas recently vacated by the massive ice-sheets. These people lived in small family groups and it is presumed that they hunted caribou and other fauna associated with the cooler environment of this time period. As the glaciers melted at the end of the last ice age, the landscape of southern Ontario was very much like the tundra of the present day eastern sub-arctic. Traditionally, the occupation of southern Ontario during the Paleo Period has been associated with glacial lake shorelines, however recent investigations in the Toronto vicinity indicate that these peoples also exploited interior locations situated inland from the glacial lakes.

Intense Diversification Period – 10,000 to 2,800 BP

As the climate in southern Ontario warmed, Indigenous populations adapted to these new environments and associated fauna. Thus, many new technologies and subsistence strategies were introduced and developed by the Indigenous peoples of this time period. Woodworking implements such as groundstone axes, adzes, and gouges began to appear, as did net-sinkers (for fishing), numerous types of spear points and items made from native copper, which was mined from the Lake Superior region. The presence of native copper on

archaeological sites in southern Ontario and adjacent areas suggests that people were involved in long range exchange and interaction. The trade networks established at this time were to persist between Indigenous groups until European contact. To harvest the new riches of the warming climate, the bands residing in southern Ontario followed an annual cycle, which exploited seasonably available resources in differing geographic locales within watersheds. As the seasons changed, these bands split into smaller groups and moved inland to exploit other resources that were available during the fall and winter such as deer, rabbit, squirrel, and bear, which thrived in the forested margins of these areas.

Initial Woodland Period – 2,800 BP to AD 700

Early in the Initial Woodland period, band size and subsistence activities were generally consistent with the groups of the preceding Intense Diversification Period. Associated with the earliest components of this cultural period is the introduction of clay pots. Additionally, around two thousand years ago a revolutionary new technology, the bow and arrow, was brought into southern Ontario and radically changed approaches to hunting and warfare. These two technological innovations allowed for major changes in subsistence and settlement patterns. As populations became larger, camps and villages with more permanent structures were occupied longer and more consistently. Generally, these larger sites are associated with the gathering of macrobands. Often these larger groups would reside in favourable locations to cooperatively take advantage of readily exploitable resources. It was also during this period that elaborate burial rituals and the interment of numerous exotic grave goods with the deceased began to take place. Increased trade and interaction between southern Ontario populations and groups as far away as the Atlantic coast and the Ohio Valley was also taking place.

Late Woodland Period – AD 700 to 1650

Around AD 700, maize was introduced into southern Ontario from the south. With the development of horticulture as the predominant subsistence base, the Late Woodland Period gave rise to a tremendous population increase and the establishment of permanent villages. These villages consisted of longhouses measuring six metres wide and high and extending anywhere from three to 15 metres in length. Quite often these villages, some of which are one to four hectares in size, were surrounded by multiple rows of palisades suggesting that defence was a community concern. Aside from villages, Late Woodland peoples also inhabited hamlets and special purpose cabins and campsites that are thought to have been associated with larger settlements. Social changes were also taking place, as reflected in the fluorescence of smoking pipes; certain burial rituals; increased settlement size; and distinct clustering of both longhouses within villages (clan development) and villages within a region (tribal development). One interesting socio-cultural phenomenon that occurred during this period as a result of the shift in emphasis from hunting to horticulture was a movement away from the traditional patrilineal and patrilocal societies of the preceding band-oriented groups to a matrilineal orientation. Warfare was also on the rise.

The movement of villages northward within individual watersheds in the Toronto region is clearly documented over time. This movement is generally attributed to the decline of resource availability over the lifetime of the village. After which, communities continued a northward trend eventually settling in Huronia (in the Penetanguishene Peninsula) and it was these communities that eventually interacted with and were described by French missionaries and explorers during the early seventeenth century.

According to oral traditions, *Anishinaabe* peoples migrated from the Eastern coast into the Great Lakes region. The Anishinaabe include people identified as Ojibway, Chippewa, or Mississauga and until the seventeenth century lived primarily a nomadic lifestyle north of Lake Ontario on the Canadian Shield. The *Wendat,* who are recognized as the cultural group that inhabited the Toronto area during the Late Woodland Period, eventually moved their villages northward toward Georgian Bay. The Huron-Wendat Nation was decimated by warfare with the Iroquois from south of the lake that was exacerbated by illnesses brought to the New World by Europeans. They fled Huronia around 1650, and now have established communities in Wendake, Quebec and in the American States of Kansas and New York. The Haudenosaunee, or people of the longhouse, comprise the six Iroquois Nations of Mohawk, Oneida, Onondaga, Cayuga, Seneca, and Tuscarora. As allies of the British during the American Revolution under Captain Joseph Brant the Haudenosaunee were granted a tract of land along the Grand River where many relocated from the Finger Lakes region of New York State. It was these and other nations in southwestern Ontario that interacted with and were described by French missionaries and explorers during the early seventeenth century.

Contact Period – AD 1650 to 1778

Also called the Early Historic Period, these years are characterized by the arrival of a small number of Europeans interested in exploration, trade, and establishing missions, coupled with a gradual adoption of European materials by First Nations peoples.

Anishinaabe peoples who traditionally lived further north on the Canadian Shield remained largely nomadic well into the Historic Period. Exploration and fur trade activities between Lake Ontario and the upper Great Lakes were carried out along well-established trails linking Lake Ontario to the Holland River, Lake Simcoe and Lake Huron. The "*Passage de Taronto*" also known as the Toronto Carrying Place Trail, was actually a series of interconnected trails with two main branches; the west branch followed the Humber River and the east branch followed the Rouge River. It was during this period of trade and exploration that male fur traders established families with Indigenous women during their travels. A blending of cultural traditions eventually resulted in distinct Métis communities along the lakes and waterways of Ontario. The French explorers and fur traders began to travel along the Lake Ontario shoreline and explore parts of the north shore inland. They followed the centuries-old route of the well-established west branch of the Toronto Carrying Place Trail along the Humber River and the east branch along the Rouge River north to the Holland River and beyond, to the upper lakes.

By AD 1650 the lands along the north shore of Lake Ontario were largely uninhabited and small groups of Seneca subsequently moved into the area *ca.*1660. The Seneca established the villages of Teiaiagon and Ganatsekwyagon at strategic trading locations at the mouths of the Humber and Rouge Rivers, effectively controlling access to the west and east branches of the Toronto Carrying Place Trail. Teiaiagon and Ganatsekwyagon were also connected east-west by an overland route along the lakeshore.

In terms of material culture, it is often difficult to distinguish between *Haudenosaunee*, *Anishinaabe*, *Métis* and colonial settler campsites during these early years. This is due to the interaction and adoption of each other's material goods and subsistence strategies which blur cultural boundaries. Such interaction was essential to early explorers and missionaries who relied on local people for survival strategies and knowledge of the local landscape.

These permeable boundaries continued until the Crown established segregated reserves in the eighteenth and early nineteenth centuries for the *Haudenosaunee* and *Anishinaabe* communities who remained here while granting properties to European settlers.

Due to the trade disputes between the French and English these disruptions to trade resulted in the Seneca abandoning their villages after 1695, leaving the region without a permanent First Nations settlement. The Mississauga people began moving south in the seventeenth century, traversing southern Ontario on their seasonal rounds and establishing villages along the north shore of Lake Ontario, even re-occupying those formerly abandoned by the Seneca. The Mississauga were largely fishers and hunters and participated in more casual maize horticulture. By the late eighteenth century, the Mississauga resided along the north shore of Lake Ontario and in the Trent River valley, and the Chippewa resided near Lake Simcoe, the Bruce Peninsula, and the Thames River valley. The Five Nations Iroquois were not residing within the region at the time nor were the Huron.

Following the signing of the Treaty of Paris, which passed New France into British hands, King George III issued the Royal Proclamation, a document attributed to the first formal recognition of Indigenous rights. The Royal Proclamation asserted the British Crown's sovereignty of the region, while also declaring the land to be in possession of the Indigenous peoples who lived there. It forbade non-Indigenous people from entering the land and denied individual land purchasing rights. Only the Crown could purchase land from the Indigenous peoples living there, and this land could then subsequently be bought from the Crown. A number of key land surrenders were negotiated between the Crown and the Chippewa, the Mississauga, and the Five Nation Iroquois, that potentially impact lands within the Greater Toronto Area including: the Treaties of 1701, the Toronto Purchase (1805), the Head of the Lake Treaty (1806), the Ajetance Treaty (1818), and the Williams Treaties (1923).

Post Contact Period – AD 1778 to Present

York County

Since 1788, the land north of Lake Ontario formed part of the District of Nassau in the Province of Quebec. The Province of Upper Canada was created in 1791, and in the following year Colonel John Graves Simcoe renamed it the Home District and formed York County along with eighteen other counties. York County originally included modern day York Region, Peel Region, Halton Region, Toronto, parts of Durham Region and the City of Hamilton. It was divided into two ridings, East and West York and the former included Markham Township.

The townships which formed York County included Georgina, North Gwillimbury, East Gwillimbury, King, Whitchurch, Vaughan, Markham, Etobicoke, York and Scarborough, (Reaman, 1971:20). "Simcoe made every effort to give English names to counties, towns, townships and rivers, in order to impress on the Loyalists that there was a continuing British presence north of the lost American Colonies" (Rayburn 1996).

During the early nineteenth century, land grants of 200 acres (81 hectares) were given outside of the town core as a reward to soldiers who fought for the British in the fight against the American colonies. In addition, land patents were issued to attract settlers from the British Isles as well as United Empire Loyalists from the United States. Townships situated further inland were not a desirable location by the Loyalists and were therefore of secondary importance to the settlement policies of Simcoe. As a result, the prime waterfront townships were quickly occupied by the Loyalists, while other townships were left for the children of Loyalists, "late-Loyalists" and settlers from Europe and the United States to clear. These land patents were granted under conditions written in the Settlement Duty Agreement that required patent holders to clear and fence five acres (two

hectares) of land and build a house 16 feet by 20 feet (5.5 metres by 6.1 metres) within the first twelve months of settlement.

The townships of York County were partially surveyed in 1793 and 1794 by Abraham Iredell. The first complete survey was begun in 1801 and finished in 1802 by Johann Stegman, an officer in the Hessian Regiment during the American Revolution. The townships were laid out in ten concessions one and a quarter mile apart, running north and south from Yonge Street east to the Pickering Town Line and were divided by six sideroads also one and a quarter mile apart running east and west. Each concession was divided into 200 acre lots, with five concessions between every sideroad. Thus, a lot and concession referred to a 200-acre parcel of land defined by the concession road on its western boundary.

The Constitutional Act of 1791 provided for a reserve of land in each township for the support of the Crown and the Protestant clergy. These reserves were to equal one seventh of the lands granted in each township. The Surveyor-General, D.W. Smith, evolved the Chequered Plan for the location of these Clergy and Crown Reserves. No doubt, Abraham Iredell's 1793 survey was based on the Chequered Plan. Simcoe wished to maintain Yonge Street as a military road to the north and therefore decided the reserve plan should not include concessions bordering the street. These reserves hindered road improvement as each settler was only responsible for clearing the road fronting his own lot. Access to streams was also blocked. Settlers could lease the reserve lots for a period of 21 years and if the duties of building the house and clearing the road were performed he could then sell his lease and be compensated for his work. In 1828 the Crown Reserves were turned over to King's College (later to become the University of Toronto) and then sold off. Interestingly, the Clergy Reserves were a contributing factor to the Upper Canada Rebellion of 1837.

Settlers arrived in York as early as 1794 and in some cases were squatters who obtained squatters rights at the time of the first survey. Many of the earliest settlers in both townships arrived from the United States, including United Empire Loyalists and Hessian soldiers. Others were attracted by the conditional offer of 200 acre land grants as outlined in the Settlement Duty Agreement. Townships were quickly settled by Scottish, Irish and English immigrants and French *émigré* families from the French Revolution. Many were also from Pennsylvania. These included the Pennsylvania Dutch (more correctly Pennsylvania Deutsch or German), Quakers, Mennonites and Brethren in Christ – known as "Dunkards" or "Tunkers." Many Pennsylvania Dutch family names continue to be prominent throughout the area. Censuses and other records from the nineteenth century reveal how extensively the families intermarried, the frequency with which land transactions occurred between the families, and how common it was for them as kin to be adjacent landowners over the generations. For example, in 1802 Eli Player noted passage through York of three wagons of "Pennsylvanians" on their way to Markham. Also, Timothy Rogers, a Quaker from Vermont, led a settlement of forty Quaker families into Whitchurch from Vermont, New York and Pennsylvania.

Settlement commonly grew around waterways, fertile land and timber resources, with the Oak Ridges Moraine influencing the settlement patterns. Stretching from Orangeville to Rice Lake, the Oak Ridges Moraine is an extensive area of sandy and gravely hills that form a watershed between Lake Ontario and Lake Simcoe, and provides the source water for the tributaries of the Humber, Don, Rouge, and Holland Rivers. To the north and south of this land ridge were hamlets and villages. The early development of the township began as small communities arose around the intersections of main roads or adjacent to streams or rivers which provided a

source of power for a mill. Around the mills, facilities to serve the settlers would begin to spring up, including general stores, churches, schools, and later post offices.

Hardwood forests of maple mixed with beech, cherry, oak, basswood, hemlock and pine were located in the fertile soils of the highlands while stands of white and red pine were found in the lighter sandy soil. The wet and moist areas supported cedar, black ash, elm, soft maple and spruce. The earliest settlers needed to clear these trees to cultivate their lands and make their homes. The many tributaries of the rivers were home to small saw mills throughout the townships, supplying lumber for local use, the mast and spar industry for the Royal Navy and planks for the roadways. These were soon followed by larger sawmills, grist mills for flour, woolen mills and distilleries.

Etobicoke Township

The land that makes up Etobicoke extends from Lake Ontario to Steeles Avenue, between the Etobicoke Creek and Humber River. First Nations referred to this area as “Wah-do-be-kaug”, an Ojibwe expression meaning “Where the Black Alders Grow”, in reference to the historic abundance of black alder. This name saw various iterations as settlers attempted to document its name. Augustus Jones had the closest version to modern spelling with “Ato-be-coake”. His son once spelled it A-doo-be-kog, Alexander Aitkin used Tobicoak and Abraham Iredell created a very English rendition as “Toby Cook”, which can be seen in some of the earliest historic maps of York from the 1790s.

The British purchased the land from the Mississaugas in 1784 and it formed part of the District of Nassau in the Province of Quebec until 1791. In 1792, the land became part of the East Riding of York in the Home District of Upper Canada. As early settlement in the province occurred in the Niagara District and east of Toronto, it was not until March 21, 1795, that Abraham Iredell was issued instructions to survey the township. One month later, Iredell completed his first survey of the southern part of the township. Iredell noted that the quality of the land in the area varied from “very good” to “burnt land but tolerable good” with some “burr and pine plain,” observing that the township was generally well-watered.

Additional surveys of the township were later undertaken in 1795, possibly by William Chewett when a tract of military land was mapped, Augustus Jones in 1797, and by William Hambly in June of 1798. The latter produced a map showing the location of the various Crown and Clergy reserves, including an 830-acre tract known as the King’s Mill Reserve. The Township of Etobicoke was initially selected for the settlement of the Queen’s Rangers corps after they disbanded. The first legal settler in the township arrived around 1800, shortly after the initial surveys were completed. The township has an irregular shape and as noted in the 1878 County Atlas, “it is difficult to comprehend the divisions into concessions. This has arisen from the time and manner of the original surveys. We have here a good instance of the practice first favoured of laying out the lots as to obtain a frontage upon a waterway.”

Lot Summaries

The project area is situated within Lot 12, Concession Fronting the Humber I, in the Geographic Township of Etobicoke, historic York County. A review of nineteenth century maps was conducted to provide a history of land use and ownership of the property. The maps reviewed include Tremaine’s 1860 Map of York County (**Map 3**) and the 1878 Miles & Co. Illustrated Atlas of York County (**Map 4**). **Table 1** details the results of this review by displaying the property owners and historic features of archaeological potential as they were noted on the maps.

Table 1. **Nineteenth Century Residents and Features on Lot 12, Concession Fronting the Humber I**

Maps	Concession	Lot	Landowner(s)	Historical Feature(s)
1860 Tremaine	Fronting the Humber I	12	Samuel Bingham	Historic Roadways, Orchard, Watercourse
1878 Miles & Co.	Fronting the Humber I	12	Samuel Bingham	Historic Roadways and Watercourse, one Structure with Orchards

Both maps show a possible orchard in the project area. Historic mapping reveals historic roadways, watercourse and a historic structure were located within close proximity (i.e. 300 metres) of the project area. There is elevated potential for the recovery of nineteenth century cultural material within the project area based on the historic proximity of these features. It should also be stressed that not every aspect of potential interest today would have been illustrated on these maps and unknown features could be located within the project area. It is probable that outbuildings, such as shanties were located on some of the properties that are not illustrated on nineteenth century maps. Consequently, the possibility remains that farm middens, outbuildings, or tenant structures may be encountered.

Twentieth Century Land Use

Aerial photographs were reviewed to illustrate the growth and development of the project area (**Images 7** to **9**). It should be noted that not every aerial photograph reviewed has been included in this report. A large structure once stood within the project area as early as 1946 and continued to stand in the 1950s and 1960s until it was demolished sometime before the 1977 aerial photograph was taken. The aerial photography of this area shows heavy disturbances to the project area and surrounding lands during this time.

Present Land Use

The project area is presently used as a Park with trail system within the City of Toronto.

1.3 Archaeological Context

The general geography and geology, previous archaeological sites registered in the vicinity, site predictive models, heritage resource registries, and previous archaeological assessments within 50 metres of the current project area were reviewed to provide archaeological context for the current project area.

General Geography and Geology

The project area is located along the Mimico Creek in the South Slope physiographic region of southern Ontario. The South Slope is a sloping plain that extends across the lower headwater areas in a band from an elevation of about 245 metres above sea level at the boundary with the Oak Ridges Moraine to about 220 metres at the southern boundary with the Peel Plain, with a second lower band along the southern boundary of the Peel Plain to the Lake Iroquois shoreline. This region represents the southern flank of the Oak Ridges Moraine and is underlain by glacial till. The resulting soil types are predominantly clay with some clay loam, and loam. The topography of this physiographic region generally slopes south toward Lake Ontario, though the rivers that bisect the South Slope, have deep cut valleys (Chapman and Putnam 1984:173).

The project area is situated within the Mimico Creek Watershed. The headwaters of the creek are located in Brampton and it extends over 30 kilometres to Lake Ontario, approximately one kilometre to the west of the

mouth of the Humber River. Humber Bay Park is situated at the mouth of Mimico Creek and as a result, the creek is often confused with the Humber River. The creek flows through the urban neighbourhoods of Malton and Islington and has been largely channelized to control fast flowing water during rain storms. Unfortunately, the Mimico Creek Watershed is one of the most degraded watersheds in the Toronto area due to high levels of development. In fact, nearly 80% of the total area of the watershed has been urbanized. Accordingly, many wetlands have been drained and natural corridors and forests have largely vanished.

Current Land Use and Conditions

The project area currently encompasses a manicured park and trails within a residential neighbourhood. The topography of the project area is gently sloping with an average elevation of 140 metres above sea level (**Map 5**). The native soil types of the project area are Oneida clay loam, Bottom Land, and Urban. Oneida clay loam is a grey-brown podzolic with few stones and good drainage. Bottom Land is an alluvial soil with variable drainage. Due to the extensive urban expansion of the Greater Toronto Area since 1954, the native soil information within portions of the project area is unavailable and identified as Urban (OMAFRA 2009).

Reports Documenting Archaeological Assessments within 50 metres

No reports documenting previous archaeological assessments within 50 metres of the project area were identified by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) and TRCA project records.

Previously Identified Archaeological Sites

Consultation with the Ontario Archaeological Sites Database (OASD) maintained by the MHSTCI and TRCA project records indicates that no archaeological sites have been previously located within one kilometre of the project area.

Archaeological Potential Models

An application of TRCA's Archaeological Site Potential Model (**Map 6**) indicates that the project area may be classified as a High Probability Area for encountering Indigenous sites (TRCA 2003). High Probability Areas are largely based on proximity to water and adequate soil drainage, Medium Probability Areas within the project area are the result of steep slopes or poor soil drainage, Low Probability Areas are often found in low lying wetlands and scenarios like this greatly reduce the potential for encountering archaeological sites. Within the Greater Toronto Area's watersheds, nearly 80% of all Indigenous archaeological sites have been found within High Potential areas. It should be noted that this potential model does not take into account impacts due to previous development.

The City of Toronto (City of Toronto 2011) archaeological potential model indicates that the project area does retain archaeological potential (**Map 7**). This potential model takes into consideration impacts from previous development which may have resulted in the removal of archaeological potential.

Existing Cultural Heritage Resources

Heritage Register

The *Ontario Heritage Act (OHA)* gives municipal heritage advisory committees the responsibility of researching and recommending to municipal council properties of cultural value or interest. The properties are recorded and monitored through a heritage register as *designated* (under the OHA) or *listed* (non-designated properties with cultural heritage interest or value that may become candidates for designation). No designated or listed heritage properties were identified within or adjacent to (i.e. 50 metres) the project area.

Commemorative Plaques

No commemorative plaques were identified within or in close proximity (300 metres) of the project area.

Cultural Heritage Landscapes

No registered cultural heritage landscapes are located within or in close proximity (300 metres) of the project area.

Cemeteries

No cemeteries are located within or in close proximity (300 metres) of the project area.

Date of Fieldwork

Fieldwork was conducted on September 20th, 2021.

2.0 Field Methods

2.1 Site Preparation

Given that the project area was situated within a manicured public greenspace with paved trails, ploughing was not viable (**Images 1 to 6**). Consequently, test pit investigation was the methodology employed where property survey was required. Development plans were provided prior to the start of fieldwork (**Map 2**).

2.2 Survey Methods

The weather during the Stage 2 investigation in the fall of 2021 was sunny with a high of 24°C, with lighting conditions that permitted good visibility of land features.

A thorough investigation of the project area was conducted in accordance with 2011 Standards and Guidelines for Consultant Archaeologists (*Standards and Guidelines*), published by the MHSTCI, to determine if any cultural heritage resources were present and in danger of being impacted by the proposed construction.

The project area was evaluated for extensive disturbances that have removed archaeological potential. Part of the project area was determined to have been heavily disturbed by previous construction activities associated with the existing watermain, grading, building construction and demolition, and the construction of paved sidewalks. Disturbed areas encompass 6,233 square metres or 63% of the project area.

The remainder of the project area was subject to shovel test pit survey beginning at five metre intervals, which involves the excavation of 30 centimetre diameter test pits. At the onset of test pit survey, disturbed ground conditions were encountered. Therefore, these areas were strategically tested according to professional judgement as per *Section 2.1.8, Standard* 2 of the 2011 Standards and Guidelines to determine the extent and nature of disturbed ground conditions (**Map 8; Images 5 to 6**). Strategically tested areas encompassed 3,655 square metres or 37% of the project area. Disturbances consisted of mottled grey soils within a light to medium brown matrix with concrete inclusions. Test pits were excavated to five centimetres below the depth of sterile subsoil or as far as disturbed fills allowed. Each test pit was examined for stratigraphy, cultural features, or evidence of fill. No undisturbed ground conditions were encountered. All test pits were backfilled.

In normal practice, strategic locations such as project area limits, changes to field methodology, and photo locations, are referenced with Universal Transverse Mercator (UTM) coordinates. These coordinates are recorded using a *Garmin eTrex* global positioning system, NAD 83, 17T, with a plus-minus error of three metres. All field conditions were recorded photographically with a *Canon Powershot*, 16-megapixel digital camera (**Map 9; Images 1 to 6**).

3.0 Record of Finds

Despite careful scrutiny, no artifactual material or cultural features were located in the project area during the archaeological investigation. All field records and photographs are on file with TRCA Archaeology (**Appendix C: Document Inventory**).

4.0 Analysis and Conclusions

TRCA Archaeology has completed a Stage 1 and 2 archaeological assessment for the proposed watermain replacement works. No archaeological material or cultural features were encountered.

5.0 Recommendations

It is therefore recommended that:

- The project area as tested (**Map 8**) requires no further archaeological assessment.

However, if there is any deviation from the agreed upon project area, additional assessment may be necessary. Furthermore, if any deeply buried deposits or human remains are encountered, all activities will cease and TRCA Archaeology as well as the proper authorities will be contacted immediately.

Advice on Compliance and Legislation

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

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

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

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

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2011 Standards and Guidelines for Consultant Archaeologists. Queen's Printer for Ontario, Toronto.

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2009 *Soil Survey Complex (Southern Ontario Soil Survey) (Version 1.0)***.** ESRI Shapefile.

Toronto, City of

2011 *Interim Archaeological Potential*. toronto.ca/open accessed on June 17, 2011.

Toronto and Region Conservation Authority

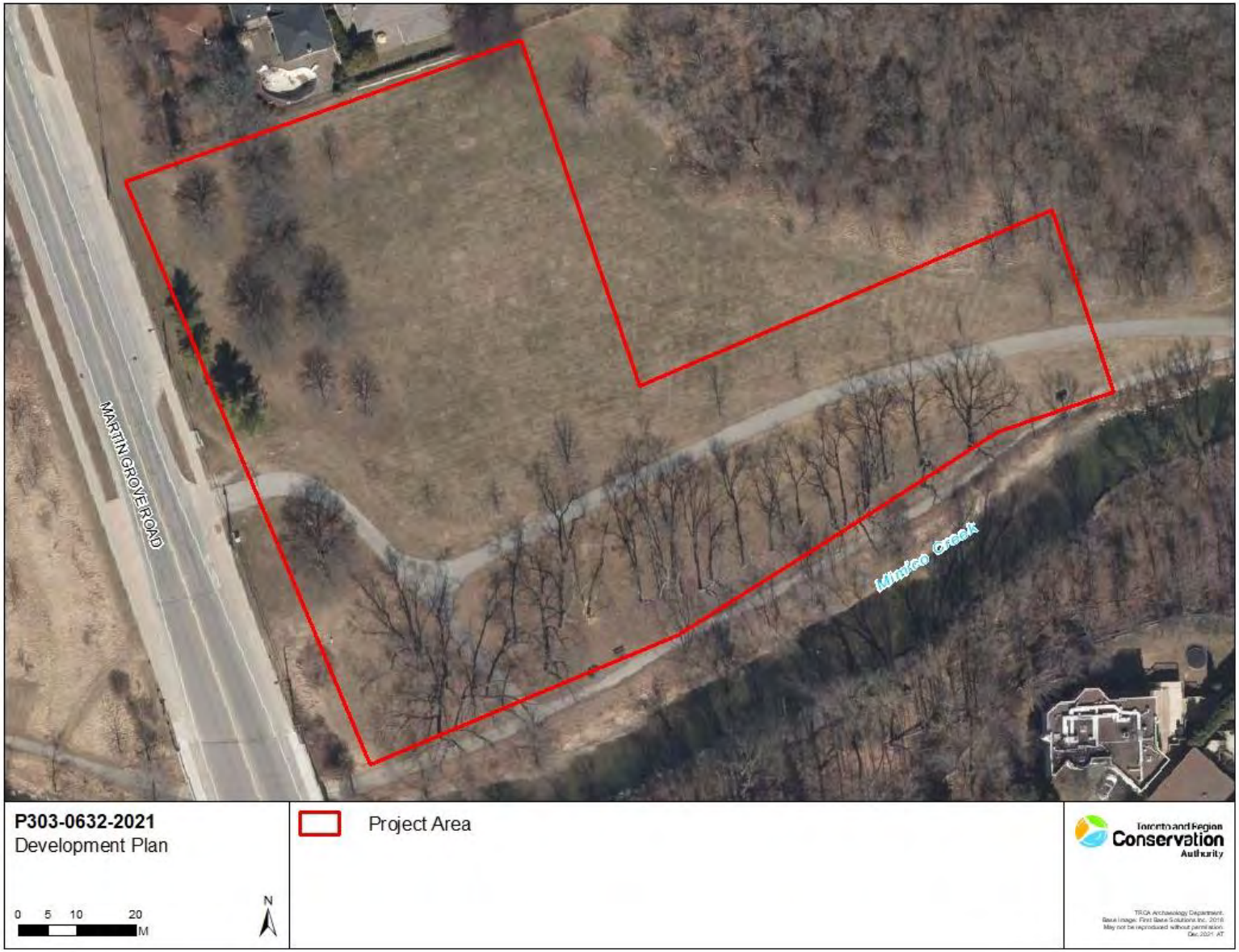
2003 *Archaeological Site Predictive Model*. On file with Toronto and Region Conservation Authority.

Tremaine, G.R.

1860 Tremaine's Map of the County of York, Canada West. G.C. Tremaine, Toronto.

Appendix A: Maps

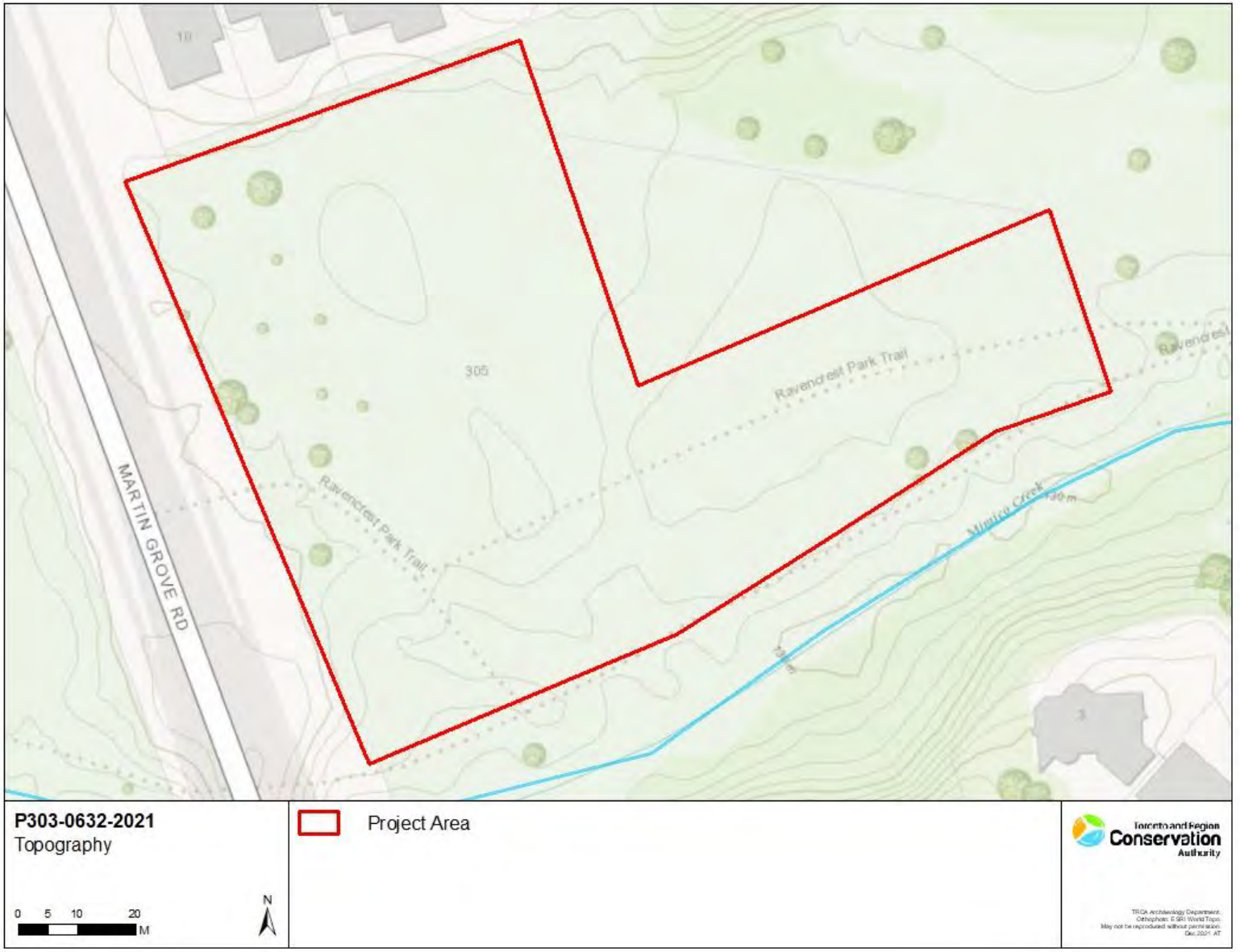
Map 1. General Project Area



Map 2. Development Plan

Map 3. Detail of 1860 Tremaine Map – York County

Map 4. Detail of 1878 Miles & Co. Illustrated Atlas – York County

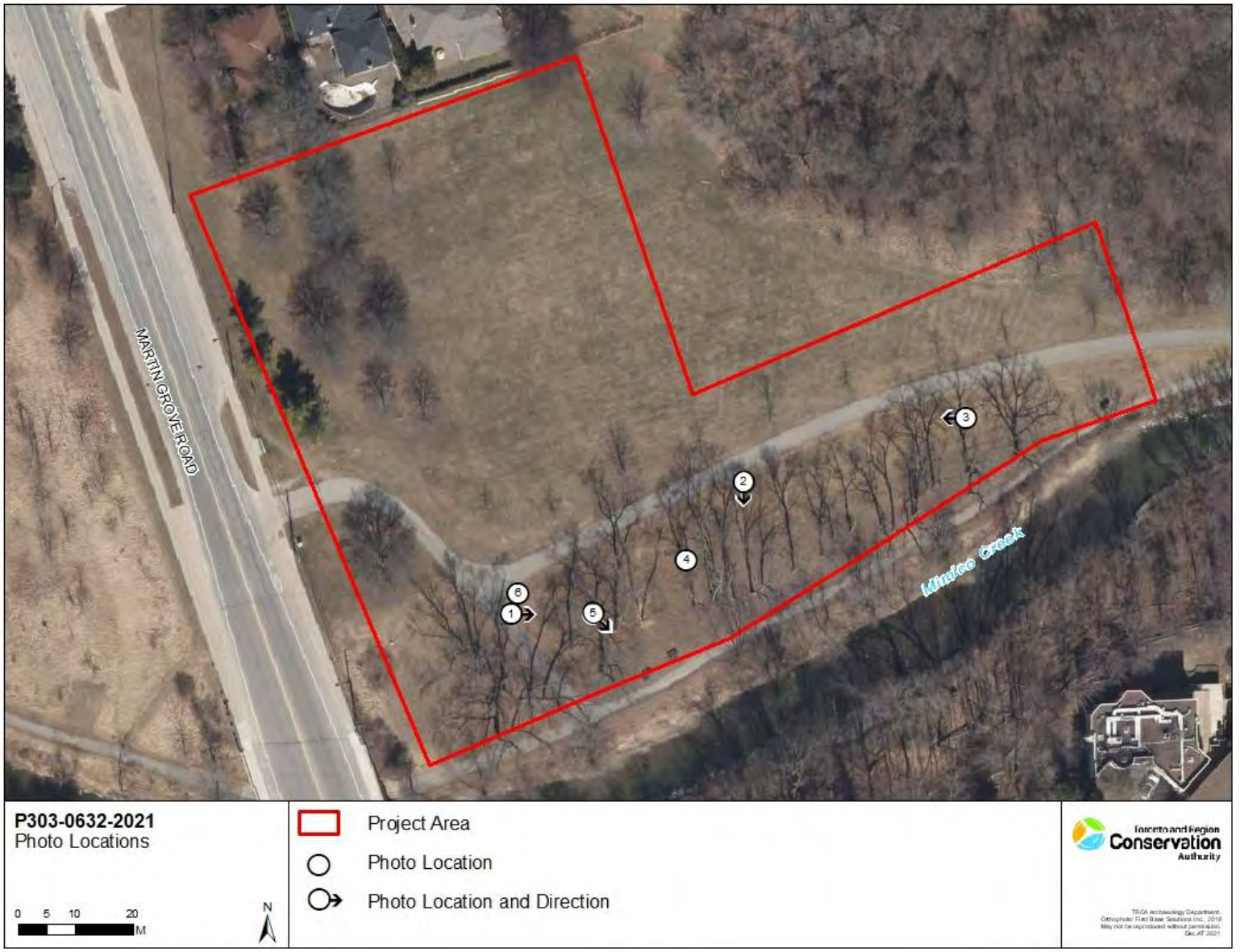


Map 5. Local Topography – Project Area

Map 6. TRCA Archaeological Potential Model

Map 7. City of Toronto Archaeological Potential Model

Map 8. Assessment Methodology



Map 9. Location and Direction of Photographs

Appendix B: Images

Image 1. Environs facing east.

Image 2. Environs facing south.

Image 3. Environs facing west.

Image 4. Evidence of disturbance (ex. Manhole) within project area.

Image 5. Strategic test pit survey facing southeast.

Image 6. Example of a disturbed test pit, mottling and concrete present at bottom.

Image 7. Aerial Photography 1957.

Image 8. Aerial Photography 1961.

Image 9. Aerial Photography 1977.

Appendix C: Document Inventory

All documentary material is located at the offices of the Archaeology department of TRCA, 5 Shoreham Drive, Downsview, ON M3N 1S4. All documentation is digitized and stored on the local server.

Dates	Document Page #	Digital Photographs	
	Field Notes	Camera	Photo
20-Sep-21	3.131	Canon	IMG_0916 to IMG_0922

www.trca.ca

Toronto and Region Conservation Authority

Appendix 4

Factual Geotechnical Report
Geotechnical Discussion and Recommendations Report

Englobe
Soils Materials Environment

R. V. Anderson Associates Limited

CONTRACT PM6A – 2021 – SITE NO. 45
MARTIN GROVE ROAD – WATERMAIN REPLACEMENT

Factual Geotechnical Report

February 3, 2021

124-P-0021561-0-01-145-GE-R-001-00

FINAL VERSION

Prepared by:

Steven Chen, P.Eng.
Geotechnical Engineer

Prepared by:

Sunil Ganesh, M.Eng., P.Eng., PMP
Pavement Engineer

Approved by:

Houshang Akbari, P.Eng.
Senior Geotechnical Engineer

Production Team

Client

R.V. Anderson Associates Limited	Bavendan Paramsothy, P.Eng

Englobe Corp.

Project Manager	Houshang Akbari, P.Eng.
Project Engineer	Steven Chen, P.Eng.
Pavement Engineer	Sunil Ganesh, M.Eng., P.Eng., PMP
Drilling Technician	Syed Ahsan
Drafter	Mai Soufan

Revision and Publication Register		
Revision N°	Date	Modification and/or Publication Details
0A	2020-11-27	Draft Report issued for client comments
00	2021-02-03	Final Report

Property and Confidentiality

Table of Contents

Tables

Appendices

1 INTRODUCTION

Englobe Corp. has completed a geotechnical investigation for the proposed watermain replacement on Martin Grove Road from Lorranie Gardens to 180 m N of Rathburn Road. The geotechnical investigation was completed at the request of Bavendan Paramsothy, P. Eng of R.V. Anderson Associates Limited for Contract PM6A – 2021 – Site No. 45.

The purpose of this geotechnical investigation was to determine the subsoil types and groundwater conditions within the project limits and obtain samples for laboratory examination and testing. Representative soil samples were also selected by Englobe and submitted for environmental analysis. In addition, core samples of the asphalt concrete in the areas of proposed watermain replacements were obtained for asbestos testing.

The geotechnical discussion and recommendations are compiled in a separate Englobe report Geotechnical Discussion and Recommendations Report
124-P-0021561-0-01-145-GE-R-002-00.

2 PROJECT METHODOLOGY

The geotechnical investigation for this project followed the procedure outlined in the following paragraphs.

Subsequent to obtaining service clearances and cut permits, eighteen (18) asphalt cores (45-CH1 to 45-CH18) were cored on July 9 and 10, 2020 and fifteen (15) boreholes (45-BH-1 to 45-BH-15) were advanced to a maximum depth of 14.3 meters below ground surface (mbgs) within the project limits. The locations of the boreholes and cores are indicated on the attached Borehole/Core Location Drawings (Appendix 1, Drawings 1 to 5) with the Borehole Logs provided in Appendix 2. The boreholes (45-BH-1 to 45-BH-15) were drilled on August 11/17 and November 04/05, 2020 using continuous flight solid stem auger equipment supplied by Drilltech Drilling Limited operated under the continuous supervision of an Englobe field technician.

Subsoil samples were recovered at regular intervals of depth using a 50 mm O.D. split-barrel sampler driven into the subsoil in accordance with the Standard Penetration Test (SPT) procedure (ASTM D1586). The recovered subsoil samples were visually examined in the field and then preserved and transported to the Englobe Toronto laboratory for examination and testing. Groundwater observations were carried out in the open boreholes upon completion of the field work. The boreholes without monitoring wells were promptly backfilled upon completion of drilling in accordance with Ontario Regulation 903 (as amended).

The site was visited on August 28, 2020 to carry out a semi-automated visual condition survey. During the site visit, the severity level and general extent of the pavement distresses were observed. An assessment of safety hazards, utility cuts, and surface drainage were also undertaken. Photographs of the typical pavement distresses and general condition with annotated comments are given in Appendix 6.

In the laboratory, each soil sample was examined as to its visual and textural characteristics by the Project Engineer. Moisture content determinations were carried out on all granular base/subbase and subgrade soil samples.

Fifteen (15) representative subsoil samples were selected by Englobe and submitted to Eurofins for the following environmental analysis in accordance with Ontario Regulation 153/04 (as amended) for metal and inorganic parameters, Volatile Organic compounds (VOCs), Petroleum Hydrocarbons (BTEX, F1 to F4), Polychlorinated Biphenyl (PCBs) and Polycyclic Aromatic Hydrocarbon (PAHs) parameters. Additionally, fifteen (15) composite samples from each borehole were submitted to Eurofins for environmental analysis in accordance with Ontario Regulation 347 (as amended by O. Reg, 558/00) metals and inorganics, TCLP Leachate Extraction Procedures for classification for disposal purposes. The complete environmental testing results, including Eurofins Certificates of Analysis are attached in Appendix 4.

Eighteen (18) asphalt concrete cores were obtained by Englobe to determine the asphalt concrete thicknesses and to check for the presence of asbestos fibres in the existing asphalt concrete. The tested cores were cut vertically into two halves with a composite of one half of the core tested to determine if fibres were present. If fibres were observed, additional testing was completed to determine the lifts where the fibres were found. Any observed fibres were carefully packaged and delivered to Pinchin Environmental for classification in accordance with Ontario regulatory requirements (NIOSH 9002, I.R.S.T. 244-3). Core locations are shown on the Borehole/Core Location Drawings in Appendix 1, with asbestos testing results provided in Appendix 5.

3 LABORATORY TESTING

Soil samples recovered during this investigation were preserved and transported to the Englobe Toronto laboratory for additional testing. Moisture content testing was completed on all recovered samples with the results plotted on the borehole logs attached in Appendix 2. Five representative soil samples were selected and tested for gradation and hydrometer analysis. The complete laboratory test results are included in Appendix 3.

The soil samples will be stored for a period of three months from the date of reporting. After this time, they will be discarded unless arrangements are made for extended storage.

4 PAVEMENT CONDITIONS

4.1 VISUAL CONDITION SURVEY

A semi-automated visual condition survey was conducted on August 28, 2020 by a Pavement Engineer from Englobe Corp. to assess the condition of the existing pavement of Martin Grove Road from Lorranie Gardens to 180 m N of Rathburn Road. The visual survey was conducted in accordance with ASTM D6433-16 test method*, Standard Practice for Roads and Parking*

Lots Pavement Condition Index Surveys supplemented by the Ontario Ministry of Transportation *Manual for Condition Rating of Flexible Pavements (SP-024)*.

The Pavement Quality Index (PQI) was determined in accordance with the City of Toronto, Pavement Design and Rehabilitation Guide. Based on the types, severity levels and distress density observed the PQI is estimated as 60. In general, the pavement condition was found to be in a fair condition with localized poor areas.

A summary of pavement distresses is presented in Table 1.

Table 1 Summary of Pavement Distresses

Road Section	General Condition	Typical Distresses Observed (Severity Frequency)
Martin Grove Road		
From 180 m N of Rathburn Road to Lorranie Gardens	Fair	Longitudinal cracking (low to medium, intermittent) Transverse cracking (low to medium, intermittent) Alligator cracking (low, few) Depression (low to medium severity, intermittent) Utility Patching (low, intermittent)

Based on the visual assessment, no utility cuts and safety hazards were observed along the project limits. The pavement surface drainage at the subject site appears to be in a satisfactory condition to provide adequate drainage. However, at some localized locations, the drainage is impaired by pavement surface distresses allowing surface water to infiltrate into the pavement.

4.2 BOREHOLE/COREHOLE INVESTIGATION

A borehole/corehole investigation was carried out to determine the existing pavement structure layer thicknesses and subsurface conditions. The approximate borehole/corehole locations are indicated on the attached Borehole and Corehole Location Drawings in Appendix 1, with the Borehole Logs provided in Appendix 2. The core thicknesses are detailed in Appendix 5. The general pavement conditions are outlined briefly below.

A flexible pavement structure was observed on Martin Grove Road, Lorranie Gardens, Cowley Avenue, Donalbert Road, Saralou Court and Rathburn Road. The average asphalt thickness/ pavement structure thicknesses are summarized in Table 2.

Table 2 Summary of Asphalt Thickness/Pavement Structure

ROADWAY	ASPHALT CONCRETE BOREHOLES and COREHOLES (AVERAGE) mm	PORTLAND CEMENT CONCRETE BOREHOLES and COREHOLES (AVERAGE) mm	GRANULAR BASE/ SUBBASE (AVERAGE) mm
Martin Grove Road	90 to 220 (170)	-	150 to 410 (235)
Lorranie Gardens	85 (85)	-	-
Cowley Avenue	190 (190)	-	-
Donalbert Road	165 (165)	-	-

ROADWAY	ASPHALT CONCRETE BOREHOLES and COREHOLES (AVERAGE) mm	PORTLAND CEMENT CONCRETE BOREHOLES and COREHOLES (AVERAGE) mm	GRANULAR BASE/ SUBBASE (AVERAGE) mm
Saralou Court	185 (185)	-	-
Rathburn Road	110-170 (140)	-	180-300 (240)

5 SUBSURFACE SOIL AND GROUNDWATER CONDITIONS

Two boreholes (45-BH-10 to 45-BH-11) were drilled on Rathburn Road, eleven boreholes (45-BH-1 to 45-BH-9 and 45-BH-12 to 45-BH-13) were drilled on Martin Grove Road and two boreholes (45-BH-14 and 45-BH-15) were drilling on TRCA lands east of Martin Grove Road north of Rathburn Road. The subsoil at the borehole locations, under the pavement structure and/or landscaped area were observed to consist of fill, underlying by clayey silt and followed by sandy silt/silty sand.

5.1 RATHBURN ROAD (45-BH-10 to 45-BH-11):

Fill material was encountered in BH-10 just below the pavement structure, the fill was composed sandy clayey silt and extended up to from 1.0 to 3.8 m below the pavement structure in the borehole. The fill material was very loose to compact in relative density, with a measured SPT "N" values ranging from 4 to 12 blows per 300 mm of penetration and a natural moisture content ranging from 2.5 to 32 (moist) percent.

The clayey silt deposit was encountered below the fill material in BH-10 and and below sub-base/base material in BH-11. This deposit was very stiff in consistency, with a measured SPT "N' values ranging from 20 to 22 blows per 300 mm of penetration and a natural moisture content ranging from 9.5 to 16 (moist) percent.

The silty sand deposit was encountered below the clayey silt in 45-BH-11. This deposit was very dense in relative density, with a measured SPT "N' values ranging from 50 to 85 blows per 300 mm of penetration and a natural moisture content ranging from 4 to 9 (moist) percent.

5.2 MARTIN GROVE ROAD (45-BH-1 to 45-BH-9, 45-BH-12 to 45-BH-15):

Fill material was encountered in boreholes 45-BH-12 to 45-BH-15 on Martin Grove Road and TRCA lands below the topsoil or pavement structure. In borehole 45-BH-4 fill was encountered at the surface of borehole. The fill was composed of sandy clayey silt and silty sand extended up to from 0.8 to 7.6 mbgs in the boreholes. The fill material was very loose to dense in relative density, with a measured SPT "N" values ranging from 2 to 44 blows per 300 mm of penetration and a natural moisture content ranging from 3 to 23.7 (moist) percent.

The clayey silt and clayey silt till deposit was encountered below the fill material in 45-BH-1, 45-BH-2, 45-BH-5, 45-BH-8 and 45-BH-9. This deposit was firm to hard in consistency, with a measured SPT "N' values ranging from 4 to 80 blows per 300 mm of penetration and a natural moisture content ranging from 5 to 18 (moist) percent.

The silty sand/silty sand deposit was encountered below the clayey silt or fill material in 45-BH-1, 45-BH-3, 45-BH-4, 45-BH-6, 45-BH-7, 45-BH-12, 45-BH-13, 45-BH-14 and 45-BH-15. This deposit was loose to very dense in relative density, with a measured SPT "N' values ranging from 4 to 90 blows per 300 mm of penetration and a natural moisture content ranging from 5 to 24.3 (moist) percent.

5.3 GROUNDWATER CONDITION

Groundwater measurements conducted in the open boreholes on Martin Grove Road as well as along the roadway section close to the proposed alignment of the watermain replacement upon completion of drilling. Groundwater was encountered in the monitoring wells installed in boreholes 45-BH-13, 45-BH-14 and 5-BH-15 at highest measured depth ranging from 1.5 to 8.1 mbgs.

The groundwater level measurements in the monitoring wells are summarized in the table 3.

Table 3 Summary of Groundwater Levels

BOREHOLE ID	WATER LEVEL (mbgs)	DATE
45-BH-12	Dry	August 28 and November 12, 2020
45-BH-13	8.1	November 12, 2020
45-BH-14	1.5	November 12, 2020
45-BH-15	3.4	November 12, 2020

Note that the groundwater levels can vary and are subject to seasonal fluctuations in response to major weather events.

6 ENVIRONMENTAL ANALYSIS RESULTS

6.1 SOIL SAMPLE ANALYTICAL RESULTS

None of the soil samples which were extracted from the boreholes exhibited any visible or olfactory evidence of chemical contamination. Fifteen (15) subsoil samples were selected by Englobe and submitted to Eurofins for environmental analysis in accordance with Ontario Regulation 153/04 (as amended by Ontario Regulation 511/09) for metals and inorganic parameters, Volatile Organic compounds (VOCs), Petroleum Hydrocarbons (BTEX, F1 to F4), Polychlorinated Biphenyl (PCBs) and Polycyclic Aromatic Hydrocarbon (PAHs) parameters. The bulk analysis results were then compared to the Industrial / Commercial / Community property use standards as defined in Table 3.1 – Full Depth Excess Soil Quality Standards in a Non-Potable Ground Water Condition of the O. Reg. 406/19 Standards (hereafter referred to as the MECP Table 3.1 Standards) and Table 1 – Full Depth Background Site Condition Standards for Residential / Parkland / Institutional / Industrial / Commercial / Community

property use (hereafter referred to as the MECP Table 1) Standards. The complete environmental analysis results including the Eurofins Certificate of Analysis are provided in Appendix 4. The analysis did not indicate any exceedances of the parameters tested except for Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR) and Petroleum Hydrocarbons (F4 and F4g). The analysis did not indicate any other exceedances of the parameters tested. Table 4 summarizes the exceedance of parameters tested in comparison with Table 1 RPIICC and Table 3.1 ICC standards.

A composite soil sample from each borehole was tested in accordance with Ontario Regulation 347 as amended by O.Reg.558/00 for metals and Inorganics. The TCLP sample results were compared with Ontario Regulation 347 (as amended by O.Reg.558/00) Schedule 4 criteria (Leachate Quality Criteria). There were no exceedances of Schedule 4 Leachate Quality criteria and as such, any excess materials generated at the site would be classified as non-registrable and non-hazardous, for disposal purposes.

Table 4 Summary of Environmental Testing Exceedances

BH	Sample No	MECP TABLE 1 STANDARDS RPIICC			MECP TABLE 3.1 STANDARDS ICC		
		EC	SAR	PETROLEUM HYDROCARBONS	EC	SAR	PETROLEUM HYDROCARBONS
45-BH-1	SS3	✓	✓	F4 and F4g	✓	-	-
45-BH-2	SS3	✓	✓	F4g	✓	✓	-
45-BH-3	SS2	✓	✓	-	-	✓	-
45-BH-4	SS3		✓	-	-	-	-
45-BH-5	SS2	✓	✓	F4g	✓	✓	-
45-BH-6	SS2	✓	✓	-	✓	✓	-
45-BH-7	SS3	✓	✓	F4g	-	-	-
45-BH-8	SS3	✓	✓	F4 and F4g	-	✓	-
45-BH-9	SS2	✓	✓	F4g	-	-	-
45-BH-10	SS2	✓	✓	-	✓	✓	-
45-BH-11	SS3	✓	✓	-	-	-	-
45-BH-12	SS3	✓	✓	-	✓	✓	-
45-BH-13	SS9	✓	✓	-	-	✓	-

7 ASBESTOS FIBRE TESTING RESULTS

Eighteen (18) asphalt concrete cores were taken along the roadway section close to the proposed alignment of the watermain replacement to determine if asbestos fibres are present

in the existing asphalt concrete. Extraction was carried out on a composite of all of the lifts on the core to allow a visual examination of the retained material.

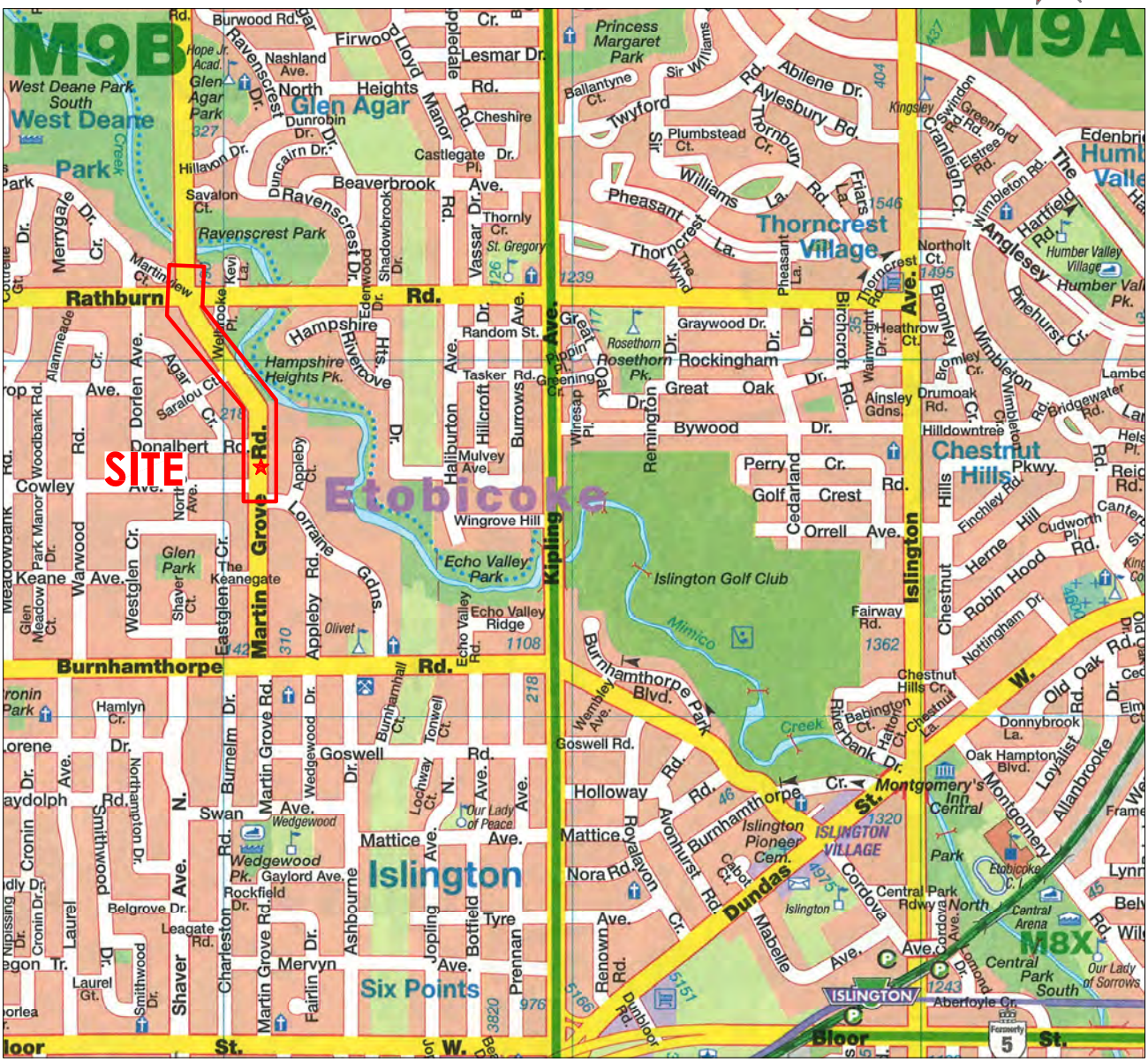
After extraction, no asbestos fibres were observed to be present in the retained material from the flexible core samples and no further testing was completed. The complete asbestos testing results are given in Appendix 4.

8 GENERAL COMMENTS

The comments provided in this report have been developed for the use of R. V. Anderson Associates Limited and the City of Toronto. It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling and should not be interpreted as exact planes of geological change. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design. Also, the subsoil and groundwater conditions have been determined at the borehole locations only. Additional boreholes and/or test pits would be necessary to determine the localized conditions between boreholes. Contractors bidding on, or undertaking the works, must conduct their own investigations, and interpretations of the factual borehole data, and draw their own conclusions as to how the subsoil and groundwater conditions may affect their construction techniques, scheduling and costs.

It is further noted that, depending on the time of year the field work was completed, water levels should be expected to vary, perhaps significantly from those observed at the time of this investigation.

Appendix 1 Borehole/Core Location Drawings



NOTES :

1-REFERENCE : © MAPART PUBLISHING , PAGE 113, TORONTO & AREA (2007).

Project

R. V. Anderson Associates LImited

PM6A - ASSIGNMENT 2021 -45

WATERMAIN REPLACEMENT

MARTIN GROVE ROAD

FROM LORRAINE GARDENS TO 180 m NORTH OF RATHBURN ROAD

Title

LOCATION PLAN

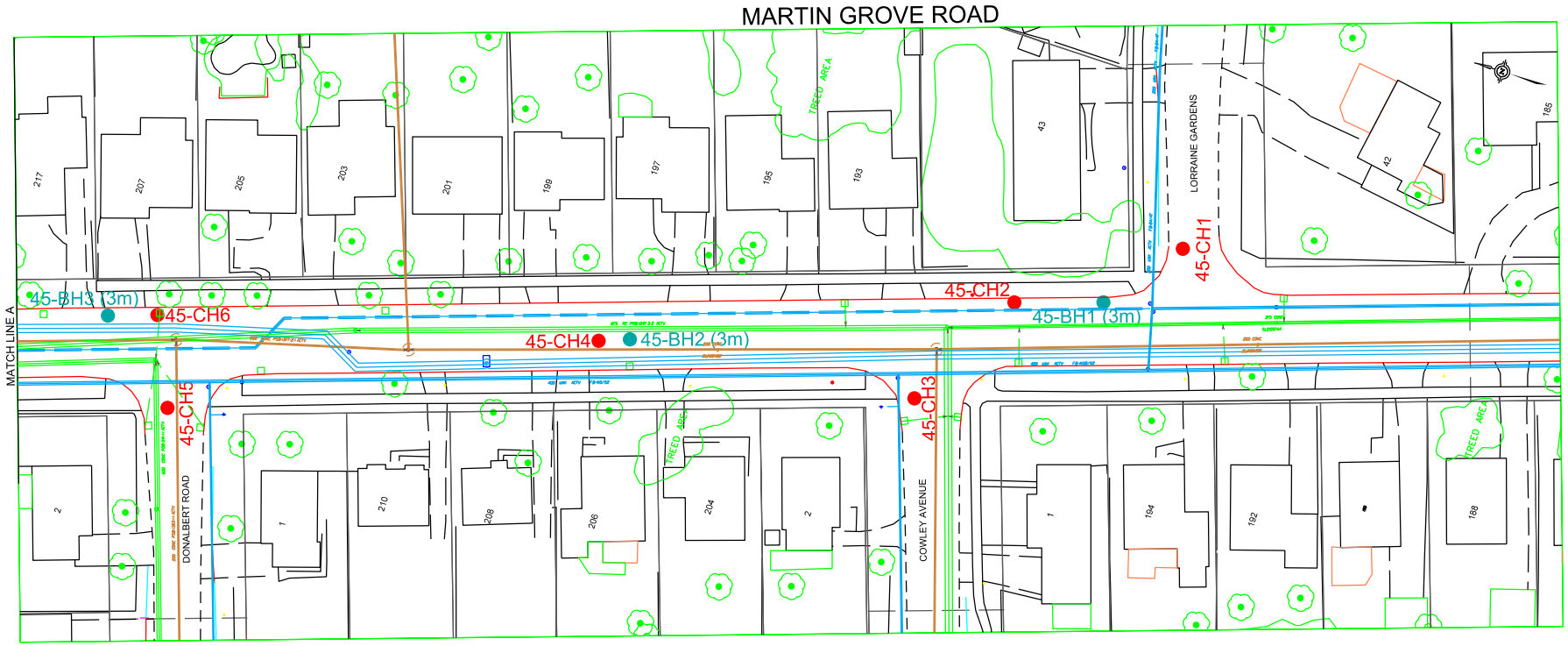
Englobe

1821, Albion Road, Unit 7
Toronto (Ontario) M9W 5W8
Telephone : 416.213.1060
Fax : 416.213.1070

Prepared	S. Mehdizadeh	Discipline	GEOTECHNICAL	Project manager	H. Akbari
Drawn	M. Soufan	Scale	AS SHOWN	Sequence no.	01 of 05
Checked	S. Mehdizadeh	Date	2020/11/26		

M. dept.	Project	Disc.	Dwg no.	Rev.
124	P-0021561-0-01-145	GE	01	00

G:\124\P-0021561 RV ANDERSON - PM6A - 2021 ASSIGNMENTS\Z4_CAD\2021\ENGLOBE-DWG - REV -RVA\45-MARTIN GROVE RD\PM6A-45-MARTIN GROVEL.DWG



LEGEND:

- BOREHOLE
- COREHOLE

STREET	LENGTH (m)	BH #
MARTIN GROVE RD	-	15

Project

R. V. Anderson Associates Limited
PM6A - ASSIGNMENT 2021-45
WATERMAIN REPLACEMENT
MARTIN GROVE ROAD
FROM LORRAINE GARDENS TO 180 m NORTH OF RATHBURN RD

Title

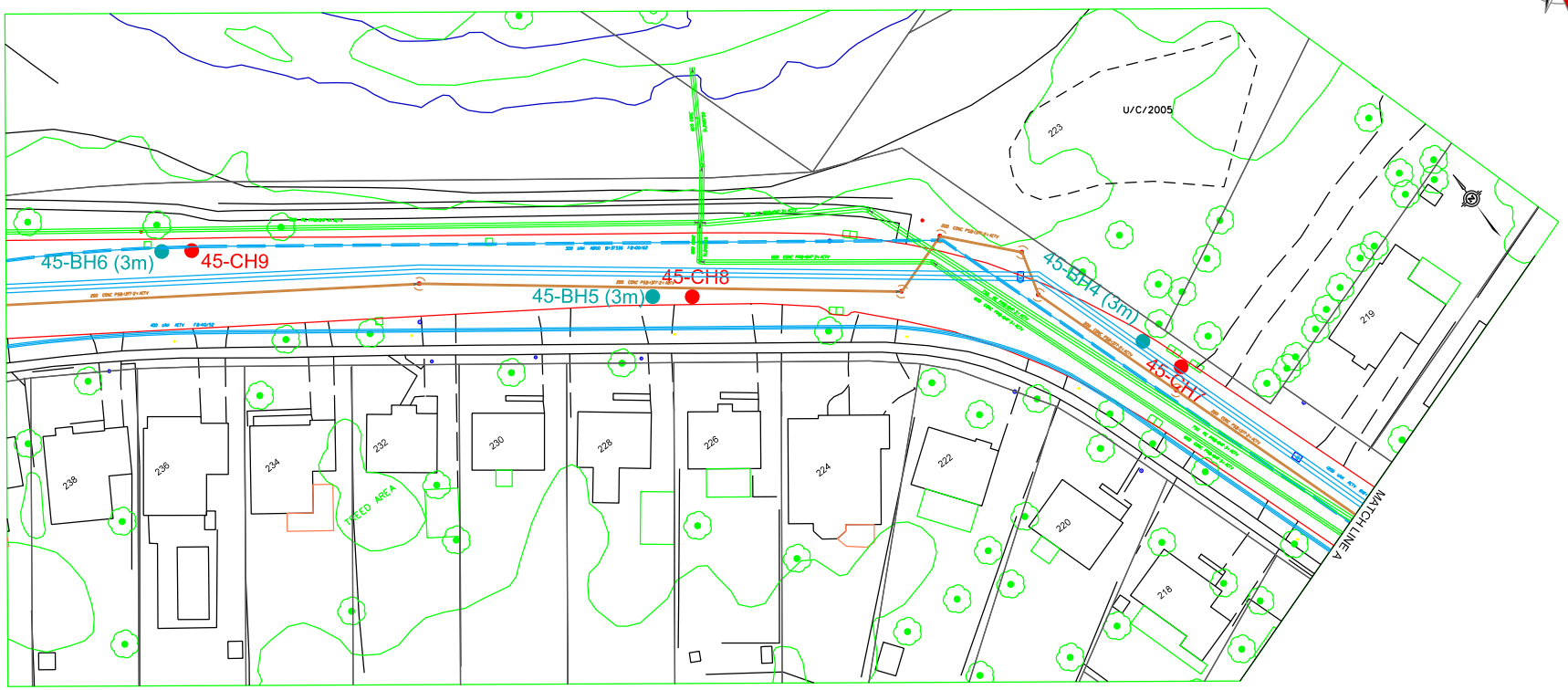
GEOTECHNICAL INVESTIGATION
BOREHOLE/CORE LOCATION PLAN

Englobe
1821, Albion Road, Unit 7
Toronto (Ontario) M9W 5W8
Telephone : 416.213.1060
Fax : 416.213.1070

Prepared	S. Mehdizadeh	Discipline	GEOTECHNICAL
Drawn	M. Soufan	Scale	AS SHOWN
Checked	S. Mehdizadeh	Date	2020/11/26

Project manager: H. Akbarl
Sequence no.: 02 of 05

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Type	Drawing no.	Rev.
124	P-0021561	0-01	145	GE	D	02	00



LEGEND:

- BOREHOLE
- COREHOLE

STREET	LENGTH (m)	BH #
MARTIN GROVE RD	-	15

Project

R. V. Anderson Associates Limited
PM6A - ASSIGNMENT 2021-45
WATERMAIN REPLACEMENT
MARTIN GROVE ROAD
FROM LORRAINE GARDENS TO 180 m NORTH OF RATHBURN RD

Title

GEOTECHNICAL INVESTIGATION
BOREHOLE/CORE LOCATION PLAN

Englobe
1821, Albion Road, Unit 7
Toronto (Ontario) M9W 5W8
Telephone : 416.213.1060
Fax : 416.213.1070

Prepared	S. Mehdizadeh	Discipline	GEOTECHNICAL	Project manager	H. Akbari
Drawn	M. Soufan	Scale	AS SHOWN	Sequence no.	03 of 05
Checked	S. Mehdizadeh	Date	2020/11/26		

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Type	Drawing no.	Rev.
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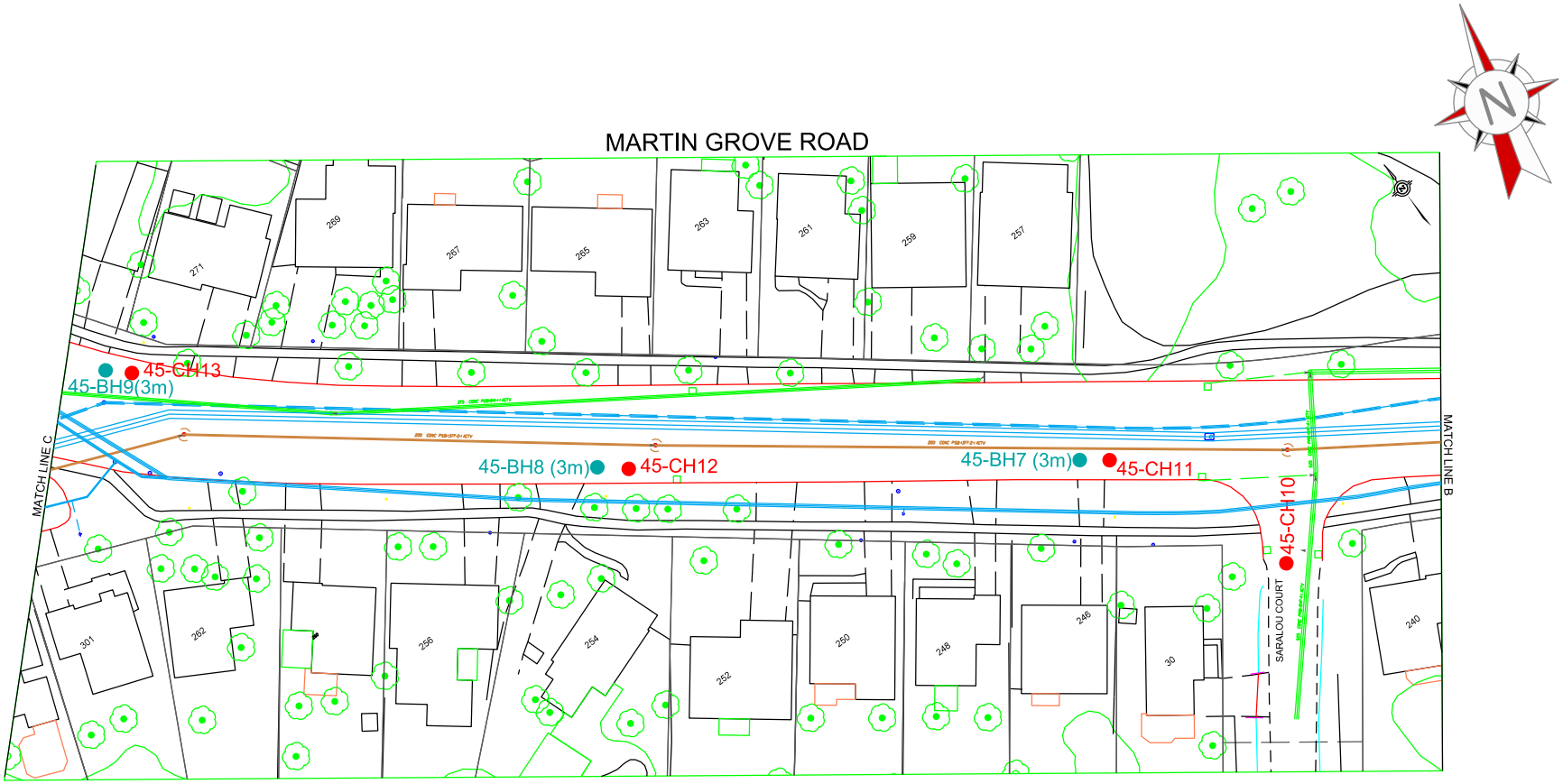

LEGEND:

- BOREHOLE
- COREHOLE

STREET	LENGTH (m)	BH #
MARTIN GROVE RD	-	15

Project

R. V. Anderson Associates Limited
PM6A - ASSIGNMENT 2021-45
WATERMAIN REPLACEMENT
MARTIN GROVE ROAD
FROM LORRAINE GARDENS TO 180 m NORTH OF RATHBURN RD

Title

GEOTECHNICAL INVESTIGATION
BOREHOLE/CORE LOCATION PLAN

Englobe
1821, Albion Road, Unit 7
Toronto (Ontario) M9W 5W8
Telephone : 416.213.1060
Fax : 416.213.1070

Prepared	S. Mehdizadeh	Discipline	GEOTECHNICAL	Project manager	H. Akbari	
Drawn	M. Soufan	Scale	AS SHOWN	Sequence no.	04 of 05	
Checked	S. Mehdizadeh	Date	2020/11/26			

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Type	Drawing no.	Rev.
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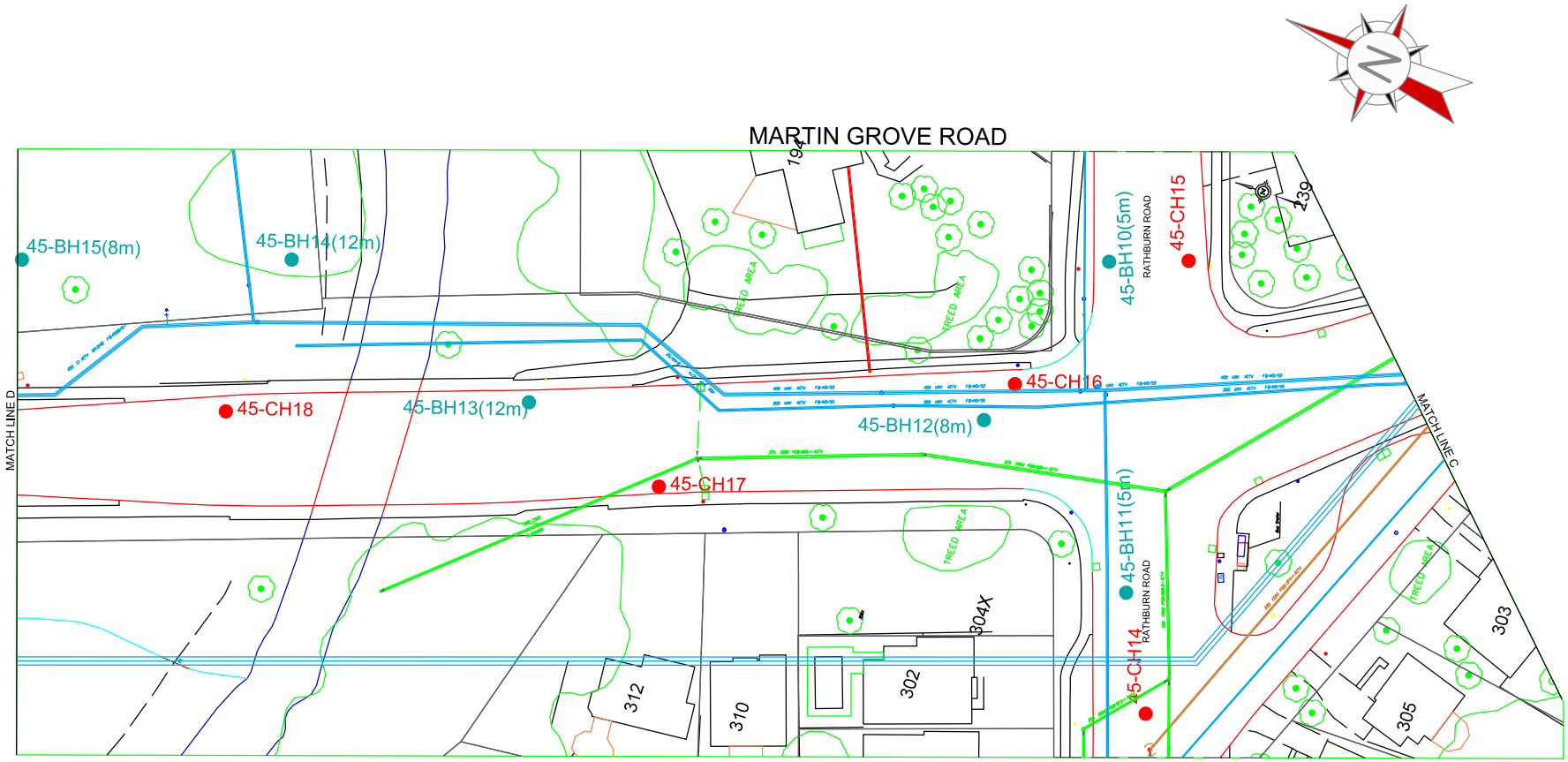

LEGEND:

- BOREHOLE
- COREHOLE

STREET	LENGTH (m)	BH #
MARTIN GROVE RD	-	15

Project

R. V. Anderson Associates Limited
PM6A - ASSIGNMENT 2021-45
WATERMAIN REPLACEMENT
MARTIN GROVE ROAD
FROM LORRAINE GARDENS TO 180 m NORTH OF RATHBURN RD

Title

GEOTECHNICAL INVESTIGATION
BOREHOLE/CORE LOCATION PLAN

Englobe
1821, Albion Road, Unit 7
Toronto (Ontario) M9W 5W8
Telephone : 416.213.1060
Fax : 416.213.1070

Prepared	S. Mehdizadeh	Discipline	GEOTECHNICAL	Project manager	H. Akbari
Drawn	M. Soufan	Scale	AS SHOWN	Sequence no.	05 of 05
Checked	S. Mehdizadeh	Date	2020/11/26		

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Type	Drawing no.	Rev.
124	P-0021561	0-01	145	GE	D	05	00

Appendix 2 Borehole Logs

LOG OF No. 45-BH-1

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 1

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 43 Lorrane Gardens, 1.5 m West of East curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH
		ASPHALT (195 mm)	0.2	0
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.3	
		Brown, moist, loose, SANDY SILT (ML)		
		Grey, moist, stiff, CLAYEY SILT with sand; (TILL; CL-ML)	1.5	1
		Grey, moist, dense, SANDY SILT (ML)	3.0	2
		Terminated at 3.5 m Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.	3.5	3

Standard Penetration Test N Value
Shear Strength kPa: 40 80 120 160 | 50 100 150 200

Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %	Shear Strength kPa	Natural Moisture Content %
	AS1				4.6
	SS2			9	13.6
	SS3			13	14.5
	SS4			14	16.1
	SS5			46	16.7

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	Open

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-2

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 2

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 197 Martin Grove Rd, 1.5 m East of West curb.

Date Drilled: 11/5/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		ASPHALT (180 mm)	0.2	0						
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 410 mm)	0.6			5.0		AS1		
		Brown, moist, firm to hard, SANDY CLAYEY SILT; (TILL; CL-ML)		1	8	14.7		SS2		
				2	10	14.6		SS3		
					40	13.9		SS4		
				3	80/280 mm	9.9		SS5		
			3.5							
		Terminated at 3.5 m Borehole advanced using continuous flight solid stem augering equipment on November 5, 2020 by Drilltech Drilling Limited.								

Standard Penetration Test N Value: 40 80 120 160
Shear Strength kPa: 50 100 150 200
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 20 40 60

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	Open

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-3

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 3

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 207 Martin Grove Rd., 1.5 m West of East curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH
		ASPHALT (200 mm)	0.2	0
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 150 mm)	0.4	
		Brown, moist, compact, SILTY SAND; (SM)		1
				2
				3
			3.6	
		Terminated at 3.6 m Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.		

Standard Penetration Test N Value: 40 80 120 160
Shear Strength kPa: 50 100 150 200
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

Sample No	N	Natural Moisture Content %
AS1		6.2
SS2	12	10.8
SS3	10	9.6
SS4	13	8.9
SS5	15	9.2

Natural Unit Weight kN/m³

Percent of Fines, %

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	Open

LOG OF No. 45-BH-4

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 4

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 223 Maritn Grove Rd., 5.5 m East of East curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		Brown, moist, SANDY CLAYEY SILT; (FILL)		0	13	10.3		AS1		
			0.8							
		Brown, moist, compact to dense, SILTY SAND; (SM)		1	18	5.2		SS2		
				2	26	8.8		SS3		
					24	9.1		SS4		
				3	48	8.8		SS5		
			3.6							
		Terminated at 3.6 m Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.								

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	Open

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-5

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 5

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 228 Maritn Grove Rd., 1.5 m East of West curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH
		ASPHALT (150 mm)	0.2	0
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.4	
		Brown, moist, very stiff to hard, SANDY CLAYEY SILT; (CL-ML)		1
				2
				3
			3.4	
		Terminated at 3.4 m Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.		

Standard Penetration Test N Value: 40 80 120 160
Shear Strength kPa: 50 100 150 200
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

Sample No	Natural Moisture Content %	Standard Penetration Test N Value	Shear Strength kPa
AS1	5.7		
SS2	9.1	32	
SS3	10.3	24	
SS4	10.1	30	
SS5	15.1	70	

SAMPLES | Sample No | Natural Unit Weight kN/m³ | Percent of Fines, %

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	Dry	Open

LOG OF No. 45-BH-6

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 6

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 236 Maritn Grove Rd., 1.5 m West of East curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH
		ASPHALT (220 mm)	0.2	0
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.4	
		Brown, moist, loose to very dense, SANDY SILT; (ML)		1
				2
				3
			3.6	
		Terminated at 3.6 m Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.		

Standard Penetration Test N Value: 40 80 120 160
Shear Strength kPa: 50 100 150 200
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
	AS1		
	SS2		
	SS3		
	SS4		
	SS5		

Data points: 4.3; 7; 18.6; 6; 6.6; 5; 6.9; 56; 6.8

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open

LOG OF No. 45-BH-7

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 7

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 257 Maritn Grove Rd., 2.0 m North of South curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		ASPHALT (170 mm)	0.2	0		3.1		AS1		
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.4							
		Brown, moist, loose to very dense, SANDY SILT; (ML)		1	5	21.4		SS2		
					4	17.4		SS3		
				2	40	11.8		SS4		
				3	50	9.5		SS5		
		Terminated at 3.3 m	3.3							

Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Checked By: H.Akbari

Logged By: S.Ahsan

LOG OF No. 45-BH-8

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 8

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 254 Maritn Grove Rd., 1.5 m North of South curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		ASPHALT (190 mm)	0.2	0						
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.4							
		Brown, moist, soft to very stiff, SANDY CLAYEY SILT; (CL-ML)		1	2	15.7		SS2		
					4	14.8		SS3		
				2						
					20	18.2		SS4		
				3	22	13.1		SS5		
			3.4							
		Terminated at 3.4 m								

Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-9

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 9

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: In front of 271 Maritn Grove Rd., 2.0 m East of West curb

Date Drilled: 8/11/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		ASPHALT (170 mm)	0.2	0						
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.4							
		Brown, moist, soft to hard, SANDY CLAYEY SILT; (CL-ML)				3.6		AS1		
				1	4	13.8		SS2		
					14	11.7		SS3		
				2	50/50mm	11.0		SS4		
		Terminated at 2.3 m	2.3							

Borehole advanced using continuous flight solid stem augering equipment on August 11, 2020 by Drilltech Drilling Limited.

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Checked By: H.Akbari

Logged By: S.Ahsan

LOG OF No. 45-BH-10

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 10

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: Across from 239 Rathburn Rd., 1.1 m South of North curb

Date Drilled: 8/17/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test

Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		ASPHALT (110 mm)	0.1	0		2.5		AS1		
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 180 mm)	0.5							
		Brown, moist, SANDY CLAYEY SILT, wood fagments; (FILL)		1	6	9.2		SS2		
					12	11.7		SS3		
				2	4	21.3		SS4		
				3	4	32.3		SS5		
		Brown, moist, very stiff, SANDY CLAYEY SILT wih sand; (CL-ML)	3.8	4						
					22	15.6		SS6		
			5.1	5						

Terminated at 5.1 m

Borehole advanced using continuous flight solid stem augering equipment on August 17, 2020 by Drilltech Drilling Limited.

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-11

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 11

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: South of 304X Martin Grove Rd., 1.5 m South of North curb

Date Drilled: 8/17/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test

Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		ASPHALT (170 mm)	0.2	0		2.4		AS1		
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 300 mm)	0.5							
		Brown, moist, very stiff, CLAYEY SILT; (CL-ML)		1	20	9.5		SS2		
			1.5							
		Brown, moist, very dense, SILTY SAND; (SM)		2	64	9.2		SS3		
					85/280 mm	9.1		SS4		
				3	50/125 mm	3.8		SS5		
				4						
					50/125 mm	9.4		SS6		
		Terminated at 4.8 m	4.8							

Borehole advanced using continuous flight solid stem augering equipment on August 17, 2020 by Drilltech Drilling Limited.

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Checked By: H.Akbari

Logged By: S.Ahsan

LOG OF No. 45-BH-12

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 12

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: East of 304X Martin Grove Rd., 6.3 m West of East curb

Date Drilled: 8/17/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH
		ASPHALT (90 mm)	0.1	0
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 300 mm)	0.4	
		Brown, moist, CLAYEY SILT with sand; (FILL)	1.5	1
		Brown, moist, loose to very dense, SILTY SAND; (SM)		2
				3
				4
				5
				6
				7
			8.2	8
		Terminated at 8.2 m		

Borehole advanced using continuous flight solid stem augering equipment on August 17, 2020 by Drilltech Drilling Limited.

Monitoring well installed upon completion of drilling, (screen from 4.6 m to 7.6 m).

Standard Penetration Test N Value: 40 80 120 160
Shear Strength kPa: 50 100 150 200
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

Sample No	Natural Moisture Content %	SPT (N) Value	Shear Strength kPa
AS1	2.5		
SS2	11.0	18	
SS3	10.1	36	
SS4	11.5	18	
SS5	13.7	7	
SS6	14.9	42	
SS7	12.0	80/250 mm	
SS8	21.4	50	

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	none	Open
2020-08-28	none	
2020-11-12	none	

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-13

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 13

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 2

Location: Across from 312 Martin Grove Rd, 1.5 m West of East curb

Date Drilled: 11/5/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH
		ASPHALT (200 mm)	0.2	0
		Brown, moist, SAND with gravel; (BASE/SUB-BASE, 410 mm)	0.4	
		Brown, moist, SILTY SAND with gravel; (FILL)		1
				2
				3
				4
				5
				6
				7
			7.6	8
		Brown to grey, moist, dense to very dense, SILTY SAND; (SM) Gr: 0.0%, Sa: 81.9%, Si: 17.1%, Cl: 1.0%		
				9
		Gr: 0.1%, Sa: 72.3%, Si: 26.6%, Cl: 1.0%		10

Standard Penetration Test N Value: 40 80 120 160
Shear Strength kPa: 50 100 150 200
Natural Moisture Content % Atterberg Limits (% Dry Weight): 20 40 60

SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %	N	Shear Strength kPa	Natural Moisture Content %
	AS1					3.3
	SS2			26		7.3
	SS3			20		14.4
	SS4			28		14.2
	SS5			30		13.0
	SS6			22		7.4
	SS7			8		10.9
	SS8			46		20.5
	SS9			90/250 mm		20.8

Continued Next Page

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	9.8	Open
2020-11-12	8.1	

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-13

Englobe

Project No. P-0021561-0-01-145 DRAWING No. 13

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road Sheet No. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		Brown to grey, moist, dense to very dense, SILTY SAND; (SM) *(continued)*		10						
				11	78/275 mm	17.2		SS10		
				12	50/125 mm	17.8		SS11		
				13						
					50/125 mm	19.5		SS12		
			14.0							
		Terminated at 14.0 m								

Borehole advanced using continuous flight solid stem augering equipment on November 5, 2020 by Drilltech Drilling Limited.

Monitoring well installed upon completion of drilling, (screen from 7.6 m to 10.6 m).

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	9.8	Open
2020-11-12	8.1	

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-14

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 14

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 2

Location: Ravenscrest Park, Martin Grove Rd, 8.0 m North of Walk Way

Date Drilled: 11/4/2020

Drill Type: Hollow Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		TOPSOIL (125 mm)	0.1	0	9	23.8		SS1		
		Black to brown, moist, SILTY SAND, trace rootlets; (FILL)		1	6	16.8		SS2		
					2	19.9		SS3		
			2.3	2	22	8.5		SS4		
		Brown to grey, moist, compact, SILTY SAND to SANDY SILT; (SM/ML)		3	24	24.3		SS5		
				4						
				5	15	20.5		SS6		
		Gr: 0.4%, Sa: 50.5%, Si: 48.1%, Cl: 1.0%		6	24	22.1		SS7		
				7						
				8	17	20.2		SS8		
				9						
		Gr:2.7%, Sa:39.2%, Si: 55.7%, Cl: 2.4%		10	18	18.7		SS9		

Continued Next Page

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	1.7	13.7
2020-11-12	1.5	

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

LOG OF No. 45-BH-14

Englobe

Project No. P-0021561-0-01-145 DRAWING No. 14

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road Sheet No. 2 of 2

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		Brown to grey, moist, compact, SILTY SAND to SANDY SILT; (SM/ML) *(continued)*		10	40 80 120 160 / 50 100 150 200	20 40 60				
				11	17	20.4		SS10		
				12	24	19.2		SS11		
				13						
				14	4	19.8		SS12		
			14.3							
		Terminated at 14.3 m Borehole advanced using continuous flight solid stem augering equipment on November 4, 2020 by Drilltech Drilling Limited. Monitoring well installed upon completion of drilling, (screen from 7.6 m to 10.6 m).								

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	1.7	13.7
2020-11-12	1.5	

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Checked By: H.Akbari

Logged By: S.Ahsan

LOG OF No. 45-BH-15

Englobe

Project No. P-0021561-0-01-145

DRAWING No. 15

Project: Geotechnical Investigation, 2021-45 - Martin Grove Road

Sheet No. 1 of 1

Location: Matrin Grove Rd, South of Savalon Ct, Ravenscrest Park

Date Drilled: 11/4/2020

Drill Type: Solid Stem Augers

Datum: Assumed

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	ELEV. m	DEPTH	Standard Penetration Test N Value / Shear Strength kPa	Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Sample No	Natural Unit Weight kN/m³	Percent of Fines, %
		TOPSOIL (125 mm)	0.1	0	21	10.0		SS1		
		Black to brown, moist, SILTY SAND, trace rootlets; (FILL)		1	44	7.4		SS2		
					24	7.5		SS3		
				2	7	10.8		SS4		
			3.7	3	6	23.7		SS5		
		Brown to grey, moist, compact, SILTY SAND; (SM)		4						
		- lens of gravel		5	20	10.4		SS6		
				6						
		Gr: 0.0%, Sa: 59.7%, Si: 37.8%, Cl: 2.5%			34	15.5		SS7		
				7						
			8.2	8	20	20.4		SS8		
		Terminated at 8.2 m								

Borehole advanced using continuous flight solid stem augering equipment on November 4, 2020 by Drilltech Drilling Limited.

Monitoring well installed upon completion of drilling, (screen from 4.6 m to 7.6 m).

Time	Water Level (m)	Depth to Cave (m)
Upon Completion	6.1	Open
2020-11-12	3.4	

Checked By: H.Akbari

Logged By: S.Ahsan

CLASSIFICATION LOG P-0021561-2021-RVA-45-MARTIN GROVE RD.GPJ LOG A GWGL02.GDT 1/26/21

Appendix 3 Geotechnical Test Results

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GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT
MTO LS-602, 702, AND 703/704

PROJECT: P-0021561-45 CLIENT/JOB NAME: R.V. Anderson and Associates Ltd CONTRACT NUMBER: -

ROS ID: 93944 PROJECT/LOCATION: PM6A-45 / Martin Grove Rd

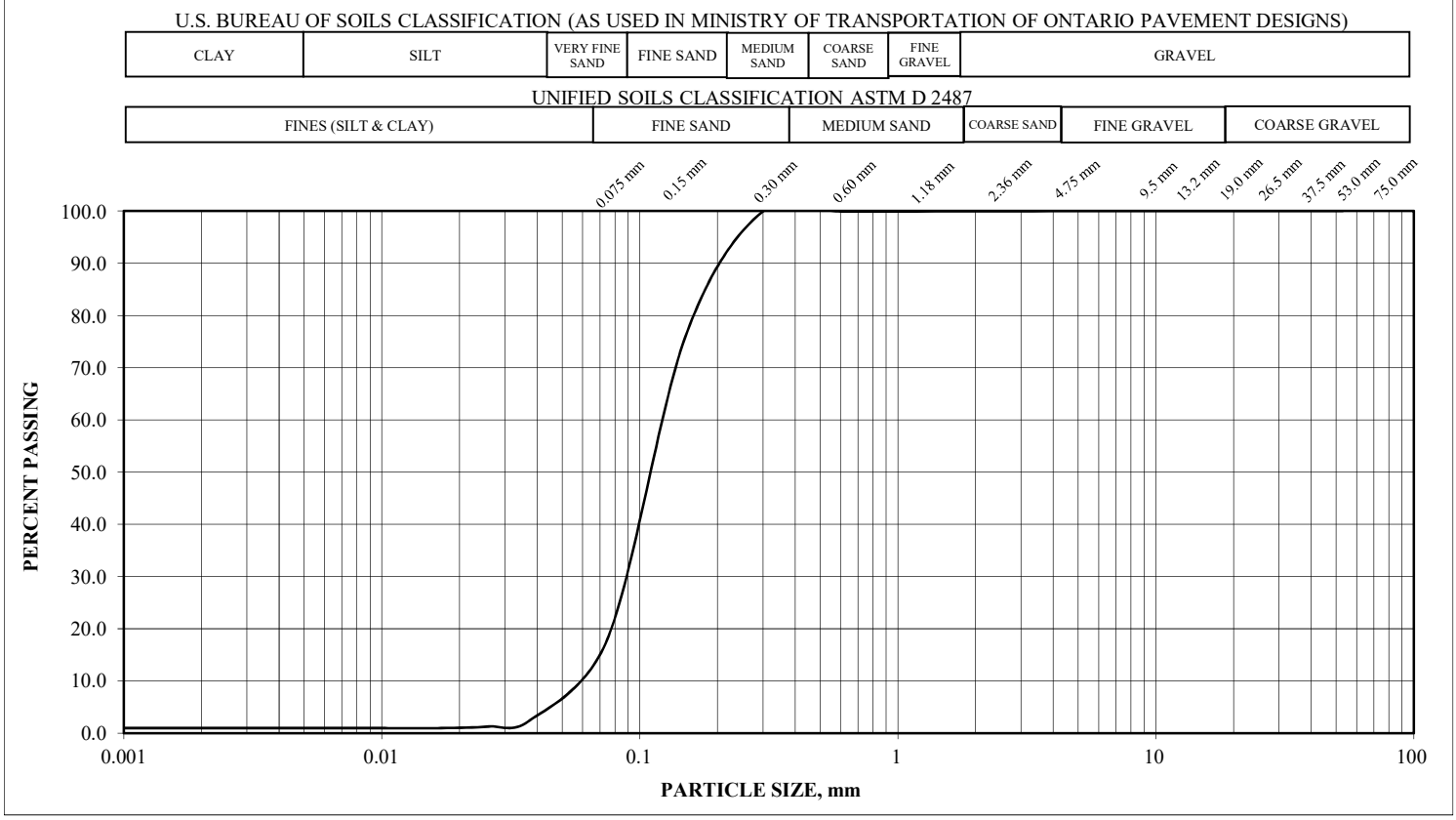
SAMPLING LOCATION:	BH13_SS8
SAMPLING DEPTH, m	7.60
SAMPLING METHOD:	Split Spoon
SAMPLED BY:	S.A. Englobe Corp
SAMPLE DESCRIPTION:	Silty Sand trace Clay
SAMPLING DATE:	2020-11-06
SAMPLE RECEIVED DATE:	2020-11-06

GRAIN SIZE PROPORTIONS, %

% GRAVEL (> 4.75 mm):	0.0
% SAND (75 µm to 4.75 mm):	81.9
% Silt (5 µm to 75 µm):	17.1
% Clay (<5 µm):	1.0
SUSCEPTIBILITY TO FROST HEAVING:	Low

GRAIN SIZE ANALYSIS		HYDROMETER ANALYSIS	
SIEVE SIZE mm	% PASSING	DIAMETER mm	% PASSING
53.0	100.0	0.037	2.3
37.5	100.0	0.026	1.3
26.5	100.0	0.017	1.0
19.0	100.0	0.010	1.0
13.2	100.0	0.007	1.0
9.5	100.0	0.005	1.0
4.75	100.0	0.003	1.0
2.36	100.0	0.001	1.0
1.18	99.9	ATTERBERG LIMITS, %	
0.60	99.9		
0.30	99.9	Plastic Limit	
0.15	75.9	Liquid Limit	
0.075	18.1	Plastic Index	

PARTICLE SIZE DISTRIBUTION, MTO LS-702



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GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT
MTO LS-602, 702, AND 703/704

PROJECT: P-0021561-45 CLIENT/JOB NAME: R.V. Anderson and Associates Ltd CONTRACT NUMBER: -

ROS ID: 93944 PROJECT/LOCATION: PM6A-45 / Martin Grove Rd

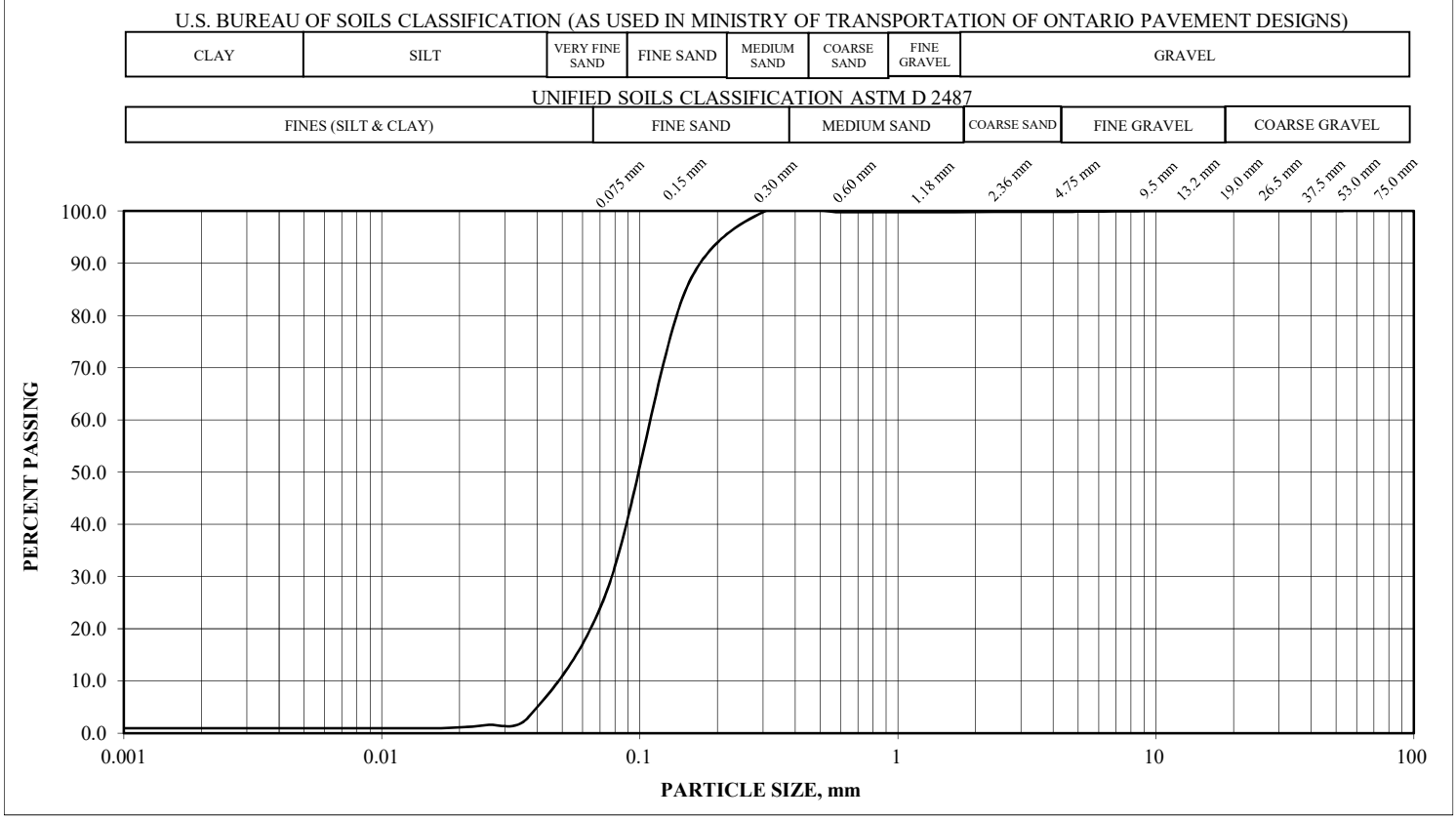
SAMPLING LOCATION:	BH13_SS9
SAMPLING DEPTH, m	9.10
SAMPLING METHOD:	Split Spoon
SAMPLED BY:	S.A. Englobe Corp
SAMPLE DESCRIPTION:	Silty Sand trace Clay
SAMPLING DATE:	2020-11-06
SAMPLE RECEIVED DATE:	2020-11-06

GRAIN SIZE PROPORTIONS, %

% GRAVEL (> 4.75 mm):	0.1
% SAND (75 µm to 4.75 mm):	72.3
% Silt (5 µm to 75 µm):	26.6
% Clay (<5 µm):	1.0
SUSCEPTIBILITY TO FROST HEAVING:	Low

GRAIN SIZE ANALYSIS		HYDROMETER ANALYSIS	
SIEVE SIZE mm	% PASSING	DIAMETER mm	% PASSING
53.0	100.0	0.037	3.1
37.5	100.0	0.026	1.6
26.5	100.0	0.017	1.0
19.0	100.0	0.010	1.0
13.2	100.0	0.007	1.0
9.5	100.0	0.005	1.0
4.75	99.9	0.003	1.0
2.36	99.8	0.001	1.0
1.18	99.8	ATTERBERG LIMITS, %	
0.60	99.8		
0.30	99.8	Plastic Limit	
0.15	84.7	Liquid Limit	
0.075	27.6	Plastic Index	

PARTICLE SIZE DISTRIBUTION, MTO LS-702



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GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT
MTO LS-602, 702, AND 703/704

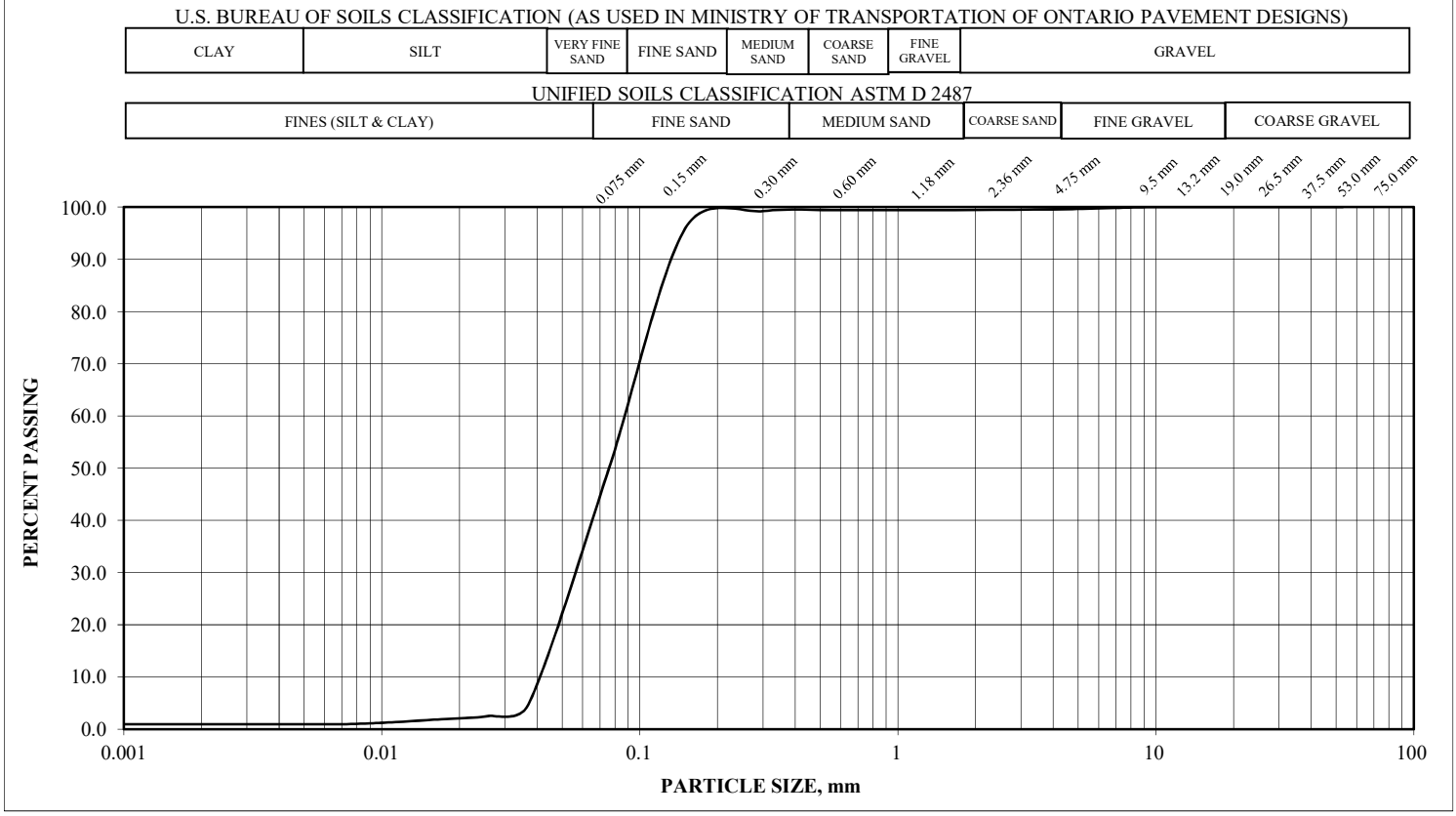
PROJECT: P-0021561-45 CLIENT/JOB NAME: R.V. Anderson and Associates Ltd CONTRACT NUMBER: -

ROS ID: 93944 PROJECT/LOCATION: PM6A-45 / Martin Grove Rd

SAMPLING LOCATION:	BH14_SS7
SAMPLING DEPTH, m	6.1
SAMPLING METHOD:	Split Spoon
SAMPLED BY:	S.A. Englobe Corp
SAMPLE DESCRIPTION:	Silty Sand trace Clay
SAMPLING DATE:	2020-11-04
SAMPLE RECEIVED DATE:	2020-11-04
GRAIN SIZE PROPORTIONS, %	
% GRAVEL (> 4.75 mm):	0.4
% SAND (75 µm to 4.75 mm):	50.5
% Silt (5 µm to 75 µm):	48.1
% Clay (<5 µm):	1.0
SUSCEPTIBILITY TO FROST HEAVING:	Moderate

GRAIN SIZE ANALYSIS		HYDROMETER ANALYSIS	
SIEVE SIZE mm	% PASSING	DIAMETER mm	% PASSING
53.0	100.0	0.037	4.7
37.5	100.0	0.026	2.5
26.5	100.0	0.017	1.9
19.0	100.0	0.010	1.2
13.2	100.0	0.007	1.0
9.5	100.0	0.005	1.0
4.75	99.6	0.003	1.0
2.36	99.5	0.001	1.0
1.18	99.4	ATTERBERG LIMITS, %	
0.60	99.4		
0.30	99.2	Plastic Limit	
0.15	95.9	Liquid Limit	
0.075	49.1	Plastic Index	

PARTICLE SIZE DISTRIBUTION, MTO LS-702



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1821 Albion Road, Unit 7, Toronto (Ontario) M9W 5W8
T 416.213.1060 | F 416.213.1070
toronto@englobecorp.com | www.englobecorp.com

GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT
MTO LS-602, 702, AND 703/704

PROJECT: P-0021561-45 CLIENT/JOB NAME: R.V. Anderson and Associates Ltd CONTRACT NUMBER: -

ROS ID: 93944 PROJECT/LOCATION: PM6A-45 / Martin Grove Rd

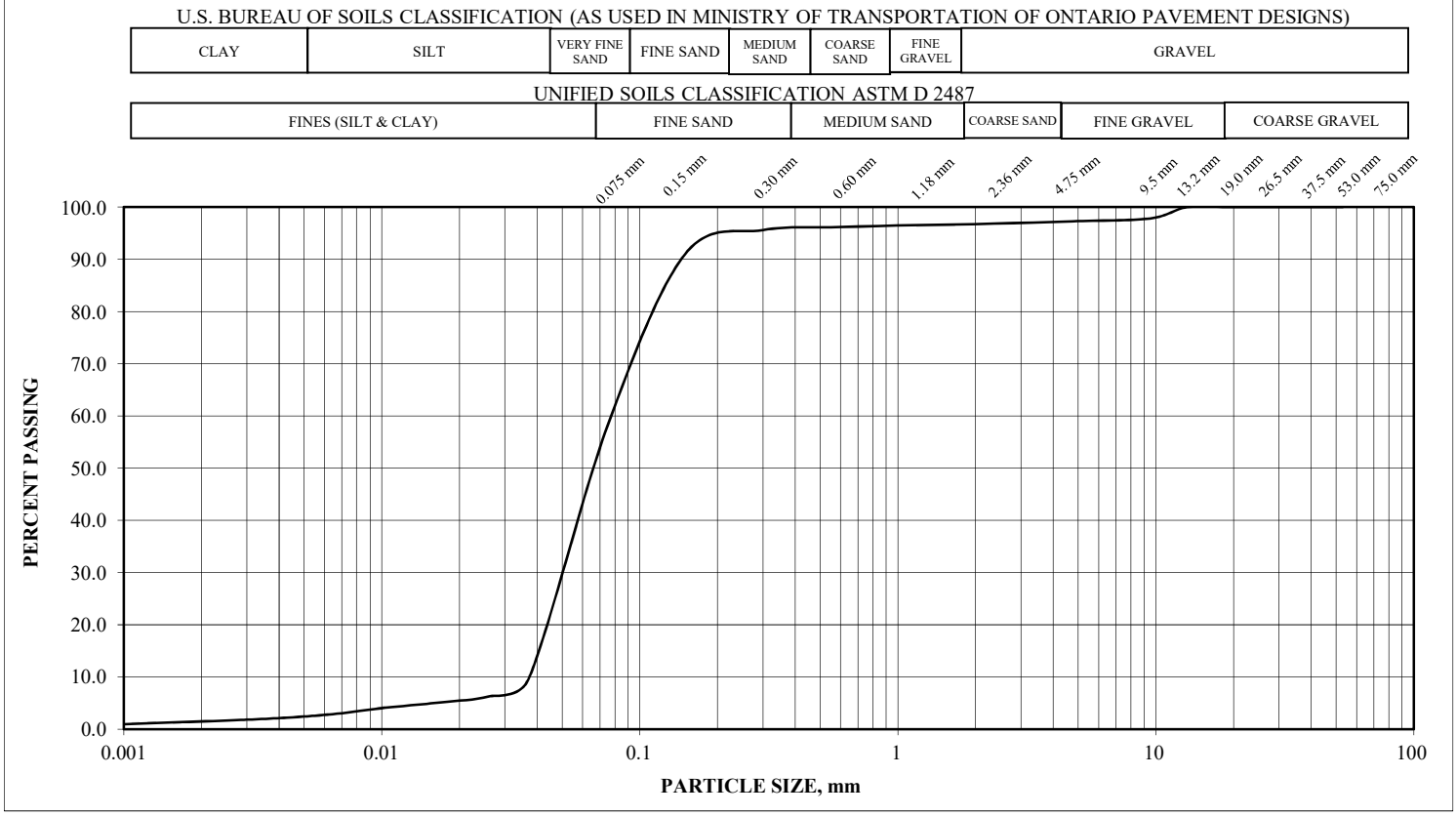
SAMPLING LOCATION:	BH14_SS9
SAMPLING DEPTH, m	9.10
SAMPLING METHOD:	Split Spoon
SAMPLED BY:	S.A. Englobe Corp
SAMPLE DESCRIPTION:	Sandy Silt trace Clay and Gravel
SAMPLING DATE:	2020-11-04
SAMPLE RECEIVED DATE:	2020-11-04

GRAIN SIZE PROPORTIONS, %

% GRAVEL (> 4.75 mm):	2.7
% SAND (75 µm to 4.75 mm):	39.2
% Silt (5 µm to 75 µm):	55.7
% Clay (<5 µm):	2.4
SUSCEPTIBILITY TO FROST HEAVING:	High

GRAIN SIZE ANALYSIS		HYDROMETER ANALYSIS	
SIEVE SIZE mm	% PASSING	DIAMETER mm	% PASSING
53.0	100.0	0.037	9.5
37.5	100.0	0.026	6.3
26.5	100.0	0.017	5.1
19.0	100.0	0.010	4.0
13.2	100.0	0.007	3.1
9.5	97.8	0.005	2.4
4.75	97.3	0.003	1.8
2.36	96.8	0.001	0.9
1.18	96.5	ATTERBERG LIMITS, %	
0.60	96.2		
0.30	95.6	Plastic Limit	
0.15	91.0	Liquid Limit	
0.075	58.1	Plastic Index	

PARTICLE SIZE DISTRIBUTION, MTO LS-702



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GRAIN SIZE ANALYSIS AND HYDROMETER TEST REPORT
MTO LS-602, 702, AND 703/704

PROJECT: P-0021561-45 CLIENT/JOB NAME: R.V. Anderson and Associates Ltd CONTRACT NUMBER: -

ROS ID: 93944 PROJECT/LOCATION: PM6A-45 / Martin Grove Rd

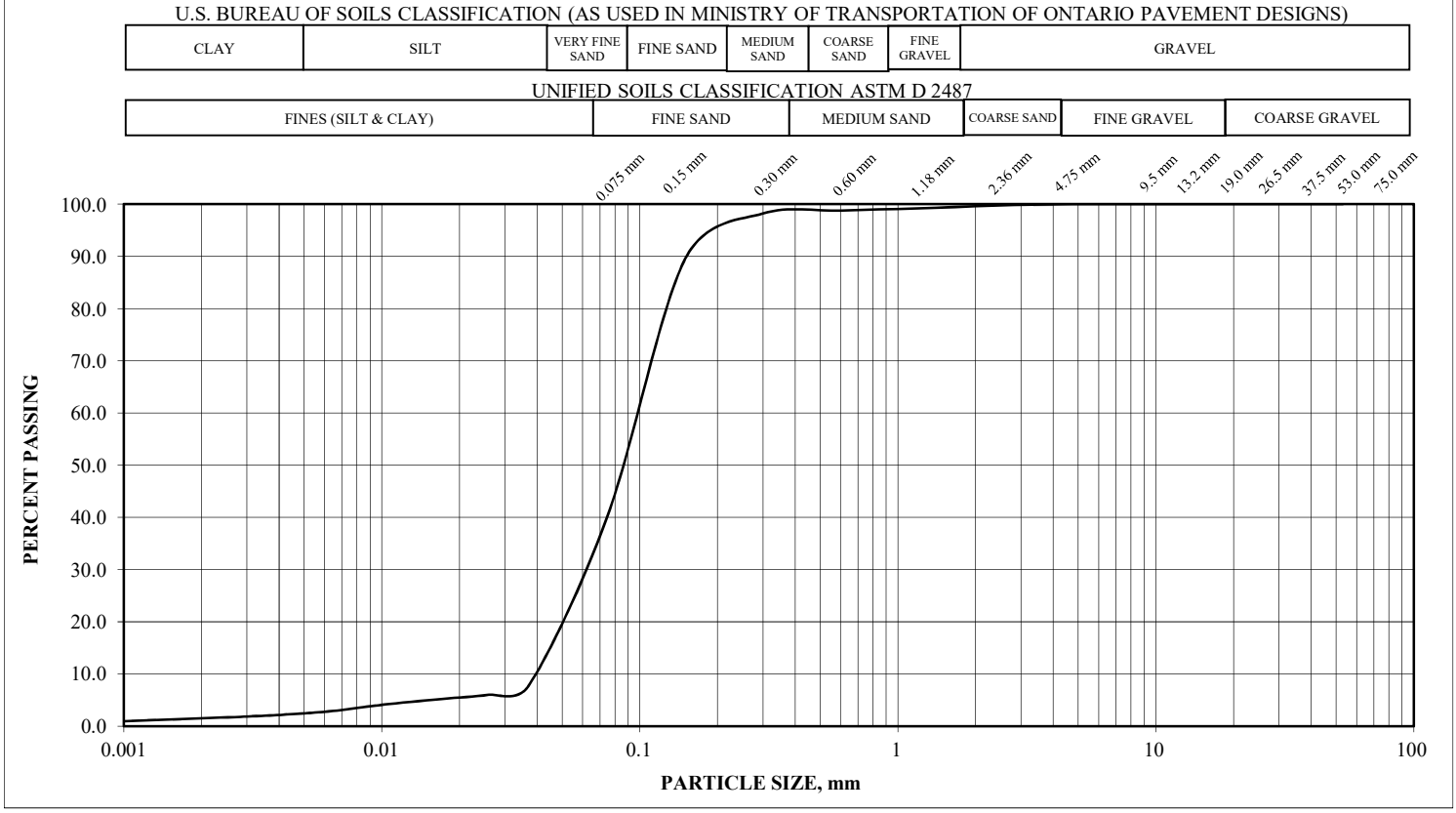
SAMPLING LOCATION:	BH15_SS7
SAMPLING DEPTH, m	6.10
SAMPLING METHOD:	Split Spoon
SAMPLED BY:	S.A. Englobe Corp
SAMPLE DESCRIPTION:	Silty Sand trace Clay
SAMPLING DATE:	2020-11-04
SAMPLE RECEIVED DATE:	2020-11-04

GRAIN SIZE PROPORTIONS, %

% GRAVEL (> 4.75 mm):	0.0
% SAND (75 µm to 4.75 mm):	59.7
% Silt (5 µm to 75 µm):	37.8
% Clay (<5 µm):	2.5
SUSCEPTIBILITY TO FROST HEAVING:	Low

GRAIN SIZE ANALYSIS		HYDROMETER ANALYSIS	
SIEVE SIZE mm	% PASSING	DIAMETER mm	% PASSING
53.0	100.0	0.037	7.7
37.5	100.0	0.026	6.0
26.5	100.0	0.017	5.2
19.0	100.0	0.010	4.1
13.2	100.0	0.007	3.1
9.5	100.0	0.005	2.5
4.75	100.0	0.003	1.8
2.36	99.7	0.001	0.9
1.18	99.2	ATTERBERG LIMITS, %	
0.60	98.8		
0.30	98.2	Plastic Limit	
0.15	89.5	Liquid Limit	
0.075	40.3	Plastic Index	

PARTICLE SIZE DISTRIBUTION, MTO LS-702



Appendix 4 Environmental Testing Results

Certificate of Analysis

eurofins | Environment Testing

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E 04530

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422
Temperature (C): 6
Custody Seal:

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1510543 45-BH01-SS3 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510544 45-BH03-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510546 45-BH05-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510547 45-BH06-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510548 45-BH07-SS3 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510549 45-BH08-SS3 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510550 45-BH09-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).

Report Comments:

Sarah Horner, Inorganics Technician

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

O.Reg 153-T1-All Other Soils

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
45-BH01-SS3	Petroleum Hydrocarbons F4	140	ug/g	STD 120
45-BH01-SS3	Petroleum Hydrocarbons F4g	7600	ug/g	STD 120
45-BH05-SS2	Petroleum Hydrocarbons F4g	200	ug/g	STD 120
45-BH07-SS3	Petroleum Hydrocarbons F4g	300	ug/g	STD 120
45-BH08-SS3	Petroleum Hydrocarbons F4	140	ug/g	STD 120
45-BH08-SS3	Petroleum Hydrocarbons F4g	400	ug/g	STD 120
45-BH09-SS2	Petroleum Hydrocarbons F4g	200	ug/g	STD 120
Inorganics				
45-BH01-SS3	Electrical Conductivity	1.69	mS/cm	STD 0.57
45-BH01-SS3	Sodium Adsorption Ratio	11.2		STD 2.4
45-BH03-SS2	Electrical Conductivity	1.31	mS/cm	STD 0.57
45-BH03-SS2	Sodium Adsorption Ratio	28.6		STD 2.4
45-BH04-SS3	Sodium Adsorption Ratio	3.14		STD 2.4
45-BH05-SS2	Electrical Conductivity	1.76	mS/cm	STD 0.57
45-BH05-SS2	Sodium Adsorption Ratio	32.5		STD 2.4
45-BH06-SS2	Electrical Conductivity	1.71	mS/cm	STD 0.57
45-BH06-SS2	Sodium Adsorption Ratio	38.2		STD 2.4
45-BH07-SS3	Electrical Conductivity	0.79	mS/cm	STD 0.57
45-BH07-SS3	Sodium Adsorption Ratio	11.4		STD 2.4
45-BH08-SS3	Electrical Conductivity	1.39	mS/cm	STD 0.57
45-BH08-SS3	Sodium Adsorption Ratio	13.2		STD 2.4
45-BH09-SS2	Electrical Conductivity	0.71	mS/cm	STD 0.57
45-BH09-SS2	Sodium Adsorption Ratio	6.53		STD 2.4

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

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Guideline = O.Reg 153-T1-All Other Soils

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
PHC's F1	388118	10	ug/g	STD 25	<10	<10	<10	<10	<10
PHC's F2	388163	10	ug/g	STD 10	<10	<10	<10	<10	<10
PHC's F3	388163	20	ug/g	STD 240	40	<20	<20	<20	<20
PHC's F4	388163	20	ug/g	STD 120	140*	20	<20	60	30
PHC's F4g	388175	100	ug/g	STD 120	7600*	<100		200*	<100

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
PHC's F1	388118	10	ug/g	STD 25	<10	<10	<10
PHC's F2	388163	10	ug/g	STD 10	<10	<10	<10
PHC's F3	388163	20	ug/g	STD 240	<20	50	<20
PHC's F4	388163	20	ug/g	STD 120	110	140*	40
PHC's F4g	388175	100	ug/g	STD 120	300*	400*	200*

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Metals

Analyte	Batch No	MRL	Units	Guideline	1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.									
Antimony	387927	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	387927	1	ug/g	STD 18	3	3	3	3	6
Barium	387927	1	ug/g	STD 220	150	35	27	72	82
Beryllium	387927	1	ug/g	STD 2.5	2	<1	<1	<1	<1
Boron (Hot Water Soluble)	387809	0.5	ug/g		1.3	<0.5	<0.5	<0.5	
	387918	0.5	ug/g						<0.5
Boron (total)	387927	5	ug/g	STD 36	24	7	<5	9	6
Cadmium	387927	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	387927	1	ug/g	STD 70	19	11	11	25	23
Chromium VI	387917	0.20	ug/g	STD 0.66	<0.20	<0.20	<0.20	<0.20	<0.20
Cobalt	387927	1	ug/g	STD 21	4	3	4	4	6
Copper	387927	1	ug/g	STD 92	11	14	14	14	40
Lead	387927	1	ug/g	STD 120	7	9	6	6	14
Mercury	387927	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	387927	1	ug/g	STD 2	<1	<1	<1	<1	<1
Nickel	387927	1	ug/g	STD 82	11	8	9	15	21
Selenium	387927	1	ug/g	STD 1.5	<1	<1	<1	<1	<1
Silver	387927	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	387927	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	387927	0.5	ug/g	STD 2.5	1.0	<0.5	<0.5	0.6	0.6
Vanadium	387927	2	ug/g	STD 86	19	17	14	15	24
Zinc	387927	2	ug/g	STD 290	24	28	25	22	56

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COC #: 861422

Guideline = O.Reg 153-T1-All Other Soils

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510548	1510549	1510550
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-08-11	2020-08-11	2020-08-11
Sampling Time							
Sample I.D.					45-BH07-SS3	45-BH08-SS3	45-BH09-SS2
Antimony	387927	1	ug/g	STD 1.3	<1	<1	<1
Arsenic	387927	1	ug/g	STD 18	4	5	4
Barium	387927	1	ug/g	STD 220	44	47	44
Beryllium	387927	1	ug/g	STD 2.5	<1	<1	<1
Boron (Hot Water Soluble)	387918	0.5	ug/g		<0.5	<0.5	<0.5
Boron (total)	387927	5	ug/g	STD 36	<5	5	5
Cadmium	387927	0.4	ug/g	STD 1.2	<0.4	0.9	<0.4
Chromium Total	387927	1	ug/g	STD 70	32	22	16
Chromium VI	387917	0.20	ug/g	STD 0.66	<0.20	<0.20	<0.20
Cobalt	387927	1	ug/g	STD 21	6	6	6
Copper	387927	1	ug/g	STD 92	18	23	22
Lead	387927	1	ug/g	STD 120	10	19	10
Mercury	387927	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1
Molybdenum	387927	1	ug/g	STD 2	<1	<1	<1
Nickel	387927	1	ug/g	STD 82	20	16	14
Selenium	387927	1	ug/g	STD 1.5	<1	<1	<1
Silver	387927	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2
Thallium	387927	1	ug/g	STD 1	<1	<1	<1
Uranium	387927	0.5	ug/g	STD 2.5	<0.5	0.6	<0.5
Vanadium	387927	2	ug/g	STD 86	19	23	21
Zinc	387927	2	ug/g	STD 290	212	118	47

Results relate only to the parameters tested on the samples submitted.
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Guideline = O.Reg 153-T1-All Other Soils

PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
1+2-methylnaphthalene	388054	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	388054	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	388054	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	388054	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	388054	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	388054	0.05	ug/g	STD 0.3	0.06	0.08	<0.05	0.05	<0.05
Benzo[b]fluoranthene	388054	0.05	ug/g	STD 0.47	0.06	0.06	<0.05	<0.05	<0.05
Benzo[ghi]perylene	388054	0.05	ug/g	STD 0.68	0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	388054	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	388054	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	388054	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	388054	0.05	ug/g	STD 0.56	0.07	<0.05	<0.05	<0.05	<0.05
Fluorene	388054	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	388054	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	388054	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	388054	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	388054	0.05	ug/g	STD 0.09	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	388054	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	388054	0.05	ug/g	STD 1	0.07	<0.05	<0.05	<0.05	<0.05

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Guideline = O.Reg 153-T1-All Other Soils

PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
1+2-methylnaphthalene	388054	0.05	ug/g		<0.05	<0.05	<0.05
Acenaphthene	388054	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	388054	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	388054	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	388054	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	388054	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	388054	0.05	ug/g	STD 0.47	<0.05	0.06	<0.05
Benzo[ghi]perylene	388054	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	388054	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05
Chrysene	388054	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	388054	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	388054	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	388054	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	388054	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	388054	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	388054	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Naphthalene	388054	0.05	ug/g	STD 0.09	<0.05	<0.05	<0.05
Phenanthrene	388054	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	388054	0.05	ug/g	STD 1		<0.05	<0.05
	388109	0.05	ug/g	STD 1	<0.05		

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Guideline = O.Reg 153-T1-All Other Soils

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Acetone	388130	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	388122	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	388125	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Project: P0021561
COC #: 861422

Guideline = O.Reg 153-T1-All Other Soils

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Ethylene dibromide	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	388130	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	388130	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	388130	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	388122	0.20	ug/g	STD 0.2	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	388122	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	388122	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	388126	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

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Project: P0021561
COC #: 861422

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Acetone	388130	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	388122	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Bromodichloromethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	388125	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	388122	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	388122	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Ethylene dibromide	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	388130	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	388130	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	388130	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Styrene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Toluene	388122	0.20	ug/g	STD 0.2	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	388122	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05
Vinyl Chloride	388122	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Xylene Mixture	388126	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Xylene, m/p-	388122	0.05	ug/g		<0.05	<0.05	<0.05
Xylene, o-	388122	0.05	ug/g		<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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Certificate of Analysis

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Inorganics

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					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Cyanide (CN-)	387853	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005	
		0.02	ug/g	STD 0.051					<0.02
Electrical Conductivity	387997	0.05	mS/cm	STD 0.57	1.69*	1.31*	0.22	1.76*	1.71*
pH - CaCl2	387915	2.00			9.34	7.91	7.84	8.45	7.94
Sodium Adsorption Ratio	388017	0.01		STD 2.4	11.2*	28.6*	3.14*	32.5*	38.2*

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Cyanide (CN-)	387853	0.02	ug/g	STD 0.051	<0.02	<0.02	
		0.05	mg/L	STD 0.051			N.R.
Electrical Conductivity	387997	0.05	mS/cm	STD 0.57	0.79*	1.39*	0.71*
pH - CaCl2	387915	2.00			7.67	7.72	7.61
Sodium Adsorption Ratio	388017	0.01		STD 2.4	11.4*	13.2*	6.53*

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Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Moisture-Humidite	388163	0.1	%		11.1	10.1	4.9	6.9	15.9

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Moisture-Humidite	388163	0.1	%		11.4	8.7	9.4

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PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Aroclor 1242	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Aroclor 1248	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Aroclor 1254	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Aroclor 1260	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Polychlorinated Biphenyls	388087	0.02	ug/g	STD 0.3	<0.02	<0.02	<0.02	<0.02	<0.02

PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Aroclor 1242	388087	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1248	388087	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1254	388087	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1260	388087	0.02	ug/g		<0.02	<0.02	<0.02
Polychlorinated Biphenyls	388087	0.02	ug/g	STD 0.3	<0.02	<0.02	<0.02

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Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Guideline = O.Reg 153-T1-All Other Soils

PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Decachlorobiphenyl	388075	0	%		67	N/A	80	N/A	N/A

PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Decachlorobiphenyl	388075	0	%		N/A	N/A	N/A

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Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
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M9W 5W8
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PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Alpha-androstrane	388163	0	%		70	0	0	0	0

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Alpha-androstrane	388163	0	%		0	0	0

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
1,2-dichloroethane-d4	388122	0	%		108	103	106	106	107
4-bromofluorobenzene	388122	0	%		104	105	103	109	108
Toluene-d8	388122	0	%		101	106	103	105	107

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
1,2-dichloroethane-d4	388122	0	%		104	102	101
4-bromofluorobenzene	388122	0	%		105	101	105
Toluene-d8	388122	0	%		108	100	106

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
387809	Boron (Hot Water Soluble)	<0.5 ug/g	91	70-130	95	75-125	0	0-30
387853	Cyanide (CN-)	<0.005 ug/g	99	75-125	108	70-130	0	0-20
387915	pH - CaCl2	5.28	100	90-110			0	
387917	Chromium VI	<0.20 ug/g	99	80-120	88	70-130	0	0-35
387918	Boron (Hot Water Soluble)	<0.5 ug/g	90	70-130	108	75-125	0	0-30
387927	Silver	<0.2 ug/g	97	70-130	97	70-130	3	0-20
387927	Arsenic	<1 ug/g	96	70-130	98	70-130	0	0-20
387927	Boron (total)	<5 ug/g	101	70-130	102	70-130	0	0-20
387927	Barium	<1 ug/g	94	70-130	108	70-130	3	0-20
387927	Beryllium	<1 ug/g	101	70-130	102	70-130	0	0-20
387927	Cadmium	<0.4 ug/g	100	70-130	97	70-130	0	0-20
387927	Cobalt	<1 ug/g	94	70-130	94	70-130	0	0-20
387927	Chromium Total	<1 ug/g	96	70-130	121	70-130	1	0-20
387927	Copper	<1 ug/g	106	70-130	102	70-130	0	0-20
387927	Mercury	<0.1 ug/g	90	70-130	87	70-130	13	0-20
387927	Molybdenum	<1 ug/g	89	70-130	85	70-130	4	0-20
387927	Nickel	<1 ug/g	101	70-130	100	70-130	0	0-20
387927	Lead	<1 ug/g	105	70-130	98	70-130	4	0-20
387927	Antimony	<1 ug/g	85	70-130	90	70-130	0	0-20
387927	Selenium	<1 ug/g	107	70-130	101	70-130	0	0-20
387927	Thallium	<1 ug/g	104	70-130	98	70-130	0	0-20
387927	Uranium	<0.5 ug/g	95	70-130	95	70-130	0	0-20
387927	Vanadium	<2 ug/g	89	70-130	98	70-130	3	0-20
387927	Zinc	<2 ug/g	109	70-130	101	70-130	2	0-20
387997	Electrical Conductivity	<0.05	97	90-110			3	0-10
388017	Sodium Adsorption Ratio	<0.01					0	
388054	1+2-methylnaphthalene	<0.05 ug/g						
388054	Methlynaphthalene, 1-	<0.05 ug/g	69	50-140	61	50-140	0	0-40
388054	Methlynaphthalene, 2-	<0.05 ug/g	67	50-140	62	50-140	0	0-40
388054	Acenaphthene	<0.05 ug/g	75	50-140	61	50-140	0	0-40
388054	Acenaphthylene	<0.05 ug/g	73	50-140	58	50-140	0	0-40
388054	Anthracene	<0.05 ug/g	87	50-140	68	50-140	0	0-40
388054	Benz[a]anthracene	<0.05 ug/g	75	50-140	65	50-140	0	0-40

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Project: P0021561
COC #: 861422

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388054	Benzo[a]pyrene	<0.05 ug/g	87	50-140	61	50-140	0	0-40
388054	Benzo[b]fluoranthene	<0.05 ug/g	84	50-140	40	50-140	0	0-40
388054	Benzo[ghi]perylene	<0.05 ug/g	114	50-140	74	50-140	0	0-40
388054	Benzo[k]fluoranthene	<0.05 ug/g	82	50-140				0-40
388054	Chrysene	<0.05 ug/g	93	50-140	75	50-140	0	0-40
388054	Dibenz[a h]anthracene	<0.05 ug/g	117	50-140	71	50-140	0	0-40
388054	Fluoranthene	<0.05 ug/g	91	50-140	76	50-140	0	0-40
388054	Fluorene	<0.05 ug/g	77	50-140	61	50-140	0	0-40
388054	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	100	50-140	69	50-140	0	0-40
388054	Naphthalene	<0.05 ug/g	69	50-140	57	50-140	0	0-40
388054	Phenanthrene	<0.05 ug/g	82	50-140	66	50-140	0	0-40
388054	Pyrene	<0.05 ug/g	92	50-140	75	50-140	0	0-40
388087	Aroclor 1242	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Aroclor 1248	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Aroclor 1254	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Aroclor 1260	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Polychlorinated Biphenyls	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388109	Pyrene	<0.05 ug/g	92	50-140	75	50-140	0	0-40
388118	PHC's F1	<10 ug/g	94	80-120	96	60-140	0	0-30
388122	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	82	60-130	83	50-140	0	0-50
388122	Trichloroethane, 1,1,1-	<0.05 ug/g	105	60-130	90	50-140	0	0-50
388122	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	114	60-130	84	50-140	0	0-30
388122	Trichloroethane, 1,1,2-	<0.05 ug/g	104	60-130	88	50-140	0	0-50
388122	Dichloroethane, 1,1-	<0.05 ug/g	94	60-130	64	50-140	0	0-50
388122	Dichloroethylene, 1,1-	<0.05 ug/g	104	60-130	74	50-140	0	0-50
388122	Dichlorobenzene, 1,2-	<0.05 ug/g	113	60-130	94	50-140	0	0-50
388122	Dichloroethane, 1,2-	<0.05 ug/g	103	60-130	100	50-140	0	0-50
388122	Dichloropropane, 1,2-	<0.05 ug/g	111	60-130	96	50-140	0	0-50
388122	Dichlorobenzene, 1,3-	<0.05 ug/g	114	60-130	73	50-140	0	0-50
388122	Dichlorobenzene, 1,4-	<0.05 ug/g	105	60-130	102	50-140	0	0-50
388122	Benzene	<0.02 ug/g	116	60-130	91	50-140	0	0-50
388122	Bromodichloromethane	<0.05 ug/g	97	60-130	94	50-140	0	0-50
388122	Bromoform	<0.05 ug/g	100	60-130	80	50-140	0	0-50

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COC #: 861422

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388122	Bromomethane	<0.05 ug/g	77	60-130	70	50-140	0	0-50
388122	Dichloroethylene, 1,2-cis-	<0.05 ug/g	103	60-130	90	50-140	0	0-50
388122	Dichloropropene,1,3-cis-	<0.05 ug/g	87	60-130	71	50-140	0	0-50
388122	Carbon Tetrachloride	<0.05 ug/g	83	60-130	87	50-140	0	0-50
388122	Chloroform	<0.05 ug/g	102	60-130	82	50-140	0	0-50
388122	Dibromochloromethane	<0.05 ug/g	105	60-130	91	50-140	0	0-50
388122	Dichlorodifluoromethane	<0.05 ug/g	84	60-130	60	50-140	0	0-50
388122	Methylene Chloride	<0.05 ug/g	110	60-130	102	50-140	0	0-50
388122	Ethylbenzene	<0.05 ug/g	91	60-130	98	50-140	0	0-50
388122	Ethylene dibromide	<0.05 ug/g	102	60-130		50-140		0-50
388122	Hexane (n)	<0.05 ug/g	110	60-130	84	50-140	0	0-50
388122	Xylene, m/p-	<0.05 ug/g	88	60-130	88	50-140	0	0-50
388122	Chlorobenzene	<0.05 ug/g	101	60-130	98	50-140	0	0-50
388122	Xylene, o-	<0.05 ug/g	103	60-130	99	50-140	0	0-50
388122	Styrene	<0.05 ug/g	98	60-130	89	50-140	0	0-50
388122	Dichloroethylene, 1,2-trans-	<0.05 ug/g	116	60-130	87	50-140	0	0-50
388122	Dichloropropene,1,3-trans-	<0.05 ug/g	85	60-130	79	50-140	0	0-50
388122	Tetrachloroethylene	<0.05 ug/g	87	60-130	91	50-140	0	0-50
388122	Toluene	<0.20 ug/g	90	60-130	92	50-140	0	0-50
388122	Trichloroethylene	<0.05 ug/g	105	60-130	93	50-140	0	0-50
388122	Trichlorofluoromethane	<0.05 ug/g	98	60-130	72	50-140	0	0-50
388122	Vinyl Chloride	<0.02 ug/g	74	60-130	79	50-140	0	0-50
388125	Dichloropropene,1,3-							
388126	Xylene Mixture							
388130	Acetone	<0.50 ug/g	110	60-130	129	50-140	0	0-50
388130	Methyl Ethyl Ketone	<0.50 ug/g	115	60-130	132	50-140	0	0-50
388130	Methyl Isobutyl Ketone	<0.50 ug/g	112	60-130	126	50-140	0	0-50
388130	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	101	60-130	107	50-140	0	0-50
388163	PHC's F2	<10 ug/g	120	80-120	97	60-140	0	0-30
388163	PHC's F3	<20 ug/g	120	80-120	97	60-140	0	0-30
388163	PHC's F4	<20 ug/g	120	80-120	97	60-140	0	0-30
388163	Moisture-Humidite		100	80-120			4	
388175	PHC's F4g	<100 ug/g		80-120		60-140		0-30

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Certificate of Analysis

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
387809	Boron (Hot Water Soluble)	iCAP OES	2020-08-17	2020-08-17	Z_S	MOECC E3470
387853	Cyanide (CN-)	Skalar CN Analyzer	2020-08-18	2020-08-18	QT	MOECC E3015
387915	pH - CaCl2	pH Meter	2020-08-18	2020-08-18	SG	Ag Soil
387917	Chromium VI	FAA	2020-08-18	2020-08-18	Z_S	M US EPA 3060A
387918	Boron (Hot Water Soluble)	iCAP OES	2020-08-18	2020-08-18	Z_S	MOECC E3470
387927	Silver	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Arsenic	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Boron (total)	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Barium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Beryllium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Cadmium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Cobalt	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Chromium Total	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Copper	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Mercury	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Molybdenum	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Nickel	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Lead	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Antimony	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Selenium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Thallium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Uranium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Vanadium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Zinc	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387997	Electrical Conductivity	Electrical Conductivity Mete	2020-08-19	2020-08-19	Z_S	Cond-Soil
388017	Sodium Adsorption Ratio	iCAP OES	2020-08-19	2020-08-19	Z_S	Ag Soil
388054	1+2-methylnaphthalene	GC-MS	2020-08-20	2020-08-20	QL	P 8270
388054	Methlynaphthalene, 1-	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Methlynaphthalene, 2-	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Acenaphthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Acenaphthylene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Anthracene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benz[a]anthracene	GC-MS	2020-08-15	2020-08-19	QL	P 8270

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Test Summary

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388054	Benzo[a]pyrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benzo[b]fluoranthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benzo[ghi]perylene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benzo[k]fluoranthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Chrysene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Dibenz[a h]anthracene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Fluoranthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Fluorene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Indeno[1 2 3-cd]pyrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Naphthalene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Phenanthrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Pyrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388087	Aroclor 1242	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Aroclor 1248	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Aroclor 1254	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Aroclor 1260	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Polychlorinated Biphenyls	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388109	Pyrene	GC-MS	2020-08-18	2020-08-19	QL	P 8270
388118	PHC's F1	GC/FID	2020-08-21	2020-08-21	TJB	CCME
388122	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichloroethane, 1,1,1-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichloroethane, 1,1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethane, 1,1-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethylene, 1,1-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorobenzene, 1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethane, 1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloropropane, 1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorobenzene, 1,3-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorobenzene, 1,4-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Benzene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Bromodichloromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Bromoform	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B

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Certificate of Analysis

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388122	Bromomethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethylene, 1,2-cis-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloropropene,1,3-cis-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Carbon Tetrachloride	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Chloroform	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dibromochloromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorodifluoromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Methylene Chloride	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Ethylbenzene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Ethylene dibromide	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Hexane (n)	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Xylene, m/p-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Chlorobenzene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Xylene, o-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Styrene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethylene, 1,2-trans-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloropropene,1,3-trans-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Tetrachloroethylene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Toluene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichloroethylene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichlorofluoromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Vinyl Chloride	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388125	Dichloropropene,1,3-	GC-MS	2020-08-21	2020-08-21	TJB	V 8260B
388126	Xylene Mixture	GC-MS	2020-08-21	2020-08-21	TJB	V 8260B
388130	Acetone	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388130	Methyl Ethyl Ketone	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388130	Methyl Isobutyl Ketone	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388130	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388163	PHC's F2	GC/FID	2020-08-20	2020-08-20	A_A	CCME
388163	PHC's F3	GC/FID	2020-08-20	2020-08-20	A_A	CCME
388163	PHC's F4	GC/FID	2020-08-20	2020-08-20	A_A	CCME
388163	Moisture-Humidite	Oven	2020-08-20	2020-08-20	A_A	ASTM 2216
388175	PHC's F4g	GC/FID	2020-08-21	2020-08-21	A_A	CCME

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Certificate of Analysis

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E04530

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094
Temperature (C): 5
Custody Seal:

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1511405	45-BH010-SS2	CN (free) MRL elevated due to matrix interference (dilution was done).
Sample ID: 1511407	45-BH012-SS3	CN (free) MRL elevated due to matrix interference (dilution was done).

Report Comments:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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COC #: 859094

O.Reg 153-T1-All Other Soils

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
45-BH010-SS2	Electrical Conductivity	2.15	mS/cm	STD 0.57
45-BH010-SS2	Sodium Adsorption Ratio	14.5		STD 2.4
45-BH011-SS3	Electrical Conductivity	0.92	mS/cm	STD 0.57
45-BH011-SS3	Sodium Adsorption Ratio	5.98		STD 2.4
45-BH012-SS3	Electrical Conductivity	2.04	mS/cm	STD 0.57
45-BH012-SS3	Sodium Adsorption Ratio	14.9		STD 2.4

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Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
				Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
PHC's F1	388283	10	ug/g	STD 25	<10	<10	<10
PHC's F2	388422	10	ug/g	STD 10	<10	<10	<10
PHC's F3	388422	20	ug/g	STD 240	<20	<20	<20
PHC's F4	388422	20	ug/g	STD 120	<20	<20	20

Metals

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
				Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
Antimony	388180	1	ug/g	STD 1.3	<1	<1	<1
Arsenic	388180	1	ug/g	STD 18	3	3	3
Barium	388180	1	ug/g	STD 220	46	37	34
Beryllium	388180	1	ug/g	STD 2.5	<1	<1	<1
Boron (Hot Water Soluble)	388091	0.5	ug/g		<0.5	<0.5	<0.5
Boron (total)	388180	5	ug/g	STD 36	<5	<5	<5
Cadmium	388180	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4
Chromium Total	388180	1	ug/g	STD 70	17	17	14
Chromium VI	388241	0.20	ug/g	STD 0.66	<0.20	0.25	0.29
Cobalt	388180	1	ug/g	STD 21	6	5	6
Copper	388180	1	ug/g	STD 92	20	18	15
Lead	388180	1	ug/g	STD 120	10	8	8
Mercury	388180	0.1	ug/g	STD 0.27	0.1	<0.1	<0.1

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Guideline = O.Reg 153-T1-All Other Soils

Metals

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
				Lab I.D.			
				Sample Matrix			
				Sample Type			
				Sample Date			
				Sampling Time			
				Sample I.D.			
Molybdenum	388180	1	ug/g	STD 2	<1	<1	<1
Nickel	388180	1	ug/g	STD 82	15	13	13
Selenium	388180	1	ug/g	STD 1.5	<1	<1	<1
Silver	388180	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2
Thallium	388180	1	ug/g	STD 1	<1	<1	<1
Uranium	388180	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5
Vanadium	388180	2	ug/g	STD 86	22	17	20
Zinc	388180	2	ug/g	STD 290	52	29	39

PAH

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
				Lab I.D.			
				Sample Matrix			
				Sample Type			
				Sample Date			
				Sampling Time			
				Sample I.D.			
1+2-methylnaphthalene	208523	0.05	ug/g		<0.05	<0.05	<0.05
Acenaphthene	388307	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	388307	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	388307	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	388307	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	388307	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	388307	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05
Benzo[ghi]perylene	388307	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	388307	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05
Chrysene	388307	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	388307	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05

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PAH

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.							
Fluoranthene	388307	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	388307	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	388307	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	388307	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	388307	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Naphthalene	388307	0.05	ug/g	STD 0.09	<0.05	<0.05	<0.05
Phenanthrene	388307	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	388307	0.05	ug/g	STD 1	<0.05	<0.05	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.							
Acetone	388288	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	388283	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Bromodichloromethane	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1511405 Sample Matrix Soil153 Sample Type Sample Date 2020-08-17 Sampling Time Sample I.D. 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Dichlorobenzene, 1,4-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	388283	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	388283	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Ethylene dibromide	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	388288	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	388288	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	388288	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Styrene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Toluene	388283	0.20	ug/g	STD 0.2	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Trichloroethane, 1,1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethylene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	388283	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05
Vinyl Chloride	388283	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Xylene Mixture	388284	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Xylene, m/p-	388283	0.05	ug/g		<0.05	<0.05	<0.05
Xylene, o-	388283	0.05	ug/g		<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Cyanide (CN-)	388331	0.005	ug/g	STD 0.051		<0.005	
		0.02	ug/g	STD 0.051	<0.02		<0.02
Electrical Conductivity	388059	0.05	mS/cm	STD 0.57	2.15*	0.92*	2.04*
pH - CaCl2	388070	2.00			7.78	7.99	7.83
Sodium Adsorption Ratio	388086	0.01		STD 2.4	14.5*	5.98*	14.9*

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Guideline = O.Reg 153-T1-All Other Soils

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Moisture-Humidite	388422	0.1	%		13.5	7.0	10.1

PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Aroclor 1242	388132	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1248	388132	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1254	388132	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1260	388132	0.02	ug/g		<0.02	<0.02	<0.02
Polychlorinated Biphenyls	388132	0.02	ug/g	STD 0.3	<0.02	<0.02	<0.02

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PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Decachlorobiphenyl	388135	0	%		0	0	0

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Alpha-androstrane	388422	0	%		74	78	110

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Guideline = O.Reg 153-T1-All Other Soils

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
1,2-dichloroethane-d4	388283	0	%		103	105	108
4-bromofluorobenzene	388283	0	%		95	95	96
Toluene-d8	388283	0	%		106	106	103

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
388059	Electrical Conductivity	<0.05	97	90-110			3	0-10
388070	pH - CaCl2	5.06	100	90-110			0	
388086	Sodium Adsorption Ratio	<0.01					7	
388091	Boron (Hot Water Soluble)	<0.5 ug/g	92	70-130	91	75-125	0	0-30
388132	Aroclor 1242	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Aroclor 1248	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Aroclor 1254	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Aroclor 1260	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Polychlorinated Biphenyls	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388180	Silver	<0.2 ug/g	108	70-130	138	70-130	0	0-20
388180	Arsenic	<1 ug/g	93	70-130	99	70-130	6	0-20
388180	Boron (total)	<5 ug/g	101	70-130	129	70-130	0	0-20
388180	Barium	<1 ug/g	104	70-130	127	70-130	4	0-20
388180	Beryllium	<1 ug/g	98	70-130	98	70-130	0	0-20
388180	Cadmium	<0.4 ug/g	107	70-130	113	70-130	0	0-20
388180	Cobalt	<1 ug/g	101	70-130	96	70-130	1	0-20
388180	Chromium Total	<1 ug/g	101	70-130	108	70-130	2	0-20
388180	Copper	<1 ug/g	109	70-130	69	70-130	3	0-20
388180	Mercury	<0.1 ug/g	90	70-130	113	70-130	0	0-20
388180	Molybdenum	<1 ug/g	95	70-130	96	70-130	0	0-20
388180	Nickel	<1 ug/g	105	70-130	98	70-130	1	0-20
388180	Lead	<1 ug/g	109	70-130		70-130	99	0-20
388180	Antimony	<1 ug/g	72	70-130	101	70-130	0	0-20
388180	Selenium	<1 ug/g	105	70-130	95	70-130	0	0-20
388180	Thallium	<1 ug/g	109	70-130	104	70-130	0	0-20
388180	Uranium	<0.5 ug/g	103	70-130	107	70-130	0	0-20
388180	Vanadium	<2 ug/g	95	70-130	139	70-130	1	0-20
388180	Zinc	<2 ug/g	112	70-130	177	70-130	2	0-20
388241	Chromium VI	<0.20 ug/g	119	80-120	113	70-130	0	0-35
388283	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	82	60-130	83	50-140	0	0-50
388283	Trichloroethane, 1,1,1-	<0.05 ug/g	105	60-130	90	50-140	0	0-50
388283	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	114	60-130	84	50-140	0	0-30

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M9W 5W8
Attention: Mr. Houshang Akbari
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Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388283	Trichloroethane, 1,1,2-	<0.05 ug/g	104	60-130	88	50-140	0	0-50
388283	Dichloroethane, 1,1-	<0.05 ug/g	94	60-130	64	50-140	0	0-50
388283	Dichloroethylene, 1,1-	<0.05 ug/g	104	60-130	74	50-140	0	0-50
388283	Dichlorobenzene, 1,2-	<0.05 ug/g	113	60-130	94	50-140	0	0-50
388283	Dichloroethane, 1,2-	<0.05 ug/g	103	60-130	100	50-140	0	0-50
388283	Dichloropropane, 1,2-	<0.05 ug/g	111	60-130	96	50-140	0	0-50
388283	Dichlorobenzene, 1,3-	<0.05 ug/g	114	60-130	73	50-140	0	0-50
388283	Dichloropropene,1,3-							
388283	Dichlorobenzene, 1,4-	<0.05 ug/g	105	60-130	102	50-140	0	0-50
388283	Benzene	<0.02 ug/g	116	60-130	91	50-140	0	0-50
388283	Bromodichloromethane	<0.05 ug/g	97	60-130	94	50-140	0	0-50
388283	Bromoform	<0.05 ug/g	100	60-130	80	50-140	0	0-50
388283	Bromomethane	<0.05 ug/g	77	60-130	70	50-140	0	0-50
388283	Dichloroethylene, 1,2-cis-	<0.05 ug/g	103	60-130	90	50-140	0	0-50
388283	Dichloropropene,1,3-cis-	<0.05 ug/g	87	60-130	71	50-140	0	0-50
388283	Carbon Tetrachloride	<0.05 ug/g	83	60-130	87	50-140	0	0-50
388283	Chloroform	<0.05 ug/g	102	60-130	82	50-140	0	0-50
388283	Dibromochloromethane	<0.05 ug/g	105	60-130	91	50-140	0	0-50
388283	Dichlorodifluoromethane	<0.05 ug/g	84	60-130	60	50-140	0	0-50
388283	Methylene Chloride	<0.05 ug/g	110	60-130	102	50-140	0	0-50
388283	Ethylbenzene	<0.05 ug/g	91	60-130	98	50-140	0	0-50
388283	Ethylene dibromide	<0.05 ug/g	102	60-130		50-140		0-50
388283	PHC's F1	<10 ug/g	94	80-120	96	60-140	0	0-30
388283	Hexane (n)	<0.05 ug/g	110	60-130	84	50-140	0	0-50
388283	Xylene, m/p-	<0.05 ug/g	88	60-130	88	50-140	0	0-50
388283	Chlorobenzene	<0.05 ug/g	101	60-130	98	50-140	0	0-50
388283	Xylene, o-	<0.05 ug/g	103	60-130	99	50-140	0	0-50
388283	Styrene	<0.05 ug/g	98	60-130	89	50-140	0	0-50
388283	Dichloroethylene, 1,2-trans-	<0.05 ug/g	116	60-130	87	50-140	0	0-50
388283	Dichloropropene,1,3-trans-	<0.05 ug/g	85	60-130	79	50-140	0	0-50
388283	Tetrachloroethylene	<0.05 ug/g	87	60-130	91	50-140	0	0-50
388283	Toluene	<0.20 ug/g	90	60-130	92	50-140	0	0-50
388283	Trichloroethylene	<0.05 ug/g	105	60-130	93	50-140	0	0-50

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1821 Albion Road, Unit 7
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M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388283	Trichlorofluoromethane	<0.05 ug/g	98	60-130	72	50-140	0	0-50
388283	Vinyl Chloride	<0.02 ug/g	74	60-130	79	50-140	0	0-50
388284	Xylene Mixture							
388288	Acetone	<0.50 ug/g	110	60-130	129	50-140	0	0-50
388288	Methyl Ethyl Ketone	<0.50 ug/g	115	60-130	132	50-140	0	0-50
388288	Methyl Isobutyl Ketone	<0.50 ug/g	112	60-130	126	50-140	0	0-50
388288	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	101	60-130	107	50-140	0	0-50
388307	Methlynaphthalene, 1-	<0.05 ug/g	67	50-140		50-140		0-40
388307	Methlynaphthalene, 2-	<0.05 ug/g	66	50-140		50-140		0-40
388307	Acenaphthene	<0.05 ug/g	84	50-140		50-140		0-40
388307	Acenaphthylene	<0.05 ug/g	82	50-140		50-140		0-40
388307	Anthracene	<0.05 ug/g	92	50-140		50-140		0-40
388307	Benz[a]anthracene	<0.05 ug/g	106	50-140		50-140		0-40
388307	Benzo[a]pyrene	<0.05 ug/g	97	50-140		50-140		0-40
388307	Benzo[b]fluoranthene	<0.05 ug/g	87	50-140		50-140		0-40
388307	Benzo[ghi]perylene	<0.05 ug/g	91	50-140		50-140		0-40
388307	Benzo[k]fluoranthene	<0.05 ug/g	107	50-140				0-40
388307	Chrysene	<0.05 ug/g	84	50-140		50-140		0-40
388307	Dibenz[a h]anthracene	<0.05 ug/g	82	50-140		50-140		0-40
388307	Fluoranthene	<0.05 ug/g	96	50-140		50-140		0-40
388307	Fluorene	<0.05 ug/g	86	50-140		50-140		0-40
388307	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	89	50-140		50-140		0-40
388307	Naphthalene	<0.05 ug/g	71	50-140		50-140		0-40
388307	Phenanthrene	<0.05 ug/g	94	50-140		50-140		0-40
388307	Pyrene	<0.05 ug/g	98	50-140		50-140		0-40
388331	Cyanide (CN-)	<0.005 ug/g	99	75-125	114	70-130	0	0-20
388422	PHC's F2	<10 ug/g	88	80-120	89	60-140	0	0-30
388422	PHC's F3	<20 ug/g	88	80-120	89	60-140	0	0-30
388422	PHC's F4	<20 ug/g	88	80-120	89	60-140	0	0-30
388422	Moisture-Humidite		100	80-120			4	

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-08-25	2020-08-25	C_M	P 8270
388059	Electrical Conductivity	Electrical Conductivity Mete	2020-08-20	2020-08-20	Z_S	Cond-Soil
388070	pH - CaCl2	pH Meter	2020-08-20	2020-08-20	H_D	Ag Soil
388086	Sodium Adsorption Ratio	iCAP OES	2020-08-20	2020-08-20	Z_S	Ag Soil
388091	Boron (Hot Water Soluble)	iCAP OES	2020-08-20	2020-08-20	Z_S	MOECC E3470
388132	Aroclor 1242	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Aroclor 1248	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Aroclor 1254	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Aroclor 1260	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Polychlorinated Biphenyls	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388180	Silver	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Arsenic	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Boron (total)	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Barium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Beryllium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Cadmium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Cobalt	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Chromium Total	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Copper	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Mercury	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Molybdenum	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Nickel	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Lead	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Antimony	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Selenium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Thallium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Uranium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Vanadium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Zinc	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388241	Chromium VI	FAA	2020-08-24	2020-08-24	Z_S	M US EPA 3060A
388283	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Trichloroethane, 1,1,1-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B

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Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388283	Trichloroethane, 1,1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethane, 1,1-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethylene, 1,1-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichlorobenzene, 1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethane, 1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropane, 1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichlorobenzene, 1,3-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropene,1,3-	GC-MS	2020-08-25	2020-08-25	TJB	V 8260B
388283	Dichlorobenzene, 1,4-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Benzene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Bromodichloromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Bromoform	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Bromomethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethylene, 1,2-cis-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropene,1,3-cis-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Carbon Tetrachloride	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Chloroform	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dibromochloromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichlorodifluoromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Methylene Chloride	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Ethylbenzene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Ethylene dibromide	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	PHC's F1	GC/FID	2020-08-25	2020-08-25	TJB	CCME
388283	Hexane (n)	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Xylene, m/p-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Chlorobenzene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Xylene, o-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Styrene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethylene, 1,2-trans-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropene,1,3-trans-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Tetrachloroethylene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Toluene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Trichloroethylene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B

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Certificate of Analysis

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388283	Trichlorofluoromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Vinyl Chloride	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388284	Xylene Mixture	GC-MS	2020-08-25	2020-08-25	TJB	V 8260B
388288	Acetone	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388288	Methyl Ethyl Ketone	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388288	Methyl Isobutyl Ketone	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388288	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388307	Methlynaphthalene, 1-	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Methlynaphthalene, 2-	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Acenaphthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Acenaphthylene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Anthracene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benz[a]anthracene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[a]pyrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[b]fluoranthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[ghi]perylene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[k]fluoranthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Chrysene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Dibenz[a h]anthracene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Fluoranthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Fluorene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Indeno[1 2 3-cd]pyrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Naphthalene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Phenanthrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Pyrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388331	Cyanide (CN-)	Skalar CN Analyzer	2020-08-25	2020-08-25	QT	MOECC E3015
388422	PHC's F2	GC/FID	2020-08-21	2020-08-26	C_M	CCME
388422	PHC's F3	GC/FID	2020-08-21	2020-08-26	C_M	CCME
388422	PHC's F4	GC/FID	2020-08-21	2020-08-26	C_M	CCME
388422	Moisture-Humidite	Oven	2020-08-21	2020-08-26	C_M	ASTM 2216

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eurofins 859094

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 1936890

CLIENT INFORMATION				INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)			
Company:	Englobe Corp			Company:			
Contact:	Houshang Akbari			Contact:			
Address:				Address:			
Telephone:	416-213-1060	Fax:		Telephone:		Fax:	
Email:	#1: houshang.akbari@englobecorp.com			Email:	#1:		
Email:	#2:			Email:	#2:		
Project:	P0021561			PO #:	E 04530	Quote #:	

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
- ☐ Storm Sewer, City: _____
- ☑ O. Reg 153, Table: 1&3, Type: Coarse Soil
- ☐ Excess Soil, Table: _____, Type: _____
- ☐ ODWSOG
- ☐ PWQO
- ☑ O. Reg 347/558
- ☐ Other: _____

TURN-AROUND TIME

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact the laboratory in advance to determine rush availability. Surcharges may apply to rush service.

*If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details				Sample Analysis Required												Field Parameters			RN# (Lab Use Only)
Sample ID	Date/Time Collected	Sample Matrix	Resample? Y = Yes N = No	# of Containers	Metals and Inorganics	Metals (ex. Hg, B, CrVI)	BTEX	VOC	PHC F1-F4	O. Reg 558 M&I	O. Reg 153 M&I	PAHs	PCBs	PHCs(BTEX F1-F4)					
		Field Filtered -->																	
45-BH010-TCLP	August/17/2020			1						✓									
45-BH010-SS2	August/17/2020			4				✓			✓	✓	✓	✓					1511405
45-BH011-TCLP	August/17/2020			1						✓									
45-BH011-SS3	August/17/2020			4				✓			✓	✓	✓	✓					06
45-BH012-TCLP	August/17/2020			1						✓									
45-BH012-SS3	August/17/2020			4				✓			✓	✓	✓	✓					07

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:				
Relinquished By:	Alfred Iskander		Aug 18, 2020 08/18/20 2:38pm	5.1 °C
Received By:	Victor Gallant			

COMMENTS:
Table 1: Residential/Parkland/Institutional/Industrial/Commercial/Community Use.
Table3: Industrial/Commercial/Community Use.

CUSTODY SEAL: YES ☐ NO ☐ Ice inside

Certificate of Analysis

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E04530

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674
Temperature (C): 6
Custody Seal:

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1527313 45-BH02-SS3	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1527314 45-BH013-SS9	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).PCB Surrogate recoveries are not within acceptable limits due to matrix interferences.

Report Comments:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

O.Reg 153-T1-All Other Soils

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Hydrocarbons				
45-BH02-SS3	Petroleum Hydrocarbons F4g	200	ug/g	STD 120
Inorganics				
45-BH013-SS9	Electrical Conductivity	1.13	mS/cm	STD 0.57
45-BH013-SS9	Sodium Adsorption Ratio	12.8		STD 2.4
45-BH02-SS3	Electrical Conductivity	1.44	mS/cm	STD 0.57
45-BH02-SS3	Sodium Adsorption Ratio	40.7		STD 2.4

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COC #: 862674

Guideline = O.Reg 153-T1-All Other Soils

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
PHC's F1	392199	10	ug/g	STD 25	<10	<10	<10	<10
PHC's F2	392171	10	ug/g	STD 10	<10	<10	<10	<10
PHC's F3	392171	20	ug/g	STD 240	<20	<20	<20	<20
PHC's F4	392171	20	ug/g	STD 120	50	40	<20	<20
PHC's F4g	392182	100	ug/g	STD 120	200*	<100		

Metals

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Antimony	392194	1	ug/g	STD 1.3	<1	<1	<1	<1
Arsenic	392194	1	ug/g	STD 18	3	3	1	4
Barium	392194	1	ug/g	STD 220	37	32	19	60
Beryllium	392194	1	ug/g	STD 2.5	<1	<1	<1	<1
Boron (Hot Water Soluble)	392281	0.5	ug/g		0.6	<0.5	<0.5	<0.5
Boron (total)	392194	5	ug/g	STD 36	6	<5	<5	7
Cadmium	392194	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4
Chromium Total	392194	1	ug/g	STD 70	11	12	9	21
Chromium VI	392196	0.20	ug/g	STD 0.66	<0.20	0.29	0.20	0.41
Cobalt	392194	1	ug/g	STD 21	4	4	2	7
Copper	392194	1	ug/g	STD 92	19	19	8	23
Lead	392194	1	ug/g	STD 120	6	16	3	12
Mercury	392194	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1	<0.1

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M9W 5W8
Attention: Mr. Houshang Akbari
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Invoice to: EnGlobe Corp.

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Guideline = O.Reg 153-T1-All Other Soils

Metals

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Molybdenum	392194	1	ug/g	STD 2	<1	<1	<1	<1
Nickel	392194	1	ug/g	STD 82	9	10	6	17
Selenium	392194	1	ug/g	STD 1.5	<1	<1	<1	<1
Silver	392194	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2
Thallium	392194	1	ug/g	STD 1	<1	<1	<1	<1
Uranium	392194	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5	<0.5
Vanadium	392194	2	ug/g	STD 86	17	17	12	22
Zinc	392194	2	ug/g	STD 290	29	34	13	50

PAH

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
1+2-methylnaphthalene	208523	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Acenaphthene	391385	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	391385	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	391385	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05	0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05
Chrysene	391385	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05

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PAH

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Fluoranthene	391385	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05	0.07
Fluorene	391385	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	391385	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05
Naphthalene	391385	0.05	ug/g	STD 0.09	<0.05	<0.05	<0.05	<0.05
Phenanthrene	391385	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	0.05
Pyrene	391385	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	0.06

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Acetone	392197	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50
Benzene	392197	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Dichlorobenzene, 1,4-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Ethylbenzene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	392197	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	392197	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Styrene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Toluene	392197	0.20	ug/g	STD 0.2	<0.20	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05

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1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Guideline = O.Reg 153-T1-All Other Soils

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Trichloroethane, 1,1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	392197	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	392197	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	392198	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Xylene, o-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Cyanide (CN-)	392209	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005
Electrical Conductivity	392187	0.05	mS/cm	STD 0.57	1.44*	1.13*	0.20	0.20
pH - CaCl2	392178	2.00			7.78	7.67	7.77	7.67
Sodium Adsorption Ratio	392270	0.01		STD 2.4	40.7*	12.8*	0.98	0.71

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Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Moisture-Humidite	392171	0.1	%		12.1	8.2	18.4	6.0

PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Aroclor 1242	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Aroclor 1248	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Aroclor 1254	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Aroclor 1260	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Polychlorinated Biphenyls	392238	0.02	ug/g	STD 0.3	<0.02	<0.02	<0.02	<0.02

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PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Decachlorobiphenyl	208523	1	%		60	32	62	63

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Alpha-androstrane	392171	0	%		60	73	64	70

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
1,2-dichloroethane-d4	392197	0	%		88	86	88	93
4-bromofluorobenzene	392197	0	%		107	106	105	105
Toluene-d8	392197	0	%		96	96	94	92

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
391385	Methlynaphthalene, 1-	<0.05 ug/g	83	50-140	68	50-140	0	0-40
391385	Methlynaphthalene, 2-	<0.05 ug/g	82	50-140	67	50-140	0	0-40
391385	Acenaphthene	<0.05 ug/g	78	50-140	63	50-140	0	0-40
391385	Acenaphthylene	<0.05 ug/g	66	50-140	63	50-140	0	0-40
391385	Anthracene	<0.05 ug/g	82	50-140	63	50-140	0	0-40
391385	Benz[a]anthracene	<0.05 ug/g	72	50-140	61	50-140	0	0-40
391385	Benzo[a]pyrene	<0.05 ug/g	56	50-140	55	50-140	0	0-40
391385	Benzo[b]fluoranthene	<0.05 ug/g	70	50-140	48	50-140	0	0-40
391385	Benzo[ghi]perylene	<0.05 ug/g	65	50-140	60	50-140	0	0-40
391385	Benzo[k]fluoranthene	<0.05 ug/g	92	50-140	81		0	0-40
391385	Chrysene	<0.05 ug/g	92	50-140	73	50-140	0	0-40
391385	Dibenz[a h]anthracene	<0.05 ug/g	65	50-140	54	50-140	0	0-40
391385	Fluoranthene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391385	Fluorene	<0.05 ug/g	78	50-140	60	50-140	0	0-40
391385	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	58	50-140	61	50-140	0	0-40
391385	Naphthalene	<0.05 ug/g	79	50-140	66	50-140	0	0-40
391385	Phenanthrene	<0.05 ug/g	81	50-140	62	50-140	0	0-40
391385	Pyrene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
392171	PHC's F2	<10 ug/g	100	80-120	104	60-140	0	0-30
392171	PHC's F3	<20 ug/g	100	80-120	104	60-140	0	0-30
392171	PHC's F4	<20 ug/g	100	80-120	104	60-140	0	0-30
392171	Moisture-Humidite		100	80-120			2	
392178	pH - CaCl2	5.05	100	90-110			0	
392182	PHC's F4g	<100 ug/g		80-120		60-140		0-30
392187	Electrical Conductivity	<0.05	99	90-110			2	0-10
392194	Silver	<0.2 ug/g	101	70-130	102	70-130	0	0-20
392194	Arsenic	<1 ug/g	91	70-130	100	70-130	0	0-20
392194	Boron (total)	<5 ug/g	95	70-130	103	70-130	0	0-20
392194	Barium	<1 ug/g	90	70-130	113	70-130	2	0-20
392194	Beryllium	<1 ug/g	96	70-130	93	70-130	0	0-20
392194	Cadmium	<0.4 ug/g	95	70-130	100	70-130	0	0-20
392194	Cobalt	<1 ug/g	89	70-130	92	70-130	0	0-20

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
392194	Chromium Total	<1 ug/g	91	70-130	105	70-130	5	0-20
392194	Copper	<1 ug/g	119	70-130	90	70-130	6	0-20
392194	Mercury	<0.1 ug/g	89	70-130	95	70-130	0	0-20
392194	Molybdenum	<1 ug/g	84	70-130	92	70-130	0	0-20
392194	Nickel	<1 ug/g	98	70-130	92	70-130	1	0-20
392194	Lead	<1 ug/g	95	70-130	98	70-130	3	0-20
392194	Antimony	<1 ug/g	74	70-130	96	70-130	0	0-20
392194	Selenium	<1 ug/g	102	70-130	97	70-130	0	0-20
392194	Thallium	<1 ug/g	95	70-130	98	70-130	0	0-20
392194	Uranium	<0.5 ug/g	86	70-130	97	70-130	0	0-20
392194	Vanadium	<2 ug/g	87	70-130	104	70-130	3	0-20
392194	Zinc	<2 ug/g	101	70-130	97	70-130	4	0-20
392196	Chromium VI	<0.20 ug/g	113	80-120	89	70-130	0	0-35
392197	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Trichloroethane, 1,1,1-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	90	60-130		50-140	0	0-30
392197	Trichloroethane, 1,1,2-	<0.05 ug/g	95	60-130		50-140	0	0-50
392197	Dichloroethane, 1,1-	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Dichloroethylene, 1,1-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Dichlorobenzene, 1,2-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Dichloroethane, 1,2-	<0.05 ug/g	92	60-130		50-140	0	0-50
392197	Dichloropropane, 1,2-	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Dichlorobenzene, 1,3-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Dichloropropene,1,3-							
392197	Dichlorobenzene, 1,4-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Acetone	<0.50 ug/g	100	60-130		50-140	0	0-50
392197	Benzene	<0.02 ug/g	97	60-130		50-140	0	0-50
392197	Bromodichloromethane	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Bromoform	<0.05 ug/g	88	60-130		50-140	0	0-50
392197	Bromomethane	<0.05 ug/g	238	60-130	113	50-140	0	0-50
392197	Dichloroethylene, 1,2-cis-	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Dichloropropene,1,3-cis-	<0.05 ug/g	85	60-130		50-140	0	0-50
392197	Carbon Tetrachloride	<0.05 ug/g	101	60-130		50-140	0	0-50

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392197	Chloroform	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Dibromochloromethane	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Dichlorodifluoromethane	<0.05 ug/g	110	60-130	64	50-140	0	0-50
392197	Methylene Chloride	<0.05 ug/g	117	60-130		50-140	0	0-50
392197	Ethylbenzene	<0.05 ug/g	104	60-130		50-140	0	0-50
392197	Ethylene dibromide	<0.05 ug/g	90	60-130		50-140	0	0-50
392197	Hexane (n)	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Xylene, m/p-	<0.05 ug/g	107	60-130		50-140	0	0-50
392197	Methyl Ethyl Ketone	<0.50 ug/g	76	60-130		50-140	0	0-50
392197	Methyl Isobutyl Ketone	<0.50 ug/g	78	60-130		50-140	0	0-50
392197	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	91	60-130		50-140	0	0-50
392197	Chlorobenzene	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Xylene, o-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Styrene	<0.05 ug/g	97	60-130		50-140	0	0-50
392197	Dichloroethylene, 1,2-trans-	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Dichloropropene,1,3-trans-	<0.05 ug/g	85	60-130		50-140	0	0-50
392197	Tetrachloroethylene	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Toluene	<0.20 ug/g	100	60-130		50-140	0	0-50
392197	Trichloroethylene	<0.05 ug/g	98	60-130		50-140	0	0-50
392197	Trichlorofluoromethane	<0.05 ug/g	104	60-130	117	50-140	0	0-50
392197	Vinyl Chloride	<0.02 ug/g	100	60-130	92	50-140	0	0-50
392198	Xylene Mixture							
392199	PHC's F1	<10 ug/g	92	80-120	107	60-140		0-30
392209	Cyanide (CN-)	<0.005 ug/g	100	75-125	106	70-130	0	0-20
392238	Aroclor 1242	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Aroclor 1248	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Aroclor 1254	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Aroclor 1260	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Polychlorinated Biphenyls	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392270	Sodium Adsorption Ratio	<0.01					0	
392281	Boron (Hot Water Soluble)	<0.5 ug/g	82	70-130	93	75-125	0	0-30

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Certificate of Analysis

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-11-12	2020-11-12	C_M	P 8270
391385	Methlynaphthalene, 1-	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Methlynaphthalene, 2-	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Acenaphthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Acenaphthylene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Anthracene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benz[a]anthracene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[a]pyrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[b]fluoranthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[ghi]perylene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[k]fluoranthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Chrysene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Dibenz[a h]anthracene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Fluoranthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Fluorene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Indeno[1 2 3-cd]pyrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Naphthalene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Phenanthrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Pyrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
392171	PHC's F2	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392171	PHC's F3	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392171	PHC's F4	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392171	Moisture-Humidite	Oven	2020-11-11	2020-11-11	A_A	ASTM 2216
392178	pH - CaCl2	pH Meter	2020-11-11	2020-11-11	R_R	Ag Soil
392182	PHC's F4g	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392187	Electrical Conductivity	Electrical Conductivity Mete	2020-11-11	2020-11-11	Z_S	Cond-Soil
392194	Silver	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Arsenic	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Boron (total)	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Barium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Beryllium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Cadmium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Cobalt	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8

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Report Number: 1942592
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Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
392194	Chromium Total	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Copper	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Mercury	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Molybdenum	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Nickel	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Lead	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Antimony	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Selenium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Thallium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Uranium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Vanadium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Zinc	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392196	Chromium VI	FAA	2020-11-11	2020-11-11	Z_S	M US EPA 3060A
392197	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichloroethane, 1,1,1-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichloroethane, 1,1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethane, 1,1-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethylene, 1,1-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorobenzene, 1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethane, 1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropane, 1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorobenzene, 1,3-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropene,1,3-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorobenzene, 1,4-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Acetone	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Benzene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Bromodichloromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Bromoform	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Bromomethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethylene, 1,2-cis-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropene,1,3-cis-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Carbon Tetrachloride	GC-MS	2020-11-09	2020-11-09	YH	V 8260B

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Report Number: 1942592
Date Submitted: 2020-11-06
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Project: P0021561
COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
392197	Chloroform	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dibromochloromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorodifluoromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methylene Chloride	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Ethylbenzene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Ethylene dibromide	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Hexane (n)	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Xylene, m/p-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methyl Ethyl Ketone	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methyl Isobutyl Ketone	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Chlorobenzene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Xylene, o-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Styrene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethylene, 1,2-trans-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropene,1,3-trans-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Tetrachloroethylene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Toluene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichloroethylene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichlorofluoromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Vinyl Chloride	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392198	Xylene Mixture	GC-MS	2020-11-11	2020-11-11	YH	V 8260B
392199	PHC's F1	GC/FID	2020-11-09	2020-11-09	YH	CCME
392209	Cyanide (CN-)	Skalar CN Analyzer	2020-11-11	2020-11-11	QT	MOECC E3015
392238	Aroclor 1242	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Aroclor 1248	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Aroclor 1254	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Aroclor 1260	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Polychlorinated Biphenyls	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392270	Sodium Adsorption Ratio	iCAP OES	2020-11-12	2020-11-12	Z_S	Ag Soil
392281	Boron (Hot Water Soluble)	iCAP OES	2020-11-12	2020-11-12	Z_S	MOECC E3470

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COC #: 862674

Petroleum Hydrocarbons - CCME Checklist

Samples were analysed by Eurofins Ottawa Method AMCCME2, "Petroleum Hydrocarbons in Water and Soil, CCME/TPH", "Petroleum Hydrocarbons in Water and Soil, CCME/TPH". These methods comply with the reference method for the CCME CWS PHC and are validated for use in the laboratory. Eurofins Ottawa is accredited by CALA (ISO 17025) for all CCME F1-F4 fractions as listed in this report. Eurofins Mississauga is accredited by SCC (ISO 17025) for all CCME F1-F4 fractions as listed in this report. Data for QC samples (blank, duplicate, spike) are available on request

Holding/Analysis Times	Yes/No	If NO, then reasons
All fractions analyzed within recommended hold times/analysis times?	Yes	
F1		
nC6 and nC10 response factors within 30% of toluene	Yes	
BTEX was subtracted from F1 fraction	Yes	
If YES, was F1-BTEX (C6-C10) reported	Yes	
F2		
nC10, nC16 and nC34 response factors within 10% of their average (F2-F4)	Yes	
Linearity within 15% (F2-F4)	Yes	
Napthalene was subtracted from F2 fraction		Naphthalene (PAH) not requested/analysed
If YES was F2-Napthalene reported		
F3		
PAH (selected compounds) subtracted from F3 fraction		PAH not requested/analysed
If YES was F3-PAH reported		
F4		
C50 response factor within 70% of nC10+nC16+nC34 average	Yes	
Chromatogram descended to baseline by retention time of C50	Yes	
if NO was F4 (C34-C50) gravimetric reported		

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eurofins 862674

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 1942592

CLIENT INFORMATION				INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)			
Company:	Englobe Corp			Company:			
Contact:	Houshang Akbari			Contact:			
Address:				Address:			
Telephone:	416-213-1060	Fax:		Telephone:		Fax:	
Email:	#1: houshang.akbari@englobecorp.com			Email:	#1:		
Email:	#2:			Email:	#2:		
Project:	P0021561			PO #:	E 04530	Quote #:	

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
- ☐ Storm Sewer, City: _____
- ☑ O. Reg 153, Table: 1&3, Type: Coarse Soil
- ☐ Excess Soil, Table: _____, Type: _____
- ☐ ODWSOG
- ☐ PWQO
- ☑ O. Reg 347/558
- ☐ Other: _____

TURN-AROUND TIME

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact the laboratory in advance to determine rush availability. Surcharges may apply to rush service.

*If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample ID	Date/Time Collected	Sample Details: Sample Matrix	Field Filtered --> Resample? Y = Yes N = No	# of Containers	Metals and Inorganics	Metals (ex. Hg, B, CrVI)	BTEX	VOC	PHC F1-F4	O. Reg 558 M&I	O. Reg 153 M&I	PAHs	PCBs	PHCs(BTEX F1-F4)			Field Parameters			RN# (Lab Use Only)
45-BH02-TCLP	Nov/5/2020			1						✓										
45-BH02-SS3	Nov/5/2020			4				✓			✓	✓	✓	✓						1527313
45-BH013-TCLP	Nov/5/2020			1						✓										
45-BH013-SS9	Nov/5/2020			4				✓			✓	✓	✓	✓						14
45-BH014-TCLP	Nov/4/2020			1						✓										
45-BH014-SS9	Nov/4/2020			4				✓			✓	✓	✓	✓						15
45-BH015-TCLP	Nov/4/2020			1						✓										
45-BH015-SS3	Nov/4/2020			4				✓			✓	✓	✓	✓						16

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:				
Relinquished By:	Alfred Iskander		Nov-6-2020	
Received By:	Victor Ballard	D.G.	11/06/20 2:15pm	6.1 °C

COMMENTS:
Table 1:
Residential/Parkland/Institutional/Industrial/Commercial/Community Use.
Table3: Industrial/Commercial/Community Use.

CUSTODY SEAL: YES ☐ NO ☐ Ice inside

Certificate of Analysis

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1821 Albion Road, Unit 7
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M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E04530

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094
Temperature (C): 5
Custody Seal:

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1511405	45-BH010-SS2	CN (free) MRL elevated due to matrix interference (dilution was done).
Sample ID: 1511407	45-BH012-SS3	CN (free) MRL elevated due to matrix interference (dilution was done).

Report Comments:

Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Report Number: 1936890
Date Submitted: 2020-08-18
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Project: P0021561
COC #: 859094

Excess Soil-T3.1-Ind/Cml/Comm

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
45-BH010-SS2	Electrical Conductivity	2.15	mS/cm	STD 1.4
45-BH010-SS2	Sodium Adsorption Ratio	14.5		STD 12
45-BH012-SS3	Electrical Conductivity	2.04	mS/cm	STD 1.4
45-BH012-SS3	Sodium Adsorption Ratio	14.9		STD 12

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COC #: 859094

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.							
PHC's F1	388283	10	ug/g	STD 25	<10	<10	<10
PHC's F2	388422	10	ug/g	STD 26	<10	<10	<10
PHC's F3	388422	20	ug/g	STD 1700	<20	<20	<20
PHC's F4	388422	20	ug/g	STD 3300	<20	<20	20

Metals

Analyte	Batch No	MRL	Units	Guideline	1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.							
Antimony	388180	1	ug/g	STD 40	<1	<1	<1
Arsenic	388180	1	ug/g	STD 18	3	3	3
Barium	388180	1	ug/g	STD 670	46	37	34
Beryllium	388180	1	ug/g	STD 8	<1	<1	<1
Boron (Hot Water Soluble)	388091	0.5	ug/g	STD 2	<0.5	<0.5	<0.5
Boron (total)	388180	5	ug/g		<5	<5	<5
Cadmium	388180	0.4	ug/g	STD 1.9	<0.4	<0.4	<0.4
Chromium Total	388180	1	ug/g		17	17	14
Chromium VI	388241	0.20	ug/g	STD 8	<0.20	0.25	0.29
Cobalt	388180	1	ug/g	STD 80	6	5	6
Copper	388180	1	ug/g	STD 230	20	18	15
Lead	388180	1	ug/g	STD 120	10	8	8
Mercury	388180	0.1	ug/g	STD 0.27	0.1	<0.1	<0.1

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Project: P0021561
COC #: 859094

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1511405	1511406	1511407
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-08-17	2020-08-17	2020-08-17
Sampling Time							
Sample I.D.					45-BH010-SS2	45-BH011-SS3	45-BH012-SS3
Molybdenum	388180	1	ug/g	STD 40	<1	<1	<1
Nickel	388180	1	ug/g	STD 270	15	13	13
Selenium	388180	1	ug/g	STD 5.5	<1	<1	<1
Silver	388180	0.2	ug/g	STD 40	<0.2	<0.2	<0.2
Thallium	388180	1	ug/g	STD 3.3	<1	<1	<1
Uranium	388180	0.5	ug/g	STD 33	<0.5	<0.5	<0.5
Vanadium	388180	2	ug/g	STD 86	22	17	20
Zinc	388180	2	ug/g	STD 340	52	29	39

PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1511405	1511406	1511407
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-08-17	2020-08-17	2020-08-17
Sampling Time							
Sample I.D.					45-BH010-SS2	45-BH011-SS3	45-BH012-SS3
1+2-methylnaphthalene	208523	0.05	ug/g	STD 8.7	<0.05	<0.05	<0.05
Acenaphthene	388307	0.05	ug/g	STD 8.5	<0.05	<0.05	<0.05
Acenaphthylene	388307	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	388307	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	388307	0.05	ug/g	STD 1	<0.05	<0.05	<0.05
Benzo[a]pyrene	388307	0.05	ug/g	STD 0.7	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	388307	0.05	ug/g	STD 7	<0.05	<0.05	<0.05
Benzo[ghi]perylene	388307	0.05	ug/g	STD 13	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	388307	0.05	ug/g	STD 7	<0.05	<0.05	<0.05
Chrysene	388307	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	388307	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05

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M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Fluoranthene	388307	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05
Fluorene	388307	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	388307	0.05	ug/g	STD 0.76	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	388307	0.05	ug/g		<0.05	<0.05	<0.05
Methlynaphthalene, 2-	388307	0.05	ug/g		<0.05	<0.05	<0.05
Naphthalene	388307	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05
Phenanthrene	388307	0.05	ug/g	STD 12	<0.05	<0.05	<0.05
Pyrene	388307	0.05	ug/g	STD 70	<0.05	<0.05	<0.05

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Acetone	388288	0.50	ug/g	STD 1.8	<0.50	<0.50	<0.50
Benzene	388283	0.02	ug/g	STD 0.034	<0.02	<0.02	<0.02
Bromodichloromethane	388283	0.05	ug/g	STD 5.8	<0.05	<0.05	<0.05
Bromoform	388283	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05
Bromomethane	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	388283	0.05	ug/g	STD 0.28	<0.05	<0.05	<0.05
Chloroform	388283	0.05	ug/g	STD 0.26	<0.05	<0.05	<0.05
Dibromochloromethane	388283	0.05	ug/g	STD 5.5	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	388283	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	388283	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1511405	1511406	1511407
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-08-17	2020-08-17	2020-08-17
Sampling Time							
Sample I.D.					45-BH010-SS2	45-BH011-SS3	45-BH012-SS3
Dichlorobenzene, 1,4-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	388283	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	388283	0.05	ug/g	STD 0.57	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	388283	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	388283	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	388283	0.05	ug/g	STD 1.9	<0.05	<0.05	<0.05
Ethylene dibromide	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	388283	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	388288	0.50	ug/g	STD 26	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	388288	0.50	ug/g	STD 17	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	388288	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	388283	0.05	ug/g	STD 0.2	<0.05	<0.05	<0.05
Styrene	388283	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Toluene	388283	0.20	ug/g	STD 7.8	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	388283	0.05	ug/g	STD 0.4	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Trichloroethane, 1,1,2-	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethylene	388283	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	388283	0.05	ug/g	STD 0.46	<0.05	<0.05	<0.05
Vinyl Chloride	388283	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Xylene Mixture	388284	0.05	ug/g	STD 3	<0.05	<0.05	<0.05
Xylene, m/p-	388283	0.05	ug/g		<0.05	<0.05	<0.05
Xylene, o-	388283	0.05	ug/g		<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Cyanide (CN-)	388331	0.005	ug/g	STD 0.051		<0.005	
		0.02	ug/g	STD 0.051	<0.02		<0.02
Electrical Conductivity	388059	0.05	mS/cm	STD 1.4	2.15*	0.92	2.04*
pH - CaCl2	388070	2.00			7.78	7.99	7.83
Sodium Adsorption Ratio	388086	0.01		STD 12	14.5*	5.98	14.9*

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Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Moisture-Humidite	388422	0.1	%		13.5	7.0	10.1

PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Aroclor 1242	388132	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1248	388132	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1254	388132	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1260	388132	0.02	ug/g		<0.02	<0.02	<0.02
Polychlorinated Biphenyls	388132	0.02	ug/g	STD 0.78	<0.02	<0.02	<0.02

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PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Decachlorobiphenyl	388135	0	%		0	0	0

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
Alpha-androstrane	388422	0	%		74	78	110

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1511405 Soil153 2020-08-17 45-BH010-SS2	1511406 Soil153 2020-08-17 45-BH011-SS3	1511407 Soil153 2020-08-17 45-BH012-SS3
1,2-dichloroethane-d4	388283	0	%		103	105	108
4-bromofluorobenzene	388283	0	%		95	95	96
Toluene-d8	388283	0	%		106	106	103

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
388059	Electrical Conductivity	<0.05	97	90-110			3	0-10
388070	pH - CaCl2	5.06	100	90-110			0	
388086	Sodium Adsorption Ratio	<0.01					7	
388091	Boron (Hot Water Soluble)	<0.5 ug/g	92	70-130	91	75-125	0	0-30
388132	Aroclor 1242	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Aroclor 1248	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Aroclor 1254	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Aroclor 1260	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388132	Polychlorinated Biphenyls	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388180	Silver	<0.2 ug/g	108	70-130	138	70-130	0	0-20
388180	Arsenic	<1 ug/g	93	70-130	99	70-130	6	0-20
388180	Boron (total)	<5 ug/g	101	70-130	129	70-130	0	0-20
388180	Barium	<1 ug/g	104	70-130	127	70-130	4	0-20
388180	Beryllium	<1 ug/g	98	70-130	98	70-130	0	0-20
388180	Cadmium	<0.4 ug/g	107	70-130	113	70-130	0	0-20
388180	Cobalt	<1 ug/g	101	70-130	96	70-130	1	0-20
388180	Chromium Total	<1 ug/g	101	70-130	108	70-130	2	0-20
388180	Copper	<1 ug/g	109	70-130	69	70-130	3	0-20
388180	Mercury	<0.1 ug/g	90	70-130	113	70-130	0	0-20
388180	Molybdenum	<1 ug/g	95	70-130	96	70-130	0	0-20
388180	Nickel	<1 ug/g	105	70-130	98	70-130	1	0-20
388180	Lead	<1 ug/g	109	70-130		70-130	99	0-20
388180	Antimony	<1 ug/g	72	70-130	101	70-130	0	0-20
388180	Selenium	<1 ug/g	105	70-130	95	70-130	0	0-20
388180	Thallium	<1 ug/g	109	70-130	104	70-130	0	0-20
388180	Uranium	<0.5 ug/g	103	70-130	107	70-130	0	0-20
388180	Vanadium	<2 ug/g	95	70-130	139	70-130	1	0-20
388180	Zinc	<2 ug/g	112	70-130	177	70-130	2	0-20
388241	Chromium VI	<0.20 ug/g	119	80-120	113	70-130	0	0-35
388283	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	82	60-130	83	50-140	0	0-50
388283	Trichloroethane, 1,1,1-	<0.05 ug/g	105	60-130	90	50-140	0	0-50
388283	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	114	60-130	84	50-140	0	0-30

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Quality Assurance Summary

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388283	Trichloroethane, 1,1,2-	<0.05 ug/g	104	60-130	88	50-140	0	0-50
388283	Dichloroethane, 1,1-	<0.05 ug/g	94	60-130	64	50-140	0	0-50
388283	Dichloroethylene, 1,1-	<0.05 ug/g	104	60-130	74	50-140	0	0-50
388283	Dichlorobenzene, 1,2-	<0.05 ug/g	113	60-130	94	50-140	0	0-50
388283	Dichloroethane, 1,2-	<0.05 ug/g	103	60-130	100	50-140	0	0-50
388283	Dichloropropane, 1,2-	<0.05 ug/g	111	60-130	96	50-140	0	0-50
388283	Dichlorobenzene, 1,3-	<0.05 ug/g	114	60-130	73	50-140	0	0-50
388283	Dichloropropene,1,3-							
388283	Dichlorobenzene, 1,4-	<0.05 ug/g	105	60-130	102	50-140	0	0-50
388283	Benzene	<0.02 ug/g	116	60-130	91	50-140	0	0-50
388283	Bromodichloromethane	<0.05 ug/g	97	60-130	94	50-140	0	0-50
388283	Bromoform	<0.05 ug/g	100	60-130	80	50-140	0	0-50
388283	Bromomethane	<0.05 ug/g	77	60-130	70	50-140	0	0-50
388283	Dichloroethylene, 1,2-cis-	<0.05 ug/g	103	60-130	90	50-140	0	0-50
388283	Dichloropropene,1,3-cis-	<0.05 ug/g	87	60-130	71	50-140	0	0-50
388283	Carbon Tetrachloride	<0.05 ug/g	83	60-130	87	50-140	0	0-50
388283	Chloroform	<0.05 ug/g	102	60-130	82	50-140	0	0-50
388283	Dibromochloromethane	<0.05 ug/g	105	60-130	91	50-140	0	0-50
388283	Dichlorodifluoromethane	<0.05 ug/g	84	60-130	60	50-140	0	0-50
388283	Methylene Chloride	<0.05 ug/g	110	60-130	102	50-140	0	0-50
388283	Ethylbenzene	<0.05 ug/g	91	60-130	98	50-140	0	0-50
388283	Ethylene dibromide	<0.05 ug/g	102	60-130		50-140		0-50
388283	PHC's F1	<10 ug/g	94	80-120	96	60-140	0	0-30
388283	Hexane (n)	<0.05 ug/g	110	60-130	84	50-140	0	0-50
388283	Xylene, m/p-	<0.05 ug/g	88	60-130	88	50-140	0	0-50
388283	Chlorobenzene	<0.05 ug/g	101	60-130	98	50-140	0	0-50
388283	Xylene, o-	<0.05 ug/g	103	60-130	99	50-140	0	0-50
388283	Styrene	<0.05 ug/g	98	60-130	89	50-140	0	0-50
388283	Dichloroethylene, 1,2-trans-	<0.05 ug/g	116	60-130	87	50-140	0	0-50
388283	Dichloropropene,1,3-trans-	<0.05 ug/g	85	60-130	79	50-140	0	0-50
388283	Tetrachloroethylene	<0.05 ug/g	87	60-130	91	50-140	0	0-50
388283	Toluene	<0.20 ug/g	90	60-130	92	50-140	0	0-50
388283	Trichloroethylene	<0.05 ug/g	105	60-130	93	50-140	0	0-50

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388283	Trichlorofluoromethane	<0.05 ug/g	98	60-130	72	50-140	0	0-50
388283	Vinyl Chloride	<0.02 ug/g	74	60-130	79	50-140	0	0-50
388284	Xylene Mixture							
388288	Acetone	<0.50 ug/g	110	60-130	129	50-140	0	0-50
388288	Methyl Ethyl Ketone	<0.50 ug/g	115	60-130	132	50-140	0	0-50
388288	Methyl Isobutyl Ketone	<0.50 ug/g	112	60-130	126	50-140	0	0-50
388288	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	101	60-130	107	50-140	0	0-50
388307	Methlynaphthalene, 1-	<0.05 ug/g	67	50-140		50-140		0-40
388307	Methlynaphthalene, 2-	<0.05 ug/g	66	50-140		50-140		0-40
388307	Acenaphthene	<0.05 ug/g	84	50-140		50-140		0-40
388307	Acenaphthylene	<0.05 ug/g	82	50-140		50-140		0-40
388307	Anthracene	<0.05 ug/g	92	50-140		50-140		0-40
388307	Benz[a]anthracene	<0.05 ug/g	106	50-140		50-140		0-40
388307	Benzo[a]pyrene	<0.05 ug/g	97	50-140		50-140		0-40
388307	Benzo[b]fluoranthene	<0.05 ug/g	87	50-140		50-140		0-40
388307	Benzo[ghi]perylene	<0.05 ug/g	91	50-140		50-140		0-40
388307	Benzo[k]fluoranthene	<0.05 ug/g	107	50-140				0-40
388307	Chrysene	<0.05 ug/g	84	50-140		50-140		0-40
388307	Dibenz[a h]anthracene	<0.05 ug/g	82	50-140		50-140		0-40
388307	Fluoranthene	<0.05 ug/g	96	50-140		50-140		0-40
388307	Fluorene	<0.05 ug/g	86	50-140		50-140		0-40
388307	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	89	50-140		50-140		0-40
388307	Naphthalene	<0.05 ug/g	71	50-140		50-140		0-40
388307	Phenanthrene	<0.05 ug/g	94	50-140		50-140		0-40
388307	Pyrene	<0.05 ug/g	98	50-140		50-140		0-40
388331	Cyanide (CN-)	<0.005 ug/g	99	75-125	114	70-130	0	0-20
388422	PHC's F2	<10 ug/g	88	80-120	89	60-140	0	0-30
388422	PHC's F3	<20 ug/g	88	80-120	89	60-140	0	0-30
388422	PHC's F4	<20 ug/g	88	80-120	89	60-140	0	0-30
388422	Moisture-Humidite		100	80-120			4	

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Report Number: 1936890
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COC #: 859094

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-08-25	2020-08-25	C_M	P 8270
388059	Electrical Conductivity	Electrical Conductivity Mete	2020-08-20	2020-08-20	Z_S	Cond-Soil
388070	pH - CaCl2	pH Meter	2020-08-20	2020-08-20	H_D	Ag Soil
388086	Sodium Adsorption Ratio	iCAP OES	2020-08-20	2020-08-20	Z_S	Ag Soil
388091	Boron (Hot Water Soluble)	iCAP OES	2020-08-20	2020-08-20	Z_S	MOECC E3470
388132	Aroclor 1242	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Aroclor 1248	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Aroclor 1254	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Aroclor 1260	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388132	Polychlorinated Biphenyls	GC/ECD	2020-08-20	2020-08-20	YH	EPA 8081B/8082A
388180	Silver	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Arsenic	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Boron (total)	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Barium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Beryllium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Cadmium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Cobalt	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Chromium Total	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Copper	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Mercury	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Molybdenum	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Nickel	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Lead	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Antimony	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Selenium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Thallium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Uranium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Vanadium	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388180	Zinc	ICAPQ-MS	2020-08-21	2020-08-21	H_D	EPA 200.8
388241	Chromium VI	FAA	2020-08-24	2020-08-24	Z_S	M US EPA 3060A
388283	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Trichloroethane, 1,1,1-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B

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M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388283	Trichloroethane, 1,1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethane, 1,1-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethylene, 1,1-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichlorobenzene, 1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethane, 1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropane, 1,2-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichlorobenzene, 1,3-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropene,1,3-	GC-MS	2020-08-25	2020-08-25	TJB	V 8260B
388283	Dichlorobenzene, 1,4-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Benzene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Bromodichloromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Bromoform	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Bromomethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethylene, 1,2-cis-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropene,1,3-cis-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Carbon Tetrachloride	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Chloroform	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dibromochloromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichlorodifluoromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Methylene Chloride	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Ethylbenzene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Ethylene dibromide	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	PHC's F1	GC/FID	2020-08-25	2020-08-25	TJB	CCME
388283	Hexane (n)	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Xylene, m/p-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Chlorobenzene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Xylene, o-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Styrene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloroethylene, 1,2-trans-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Dichloropropene,1,3-trans-	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Tetrachloroethylene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Toluene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Trichloroethylene	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B

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Certificate of Analysis

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1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936890
Date Submitted: 2020-08-18
Date Reported: 2020-08-26
Project: P0021561
COC #: 859094

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388283	Trichlorofluoromethane	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388283	Vinyl Chloride	GC-MS	2020-08-19	2020-08-22	TJB	V 8260B
388284	Xylene Mixture	GC-MS	2020-08-25	2020-08-25	TJB	V 8260B
388288	Acetone	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388288	Methyl Ethyl Ketone	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388288	Methyl Isobutyl Ketone	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388288	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-08-20	2020-08-22	TJB	V 8260B
388307	Methlynaphthalene, 1-	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Methlynaphthalene, 2-	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Acenaphthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Acenaphthylene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Anthracene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benz[a]anthracene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[a]pyrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[b]fluoranthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[ghi]perylene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Benzo[k]fluoranthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Chrysene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Dibenz[a h]anthracene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Fluoranthene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Fluorene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Indeno[1 2 3-cd]pyrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Naphthalene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Phenanthrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388307	Pyrene	GC-MS	2020-08-20	2020-08-24	C_M	P 8270
388331	Cyanide (CN-)	Skalar CN Analyzer	2020-08-25	2020-08-25	QT	MOECC E3015
388422	PHC's F2	GC/FID	2020-08-21	2020-08-26	C_M	CCME
388422	PHC's F3	GC/FID	2020-08-21	2020-08-26	C_M	CCME
388422	PHC's F4	GC/FID	2020-08-21	2020-08-26	C_M	CCME
388422	Moisture-Humidite	Oven	2020-08-21	2020-08-26	C_M	ASTM 2216

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1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E04530

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674
Temperature (C): 6
Custody Seal:

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1527313 45-BH02-SS3	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1527314 45-BH013-SS9	The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).PCB Surrogate recoveries are not within acceptable limits due to matrix interferences.

Report Comments:

Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Date Submitted: 2020-11-06
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Project: P0021561
COC #: 862674

Excess Soil-T3.1-Ind/Cml/Comm

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
45-BH013-SS9	Sodium Adsorption Ratio	12.8		STD 12
45-BH02-SS3	Electrical Conductivity	1.44	mS/cm	STD 1.4
45-BH02-SS3	Sodium Adsorption Ratio	40.7		STD 12

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Project: P0021561
COC #: 862674

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
PHC's F1	392199	10	ug/g	STD 25	<10	<10	<10	<10
PHC's F2	392171	10	ug/g	STD 26	<10	<10	<10	<10
PHC's F3	392171	20	ug/g	STD 1700	<20	<20	<20	<20
PHC's F4	392171	20	ug/g	STD 3300	50	40	<20	<20
PHC's F4g	392182	100	ug/g		200	<100		

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Antimony	392194	1	ug/g	STD 40	<1	<1	<1	<1
Arsenic	392194	1	ug/g	STD 18	3	3	1	4
Barium	392194	1	ug/g	STD 670	37	32	19	60
Beryllium	392194	1	ug/g	STD 8	<1	<1	<1	<1
Boron (Hot Water Soluble)	392281	0.5	ug/g	STD 2	0.6	<0.5	<0.5	<0.5
Boron (total)	392194	5	ug/g		6	<5	<5	7
Cadmium	392194	0.4	ug/g	STD 1.9	<0.4	<0.4	<0.4	<0.4
Chromium Total	392194	1	ug/g		11	12	9	21
Chromium VI	392196	0.20	ug/g	STD 8	<0.20	0.29	0.20	0.41
Cobalt	392194	1	ug/g	STD 80	4	4	2	7
Copper	392194	1	ug/g	STD 230	19	19	8	23
Lead	392194	1	ug/g	STD 120	6	16	3	12
Mercury	392194	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1	<0.1

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Report Number: 1942592
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Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1527313	1527314	1527315	1527316
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-11-05	2020-11-05	2020-11-04	2020-11-04
Sampling Time								
Sample I.D.					45-BH02-SS3	45-BH013-SS9	45-BH014-SS9	45-BH015-SS3
Molybdenum	392194	1	ug/g	STD 40	<1	<1	<1	<1
Nickel	392194	1	ug/g	STD 270	9	10	6	17
Selenium	392194	1	ug/g	STD 5.5	<1	<1	<1	<1
Silver	392194	0.2	ug/g	STD 40	<0.2	<0.2	<0.2	<0.2
Thallium	392194	1	ug/g	STD 3.3	<1	<1	<1	<1
Uranium	392194	0.5	ug/g	STD 33	<0.5	<0.5	<0.5	<0.5
Vanadium	392194	2	ug/g	STD 86	17	17	12	22
Zinc	392194	2	ug/g	STD 340	29	34	13	50

PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1527313	1527314	1527315	1527316
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-11-05	2020-11-05	2020-11-04	2020-11-04
Sampling Time								
Sample I.D.					45-BH02-SS3	45-BH013-SS9	45-BH014-SS9	45-BH015-SS3
1+2-methylnaphthalene	208523	0.05	ug/g	STD 8.7	<0.05	<0.05	<0.05	<0.05
Acenaphthene	391385	0.05	ug/g	STD 8.5	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	391385	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05
Anthracene	391385	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	391385	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	391385	0.05	ug/g	STD 0.7	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	391385	0.05	ug/g	STD 7	<0.05	<0.05	<0.05	0.05
Benzo[ghi]perylene	391385	0.05	ug/g	STD 13	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	391385	0.05	ug/g	STD 7	<0.05	<0.05	<0.05	<0.05
Chrysene	391385	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	391385	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05

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M9W 5W8
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Invoice to: EnGlobe Corp.

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PAH

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Fluoranthene	391385	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05	0.07
Fluorene	391385	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	391385	0.05	ug/g	STD 0.76	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	391385	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	391385	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Naphthalene	391385	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05	<0.05
Phenanthrene	391385	0.05	ug/g	STD 12	<0.05	<0.05	<0.05	0.05
Pyrene	391385	0.05	ug/g	STD 70	<0.05	<0.05	<0.05	0.06

Volatiles

Analyte	Batch No	MRL	Units	Guideline	1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.								
Acetone	392197	0.50	ug/g	STD 1.8	<0.50	<0.50	<0.50	<0.50
Benzene	392197	0.02	ug/g	STD 0.034	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	392197	0.05	ug/g	STD 5.8	<0.05	<0.05	<0.05	<0.05
Bromoform	392197	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05	<0.05
Bromomethane	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	392197	0.05	ug/g	STD 0.28	<0.05	<0.05	<0.05	<0.05
Chloroform	392197	0.05	ug/g	STD 0.26	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	392197	0.05	ug/g	STD 5.5	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	392197	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	392197	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1527313	1527314	1527315	1527316
Sample Matrix					Soil153	Soil153	Soil153	Soil153
Sample Type								
Sample Date					2020-11-05	2020-11-05	2020-11-04	2020-11-04
Sampling Time								
Sample I.D.					45-BH02-SS3	45-BH013-SS9	45-BH014-SS9	45-BH015-SS3
Dichlorobenzene, 1,4-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	392197	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	392197	0.05	ug/g	STD 0.57	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Ethylbenzene	392197	0.05	ug/g	STD 1.9	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	392197	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	392197	0.50	ug/g	STD 26	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	392197	0.50	ug/g	STD 17	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	392197	0.05	ug/g	STD 0.2	<0.05	<0.05	<0.05	<0.05
Styrene	392197	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Toluene	392197	0.20	ug/g	STD 7.8	<0.20	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	392197	0.05	ug/g	STD 0.4	<0.05	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Trichloroethane, 1,1,2-	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	392197	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	392197	0.05	ug/g	STD 0.46	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	392197	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	392198	0.05	ug/g	STD 3	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05
Xylene, o-	392197	0.05	ug/g		<0.05	<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Cyanide (CN-)	392209	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005
Electrical Conductivity	392187	0.05	mS/cm	STD 1.4	1.44*	1.13	0.20	0.20
pH - CaCl2	392178	2.00			7.78	7.67	7.77	7.67
Sodium Adsorption Ratio	392270	0.01		STD 12	40.7*	12.8*	0.98	0.71

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Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Moisture-Humidite	392171	0.1	%		12.1	8.2	18.4	6.0

PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Aroclor 1242	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Aroclor 1248	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Aroclor 1254	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Aroclor 1260	392238	0.02	ug/g		<0.02	<0.02	<0.02	<0.02
Polychlorinated Biphenyls	392238	0.02	ug/g	STD 0.78	<0.02	<0.02	<0.02	<0.02

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PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Decachlorobiphenyl	208523	1	%		60	32	62	63

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
Alpha-androstrane	392171	0	%		60	73	64	70

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527313 Soil153 2020-11-05 45-BH02-SS3	1527314 Soil153 2020-11-05 45-BH013-SS9	1527315 Soil153 2020-11-04 45-BH014-SS9	1527316 Soil153 2020-11-04 45-BH015-SS3
1,2-dichloroethane-d4	392197	0	%		88	86	88	93
4-bromofluorobenzene	392197	0	%		107	106	105	105
Toluene-d8	392197	0	%		96	96	94	92

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
208523	1+2-methylnaphthalene							
391385	Methlynaphthalene, 1-	<0.05 ug/g	83	50-140	68	50-140	0	0-40
391385	Methlynaphthalene, 2-	<0.05 ug/g	82	50-140	67	50-140	0	0-40
391385	Acenaphthene	<0.05 ug/g	78	50-140	63	50-140	0	0-40
391385	Acenaphthylene	<0.05 ug/g	66	50-140	63	50-140	0	0-40
391385	Anthracene	<0.05 ug/g	82	50-140	63	50-140	0	0-40
391385	Benz[a]anthracene	<0.05 ug/g	72	50-140	61	50-140	0	0-40
391385	Benzo[a]pyrene	<0.05 ug/g	56	50-140	55	50-140	0	0-40
391385	Benzo[b]fluoranthene	<0.05 ug/g	70	50-140	48	50-140	0	0-40
391385	Benzo[ghi]perylene	<0.05 ug/g	65	50-140	60	50-140	0	0-40
391385	Benzo[k]fluoranthene	<0.05 ug/g	92	50-140	81		0	0-40
391385	Chrysene	<0.05 ug/g	92	50-140	73	50-140	0	0-40
391385	Dibenz[a h]anthracene	<0.05 ug/g	65	50-140	54	50-140	0	0-40
391385	Fluoranthene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
391385	Fluorene	<0.05 ug/g	78	50-140	60	50-140	0	0-40
391385	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	58	50-140	61	50-140	0	0-40
391385	Naphthalene	<0.05 ug/g	79	50-140	66	50-140	0	0-40
391385	Phenanthrene	<0.05 ug/g	81	50-140	62	50-140	0	0-40
391385	Pyrene	<0.05 ug/g	79	50-140	67	50-140	0	0-40
392171	PHC's F2	<10 ug/g	100	80-120	104	60-140	0	0-30
392171	PHC's F3	<20 ug/g	100	80-120	104	60-140	0	0-30
392171	PHC's F4	<20 ug/g	100	80-120	104	60-140	0	0-30
392171	Moisture-Humidite		100	80-120			2	
392178	pH - CaCl2	5.05	100	90-110			0	
392182	PHC's F4g	<100 ug/g		80-120		60-140		0-30
392187	Electrical Conductivity	<0.05	99	90-110			2	0-10
392194	Silver	<0.2 ug/g	101	70-130	102	70-130	0	0-20
392194	Arsenic	<1 ug/g	91	70-130	100	70-130	0	0-20
392194	Boron (total)	<5 ug/g	95	70-130	103	70-130	0	0-20
392194	Barium	<1 ug/g	90	70-130	113	70-130	2	0-20
392194	Beryllium	<1 ug/g	96	70-130	93	70-130	0	0-20
392194	Cadmium	<0.4 ug/g	95	70-130	100	70-130	0	0-20
392194	Cobalt	<1 ug/g	89	70-130	92	70-130	0	0-20

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Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
392194	Chromium Total	<1 ug/g	91	70-130	105	70-130	5	0-20
392194	Copper	<1 ug/g	119	70-130	90	70-130	6	0-20
392194	Mercury	<0.1 ug/g	89	70-130	95	70-130	0	0-20
392194	Molybdenum	<1 ug/g	84	70-130	92	70-130	0	0-20
392194	Nickel	<1 ug/g	98	70-130	92	70-130	1	0-20
392194	Lead	<1 ug/g	95	70-130	98	70-130	3	0-20
392194	Antimony	<1 ug/g	74	70-130	96	70-130	0	0-20
392194	Selenium	<1 ug/g	102	70-130	97	70-130	0	0-20
392194	Thallium	<1 ug/g	95	70-130	98	70-130	0	0-20
392194	Uranium	<0.5 ug/g	86	70-130	97	70-130	0	0-20
392194	Vanadium	<2 ug/g	87	70-130	104	70-130	3	0-20
392194	Zinc	<2 ug/g	101	70-130	97	70-130	4	0-20
392196	Chromium VI	<0.20 ug/g	113	80-120	89	70-130	0	0-35
392197	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Trichloroethane, 1,1,1-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	90	60-130		50-140	0	0-30
392197	Trichloroethane, 1,1,2-	<0.05 ug/g	95	60-130		50-140	0	0-50
392197	Dichloroethane, 1,1-	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Dichloroethylene, 1,1-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Dichlorobenzene, 1,2-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Dichloroethane, 1,2-	<0.05 ug/g	92	60-130		50-140	0	0-50
392197	Dichloropropane, 1,2-	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Dichlorobenzene, 1,3-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Dichloropropene,1,3-							
392197	Dichlorobenzene, 1,4-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Acetone	<0.50 ug/g	100	60-130		50-140	0	0-50
392197	Benzene	<0.02 ug/g	97	60-130		50-140	0	0-50
392197	Bromodichloromethane	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Bromoform	<0.05 ug/g	88	60-130		50-140	0	0-50
392197	Bromomethane	<0.05 ug/g	238	60-130	113	50-140	0	0-50
392197	Dichloroethylene, 1,2-cis-	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Dichloropropene,1,3-cis-	<0.05 ug/g	85	60-130		50-140	0	0-50
392197	Carbon Tetrachloride	<0.05 ug/g	101	60-130		50-140	0	0-50

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
392197	Chloroform	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Dibromochloromethane	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Dichlorodifluoromethane	<0.05 ug/g	110	60-130	64	50-140	0	0-50
392197	Methylene Chloride	<0.05 ug/g	117	60-130		50-140	0	0-50
392197	Ethylbenzene	<0.05 ug/g	104	60-130		50-140	0	0-50
392197	Ethylene dibromide	<0.05 ug/g	90	60-130		50-140	0	0-50
392197	Hexane (n)	<0.05 ug/g	93	60-130		50-140	0	0-50
392197	Xylene, m/p-	<0.05 ug/g	107	60-130		50-140	0	0-50
392197	Methyl Ethyl Ketone	<0.50 ug/g	76	60-130		50-140	0	0-50
392197	Methyl Isobutyl Ketone	<0.50 ug/g	78	60-130		50-140	0	0-50
392197	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	91	60-130		50-140	0	0-50
392197	Chlorobenzene	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Xylene, o-	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Styrene	<0.05 ug/g	97	60-130		50-140	0	0-50
392197	Dichloroethylene, 1,2-trans-	<0.05 ug/g	96	60-130		50-140	0	0-50
392197	Dichloropropene,1,3-trans-	<0.05 ug/g	85	60-130		50-140	0	0-50
392197	Tetrachloroethylene	<0.05 ug/g	100	60-130		50-140	0	0-50
392197	Toluene	<0.20 ug/g	100	60-130		50-140	0	0-50
392197	Trichloroethylene	<0.05 ug/g	98	60-130		50-140	0	0-50
392197	Trichlorofluoromethane	<0.05 ug/g	104	60-130	117	50-140	0	0-50
392197	Vinyl Chloride	<0.02 ug/g	100	60-130	92	50-140	0	0-50
392198	Xylene Mixture							
392199	PHC's F1	<10 ug/g	92	80-120	107	60-140		0-30
392209	Cyanide (CN-)	<0.005 ug/g	100	75-125	106	70-130	0	0-20
392238	Aroclor 1242	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Aroclor 1248	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Aroclor 1254	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Aroclor 1260	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392238	Polychlorinated Biphenyls	<0.02 ug/g	110	60-140	89	60-140	0	0-40
392270	Sodium Adsorption Ratio	<0.01					0	
392281	Boron (Hot Water Soluble)	<0.5 ug/g	82	70-130	93	75-125	0	0-30

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Certificate of Analysis

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1821 Albion Road, Unit 7
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M9W 5W8
Attention: Mr. Houshang Akbari
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Report Number: 1942592
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
208523	1+2-methylnaphthalene	GC-MS	2020-11-12	2020-11-12	C_M	P 8270
391385	Methlynaphthalene, 1-	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Methlynaphthalene, 2-	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Acenaphthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Acenaphthylene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Anthracene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benz[a]anthracene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[a]pyrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[b]fluoranthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[ghi]perylene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Benzo[k]fluoranthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Chrysene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Dibenz[a h]anthracene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Fluoranthene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Fluorene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Indeno[1 2 3-cd]pyrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Naphthalene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Phenanthrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
391385	Pyrene	GC-MS	2020-11-10	2020-11-10	C_M	P 8270
392171	PHC's F2	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392171	PHC's F3	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392171	PHC's F4	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392171	Moisture-Humidite	Oven	2020-11-11	2020-11-11	A_A	ASTM 2216
392178	pH - CaCl2	pH Meter	2020-11-11	2020-11-11	R_R	Ag Soil
392182	PHC's F4g	GC/FID	2020-11-11	2020-11-11	A_A	CCME
392187	Electrical Conductivity	Electrical Conductivity Mete	2020-11-11	2020-11-11	Z_S	Cond-Soil
392194	Silver	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Arsenic	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Boron (total)	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Barium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Beryllium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Cadmium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Cobalt	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8

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Certificate of Analysis

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Attention: Mr. Houshang Akbari
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Report Number: 1942592
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COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
392194	Chromium Total	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Copper	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Mercury	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Molybdenum	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Nickel	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Lead	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Antimony	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Selenium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Thallium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Uranium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Vanadium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392194	Zinc	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392196	Chromium VI	FAA	2020-11-11	2020-11-11	Z_S	M US EPA 3060A
392197	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichloroethane, 1,1,1-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichloroethane, 1,1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethane, 1,1-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethylene, 1,1-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorobenzene, 1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethane, 1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropane, 1,2-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorobenzene, 1,3-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropene,1,3-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorobenzene, 1,4-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Acetone	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Benzene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Bromodichloromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Bromoform	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Bromomethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethylene, 1,2-cis-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropene,1,3-cis-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Carbon Tetrachloride	GC-MS	2020-11-09	2020-11-09	YH	V 8260B

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Certificate of Analysis

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Date Submitted: 2020-11-06
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Project: P0021561
COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
392197	Chloroform	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dibromochloromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichlorodifluoromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methylene Chloride	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Ethylbenzene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Ethylene dibromide	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Hexane (n)	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Xylene, m/p-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methyl Ethyl Ketone	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methyl Isobutyl Ketone	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Chlorobenzene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Xylene, o-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Styrene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloroethylene, 1,2-trans-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Dichloropropene,1,3-trans-	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Tetrachloroethylene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Toluene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichloroethylene	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Trichlorofluoromethane	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392197	Vinyl Chloride	GC-MS	2020-11-09	2020-11-09	YH	V 8260B
392198	Xylene Mixture	GC-MS	2020-11-11	2020-11-11	YH	V 8260B
392199	PHC's F1	GC/FID	2020-11-09	2020-11-09	YH	CCME
392209	Cyanide (CN-)	Skalar CN Analyzer	2020-11-11	2020-11-11	QT	MOECC E3015
392238	Aroclor 1242	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Aroclor 1248	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Aroclor 1254	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Aroclor 1260	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392238	Polychlorinated Biphenyls	GC/ECD	2020-11-11	2020-11-11	C_M	EPA 8081B/8082A
392270	Sodium Adsorption Ratio	iCAP OES	2020-11-12	2020-11-12	Z_S	Ag Soil
392281	Boron (Hot Water Soluble)	iCAP OES	2020-11-12	2020-11-12	Z_S	MOECC E3470

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Certificate of Analysis

eurofins | Environment Testing

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E 04530

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422
Temperature (C): 6
Custody Seal:

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1510543 45-BH01-SS3 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510544 45-BH03-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510546 45-BH05-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510547 45-BH06-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510548 45-BH07-SS3 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510549 45-BH08-SS3 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).
Sample ID: 1510550 45-BH09-SS2 F2-F4 Surrogate recoveries are not within acceptable limits due to matrix interferences.(F2-F4) MRL elevated due to matrix interference (dilution was done).The result for F4 (C34-C50) gravimetric must be substituted if it is greater than the result for F4 (C34-C50).

Report Comments:

Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Attention: Mr. Houshang Akbari
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Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Excess Soil-T3.1-Ind/Cml/Comm

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
45-BH01-SS3	Electrical Conductivity	1.69	mS/cm	STD 1.4
45-BH03-SS2	Sodium Adsorption Ratio	28.6		STD 12
45-BH05-SS2	Electrical Conductivity	1.76	mS/cm	STD 1.4
45-BH05-SS2	Sodium Adsorption Ratio	32.5		STD 12
45-BH06-SS2	Electrical Conductivity	1.71	mS/cm	STD 1.4
45-BH06-SS2	Sodium Adsorption Ratio	38.2		STD 12
45-BH08-SS3	Sodium Adsorption Ratio	13.2		STD 12

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Certificate of Analysis

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
PHC's F1	388118	10	ug/g	STD 25	<10	<10	<10	<10	<10
PHC's F2	388163	10	ug/g	STD 26	<10	<10	<10	<10	<10
PHC's F3	388163	20	ug/g	STD 1700	40	<20	<20	<20	<20
PHC's F4	388163	20	ug/g	STD 3300	140	20	<20	60	30
PHC's F4g	388175	100	ug/g		7600	<100		200	<100

Hydrocarbons

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
PHC's F1	388118	10	ug/g	STD 25	<10	<10	<10
PHC's F2	388163	10	ug/g	STD 26	<10	<10	<10
PHC's F3	388163	20	ug/g	STD 1700	<20	50	<20
PHC's F4	388163	20	ug/g	STD 3300	110	140	40
PHC's F4g	388175	100	ug/g		300	400	200

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Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510543	1510544	1510545	1510546	1510547
					Sample Matrix Soil153	Soil153	Soil153	Soil153	Soil153
					Sample Type				
					Sample Date 2020-08-11	2020-08-11	2020-08-11	2020-08-11	2020-08-11
					Sampling Time				
					Sample I.D. 45-BH01-SS3	45-BH03-SS2	45-BH04-SS3	45-BH05-SS2	45-BH06-SS2
Antimony	387927	1	ug/g	STD 40	<1	<1	<1	<1	<1
Arsenic	387927	1	ug/g	STD 18	3	3	3	3	6
Barium	387927	1	ug/g	STD 670	150	35	27	72	82
Beryllium	387927	1	ug/g	STD 8	2	<1	<1	<1	<1
Boron (Hot Water Soluble)	387809	0.5	ug/g	STD 2	1.3	<0.5	<0.5	<0.5	
	387918	0.5	ug/g	STD 2					<0.5
Boron (total)	387927	5	ug/g		24	7	<5	9	6
Cadmium	387927	0.4	ug/g	STD 1.9	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	387927	1	ug/g		19	11	11	25	23
Chromium VI	387917	0.20	ug/g	STD 8	<0.20	<0.20	<0.20	<0.20	<0.20
Cobalt	387927	1	ug/g	STD 80	4	3	4	4	6
Copper	387927	1	ug/g	STD 230	11	14	14	14	40
Lead	387927	1	ug/g	STD 120	7	9	6	6	14
Mercury	387927	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	387927	1	ug/g	STD 40	<1	<1	<1	<1	<1
Nickel	387927	1	ug/g	STD 270	11	8	9	15	21
Selenium	387927	1	ug/g	STD 5.5	<1	<1	<1	<1	<1
Silver	387927	0.2	ug/g	STD 40	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	387927	1	ug/g	STD 3.3	<1	<1	<1	<1	<1
Uranium	387927	0.5	ug/g	STD 33	1.0	<0.5	<0.5	0.6	0.6
Vanadium	387927	2	ug/g	STD 86	19	17	14	15	24
Zinc	387927	2	ug/g	STD 340	24	28	25	22	56

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Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510548	1510549	1510550
					Sample Matrix Soil153	Soil153	Soil153
					Sample Type		
					Sample Date 2020-08-11	2020-08-11	2020-08-11
					Sampling Time		
					Sample I.D. 45-BH07-SS3	45-BH08-SS3	45-BH09-SS2
Antimony	387927	1	ug/g	STD 40	<1	<1	<1
Arsenic	387927	1	ug/g	STD 18	4	5	4
Barium	387927	1	ug/g	STD 670	44	47	44
Beryllium	387927	1	ug/g	STD 8	<1	<1	<1
Boron (Hot Water Soluble)	387918	0.5	ug/g	STD 2	<0.5	<0.5	<0.5
Boron (total)	387927	5	ug/g		<5	5	5
Cadmium	387927	0.4	ug/g	STD 1.9	<0.4	0.9	<0.4
Chromium Total	387927	1	ug/g		32	22	16
Chromium VI	387917	0.20	ug/g	STD 8	<0.20	<0.20	<0.20
Cobalt	387927	1	ug/g	STD 80	6	6	6
Copper	387927	1	ug/g	STD 230	18	23	22
Lead	387927	1	ug/g	STD 120	10	19	10
Mercury	387927	0.1	ug/g	STD 0.27	<0.1	<0.1	<0.1
Molybdenum	387927	1	ug/g	STD 40	<1	<1	<1
Nickel	387927	1	ug/g	STD 270	20	16	14
Selenium	387927	1	ug/g	STD 5.5	<1	<1	<1
Silver	387927	0.2	ug/g	STD 40	<0.2	<0.2	<0.2
Thallium	387927	1	ug/g	STD 3.3	<1	<1	<1
Uranium	387927	0.5	ug/g	STD 33	<0.5	0.6	<0.5
Vanadium	387927	2	ug/g	STD 86	19	23	21
Zinc	387927	2	ug/g	STD 340	212	118	47

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PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D. 1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
1+2-methylnaphthalene	388054	0.05	ug/g	STD 8.7	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	388054	0.05	ug/g	STD 8.5	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	388054	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	388054	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	388054	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	388054	0.05	ug/g	STD 0.7	0.06	0.08	<0.05	0.05	<0.05
Benzo[b]fluoranthene	388054	0.05	ug/g	STD 7	0.06	0.06	<0.05	<0.05	<0.05
Benzo[ghi]perylene	388054	0.05	ug/g	STD 13	0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	388054	0.05	ug/g	STD 7	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	388054	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	388054	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	388054	0.05	ug/g	STD 9.6	0.07	<0.05	<0.05	<0.05	<0.05
Fluorene	388054	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	388054	0.05	ug/g	STD 0.76	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	388054	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	388054	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	388054	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	388054	0.05	ug/g	STD 12	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	388054	0.05	ug/g	STD 70	0.07	<0.05	<0.05	<0.05	<0.05

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PAH

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1+2-methylnaphthalene	388054	0.05	ug/g	STD 8.7	<0.05	<0.05	<0.05
Acenaphthene	388054	0.05	ug/g	STD 8.5	<0.05	<0.05	<0.05
Acenaphthylene	388054	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	388054	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	388054	0.05	ug/g	STD 1	<0.05	<0.05	<0.05
Benzo[a]pyrene	388054	0.05	ug/g	STD 0.7	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	388054	0.05	ug/g	STD 7	<0.05	0.06	<0.05
Benzo[ghi]perylene	388054	0.05	ug/g	STD 13	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	388054	0.05	ug/g	STD 7	<0.05	<0.05	<0.05
Chrysene	388054	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	388054	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	388054	0.05	ug/g	STD 9.6	<0.05	<0.05	<0.05
Fluorene	388054	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	388054	0.05	ug/g	STD 0.76	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	388054	0.05	ug/g		<0.05	<0.05	<0.05
Methlynaphthalene, 2-	388054	0.05	ug/g		<0.05	<0.05	<0.05
Naphthalene	388054	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05
Phenanthrene	388054	0.05	ug/g	STD 12	<0.05	<0.05	<0.05
Pyrene	388054	0.05	ug/g	STD 70		<0.05	<0.05
	388109	0.05	ug/g	STD 70	<0.05		

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Volatiles

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					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Acetone	388130	0.50	ug/g	STD 1.8	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	388122	0.02	ug/g	STD 0.034	<0.02	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	388122	0.05	ug/g	STD 5.8	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	388122	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	388122	0.05	ug/g	STD 0.28	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	388122	0.05	ug/g	STD 0.26	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	388122	0.05	ug/g	STD 5.5	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	388122	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	388122	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	388122	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	388122	0.05	ug/g	STD 0.57	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	388125	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	388122	0.05	ug/g	STD 1.9	<0.05	<0.05	<0.05	<0.05	<0.05

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Ethylene dibromide	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	388122	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	388130	0.50	ug/g	STD 26	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	388130	0.50	ug/g	STD 17	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	388130	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	388122	0.05	ug/g	STD 0.2	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	388122	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	388122	0.20	ug/g	STD 7.8	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	388122	0.05	ug/g	STD 0.4	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	388122	0.05	ug/g	STD 0.46	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	388122	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	388126	0.05	ug/g	STD 3	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	388122	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
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M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Guideline = Excess Soil-T3.1-Ind/Cml/Comm

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510548	1510549	1510550
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-08-11	2020-08-11	2020-08-11
Sampling Time							
Sample I.D.					45-BH07-SS3	45-BH08-SS3	45-BH09-SS2
Acetone	388130	0.50	ug/g	STD 1.8	<0.50	<0.50	<0.50
Benzene	388122	0.02	ug/g	STD 0.034	<0.02	<0.02	<0.02
Bromodichloromethane	388122	0.05	ug/g	STD 5.8	<0.05	<0.05	<0.05
Bromoform	388122	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05
Bromomethane	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	388122	0.05	ug/g	STD 0.28	<0.05	<0.05	<0.05
Chloroform	388122	0.05	ug/g	STD 0.26	<0.05	<0.05	<0.05
Dibromochloromethane	388122	0.05	ug/g	STD 5.5	<0.05	<0.05	<0.05
Dichlorobenzene, 1,2-	388122	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	388122	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	388122	0.05	ug/g	STD 1.8	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	388122	0.05	ug/g	STD 0.57	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-	388125	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene,1,3-cis-	388122	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene,1,3-trans-	388122	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	388122	0.05	ug/g	STD 1.9	<0.05	<0.05	<0.05

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Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. 1510548	1510549	1510550
Sample Matrix					Soil153	Soil153	Soil153
Sample Type							
Sample Date					2020-08-11	2020-08-11	2020-08-11
Sampling Time							
Sample I.D.					45-BH07-SS3	45-BH08-SS3	45-BH09-SS2
Ethylene dibromide	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	388122	0.05	ug/g	STD 2.5	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	388130	0.50	ug/g	STD 26	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	388130	0.50	ug/g	STD 17	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	388130	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	388122	0.05	ug/g	STD 0.2	<0.05	<0.05	<0.05
Styrene	388122	0.05	ug/g	STD 6.8	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Toluene	388122	0.20	ug/g	STD 7.8	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	388122	0.05	ug/g	STD 0.4	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethylene	388122	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	388122	0.05	ug/g	STD 0.46	<0.05	<0.05	<0.05
Vinyl Chloride	388122	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Xylene Mixture	388126	0.05	ug/g	STD 3	<0.05	<0.05	<0.05
Xylene, m/p-	388122	0.05	ug/g		<0.05	<0.05	<0.05
Xylene, o-	388122	0.05	ug/g		<0.05	<0.05	<0.05

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Certificate of Analysis

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Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Cyanide (CN-)	387853	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005	
		0.02	ug/g	STD 0.051					<0.02
Electrical Conductivity	387997	0.05	mS/cm	STD 1.4	1.69*	1.31	0.22	1.76*	1.71*
pH - CaCl2	387915	2.00			9.34	7.91	7.84	8.45	7.94
Sodium Adsorption Ratio	388017	0.01		STD 12	11.2	28.6*	3.14	32.5*	38.2*

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Cyanide (CN-)	387853	0.02	ug/g	STD 0.051	<0.02	<0.02	
		0.05	mg/L	STD 0.051			N.R.
Electrical Conductivity	387997	0.05	mS/cm	STD 1.4	0.79	1.39	0.71
pH - CaCl2	387915	2.00			7.67	7.72	7.61
Sodium Adsorption Ratio	388017	0.01		STD 12	11.4	13.2*	6.53

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Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Moisture-Humidite	388163	0.1	%		11.1	10.1	4.9	6.9	15.9

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Moisture-Humidite	388163	0.1	%		11.4	8.7	9.4

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PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Aroclor 1242	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Aroclor 1248	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Aroclor 1254	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Aroclor 1260	388087	0.02	ug/g		<0.02	<0.02	<0.02	<0.02	<0.02
Polychlorinated Biphenyls	388087	0.02	ug/g	STD 0.78	<0.02	<0.02	<0.02	<0.02	<0.02

PCBs

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Aroclor 1242	388087	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1248	388087	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1254	388087	0.02	ug/g		<0.02	<0.02	<0.02
Aroclor 1260	388087	0.02	ug/g		<0.02	<0.02	<0.02
Polychlorinated Biphenyls	388087	0.02	ug/g	STD 0.78	<0.02	<0.02	<0.02

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PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Decachlorobiphenyl	388075	0	%		67	N/A	80	N/A	N/A

PCB Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Decachlorobiphenyl	388075	0	%		N/A	N/A	N/A

Results relate only to the parameters tested on the samples submitted.
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PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
Alpha-androstrane	388163	0	%		70	0	0	0	0

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
Alpha-androstrane	388163	0	%		0	0	0

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VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510543 Soil153 2020-08-11 45-BH01-SS3	1510544 Soil153 2020-08-11 45-BH03-SS2	1510545 Soil153 2020-08-11 45-BH04-SS3	1510546 Soil153 2020-08-11 45-BH05-SS2	1510547 Soil153 2020-08-11 45-BH06-SS2
1,2-dichloroethane-d4	388122	0	%		108	103	106	106	107
4-bromofluorobenzene	388122	0	%		104	105	103	109	108
Toluene-d8	388122	0	%		101	106	103	105	107

VOCs Surrogates

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510548 Soil153 2020-08-11 45-BH07-SS3	1510549 Soil153 2020-08-11 45-BH08-SS3	1510550 Soil153 2020-08-11 45-BH09-SS2
1,2-dichloroethane-d4	388122	0	%		104	102	101
4-bromofluorobenzene	388122	0	%		105	101	105
Toluene-d8	388122	0	%		108	100	106

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Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
387809	Boron (Hot Water Soluble)	<0.5 ug/g	91	70-130	95	75-125	0	0-30
387853	Cyanide (CN-)	<0.005 ug/g	99	75-125	108	70-130	0	0-20
387915	pH - CaCl2	5.28	100	90-110			0	
387917	Chromium VI	<0.20 ug/g	99	80-120	88	70-130	0	0-35
387918	Boron (Hot Water Soluble)	<0.5 ug/g	90	70-130	108	75-125	0	0-30
387927	Silver	<0.2 ug/g	97	70-130	97	70-130	3	0-20
387927	Arsenic	<1 ug/g	96	70-130	98	70-130	0	0-20
387927	Boron (total)	<5 ug/g	101	70-130	102	70-130	0	0-20
387927	Barium	<1 ug/g	94	70-130	108	70-130	3	0-20
387927	Beryllium	<1 ug/g	101	70-130	102	70-130	0	0-20
387927	Cadmium	<0.4 ug/g	100	70-130	97	70-130	0	0-20
387927	Cobalt	<1 ug/g	94	70-130	94	70-130	0	0-20
387927	Chromium Total	<1 ug/g	96	70-130	121	70-130	1	0-20
387927	Copper	<1 ug/g	106	70-130	102	70-130	0	0-20
387927	Mercury	<0.1 ug/g	90	70-130	87	70-130	13	0-20
387927	Molybdenum	<1 ug/g	89	70-130	85	70-130	4	0-20
387927	Nickel	<1 ug/g	101	70-130	100	70-130	0	0-20
387927	Lead	<1 ug/g	105	70-130	98	70-130	4	0-20
387927	Antimony	<1 ug/g	85	70-130	90	70-130	0	0-20
387927	Selenium	<1 ug/g	107	70-130	101	70-130	0	0-20
387927	Thallium	<1 ug/g	104	70-130	98	70-130	0	0-20
387927	Uranium	<0.5 ug/g	95	70-130	95	70-130	0	0-20
387927	Vanadium	<2 ug/g	89	70-130	98	70-130	3	0-20
387927	Zinc	<2 ug/g	109	70-130	101	70-130	2	0-20
387997	Electrical Conductivity	<0.05	97	90-110			3	0-10
388017	Sodium Adsorption Ratio	<0.01					0	
388054	1+2-methylnaphthalene	<0.05 ug/g						
388054	Methlynaphthalene, 1-	<0.05 ug/g	69	50-140	61	50-140	0	0-40
388054	Methlynaphthalene, 2-	<0.05 ug/g	67	50-140	62	50-140	0	0-40
388054	Acenaphthene	<0.05 ug/g	75	50-140	61	50-140	0	0-40
388054	Acenaphthylene	<0.05 ug/g	73	50-140	58	50-140	0	0-40
388054	Anthracene	<0.05 ug/g	87	50-140	68	50-140	0	0-40
388054	Benz[a]anthracene	<0.05 ug/g	75	50-140	65	50-140	0	0-40

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388054	Benzo[a]pyrene	<0.05 ug/g	87	50-140	61	50-140	0	0-40
388054	Benzo[b]fluoranthene	<0.05 ug/g	84	50-140	40	50-140	0	0-40
388054	Benzo[ghi]perylene	<0.05 ug/g	114	50-140	74	50-140	0	0-40
388054	Benzo[k]fluoranthene	<0.05 ug/g	82	50-140				0-40
388054	Chrysene	<0.05 ug/g	93	50-140	75	50-140	0	0-40
388054	Dibenz[a h]anthracene	<0.05 ug/g	117	50-140	71	50-140	0	0-40
388054	Fluoranthene	<0.05 ug/g	91	50-140	76	50-140	0	0-40
388054	Fluorene	<0.05 ug/g	77	50-140	61	50-140	0	0-40
388054	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	100	50-140	69	50-140	0	0-40
388054	Naphthalene	<0.05 ug/g	69	50-140	57	50-140	0	0-40
388054	Phenanthrene	<0.05 ug/g	82	50-140	66	50-140	0	0-40
388054	Pyrene	<0.05 ug/g	92	50-140	75	50-140	0	0-40
388087	Aroclor 1242	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Aroclor 1248	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Aroclor 1254	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Aroclor 1260	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388087	Polychlorinated Biphenyls	<0.02 ug/g	110	60-140	89	60-140	0	0-40
388109	Pyrene	<0.05 ug/g	92	50-140	75	50-140	0	0-40
388118	PHC's F1	<10 ug/g	94	80-120	96	60-140	0	0-30
388122	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	82	60-130	83	50-140	0	0-50
388122	Trichloroethane, 1,1,1-	<0.05 ug/g	105	60-130	90	50-140	0	0-50
388122	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	114	60-130	84	50-140	0	0-30
388122	Trichloroethane, 1,1,2-	<0.05 ug/g	104	60-130	88	50-140	0	0-50
388122	Dichloroethane, 1,1-	<0.05 ug/g	94	60-130	64	50-140	0	0-50
388122	Dichloroethylene, 1,1-	<0.05 ug/g	104	60-130	74	50-140	0	0-50
388122	Dichlorobenzene, 1,2-	<0.05 ug/g	113	60-130	94	50-140	0	0-50
388122	Dichloroethane, 1,2-	<0.05 ug/g	103	60-130	100	50-140	0	0-50
388122	Dichloropropane, 1,2-	<0.05 ug/g	111	60-130	96	50-140	0	0-50
388122	Dichlorobenzene, 1,3-	<0.05 ug/g	114	60-130	73	50-140	0	0-50
388122	Dichlorobenzene, 1,4-	<0.05 ug/g	105	60-130	102	50-140	0	0-50
388122	Benzene	<0.02 ug/g	116	60-130	91	50-140	0	0-50
388122	Bromodichloromethane	<0.05 ug/g	97	60-130	94	50-140	0	0-50
388122	Bromoform	<0.05 ug/g	100	60-130	80	50-140	0	0-50

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388122	Bromomethane	<0.05 ug/g	77	60-130	70	50-140	0	0-50
388122	Dichloroethylene, 1,2-cis-	<0.05 ug/g	103	60-130	90	50-140	0	0-50
388122	Dichloropropene,1,3-cis-	<0.05 ug/g	87	60-130	71	50-140	0	0-50
388122	Carbon Tetrachloride	<0.05 ug/g	83	60-130	87	50-140	0	0-50
388122	Chloroform	<0.05 ug/g	102	60-130	82	50-140	0	0-50
388122	Dibromochloromethane	<0.05 ug/g	105	60-130	91	50-140	0	0-50
388122	Dichlorodifluoromethane	<0.05 ug/g	84	60-130	60	50-140	0	0-50
388122	Methylene Chloride	<0.05 ug/g	110	60-130	102	50-140	0	0-50
388122	Ethylbenzene	<0.05 ug/g	91	60-130	98	50-140	0	0-50
388122	Ethylene dibromide	<0.05 ug/g	102	60-130		50-140		0-50
388122	Hexane (n)	<0.05 ug/g	110	60-130	84	50-140	0	0-50
388122	Xylene, m/p-	<0.05 ug/g	88	60-130	88	50-140	0	0-50
388122	Chlorobenzene	<0.05 ug/g	101	60-130	98	50-140	0	0-50
388122	Xylene, o-	<0.05 ug/g	103	60-130	99	50-140	0	0-50
388122	Styrene	<0.05 ug/g	98	60-130	89	50-140	0	0-50
388122	Dichloroethylene, 1,2-trans-	<0.05 ug/g	116	60-130	87	50-140	0	0-50
388122	Dichloropropene,1,3-trans-	<0.05 ug/g	85	60-130	79	50-140	0	0-50
388122	Tetrachloroethylene	<0.05 ug/g	87	60-130	91	50-140	0	0-50
388122	Toluene	<0.20 ug/g	90	60-130	92	50-140	0	0-50
388122	Trichloroethylene	<0.05 ug/g	105	60-130	93	50-140	0	0-50
388122	Trichlorofluoromethane	<0.05 ug/g	98	60-130	72	50-140	0	0-50
388122	Vinyl Chloride	<0.02 ug/g	74	60-130	79	50-140	0	0-50
388125	Dichloropropene,1,3-							
388126	Xylene Mixture							
388130	Acetone	<0.50 ug/g	110	60-130	129	50-140	0	0-50
388130	Methyl Ethyl Ketone	<0.50 ug/g	115	60-130	132	50-140	0	0-50
388130	Methyl Isobutyl Ketone	<0.50 ug/g	112	60-130	126	50-140	0	0-50
388130	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	101	60-130	107	50-140	0	0-50
388163	PHC's F2	<10 ug/g	120	80-120	97	60-140	0	0-30
388163	PHC's F3	<20 ug/g	120	80-120	97	60-140	0	0-30
388163	PHC's F4	<20 ug/g	120	80-120	97	60-140	0	0-30
388163	Moisture-Humidite		100	80-120			4	
388175	PHC's F4g	<100 ug/g		80-120		60-140		0-30

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Certificate of Analysis

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1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
387809	Boron (Hot Water Soluble)	iCAP OES	2020-08-17	2020-08-17	Z_S	MOECC E3470
387853	Cyanide (CN-)	Skalar CN Analyzer	2020-08-18	2020-08-18	QT	MOECC E3015
387915	pH - CaCl2	pH Meter	2020-08-18	2020-08-18	SG	Ag Soil
387917	Chromium VI	FAA	2020-08-18	2020-08-18	Z_S	M US EPA 3060A
387918	Boron (Hot Water Soluble)	iCAP OES	2020-08-18	2020-08-18	Z_S	MOECC E3470
387927	Silver	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Arsenic	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Boron (total)	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Barium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Beryllium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Cadmium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Cobalt	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Chromium Total	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Copper	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Mercury	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Molybdenum	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Nickel	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Lead	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Antimony	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Selenium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Thallium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Uranium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Vanadium	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387927	Zinc	ICAPQ-MS	2020-08-18	2020-08-18	H_D	EPA 200.8
387997	Electrical Conductivity	Electrical Conductivity Mete	2020-08-19	2020-08-19	Z_S	Cond-Soil
388017	Sodium Adsorption Ratio	iCAP OES	2020-08-19	2020-08-19	Z_S	Ag Soil
388054	1+2-methylnaphthalene	GC-MS	2020-08-20	2020-08-20	QL	P 8270
388054	Methlynaphthalene, 1-	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Methlynaphthalene, 2-	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Acenaphthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Acenaphthylene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Anthracene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benz[a]anthracene	GC-MS	2020-08-15	2020-08-19	QL	P 8270

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Certificate of Analysis

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1821 Albion Road, Unit 7
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M9W 5W8
Attention: Mr. Houshang Akbari
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Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388054	Benzo[a]pyrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benzo[b]fluoranthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benzo[ghi]perylene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Benzo[k]fluoranthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Chrysene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Dibenz[a h]anthracene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Fluoranthene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Fluorene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Indeno[1 2 3-cd]pyrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Naphthalene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Phenanthrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388054	Pyrene	GC-MS	2020-08-15	2020-08-19	QL	P 8270
388087	Aroclor 1242	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Aroclor 1248	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Aroclor 1254	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Aroclor 1260	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388087	Polychlorinated Biphenyls	GC/ECD	2020-08-18	2020-08-18	YH	EPA 8081B/8082A
388109	Pyrene	GC-MS	2020-08-18	2020-08-19	QL	P 8270
388118	PHC's F1	GC/FID	2020-08-21	2020-08-21	TJB	CCME
388122	Tetrachloroethane, 1,1,1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichloroethane, 1,1,1-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Tetrachloroethane, 1,1,2,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichloroethane, 1,1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethane, 1,1-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethylene, 1,1-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorobenzene, 1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethane, 1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloropropane, 1,2-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorobenzene, 1,3-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorobenzene, 1,4-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Benzene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Bromodichloromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Bromoform	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B

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Certificate of Analysis

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1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936628
Date Submitted: 2020-08-13
Date Reported: 2020-08-21
Project: P0021561
COC #: 861422

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388122	Bromomethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethylene, 1,2-cis-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloropropene,1,3-cis-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Carbon Tetrachloride	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Chloroform	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dibromochloromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichlorodifluoromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Methylene Chloride	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Ethylbenzene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Ethylene dibromide	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Hexane (n)	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Xylene, m/p-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Chlorobenzene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Xylene, o-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Styrene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloroethylene, 1,2-trans-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Dichloropropene,1,3-trans-	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Tetrachloroethylene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Toluene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichloroethylene	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Trichlorofluoromethane	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388122	Vinyl Chloride	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388125	Dichloropropene,1,3-	GC-MS	2020-08-21	2020-08-21	TJB	V 8260B
388126	Xylene Mixture	GC-MS	2020-08-21	2020-08-21	TJB	V 8260B
388130	Acetone	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388130	Methyl Ethyl Ketone	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388130	Methyl Isobutyl Ketone	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388130	Methyl tert-Butyl Ether (MTBE)	GC-MS	2020-08-20	2020-08-20	TJB	V 8260B
388163	PHC's F2	GC/FID	2020-08-20	2020-08-20	A_A	CCME
388163	PHC's F3	GC/FID	2020-08-20	2020-08-20	A_A	CCME
388163	PHC's F4	GC/FID	2020-08-20	2020-08-20	A_A	CCME
388163	Moisture-Humidite	Oven	2020-08-20	2020-08-20	A_A	ASTM 2216
388175	PHC's F4g	GC/FID	2020-08-21	2020-08-21	A_A	CCME

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Certificate of Analysis

eurofins | Environment Testing

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E 04530

Report Number:	1936629
Date Submitted:	2020-08-13
Date Reported:	2020-08-20
Project:	P0021561
COC #:	861422
Temperature (C):	6
Custody Seal:	

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1510551 45-BH01-TCLP NO2 + NO3 MRL elevated for this report due to matrix interference (dilution was done). CN (free) MRL elevated for the report due to matrix interference (dilution was done). Metals analysis for this report was performed on an aqua-regia digest of the sample material.

Report Comments:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Report Number: 1936629
Date Submitted: 2020-08-13
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Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria

Results relate only to the parameters tested on the samples submitted.
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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936629
Date Submitted: 2020-08-13
Date Reported: 2020-08-20
Project: P0021561
COC #: 861422

Guideline = REG 558

Leachate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510551 R347 2020-08-11 45-BH01-T CLP	1510552 R347 2020-08-11 45-BH03-T CLP	1510553 R347 2020-08-11 45-BH04-T CLP	1510554 R347 2020-08-11 45-BH05-T CLP	1510555 R347 2020-08-11 45-BH06-T CLP
REG 558 Leach	387920				Y	Y	Y	Y	Y

Leachate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510556 R347 2020-08-11 45-BH07-T CLP	1510557 R347 2020-08-11 45-BH08-T CLP	1510558 R347 2020-08-11 45-BH09-T CLP
REG 558 Leach	387920				Y	Y	Y

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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Report Number: 1936629
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Guideline = REG 558

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510551 R347 2020-08-11 45-BH01-T CLP	1510552 R347 2020-08-11 45-BH03-T CLP	1510553 R347 2020-08-11 45-BH04-T CLP	1510554 R347 2020-08-11 45-BH05-T CLP	1510555 R347 2020-08-11 45-BH06-T CLP
Arsenic	388002	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02	<0.02	<0.02
Barium	388002	0.01	mg/L	LQC 100.0	0.62	0.51	0.42	0.51	0.49
Boron (total)	388002	0.1	mg/L	LQC 500.0	0.5	0.1	<0.1	0.1	<0.1
Cadmium	388002	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008	<0.008	<0.008
Chromium Total	388002	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05	<0.05	<0.05
Lead	388002	0.01	mg/L	LQC 5.0	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	388012	0.001	mg/L	LQC 0.1	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	388002	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02	<0.02	<0.02
Silver	388002	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	388002	0.01	mg/L	LQC 10.0	0.01	<0.01	<0.01	<0.01	<0.01

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510556 R347 2020-08-11 45-BH07-T CLP	1510557 R347 2020-08-11 45-BH08-T CLP	1510558 R347 2020-08-11 45-BH09-T CLP
Arsenic	388002	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02
Barium	388002	0.01	mg/L	LQC 100.0	0.49	0.42	0.42
Boron (total)	388002	0.1	mg/L	LQC 500.0	<0.1	<0.1	<0.1
Cadmium	388002	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008
Chromium Total	388002	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05
Lead	388002	0.01	mg/L	LQC 5.0	<0.01	<0.01	<0.01
Mercury	388012	0.001	mg/L	LQC 0.1	0.002	<0.001	<0.001
Selenium	388002	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02
Silver	388002	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01

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Guideline = REG 558

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510556 R347 2020-08-11 45-BH07-T CLP	1510557 R347 2020-08-11 45-BH08-T CLP	1510558 R347 2020-08-11 45-BH09-T CLP
Uranium	388002	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510551 R347 2020-08-11 45-BH01-T CLP	1510552 R347 2020-08-11 45-BH03-T CLP	1510553 R347 2020-08-11 45-BH04-T CLP	1510554 R347 2020-08-11 45-BH05-T CLP	1510555 R347 2020-08-11 45-BH06-T CLP
Cyanide (CN-)	387941	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05	<0.05	<0.05
F	388058	0.10	mg/L	LQC 150.0	0.10	0.22	1.05	0.13	0.49
NO2 + NO3 as N	387937	10	mg/L	LQC 1000	<10	<10	<10	<10	<10

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510556 R347 2020-08-11 45-BH07-T CLP	1510557 R347 2020-08-11 45-BH08-T CLP	1510558 R347 2020-08-11 45-BH09-T CLP
Cyanide (CN-)	387941	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05
F	388058	0.10	mg/L	LQC 150.0	0.32	<0.10	0.22
NO2 + NO3 as N	387937	10	mg/L	LQC 1000	<10	<10	<10

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Certificate of Analysis

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M9W 5W8
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PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936629
Date Submitted: 2020-08-13
Date Reported: 2020-08-20
Project: P0021561
COC #: 861422

Guideline = REG 558

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.				
					1510551 R347 2020-08-11 45-BH01-T CLP	1510552 R347 2020-08-11 45-BH03-T CLP	1510553 R347 2020-08-11 45-BH04-T CLP	1510554 R347 2020-08-11 45-BH05-T CLP	1510555 R347 2020-08-11 45-BH06-T CLP
Moisture-Humidite	387920	0.1	%		10.6	9.3	5.0	6.3	10.0

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1510556 R347 2020-08-11 45-BH07-T CLP	1510557 R347 2020-08-11 45-BH08-T CLP	1510558 R347 2020-08-11 45-BH09-T CLP
Moisture-Humidite	387920	0.1	%		10.0	13.0	9.8

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Report Number: 1936629
Date Submitted: 2020-08-13
Date Reported: 2020-08-20
Project: P0021561
COC #: 861422

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
387920	Moisture-Humidite			80-120				
387920	REG 558 Leach							
387937	NO2 + NO3 as N							
387941	Cyanide (CN-)	<0.05 mg/L	101	75-125	100	80-120	0	0-20
388002	Silver	<0.01 mg/L	100	70-130	98	70-130	0	0-20
388002	Arsenic	<0.02 mg/L	104	70-130	103	70-130	0	0-20
388002	Boron (total)	<0.1 mg/L	86	70-130	82	70-130	0	0-20
388002	Barium	<0.01 mg/L	102	70-130	99	70-130	0	0-20
388002	Cadmium	<0.008 mg/L	105	70-130	101	70-130	0	0-20
388002	Chromium Total	<0.05 mg/L	99	70-130	89	70-130	0	0-20
388002	Lead	<0.01 mg/L	110	70-130	100	70-130	0	0-20
388002	Selenium	<0.02 mg/L	114	70-130	110	70-130	0	0-20
388002	Uranium	<0.01 mg/L	99	70-130	96	70-130	0	0-20
388012	Mercury	<0.001 mg/L	98	76-123	92	70-130	0	0-20
388058	F	<0.10 mg/L	100	90-110			0	0-5

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Certificate of Analysis

eurofins | Environment Testing

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E 04530
Invoice to: EnGlobe Corp.

Report Number: 1936629
Date Submitted: 2020-08-13
Date Reported: 2020-08-20
Project: P0021561
COC #: 861422

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
387920	Moisture-Humidite	Oven	2020-08-18	2020-08-18	Z_S	ASTM 2216
387920	REG 558 Leach	Manual	2020-08-18	2020-08-18	Z_S	EPA 1311/O. Reg 347
387937	NO2 + NO3 as N	IC	2020-08-18	2020-08-18	SKH	SM 4110
387941	Cyanide (CN-)	Skalar CN Analyzer	2020-08-18	2020-08-18	QT	SM4500-CNC/MOE E3015
388002	Silver	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Arsenic	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Boron (total)	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Barium	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Cadmium	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Chromium Total	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Lead	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Selenium	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388002	Uranium	ICAPQ-MS	2020-08-19	2020-08-19	H_D	EPA 200.8
388012	Mercury	CV AA	2020-08-19	2020-08-19	SKH	M SM3112B-3500B
388058	F	Auto Titrator	2020-08-19	2020-08-19	QT	SM2320,2510,4500H/F

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

861422 1936628

Eurofins Workorder #:

CLIENT INFORMATION				INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)			
Company:	Englobe Corp			Company:			
Contact:	Houshang Akbari			Contact:			
Address:				Address:			
Telephone:	416-213-1060	Fax:		Telephone:		Fax:	
Email:	#1: houshang.akbari@englobecorp.com			Email:	#1:		
Email:	#2:			Email:	#2:		
Project:	P0021561			PO #:	E 04530	Quote #:	

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
- ☐ Storm Sewer, City: _____
- ☑ O. Reg 153, Table: 1&3, Type: Coarse Soil
- ☐ Excess Soil, Table: _____, Type: _____
- ☐ ODWSOG
- ☐ PWQO
- ☑ O. Reg 347/558
- ☐ Other: _____

TURN-AROUND TIME

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact the laboratory in advance to determine rush availability. Surcharges may apply to rush service.

*If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample ID	Date/Time Collected	Sample Details: Sample Matrix	Resample? Y = Yes N = No	# of Containers	Metals and Inorganics	Metals (ex. Hg, B, CrVI)	BTEX	VOC	PHC F1-F4	O. Reg 558 M&I	O. Reg 153 M&I	PAHs	PCBs	PHCs(BTEX F1-F4)	Field Parameters	RN# (Lab Use Only)
45-BH01-TCLP	August/11/2020			1						✓						
45-BH01-SS3	August/11/2020			4				✓			✓	✓	✓	✓		1510543
45-BH03-TCLP	August/11/2020			1						✓						
45-BH03-SS2	August/11/2020			4				✓			✓	✓	✓	✓		44
45-BH04-TCLP	August/11/2020			1						✓						
45-BH04-SS3	August/11/2020			4				✓			✓	✓	✓	✓		45
45-BH05-TCLP	August/11/2020			1						✓						
45-BH05-SS2	August/11/2020			4				✓			✓	✓	✓	✓		46
45-BH06-TCLP	August/11/2020			1						✓						
45-BH06-SS2	August/11/2020			4				✓			✓	✓	✓	✓		47

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:				
Relinquished By:	Alfred Iskander		Aug 13, 2020	
Received By:	Victor Gallant		08/13/20 4:02pm	6.1°C

COMMENTS:
Table 1: Residential/Parkland/Institutional/Industrial/Commercial/Community Use
Table3: Industrial/Commercial/Community Use

CUSTODY SEAL: YES ☐ NO ☐ Ice inside

eurofins

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 193062E

CLIENT INFORMATION				INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)			
Company:	Englobe Corp			Company:			
Contact:	Houshang Akbari			Contact:			
Address:				Address:			
Telephone:	416-213-1060	Fax:		Telephone:		Fax:	
Email:	#1: houshang.akbari@englobecorp.com			Email:	#1:		
Email:	#2:			Email:	#2:		
Project:	P0021561			PO #:	E 04530	Quote #:	

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
- ☐ Storm Sewer, City: _____
- ☑ O. Reg 153, Table: 1&3, Type: Coarse Soil
- ☐ Excess Soil, Table: _____, Type: _____
- ☐ ODWSOG
- ☐ PWQO
- ☑ O. Reg 347/558
- ☐ Other: _____

TURN-AROUND TIME

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

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**If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

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		Sample Details			Sample Analysis Required											Field Parameters			
		Field Filtered -->																	
Sample ID	Date/Time Collected	Sample Matrix	Resample? Y = Yes N = No	# of Containers	Metals and Inorganics	Metals (ex. Hg, B, CrVI)	BTEX	VOC	PHC F1-F4	O. Reg 558 M&I	O. Reg 153 M&I	PAHs	PCBs	PHCs(BTEX F1-F4)					RN# (Lab Use Only)
45-BH07-TCLP	August/11/2020			1						✓									
45-BH07-SS3	August/11/2020			4				✓			✓	✓	✓	✓					48
45-BH08-TCLP	August/11/2020			1						✓									
45-BH08-SS3	August/11/2020			4				✓			✓	✓	✓	✓					49
45-BH09-TCLP	August/11/2020			1						✓									
45-BH09-SS2	August/11/2020			4				✓			✓	✓	✓	✓					50

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:				
Relinquished By:	Alfred Iskander		Aug 13, 20	
Received By:	Victor Gallant		8/13/20 4:22pm	6.1 °C

COMMENTS:
Table 1: Residential/Parkland/Institutional/Industrial/Commercial/Community Use.
Table3: Industrial/Commercial/Community Use.

CUSTODY SEAL: YES ☐ NO ☐ Ice inside

Certificate of Analysis

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Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E04530

Report Number:	1936891
Date Submitted:	2020-08-18
Date Reported:	2020-08-25
Project:	P0021561
COC #:	859094
Temperature (C):	5
Custody Seal:	

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1511408 45-BH010-TCLP Metals analysis for this report was performed on an aqua-regia digest of the sample material. NO2+NO3 MRL elevated for this report due to matrix interference.

Report Comments:

Addrine Thomas, Inorganics Supervisor

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936891
Date Submitted: 2020-08-18
Date Reported: 2020-08-25
Project: P0021561
COC #: 859094

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria

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Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936891
Date Submitted: 2020-08-18
Date Reported: 2020-08-25
Project: P0021561
COC #: 859094

Guideline = REG 558

Leachate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511408 R347 / 2020-08-17 / 45-BH010-TCLP	1511409 R347 / 2020-08-17 / 45-BH011-TCLP	1511410 R347 / 2020-08-17 / 45-BH012-TCLP
REG 558 Leach	388170				Y	Y	Y

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511408 R347 / 2020-08-17 / 45-BH010-TCLP	1511409 R347 / 2020-08-17 / 45-BH011-TCLP	1511410 R347 / 2020-08-17 / 45-BH012-TCLP
Arsenic	388204	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02
Barium	388204	0.01	mg/L	LQC 100.0	0.62	0.50	0.58
Boron (total)	388204	0.1	mg/L	LQC 500.0	<0.1	<0.1	<0.1
Cadmium	388204	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008
Chromium Total	388204	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05
Lead	388204	0.01	mg/L	LQC 5.0	<0.01	<0.01	<0.01
Mercury	388259	0.001	mg/L	LQC 0.1	0.001	0.002	
		0.005	mg/L	LQC 0.1			<0.005
Selenium	388204	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02
Silver	388204	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01
Uranium	388204	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
PO#: E04530
Invoice to: EnGlobe Corp.

Report Number: 1936891
Date Submitted: 2020-08-18
Date Reported: 2020-08-25
Project: P0021561
COC #: 859094

Guideline = REG 558

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511408 R347 / 2020-08-17 / 45-BH010-TCLP	1511409 R347 / 2020-08-17 / 45-BH011-TCLP	1511410 R347 / 2020-08-17 / 45-BH012-TCLP
Cyanide (CN-)	388248	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05
F	388278	0.10	mg/L	LQC 150.0	0.21	0.22	0.18
NO2 + NO3 as N	388270	10	mg/L	LQC 1000	<10	<10	<10

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.		
					1511408 R347 / 2020-08-17 / 45-BH010-TCLP	1511409 R347 / 2020-08-17 / 45-BH011-TCLP	1511410 R347 / 2020-08-17 / 45-BH012-TCLP
Moisture-Humidite	388170	0.1	%		8.4	8.7	4.6

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Invoice to: EnGlobe Corp.

Report Number: 1936891
Date Submitted: 2020-08-18
Date Reported: 2020-08-25
Project: P0021561
COC #: 859094

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
388170	Moisture-Humidite			80-120				
388170	REG 558 Leach							
388204	Silver	<0.01 mg/L	110	70-130	114	70-130	0	0-20
388204	Arsenic	<0.02 mg/L	106	70-130	107	70-130	0	0-20
388204	Boron (total)	<0.1 mg/L	74	70-130	107	70-130	0	0-20
388204	Barium	<0.01 mg/L	114	70-130	112	70-130	0	0-20
388204	Cadmium	<0.008 mg/L	115	70-130	113	70-130	0	0-20
388204	Chromium Total	<0.05 mg/L	113	70-130	110	70-130	0	0-20
388204	Lead	<0.01 mg/L	120	70-130	112	70-130	0	0-20
388204	Selenium	<0.02 mg/L	116	70-130	118	70-130	0	0-20
388204	Uranium	<0.01 mg/L	111	70-130	107	70-130	0	0-20
388248	Cyanide (CN-)	<0.05 mg/L	99	75-125	120	80-120	0	0-20
388259	Mercury	<0.001 mg/L	94	76-123	102	70-130	0	0-20
388270	NO2 + NO3 as N							
388278	F	<0.10 mg/L	100	90-110			0	0-5

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Certificate of Analysis

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Report Number: 1936891
Date Submitted: 2020-08-18
Date Reported: 2020-08-25
Project: P0021561
COC #: 859094

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
388170	Moisture-Humidite	Oven	2020-08-21	2020-08-21	SG	ASTM 2216
388170	REG 558 Leach	Manual	2020-08-21	2020-08-21	SG	EPA 1311/O. Reg 347
388204	Silver	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Arsenic	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Boron (total)	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Barium	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Cadmium	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Chromium Total	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Lead	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Selenium	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388204	Uranium	ICAPQ-MS	2020-08-22	2020-08-22	H_D	EPA 200.8
388248	Cyanide (CN-)	Skalar CN Analyzer	2020-08-24	2020-08-24	QT	SM4500-CNC/MOE E3015
388259	Mercury	CV AA	2020-08-24	2020-08-24	SKH	M SM3112B-3500B
388270	NO2 + NO3 as N	IC	2020-08-24	2020-08-24	SKH	SM 4110
388278	F	Auto Titrator	2020-08-24	2020-08-24	QT	SM2320,2510,4500H/F

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eurofins 859094

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 1936890

CLIENT INFORMATION				INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☐ NO ☐)			
Company:	Englobe Corp			Company:			
Contact:	Houshang Akbari			Contact:			
Address:				Address:			
Telephone:	416-213-1060	Fax:		Telephone:		Fax:	
Email:	#1: houshang.akbari@englobecorp.com			Email:	#1:		
Email:	#2:			Email:	#2:		
Project:	P0021561			PO #:	E 04530	Quote #:	

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
- ☐ Storm Sewer, City: _____
- ☑ O. Reg 153, Table: 1&3, Type: Coarse Soil
- ☐ Excess Soil, Table: _____, Type: _____
- ☐ ODWSOG
- ☐ PWQO
- ☑ O. Reg 347/558
- ☐ Other: _____

TURN-AROUND TIME

☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☑ 5-7 Days (Standard)

Please contact the laboratory in advance to determine rush availability. Surcharges may apply to rush service.

*If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**If the results are reported the day after the rush due date, the following surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a $25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details				Sample Analysis Required												Field Parameters			RN# (Lab Use Only)
Sample ID	Date/Time Collected	Sample Matrix	Resample? Y = Yes N = No	# of Containers	Metals and Inorganics	Metals (ex. Hg, B, CrVI)	BTEX	VOC	PHC F1-F4	O. Reg 558 M&I	O. Reg 153 M&I	PAHs	PCBs	PHCs(BTEX F1-F4)					
		Field Filtered -->																	
45-BH010-TCLP	August/17/2020			1						✓									
45-BH010-SS2	August/17/2020			4				✓			✓	✓	✓	✓					1511405
45-BH011-TCLP	August/17/2020			1						✓									
45-BH011-SS3	August/17/2020			4				✓			✓	✓	✓	✓					06
45-BH012-TCLP	August/17/2020			1						✓									
45-BH012-SS3	August/17/2020			4				✓			✓	✓	✓	✓					07

	PRINT	SIGN	DATE/TIME	TEMP (°C)
Sampled By:				
Relinquished By:	Alfred Iskander		Aug 18, 2020 08/18/20 2:38pm	5.1 °C
Received By:	Victor Gallant			

COMMENTS:
Table 1: Residential/Parkland/Institutional/Industrial/Commercial/Community Use.
Table3: Industrial/Commercial/Community Use.

CUSTODY SEAL: YES ☐ NO ☐ Ice inside

Certificate of Analysis

eurofins | Environment Testing

Client: EnGlobe Corp. (Toronto)
1821 Albion Road, Unit 7
Toronto, ON
M9W 5W8
Attention: Mr. Houshang Akbari
Invoice to: EnGlobe Corp.
PO#: E04530

Report Number:	1942594
Date Submitted:	2020-11-06
Date Reported:	2020-11-13
Project:	P0021561
COC #:	862674
Temperature (C):	6
Custody Seal:	

Dear Houshang Akbari:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Sample Comment Summary

Sample ID: 1527320	45-BH02-TCLP	Metals analysis for this report was performed on an aqua-regia digest of the sample material.

Report Comments:

Sarah Horner, Inorganics Technician

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated
.
Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accrteditation. The scope is available at http://www.cala.ca/scopes/2602.pdf

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Invoice to: EnGlobe Corp.

Report Number: 1942594
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria

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Attention: Mr. Houshang Akbari
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Report Number: 1942594
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Guideline = REG 558

Leachate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527320 R347 2020-11-05 45-BH02-TCLP	1527321 R347 2020-11-05 45-BH013-TCLP	1527322 R347 2020-11-04 45-BH014-TCLP	1527323 R347 2020-11-04 45-BH015-TCLP
REG 558 Leach	392118				Y	Y	Y	Y

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527320 R347 2020-11-05 45-BH02-TCLP	1527321 R347 2020-11-05 45-BH013-TCLP	1527322 R347 2020-11-04 45-BH014-TCLP	1527323 R347 2020-11-04 45-BH015-TCLP
Arsenic	392195	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02	<0.02
Barium	392195	0.01	mg/L	LQC 100.0	0.27	0.34	0.48	0.58
Boron (total)	392195	0.1	mg/L	LQC 500.0	<0.1	<0.1	<0.1	<0.1
Cadmium	392195	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008	<0.008
Chromium Total	392195	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05	<0.05
Lead	392195	0.01	mg/L	LQC 5.0	<0.01	<0.01	<0.01	<0.01
Mercury	392363	0.001	mg/L	LQC 0.1	<0.001	<0.001	<0.001	<0.001
Selenium	392195	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02	<0.02
Silver	392195	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01	<0.01
Uranium	392195	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01	<0.01

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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Report Number: 1942594
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Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Guideline = REG 558

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527320 R347 2020-11-05 45-BH02-TCLP	1527321 R347 2020-11-05 45-BH013-TCLP	1527322 R347 2020-11-04 45-BH014-TCLP	1527323 R347 2020-11-04 45-BH015-TCLP
Cyanide (CN-)	392209	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05	<0.05
F	392230	0.10	mg/L	LQC 150.0	1.28	0.27	0.20	0.20
NO2 + NO3 as N	392229	10	mg/L	LQC 1000	<10	<10	<10	<10

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sample Date / Sampling Time / Sample I.D.			
					1527320 R347 2020-11-05 45-BH02-TCLP	1527321 R347 2020-11-05 45-BH013-TCLP	1527322 R347 2020-11-04 45-BH014-TCLP	1527323 R347 2020-11-04 45-BH015-TCLP
Moisture-Humidite	392118	0.1	%		11.8	9.2	21.7	12.1

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Report Number: 1942594
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Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
392118	Moisture-Humidite			80-120				
392118	REG 558 Leach							
392195	Silver	<0.01 mg/L	90	70-130	98	70-130	0	0-20
392195	Arsenic	<0.02 mg/L	93	70-130	95	70-130	0	0-20
392195	Boron (total)	<0.1 mg/L	76	70-130	64	70-130	0	0-20
392195	Barium	<0.01 mg/L	90	70-130	94	70-130	0	0-20
392195	Cadmium	<0.008 mg/L	93	70-130	98	70-130	0	0-20
392195	Chromium Total	<0.05 mg/L	109	70-130	89	70-130	0	0-20
392195	Lead	<0.01 mg/L	94	70-130	94	70-130	0	0-20
392195	Selenium	<0.02 mg/L	103	70-130	99	70-130	0	0-20
392195	Uranium	<0.01 mg/L	85	70-130	85	70-130	0	0-20
392209	Cyanide (CN-)	<0.05 mg/L	100	75-125	106	80-120	0	0-20
392229	NO2 + NO3 as N							
392230	F	<0.10 mg/L	100	90-110			0	0-5
392363	Mercury	<0.001 mg/L	81	76-123	106	70-130	0	0-20

Results relate only to the parameters tested on the samples submitted.
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eurofins | Environment Testing

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Report Number: 1942594
Date Submitted: 2020-11-06
Date Reported: 2020-11-13
Project: P0021561
COC #: 862674

Test Summary

Batch No	Analyte	Instrument	Prep aration Date	Analysis Date	Analyst	Method
392118	Moisture-Humidite	Oven	2020-11-09	2020-11-09	SG	ASTM 2216
392118	REG 558 Leach	Manual	2020-11-10	2020-11-10	SG	EPA 1311/O. Reg 347
392195	Silver	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Arsenic	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Boron (total)	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Barium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Cadmium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Chromium Total	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Lead	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Selenium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392195	Uranium	ICAPQ-MS	2020-11-11	2020-11-11	H_D	EPA 200.8
392209	Cyanide (CN-)	Skalar CN Analyzer	2020-11-11	2020-11-11	QT	SM4500-CNC/MOE E3015
392229	NO2 + NO3 as N	IC	2020-11-11	2020-11-12	SKH	SM 4110
392230	F	Auto Titrator	2020-11-11	2020-11-11	QT	SM2320,2510,4500H/F
392363	Mercury	CV AA	2020-11-13	2020-11-13	SKH	M SM3112B-3500B

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Appendix 5 Asbestos Testing Results

TABLE 4-1
ASBESTOS FIBRE TESTING
Martin Grove Rd
Contract No. PM6A - 2021-45

Core Number	Mix Type Thickness (mm)	AC (mm)	PCC (mm)	Location	Asphalt Cement Content (%)	Asbestos Content (%) By Dry Weight
45-CH1	AC Lift 1 = 30 AC Lift 2 = 55 AC Lift 3 =	85	-	Lorranie Gardens, 1.5 m South of North curb, South of 43 Lorranie Gardens	4.37	No visible fibres observed in the extracted sample
45-CH2	AC Lift 1 = 40 AC Lift 2 = 40 AC Lift 3 = 115	195	-	Martin Grove Rd, 1.5 m West of East curb, in front of 43 Lorranie Gardens	5.05	No visible fibres observed in the extracted sample
45-CH3	AC Lift 1 = 45 AC Lift 2 = 65 AC Lift 3 = 80	190	-	Cowley Ave, 1.5 m South of North curb, South of 2 Cowley Ave	4.84	No visible fibres observed in the extracted sample
45-CH4	AC Lift 1 = 30 AC Lift 2 = 55 AC Lift 3 = 95	180	-	Martin Grove Rd, 1.5 m East of West curb, in front of 208 Martin Grove Rd	4.54	No visible fibres observed in the extracted sample
45-CH5	AC Lift 1 = 45 AC Lift 2 = 65 AC Lift 3 = 55	165	-	Donalbert Rd, 1.5 m, South of North curb, South of 2 Donalbert Rd	4.86	No visible fibres observed in the extracted sample
45-CH6	AC Lift 1 = 40 AC Lift 2 = 60 AC Lift 3 = 100	200	-	Martin Grove Rd, 1.5 m West of East curb, in front of 207 Martin Grove Rd	4.43	No visible fibres observed in the extracted sample
45-CH7	AC Lift 1 = 55 AC Lift 2 = 55 AC Lift 3 = 45	155	-	Martin Grove Rd, 1.5 m West of East curb, North of 219 Martin Grove Rd	4.98	No visible fibres observed in the extracted sample
45-CH8	AC Lift 1 = 45 AC Lift 2 = 30 AC Lift 3 = 75	150	-	Martin Grove Rd, 1.5 East of West curb, in front of 228 Martin Grove Rd.	4.35	No visible fibres observed in the extracted sample
45-CH9	AC Lift 1 = 90 AC Lift 2 = 40 AC Lift 3 = 90	220	-	Martin Grove Rd, 1.5 West of East curb, across from 236 Martin Grove Rd	4.67	No visible fibres observed in the extracted sample
45-CH10	AC Lift 1 = 50 AC Lift 2 = 60 AC Lift 3 = 75	185	-	Saralou Court, 1.5 m East of West curb, East of 30 Saralou Crt	4.27	No visible fibres observed in the extracted sample
45-CH11	AC Lift 1 = 45 AC Lift 2 = 55 AC Lift 3 = 70	170	-	Martin Grove Rd, 1.5 m South of North curb, in front of 257 Martin Grove Rd	4.96	No visible fibres observed in the extracted sample
45-CH12	AC Lift 1 = 45 AC Lift 2 = 70 AC Lift 3 = 75	190	-	Martin Grove Rd, 1.5 m North of South curb, in front of 254 Martin Grove Rd	4.46	No visible fibres observed in the extracted sample
45-CH13	AC Lift 1 = 50 AC Lift 2 = 55 AC Lift 3 = 65	170	-	Martin Grove Rd, 1.5 m South of North curb, in front of 271 Martin Grove Rd	4.49	No visible fibres observed in the extracted sample
45-CH14	AC Lift 1 = 65 AC Lift 2 = 65 AC Lift 3 = 40	170	-	Rathburn Rd, 1.5 South of North curb, south of 304X Martin Grove Rd	4.58	No visible fibres observed in the extracted sample
45-CH15	AC Lift 1 = 45 AC Lift 2 = 45 AC Lift 3 = 20	110	-	Rathburn Rd, 1.5 North of South curb, North of 239 Martin Grove Rd	4.87	No visible fibres observed in the extracted sample
45-CH16	AC Lift 1 = 40 AC Lift 2 = 30 AC Lift 3 = 20	90	-	Martin Grove Rd, 1.5 West of East curb, across from 304X Martin Grove Rd	4.41	No visible fibres observed in the extracted sample
45-CH17	AC Lift 1 = 40 AC Lift 2 = 40 AC Lift 3 = 25	105	-	Martin Grove Rd, 1.5 m East of West curb, in front of 312 Martin Grove Rd	4.81	No visible fibres observed in the extracted sample
45-CH18	AC Lift 1 = 50 AC Lift 2 = 50 AC Lift 3 = 40	140	-	Martin Grove Rd, 1.5 West of East curb, North of 312 Martin Grove Rd	4.71	No visible fibres observed in the extracted sample

Appendix 6 Photographs of Typical Pavement Distresses

Photograph 1-1 — Martin Grove Road, about 30 m north of Saralou Court, looking south, showing low severity transverse cracking and low severity patching [28/08/2020, SG].

Photograph 1-2 — Martin Grove Road, about 140 m south of Saralou Court, looking south, showing low to medium severity longitudinal and transverse cracking and low severity depression [28/08/2020, SG].

Photograph 1-3 — Martin Grove Road, about 10 m north from Donalbert Road, looking south, showing low to medium severity longitudinal and transverse cracking and low severity utility patching [28/08/2020, SG].

Photograph 1-4 — Martin Grove Road, about 20 m north from Lorraine Gardens, looking south, showing low to medium severity longitudinal and transverse cracking, low severity alligator cracking, low severity patching and low to medium severity depression [28/08/2020, SG].

Englobe
Soils Materials Environment

R. V. Anderson Associates Limited

CONTRACT PM6A – 2021 – SITE NO. 45
MARTIN GROVE ROAD – WATERMAIN REPLACEMENT

Geotechnical Discussion and Recommendations

February 3, 2020

124-P-0021561-0-01-145-GE-R-002-00

FINAL VERSION

Prepared by:

Steven Chen, P.Eng.
Geotechnical Engineer

Prepared by:

Sunil Ganesh, M.Eng, P.Eng., PMP
Pavement Engineer

Approved by:

Houshang Akbari, P.Eng.
Senior Geotechnical Engineer

Revision and Publication Register		
Revision N°	Date	Modification and/or Publication Details
0A	2020-11-27	Submission of Draft Geotechnical Discussion and Recommendations Report
00	2021-02-03	Final Report

Property and Confidentiality

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Tables

1 INTRODUCTION

Englobe Corp. has completed a geotechnical investigation for the proposed watermain replacement on Martin Grove Road from Lorraine Gardens to 180 m North of Rathburn Road. The geotechnical investigation was completed at the request of Bavendan Paramsothy, P.Eng of R.V. Anderson Associates Limited for Contract PM6A – 2021 – Site No. 45.

The results of the geotechnical/pavement investigation have been summarized and recommendations developed for the proposed watermain replacements including excavation and backfill considerations, temporary construction dewatering requirements, pavement restoration and disposal of excess or contaminated materials.

It is understood that the replacement watermain will be constructed as per the City Standard Specifications, using conventional cut-and-cover and Horizontal Directional Drilling (across Mimico Creek0 techniques.

This report should be read in conjunction with the Englobe Factual Geotechnical Report 124-P-0021561-0-01-145-GE-R-001-00.

2 PAVEMENT CONDITIONS

2.1. Pavement Condition Survey

In general, based on the visual pavement condition survey, the existing pavement condition along Martin Grove Road within the project limits is fair with localized poor areas. Based on the types, severity levels and distress density observed the PQI is estimated as 60.The most significant distresses are intermittent low to medium severity longitudinal cracking, intermittent low to medium severity transverse cracking, few low severity alligator cracking; intermittent low to medium severity depression; and intermittent low severity utility patching.

Based on the visual assessment no safety hazards were observed along the project limits. The overall surface drainage is generally considered to be fair. Observations along the roadway section indicate that the pavement surface water generally follows the existing pavement grades and is being directed to the concrete curb and gutter to catch basins. However, at some localized locations, the drainage is impaired by pavement surface distresses, along with unsealed and poorly sealed cracks allowing surface water to infiltrate into pavement. The catch basins were observed to be in a fair condition (with cracking and depressions/distortions noted around some catch basins).

2.2. Existing Pavement Structure

A flexible pavement structure was observed on Martin Grove Road, Lorraine Gardens, Cowley Avenue, Donalbert Road, Saralou Court and Rathburn Road. The average pavement structure thicknesses are summarized in Table 1.

Table 1 Summary of Asphalt Thickness and Pavement Structure

ROADWAY	ASPHALT CONCRETE BOREHOLES and COREHOLES (AVERAGE) mm	PORTLAND CEMENT CONCRETE BOREHOLES and COREHOLES (AVERAGE) mm	GRANULAR BASE/ SUBBASE (AVERAGE) mm
Martin Grove Road	90 to 220 (170)	-	150 to 410 (235)
Lorranie Gardens	85 (85)	-	
Cowley Avenue	190 (190)	-	
Donalbert Road	165 (165)	-	
Saralou Court	185 (185)	-	
Rathburn Road	110-170 (140)	-	180-300 (240)

3 EXCAVATION AND BACKFILL CONSIDERATIONS

Excavations to the depths required for the watermain replacements are expected to be relatively straightforward. The pavement structure in the excavation area should be properly removed by saw-cutting and any existing granular base/subbase sub-excavated and disposed off-site. The investigation results suggest that excavations should be able to be carried out to the depths required for watermain installation using conventional excavation equipment. Excavation side slopes in the upper subsoils are expected to be excavated in vertical cuts, temporary shoring such as trench boxes will be required to support the excavation sidewalls and any surcharge loads that may be applied during the construction period. All excavations must be carried out in accordance with the Ontario Occupational Health and Safety Act (OHSA). The subsoils encountered at site as per OHSA criteria would typically be considered:

Moist, Fill – Type 3

Moist, firm, clayey silt and Sandy Clayey Till– Type 3

Moist, stiff to hard, clayey silt– Type 3

Moist, loose to compact, silty sand– Type 3

Moist, dense to very dense, silty sand– Type 2

All wet and/or disturbed material, or other obviously objectionable material such as organics, should be sub-excavated to the depths required for placement of the watermain bedding.

The watermain should then be installed in conformance with TS 441 (September 2017) (and OPSS.MUNI 441, November 2016). This requires that the watermain pipe be continuously supported by a minimum of 150 mm but no greater than 300 mm of Granular A compacted to at least 98 percent Standard Proctor Maximum Dry Density (SPMDD). The pipe bedding must then be placed completely surrounding and supporting the watermain pipe and extending to at least 300 mm above the crown of the watermain. The remainder of the trench backfill material should consist of properly placed and compacted TS 1010 50 mm crushed aggregate (or TS 13.10 Unshrinkable Fill) to the underside of the pavement structure. Crushed aggregate should be placed in lifts not exceeding 250 mm in thickness compacted to at least 95 per cent of SPMDD. No support problems are anticipated for the watermain pipes founded in the soil conditions encountered in the boreholes for all watermain replacement locations.

Where required, such as at connections, caps and bends, the watermain should be restrained by concrete blocking or restrained joints. Concrete thrust blocks should be constructed in accordance with City of Toronto Standard Drawing No. T-1103.01 and T-1103.020 requirements. Concrete for thrust blocks shall be placed against undisturbed soil.

The watermain service connections must be provided with at least 1.65 m of earth cover to provide adequate protection from frost effects. Alternatively, an appropriate insulation providing equivalent protection could also be considered where 1.65 m of earth cover cannot be consistently achieved. The insulation details should be carried out in accordance with City of Toronto Standard Drawing No. T-708.01-4 requirements.

4 PAVEMENT REINSTATEMENT

Where the watermain lies within the existing roadway carriageway, backfilling and restoration of the roadway should be carried out in accordance with the City of Toronto Standard Procedures and Specifications. Based on the City of Toronto's Road Classifications Systems, Martin Grove Road is classified as a collector road Lorraine Gardens to Rathburn Road and as a Minor Arterial Road form Rathburn Road to 180 m North of Rathburn Road. Rathburn Road is classified as a Minor arterial road within the project limit. Lorraine Gardens, Cowley Avenue, Donalbert Road and Saralou Court are classified as local roads within the project limits.

A flexible pavement was observed on Martin Grove Road, Lorranie Gardens, Cowley Avenue, Donalbert Road, Saralou Court and Rathburn Road. The pavement of these roads should be re-instated in conformance with the City of Toronto Standard Drawing T-509.010-1 (2 of 2) – Flexible Pavement Patching for utility cuts and in accordance to TS4.60- Construction Specification for Utility Cut and Restoration as follows:

- Backfill the trench and utility excavations with Unshrinkable Fill (TS 13.10) TS 1010 or 50 mm crushed aggregate to the underside of the pavement as described in Section 3 of this report;

- The granular base/subbase should be reinstated to match the existing roadway granular base/subbase thickness using TS 1010 Granular A with a minimum thickness of 150 mm in each layer, compacted to at least 100 percent SPMDD;

- Table 2 shows the proposed asphalt pavement thickness and the performance grade asphalt cement for each road. The new super-pave hot-mix asphalt concrete shall be

placed compacted in conformance with TS 1151 requirements. Prior to placing the 40 mm surface course the existing asphalt should be milled at a minimum width of 3 m or to the full width of the lane. A tack coat shall be placed between the hot-mix asphalt lifts in accordance with TS 3.20 requirements. The surface of the completed pavement should be provided with a minimum centre-to-edge cross-fall of 2 percent.

Table 2 Proposed Asphalt Pavement Thickness

ROADWAY	Surface Course Asphalt	Binder Course Asphalt
Martin Grove Road (Lorraine Gardens to Rathburn Road)	40 mm SP 12.5 B (PG 64-28)	Two lifts of 65 mm SP 19.0 B (PGAC 58-28)
Martin Grove Road (Rathburn Road to 100 m north of Rathburn Road)	40 mm SP 12.5 FC1 C (PG 64-28)	Two lifts of 65 mm SP 19.0 D (PGAC 58-28)
Lorranie Gardens	40 mm SP 12.5 B (PG 64-28)	One lifts of 60 mm SP 19.0 B (PGAC 58-28)
Cowley Avenue	40 mm SP 12.5 B (PG 64-28)	Two lifts of 65 mm SP 19.0 B (PGAC 58-28)
Donalbert Road	40 mm SP 12.5 B (PG 64-28)	Two lifts of 65 mm SP 19.0 B (PGAC 58-28)
Saralou Court	40 mm SP 12.5 B (PG 64-28)	Two lifts of 65 mm SP 19.0 B (PGAC 58-28)
Rathburn Road	40 mm SP 12.5 FC1 C (PG 64-28)	Two lifts of 50 mm SP 19.0 D (PGAC 58-28)

It should be noted that differential movement may occur between the reinstated and existing adjacent pavements if they have different thickness and structural compositions. To mitigate the potential for this, the reinstated pavement structure should be made to match the adjacent pavements as closely as possible. In addition, proper construction and compaction of the materials in the trench reinstatement is required to prevent differential settlement.

4.1. General Recommendations

The Superpave mixes and their production and placement should be completed in accordance with TS 1151 and TS 310. The Granular 'A' and 'B' to be used as road base and subbase, respectively, for this project should conform to the applicable City of Toronto specification (TS 1010). A tack coat should be applied between hot-mix asphalt lifts in accordance with TS 3.20 requirements.

It is recommended that performance graded asphalt cement (PGAC) 64-28 and (PGAC) 58-28 be used in the surface course layer and binder course layer respectively for this project and shall conform to TS 1101 requirements.

A joint transition treatment will be necessary where old and new asphalt pavement layers abut. The recommended transition treatment consists of milling the old surface layer approximately 300 mm wide and 50 mm deep to provide better pavement tie-in to adjacent new asphalt pavement structure.

It is recommended that all construction joints at the ends of the pavement be cleaned with stiff bristle brooms and compressed air to remove all dust, dirt and other foreign matter. A light tack coat should be applied (and allowed to properly cure) to all construction joints prior to the placement of hot-mix asphalt to ensure an adequate bond between the old and new pavements.

4.2. Drainage Recommendations

Prior to undertaking any pavement rehabilitation work, the roadway drainage and sub-drainage should be carefully assessed, noting that provision of proper drainage is fundamental to the performance of the roadway to mitigate frost-related movements and minimize seasonal loss of subgrade support (subgrade softening in spring). If existing sub-drainage is not functional, then the use of full-length perforated pipe subdrains should be considered for this roadway section constructed to urban (curb and gutter) standards. In this regard, proper drainage should consist of well maintained, and/or installation of subdrains, having the invert at least 0.6 m below the top of subgrade and leading to a positive outlet. For existing curb and gutter sections, subdrains could be installed below the edge of pavement in front of the curb and gutter on both sides of the road.

5 SOIL DISPOSAL RECOMMENDATIONS

The soil analytical results were compared to Standards presented in the Ontario Ministry of the Environment, Conservation and Parks (MECP's) Rules for Soil Management and Excess Soil Quality Standards in O. Reg. 406/19 (On-Site and Excess Soil Management) made under the Environmental Protection Act, R.S.O. 1990, c. E.19 (EPA). Soils exceeding the MECP Table 1 RPIICC property use for EC, SAR and Petroleum Hydrocarbons (F4 and F4g) were identified in various soil samples. The test results on the same samples compared with MECP Table 3.1 ICC property use and exceedances of EC and SAR were identified in various soil samples collected from the borehole locations.

Possible clean soil may be present in discontinues subsurface layers of fill material and native deposits. Based on the borehole locations and sampling results, it is not possible to conclude a horizontally potential clean soil zone within the areas. Based on TCLP testing results, the excavated soil from the site may be transferred to a licensed MECP landfill for final disposal as non-hazardous wastes.

6 TEMPORARY CONSTRUCTION DEWATERING

Groundwater measurements conducted in each of the open boreholes upon completion of drilling indicated that the groundwater level was generally below the anticipated depth of the watermain bedding in all boreholes. Some seepage of groundwater into the open excavations is anticipated based on the soil type. It is expected that seepage within the excavation depth should be controllable using sump pumps.

7 HORIZONTAL DIRECTIONAL DRILLING (HDD)

It is understood that the proposed watermain will cross under the Mimico Creek north of Rathburn Road by HDD method.

HDD is a method that uses steerable soil drilling in a two-stage process. Stage 1 involves drilling a pilot hole along the proposed alignment centreline. In stage 2 a backreamer is attached to the end of the drill string and pulled back through the pipe to enlarge the hole to the size necessary to pull back the new pipeline. The soil cuttings will be mixed with drilling fluid (Bentonite and/or mixture of Bentonite and polymer) to create a flowable slurry and maintaining a continuous stable bore; and transporting drilled cuttings (suspended in the slurry) from the bore to allow insertion of the pipeline. HDD relies on the passive resistance generated between the drill bit and the soil formation in order to make directional changes, therefore sharp radius bends or abrupt steering corrections are not feasible. This method creates no significant ground movement.

Based on the soil information revealed from the investigation, the anticipated subsurface soil during HDD installation may consist of sandy silt/silty sand and possible clayey silt deposit varied in consistency. No boulders and/or cobbles were encountered during site investigation at the borehole locations (45-BH-12 to 45-BH-15). The groundwater level lies at 1.5 to 8.1 mbgs. In general, no difficulties are anticipated for the installation of HDD pipe based on the soil conditions results from the geotechnical investigation. We recommend a minimum of 2.5 m soil cover over the HDD line under the Mimico Creek as per TRCA standards.

The following discussions are provided for design reference.

Control and Containment: The drilling operations should be monitored continuously by experienced personnel trained in all aspects of the directional drilling process. These procedures include, but not limited to, accurate monitoring and control system to track the progress and exact location of the drilling head at all times. Horizontal and vertical adjustments should be made throughout the procedure so that the drilling profile matches the planned profile. The specific weight of the drilling fluid should be adjusted throughout the procedure to maintain hydrological stability. Jetting pressures should be limited to avoid drilling fluid release during drilling. However, should release of drilling fluid in the project area occur, operations should stop immediately, and measures should be taken to contain the release.

Inadvertent Returns of Drilling Fluid: Hydraulic fracturing occurs when borehole pressure causes plastic deformation of the soil surrounding the borehole, initiating and propagating fractures in the soil mass. The resistance to plastic deformation and fracturing is a function of soil strength, overburden pressure, and pore water pressure. Hydraulic fracturing can result in drilling fluid inadvertently returning to the ground surface or running horizontally away from the borehole. Changes in the bore path, drilling fluid properties and drilling equipment affect the analysis results. Borehole instability issues and/or the contactor not maintaining a clean

borehole can result in poor drilling returns and partial or complete plugging of the borehole. This will result in higher fluid pressures within the bore and can lead to hydraulic fracturing and inadvertent fluid returns to the ground surface. In light of this, a contractor specialized in HDD installation should be retained and the allowable borehole pressure as well as the drill mud density/viscosity required for bore advancement and lifting of ream cuttings should be evaluated carefully based on their experience and interpretation of the soil information.

Provisions should be in place to mitigate the effects of hydraulic fracturing and inadvertent fluid returns near the exit point, such as, plastic sheeting, earthen berms, straw bales or waddles, etc., which are commonly used to provide containment for inadvertent drilling fluid releases to the surface.

Loss of Drilling Fluid Returns: Loss of drilling fluid returns typically occurs when the drill bit encounters fractures in large interstitial pore spaces in coarse materials (i.e., coarse sands and gravels). Loss of returns is recognized by a decrease of drilling fluid returns, or a drop in drilling fluid pressure. If fractures or interstitial pore spaces are small or discontinuous, they may fill with solids contained in the drilling fluid returns as drilling progresses beyond them. Once the fractures or pore spaces are filled, fluid will return up the bore hole again and fluid pressure will increase until another fracture is encountered. If fractures are continuous to the surface, drilling fluid may inadvertently return to the surface.

8 TEMPORARY EXCAVATION SUPPORT FOR ENTRY AND EXIT PITS

Based on the information provided the proposed entry and exit pits will be at the locations of boreholes 45-BH-15 and 45-BH12 respectively. The depth of the corresponding entry/exit pits is not known at this stage, but it anticipated to be between 2.5 to 3.5 mbgs.

It will be necessary for excavations be properly supported using a suitable excavation support system designed by a shoring engineer.

The lateral earth pressures (P), in kPa, acting on the shoring system, may be calculated using the equation below.

$$P = Ka\ (\gamma H + q)$$

where:

Ka= coefficient of active lateral earth pressure; use Ka= 0.30

γ = bulk unit weight of the soil behind the shoring; use 19.0 kN/m³ for native soil and 18.0 kN/m³ for fill material.

H = height in meters at which the pressure is being calculated;

q = surcharge adjacent to shoring system in kPa.

A minimum safety factor of 2.0 should be employed when analyzing the earth pressure.

9 GENERAL COMMENTS

The comments provided in this report have been developed for the use of R. V. Anderson Associates Limited and the City of Toronto. It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling and should not be interpreted as exact planes of geological change. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design. Also, the subsoil and groundwater conditions have been determined at the borehole locations only. Additional boreholes and/or test pits would be necessary to determine the localized conditions between boreholes. Contractors bidding on, or undertaking the works, must conduct their own investigations, and interpretations of the factual borehole data, and draw their own conclusions as to how the subsoil and groundwater conditions may affect their construction techniques, scheduling and costs.

The Englobe recommendations are contingent upon provision of a consistently competent, stable subgrade, which is properly drained and free of soft spots and objectionable materials such as organics.

It is further noted that, depending on the time of year the field work was completed, water levels should be expected to vary, perhaps significantly from those observed at the time of this investigation.

All watermain installations should only be completed during periods of favourable weather. The need for continuous construction supervision by a qualified, experienced technician, and quality control testing during construction projects cannot be over-emphasized. All materials and construction services required for the watermain replacement and pavement rehabilitation should be in accordance with the City of Toronto's Specifications and Standard Drawings and Ontario Provincial Standard Specification.

Appendix 5

Public Involvement

Watermain Replacement on Martin Grove Road at Mimico Creek

Public Consultation Report

May 2022

Prepared by: Ken Wallace, R.V. Anderson Associates Limited

Contents

Appendix

Notice of Commencement / Public Consultation
Advertisement
PIC presentation slides (watermain only)
Feedback Form
PIC Event Summary of Questions and Answers
Questions by email or phone and Answers
Other Stakeholder Correspondence

Executive Summary

Public consultation for the watermain replacement on Martin Grove Road crossing Mimico Creek commenced the week of November 23 and ended December 21, 2020. This included a flyer distribution, virtual public meeting, a project website, and targeted emails to the project stakeholder list. Flyers were distributed throughout the Study area and over 100 people attended the December 7, 2020 virtual public meeting.

The responses received were mostly questions and concerns about how the work will be done from construction method to schedule of construction.

Introduction

The City of Toronto has identified the need to replace the existing 300 mm and 400 mm diameter watermains located within Martin Grove Road under the 2023 Capital Works Program. Refer to Figure 1 for the Project Location. The material of these existing watermains is cast / ductile iron and were installed between 1930 and 1950. The watermain south of Savalon Court at Rathburn Road has experienced over ten breaks since 2010. The existing watermains are at the end of their service life and require to be brought to a state of good repair.

The watermain north of Savalon Court to Eglinton Avenue was recently replaced in 2019.

The watermain crossing Mimico Creek is of a similar age and also needs to be replaced. A watermain break under the creek will be very difficult to repair. To address this issue, the watermain has been scheduled for replacement. The portion of the watermain crossing Mimico Creek is not a candidate for cement mortar lining because of the number of bends originally used in the crossing of Mimico Creek.

The subject watermain crossing Mimico Creek is integral to the water distribution system in the neighbourhood as it not only provides drinking water, but also redundancy for Emergency Services.

A Class Environmental Assessment was need to determine the preferred solution to replace / rehabilitate the watermain since it is located outside the City right-of-way within the vicinity of Mimico Creek.

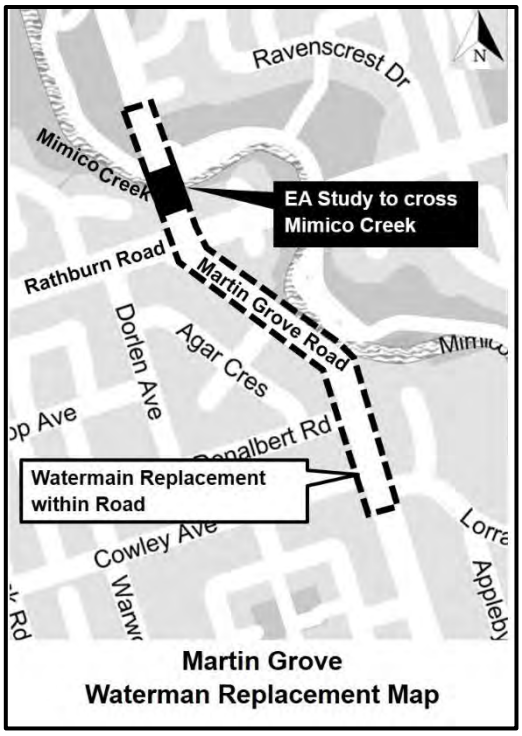

Figure 1 - Study Area

Overview of Communication Activities

The public notifications for this project included the following:

1. Flyer distribution to 3,100 households within Highway 427 to Kipling Avenue and from Sabine Avenue to Burnhamthorpe Road
2. Email notification to approximately 25 business groups on November 26, 2020
3. Webpage and online feedback form
4. Advertised in the Etobicoke Guardian (Central) on November 26, 2020
5. Posted on the City of Toronto Transportation Twitter Account on December 4, 2020
6. Follow-up email requesting feedback on December 10, 2020

The meeting was joint consultation with another project which proposed bicycle lanes in the same neighbourhood as the watermain replacement on Martin Grove Road to provide convenience for local residents to participate. The consultation summaries for each project were separated.

The published URL on the flyer was: toronto.ca/MartinGrove

A copy of the Public Consultation Record received is included at the end of this appendix.

Alternative Solutions, Preferred and the Feedback Questions

Alternative solutions to replace the watermain along a new alignment to cross Mimico Creek using Horizontal Directional Drilling have been developed and include:

- Do nothing.
- Install watermain along a new alignment below the bridge structure and inside Martin Grove road right-of-way.
- Install watermain along a new alignment west of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within an existing utility easement.
- Install watermain along a new alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way.

The following sections describe in more detail the alternative solutions:

Alternative #1: Do nothing. This alternative does not resolve the maintenance and operations issues of breaks and may continue to experience watermain breaks and service disruptions in the future. Therefore, this option is screened out.

Alternative #2: Watermain aligned below bridge and inside road right-of-way (Figure 2).

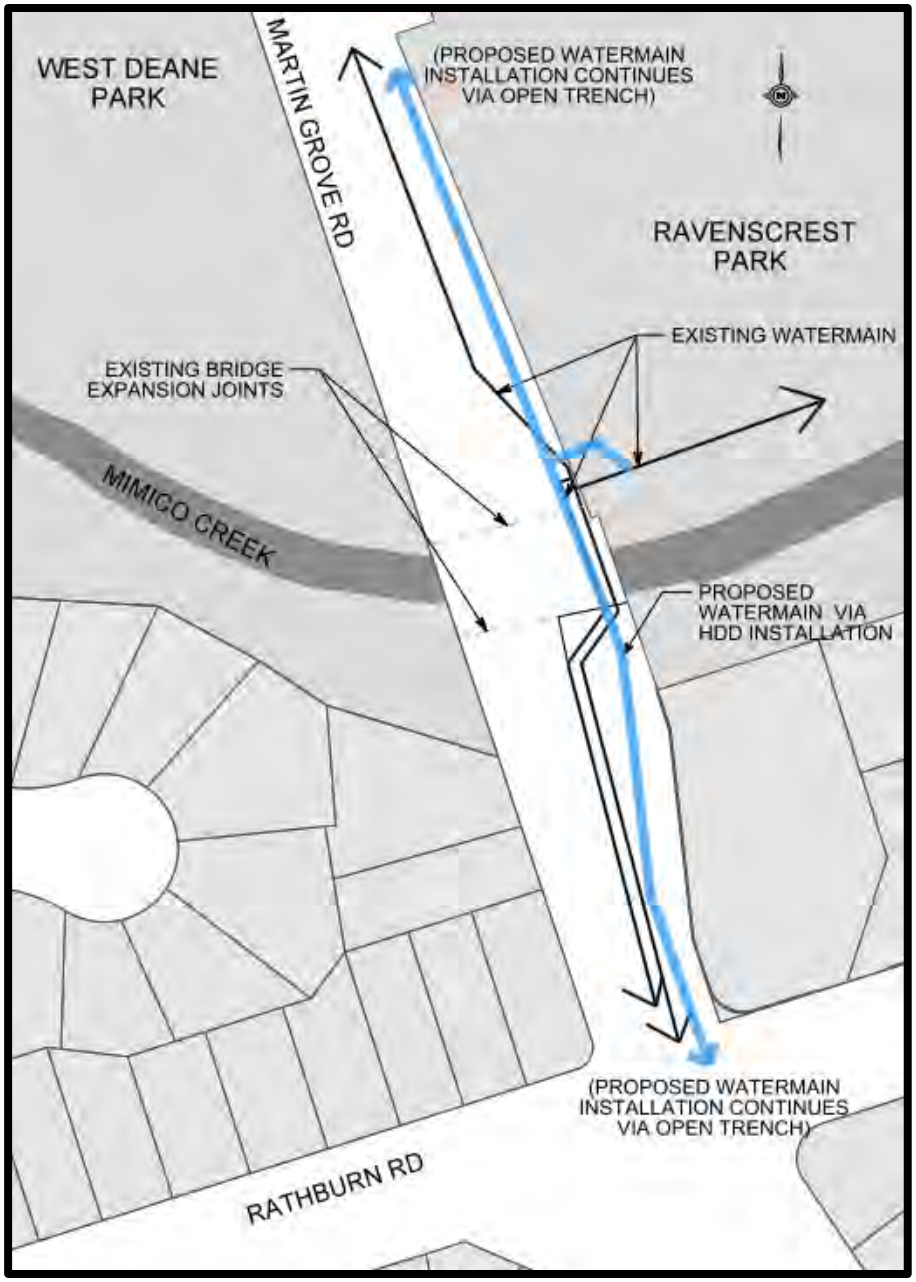

Figure 2 – Alternative #2: Watermain aligned below bridge and inside road right-of-way

Installing the new watermain by Horizontal Directional Drilling below the bridge structure and under the existing piles will require complex construction method to extend the drill into shale bedrock. Significant risk of drill failure (passing through different soil types, stuck within bedrock, conflict with piles) may require excavations to retrieve equipment or the equipment to be abandoned completely.

To ensure the bridge structure is protected from watermain breaks in the future, the watermain must be installed inside a larger sized casing so that if a break did occur, it would not impact the bridge structure. A larger casing requires a larger horizontal directional drill machine to penetrate the shale bedrock and reach the deeper depths below the piles. The deeper depths will require a larger construction staging area and the length of the watermain will need to be increased to avoid severe curves in the watermain pipe.

Up to 10 trees may need to be removed for the construction staging area. The trail entrance off Martin Grove Road may need to be detoured for construction access and staging area.

This alternative solution has an overall high level of complexity and medium risk of failure.

Alternative #3: Watermain aligned west of Martin Grove Road / Bridge (Figure 3).

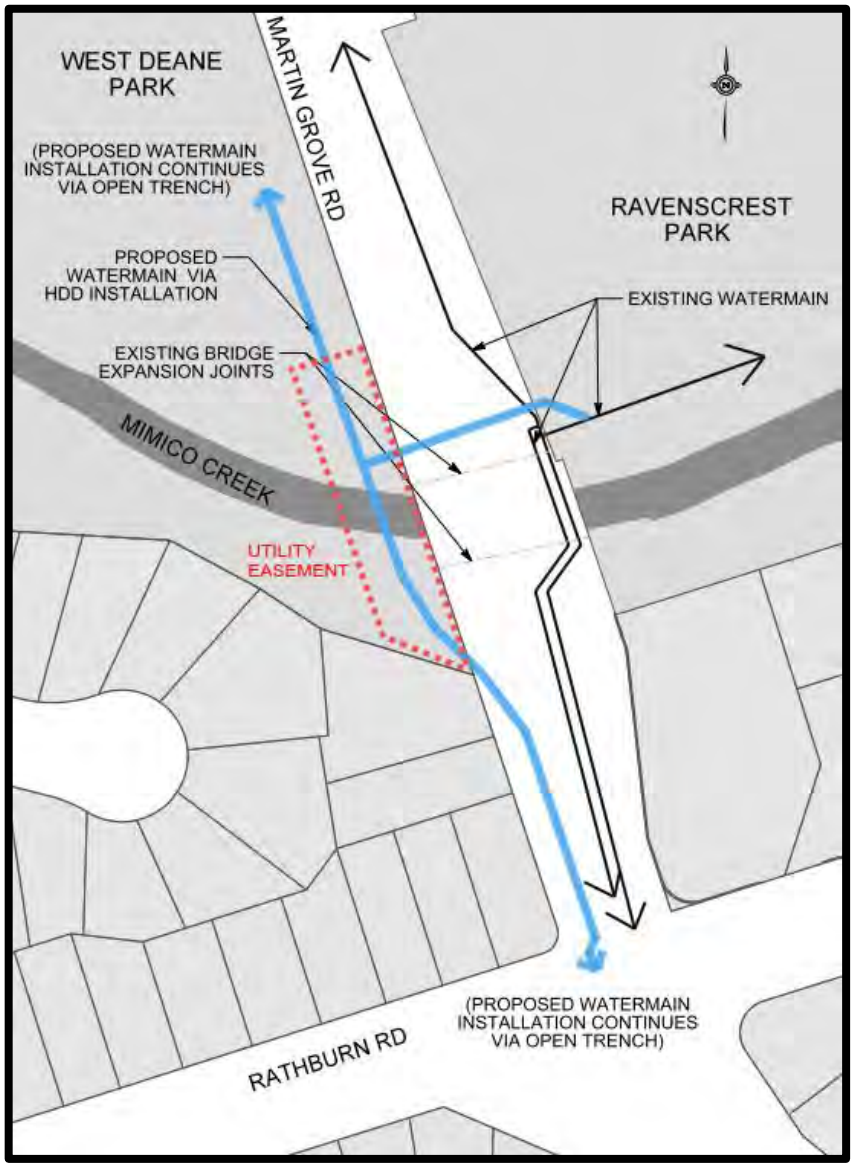

Figure 3 – Alternative #3: Watermain aligned west of Martin Grove Road / Bridge

Installing the new watermain by Horizontal Directional Drilling along an alignment west of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within an existing utility easement, will be challenging to avoid conflicts with existing the existing underground utilities within the easement. The existing utilities within the easement consist of a 300 mm natural gasmain (Enbridge) and a 1200 mm diameter trunk watermain (City of Toronto).

Sharp curves in the Horizontal Directional Drilling alignment would exceed the drill manufacturer's recommended use which would lead to an unacceptable high constructability risk.

Up to 20 trees may need to be removed for the construction staging area. However, impacts to the park is not anticipated.

This alternative solution has an overall high level of complexity and an unacceptable risk of failure.

Alternative #4: Watermain aligned east side of Martin Grove Road / Bridge (Figure 4).

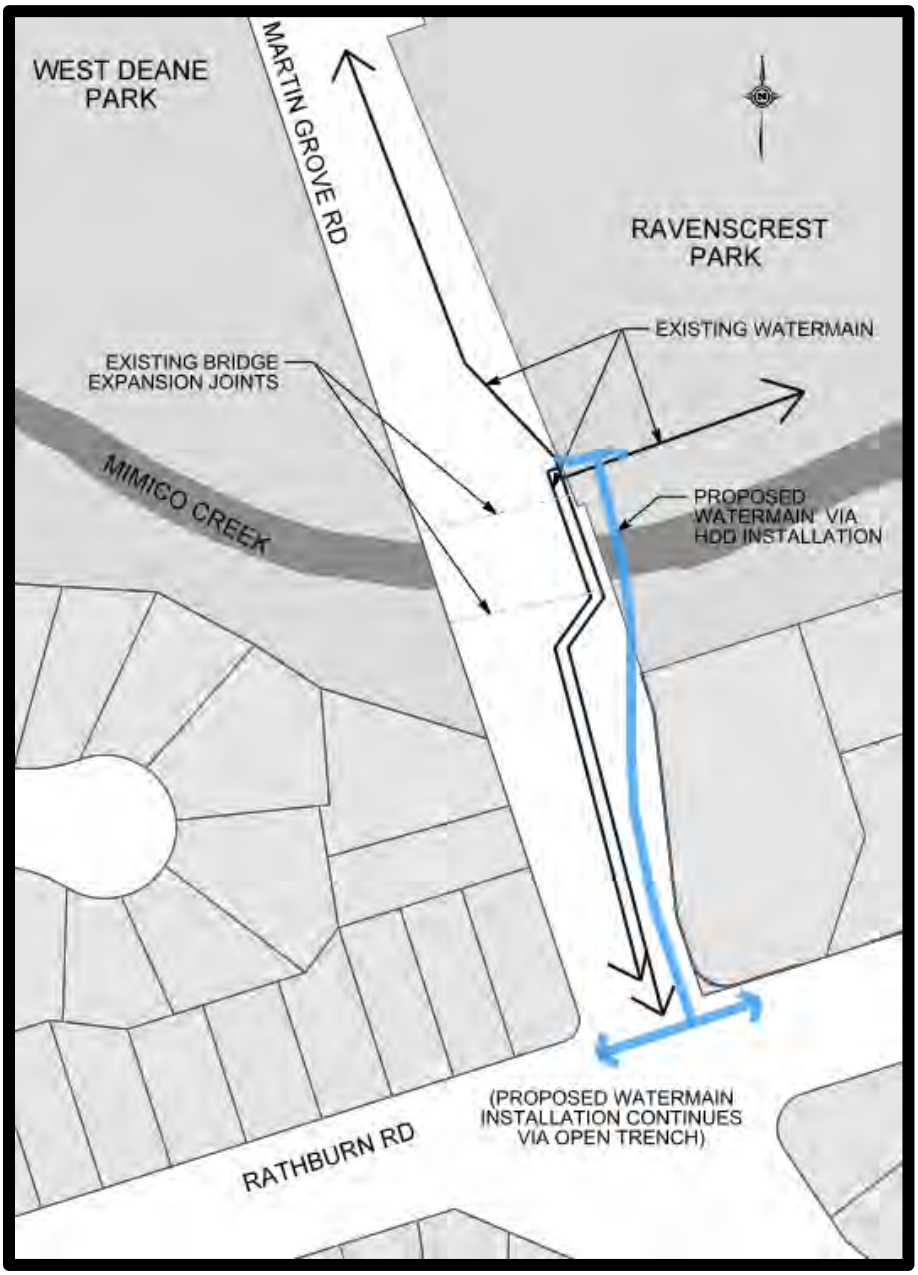

Figure 0.1 – Alternative #4: Watermain aligned east side of Martin Grove Road / Bridge

Installing the new watermain by Horizontal Directional Drilling along an alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within Ravenscrest Park, has acceptable construction impacts. The curves in the Horizontal Direction Drill are within the drill manufacturer's recommended use. Furthermore, there will be no conflicts with the bridge structure or shale bedrock.

Up to 5 trees may need to be removed for the construction staging area. The trail entrance off Martin Grove Road will need to be detoured for construction access and staging area.

This alternative solution has an acceptable level of complexity and risk.

Feedback Summary

Below is a summary of the feedback heard through all communication channels. Participants were self-selecting and not a representative sample of the affected community.

7. 113 participants attended the December 7, 2020 virtual public meeting
8. 4 participants asked questions about the watermain replacement during the question period following the presentation
9. Approximately 40 comment forms received
10. 9 emails received and responded

Overall Summary of Feedback

Majority of the comments were questions about construction methodology, capacity for the City to deliver the project, and restoration of construction. Few/none/some comments received did not indicate concern with the alternative solutions that were presented, their evaluation and the recommended solution. Refer to the feedback at the end of this appendix.

Comments by Theme

Following are topics that were raised at least once in the public feedback. Frequently raised comments are noted as such. Comments are summarized and paraphrased for succinct clarity. Statements in comments are not necessarily accurate or agreed by the City.

Support for Watermain Replacement

1. There was support for replacing the watermain along Martin Grove Road
2. There was support for Alternative #4 to replace the watermain along the alignment on the east side of the Martin Grove Road / Bridge

Background Information

1. It was asked if age was the primary cause of the past watermain break failures

Environmental

1. There were concerns about the trees to be removed which provide shade for people and food and shelter for birds and park wildlife

2. There were concerns about the size of the replacement trees not matching the size of the trees being the removal
3. There were concerns that replacement trees will take too long to reach the size of the ones being removed
4. It was asked it this project will lead to the beautification of Mimico Creek and the concerns with the reduced waterflow in the creek

Watermain Replacement Methodology

1. There was support for replacing the watermain using horizontal directional drilling
2. It was asked that trenchless technologies such as horizontal directional drilling or torpedo could be used to install the watermains everywhere
3. It was asked if relining the existing watermain could be a possibility
4. It was asked what the construction approach will be used to install the watermain

Other

1. It was noted that during certain times of the day, water pressure inside the house is low.
2. It was asked if sub-standard water services to the affected adjacent properties would be replaced with new City standard water services.
3. It was asked if water service replacement would extend beyond the property line up to / into the house
4. It was asked when the watermain will be constructed
5. It was asked if as-builts for the recent sewer upgrade project have been shared by RVA.
6. It was asked if the watermain replacement project will be delivered on time and on budget
7. There was a concern erosion and flooding of the land on another project

The Appendix provides the responses to questions received by email and during the PIC event.

Next Steps

The Project Team will review all feedback received, together with technical considerations to finalize the recommended designs for Martin Grove Road Watermain Replacement. A Notice of Completion along with a 30-day review period will be provided to residents signed up on the email notification list, posted on the project webpage and advertised.

From: City of Toronto PM6
Cc: Kate Kusiak
Bcc: Stephanie Gris Bringas; Amir Gafoor; Tomas Ycas; Ken P. Wallace; Aaron Bell; Bavendan Paramsothy; Manujaa Thilageswaran; renee.afoom-boateng@trca.on.ca; troy@beanfield.com; sharmila.kumar@telecon.ca; bell.moc@telecon.ca; blake.stutley@bell.ca; danselmi@clc.ca; UtilityCirculations@aptum.com; Brad.Swant@aptum.com; ann.newman@enbridge.com; ekriarakis@enwave.com; james.scharbach@enwave.com; Tyler.Wales@HydroOne.com; kirk.t.smoke@esso.ca; bmclean@metrofibrewerx.com; susan.rapin@ogg.com; GT.moc@netricom.com; GT.moc@telecon.ca; Edgar.Henriquez@rci.rogers.com; John.Lionti@rci.rogers.com; GTA.Markups@rci.rogers.com; Ralph.vonEppinghoven@rci.rogers.com; bobbi.hunter@rci.rogers.com; john.lionti@rci.rogers.com; Info@sun-canadian.com; Anthony.Segreto@telus.com; telusutilitymarkups@telecon.ca; tpucc@teraspan.com; utility.circulations@torontohydro.com; vvolokitin@torontohydro.com; seedgar@tnpi.ca; landroweast@tnpi.ca; richard.ntoneepeeing@videotron.com; david.pitchforth@zayo.com; Utility.Circulations@zayo.com; chilakos@gmail.com; thorncresthomes@bellnet.com; info@oneia.ca; emmay@torontoenvironment.org; info@parkpeople.ca; dharvey@parkpeople.ca; Ryan Angeles
Subject: City of Toronto Virtual Public Consultation Meeting - Mimico Creek Watermain Crossing (Martin Grove Road and Rathburn Road)
Date: November 26, 2020 9:27:00 AM
Attachments: Martin Grove combined notice FINAL_Greyscale.pdf
image002.png
image004.jpg

To whom it may concern,

The City of Toronto is consulting the public as part of an Environmental Assessment for watermain replacement along Martin Grove Road under Mimico Creek (just north of Rathburn Road). This consultation also includes planned road improvements along Rathburn Road and on Martin Grove Road.

This consultation will take place via a virtual public meeting on **Monday December 7, at 6:30PM**. For further information about this meeting and how to register/attend, please refer to the attached notice or the City's website: www.toronto.ca/martingrove . Apologies for any duplicate emails you may receive for this notification.

RVA has been retained by the City to perform the engineering design and environmental assessment for this watermain project.

Regards,
Aaron Bell

Aaron Bell, P.Eng.,
Project Engineer
Phone: 416-497-8600 x1351

R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300
Toronto, ON M2J 4Z8
website | facebook | twitter | linkedin

From:	Aaron Bell
Cc:	Kate Kusiak
Bcc:	eanotification.cregion@ontario.ca; aldo.ingraldi@ontario.ca; Borys.Wrzesnewskyj@parl.gc.ca; chunmei.liu@ontario.ca; dan.minkin@ontario.ca; josie_tomei@cpr.ca; karla.barboza@ontario.ca; kinga.surma@pc.ola.org; maya.harris@ontario.ca; orest_rojik@cpr.ca; Paul.Collins@metrolinx.com; robert.greene@ontario.ca; steven.strong@ontario.ca; stewart.Chisholm@ontario.ca; proximity@cn.ca; Ken P. Wallace; Tomas Ycas; Amir Gafoor
Subject:	City of Toronto - Virtual Public Consultation - Mimico Creek Watermain Crossing (Martin Grove and Rathburn Road)
Date:	December 10, 2020 10:22:00 AM
Attachments:	Martin Grove combined notice FINAL_Greyscale.pdf image005.png image006.jpg

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To whom it may concern,

The City of Toronto is consulting the public as part of an Environmental Assessment for watermain replacement along Martin Grove Road under Mimico Creek (just north of Rathburn Road).

This consultation has taken place place via a virtual public meeting on Monday December 7, but we continue to request feedback on the proposed work as part of the ongoing EA. For further information about this consultation, and to review material and provide feedback, please refer to the attached notice or the City's website: www.toronto.ca/martingrove . Apologies for any duplicate emails you may receive for this notification.

RVA has been retained by the City to perform engineering design and environmental assessment for this watermain project.

Regards,
Aaron Bell

Aaron Bell, P.Eng.,
Project Engineer
Phone: 416-497-8600 x1351

R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300
Toronto, ON M2J 4Z8
website | facebook | twitter | linkedin

TORONTO Notice of Public Consultation

November 19, 2020

Physical Separation in the Buffer on Rathburn Road, New Separated Bike Lanes on Martin Grove Road & Watermain Replacement at Mimico Creek

The City of Toronto is consulting the public on a number of proposed road safety and planned infrastructure improvements along Rathburn Road and on Martin Grove Road:

- Adding physical separation to the buffer area of the existing bike lanes on Rathburn Road
- Installing new separated bike lanes on Martin Grove Road, south of Rathburn Road
- Replacing the watermains under Mimico Creek

The City is planning to replace the aging watermains on Martin Grove Road from north of Rathburn Road to Lorraine Gardens. Where the watermains cross Mimico Creek, an alternate alignment is needed outside of the road right-of-way. The City is carrying out a Municipal Class Environmental Assessment study (Schedule 'B') to evaluate alignment options and identify a recommended alignment for the segment that will cross below Mimico Creek.

Public Consultation: Tell us what you think

- **Learn more about the options** being considered at a Virtual Public Meeting, or view the presentation on the project web page if you cannot attend the meeting.
- **Complete an online survey to provide feedback and indicate your preferences** for the proposed road safety improvements and watermain alignment options, or share your comments by phone or email.
- The comment deadline for this consultation is **December 21, 2020**. All comments will be considered.

Virtual Public Meeting

A Virtual Public Meeting will be held to present information about the proposed physical separation on Rathburn Road, the separated bike lanes proposed on Martin Grove Road, and the watermain replacement options. The meeting will be divided into two sessions; each half will include a presentation followed by a Question & Answer period. Please contact us if you require accommodation to participate at this meeting.

Monday December 7, 2020

- **6:30 to 7:30 p.m.: Road Safety Improvements**
- **7:30 to 8:30 p.m.: Watermain Replacement**

Join by computer, smart phone or tablet:

Register at toronto.ca/MartinGrove

Join by phone (audio only): Dial **416-915-6530** Access Code: **177 192 6456**
Phone line will open 5 minutes before the start of the meeting.

1. Proposed Road Safety Improvement: Physical separation for the bike lane on Rathburn Rd

In 2020, painted buffers were installed to improve the existing bike lane on Rathburn Road from The East Mall to Martin Grove Road. To implement the City Council-approved Vision Zero Road Safety Plan and Cycling Network Plan, the City is proposing to add physical separation in the painted buffer area in 2021 to improve safety for all road users, reduce speeding, and encourage more people to cycle.

Two design options are proposed for physical separation in the buffer. Detailed drawings with the proposed locations of the pre-cast curbs (Option A) and low profile barriers (Option B) is posted on the project web page.

Option A: Concrete curbs and bollards

Option B: Low profile barriers

With both options, snow would be plowed from the bike lane separately from the road, and be stored in the buffer and at the curb. With both options, the City proposes to reduce the speed limit from 50km/hr to 40km/hr from The East Mall to Edenwood Dr. Complete the online survey to indicate your support for the design options

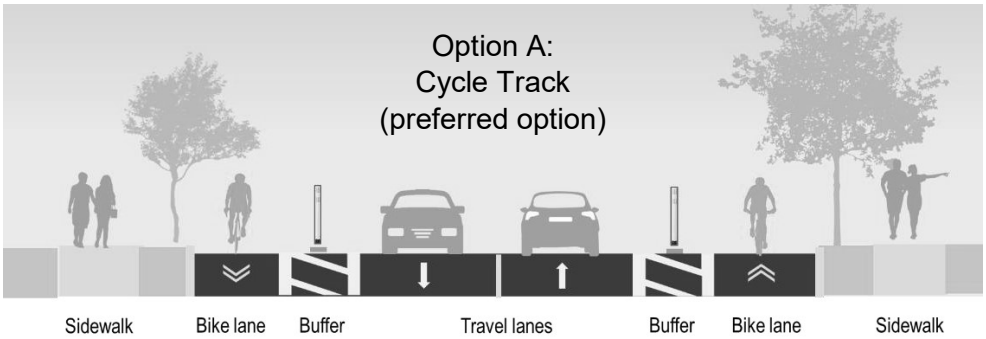
2. Proposed Road Safety Improvement: New separated bike lanes on Martin Grove Rd

The City is proposing to install new separated bike lanes on Martin Grove Road from Rathburn Road to 100 metres north of Burnhamthorpe Road in Spring 2022. Two design options are being considered:

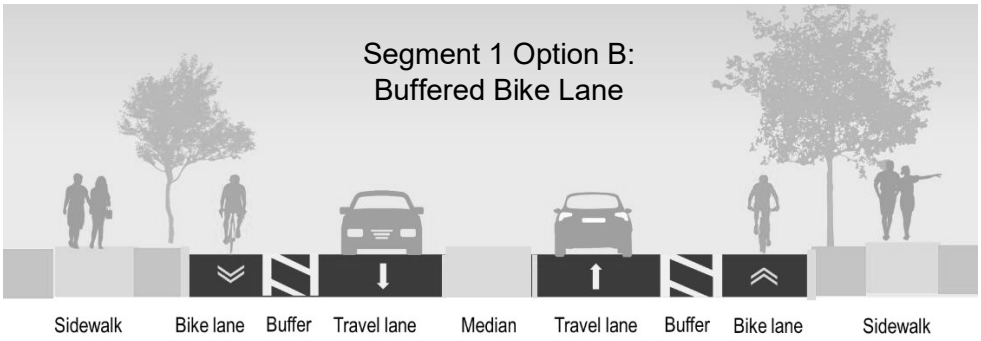
- **Option A: Cycle Tracks**: A painted buffer with pre-cast curbs and flexible posts would separate people cycling from motor vehicles
- **Option B: Buffered Bike Lanes**: A painted buffer would separate people cycling from motor vehicles

The design options for the segment of Martin Grove Rd from Rathburn Rd to Donalbert Rd are being considered separately from the segment from Donalbert Rd to 100 metres north of Burnhamthorpe Rd. With all options, the City proposes to reduce the speed limit from 50 km/h to 40 km/hr.

Design Options: Segment 1 - Rathburn Road to Donalbert Road

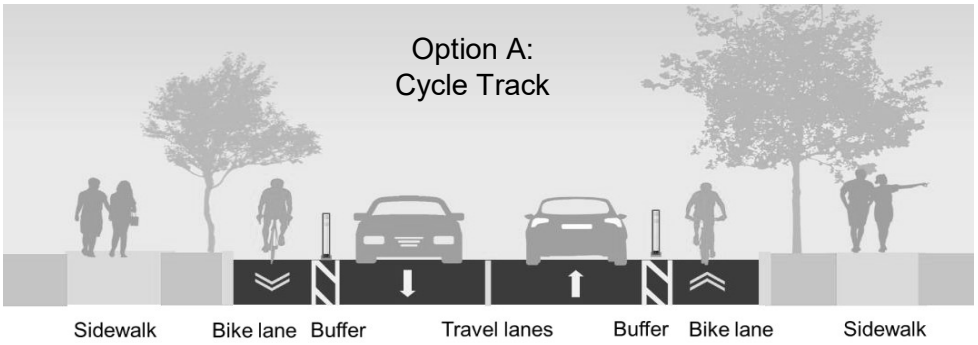


- Painted buffer with concrete curbs and flexible bollards
- Snow clearing: The bike lane and the road would be plowed separately.
- The existing painted centre median and concrete islands would be removed.

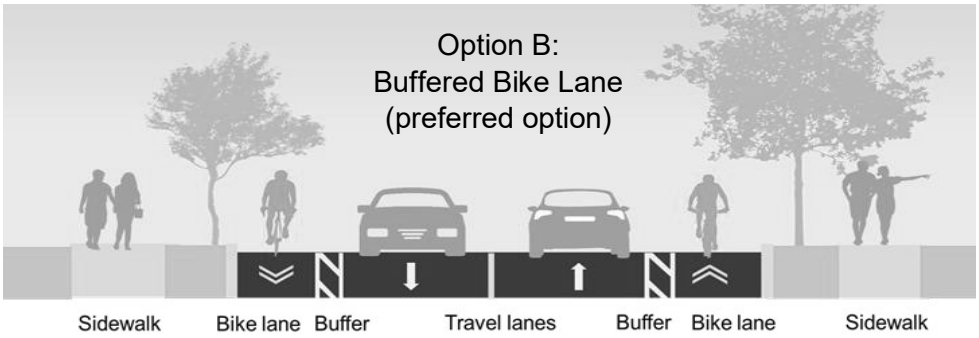


- A painted buffer would separate people cycling from people driving.
- Snow clearing: The road and bike lane would be plowed together.
- The painted centre median and three of the four concrete islands would remain.

Design Options: Segment 2 - Donalbert Road to 100m north of Burnhamthorpe Road



- A painted buffer with concrete curbs and flexible posts would separate people cycling from people driving.
- Snow clearing: The road and bike lane would be plowed separately.



- A painted buffer would separate people cycling from people driving.
- Snow clearing: The road and bike lane would be plowed together.

Detailed drawings of each option showing the proposed pavement markings and proposed locations of the pre-cast concrete curbs is posted on the project web page.

3. Planned Road Safety Improvement: Redesign and reconstruction of the intersection of Martin Grove Rd and Rathburn Rd

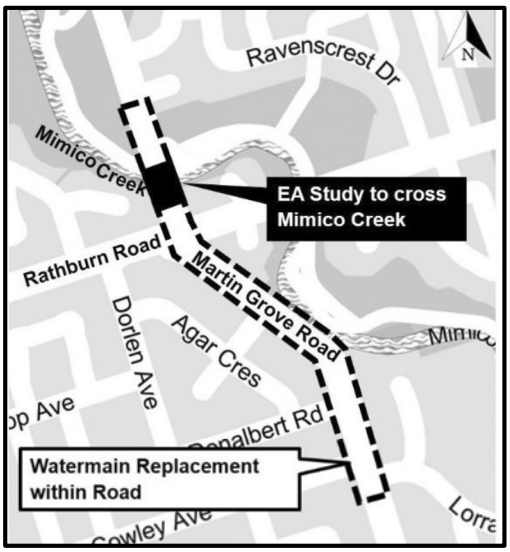
The City is planning to reconstruct the intersection of Martin Grove Road and Rathburn Road with a new design to improve road safety for people walking, cycling and driving. Construction is anticipated in 2022, following the replacement of the watermain.

The new design incorporates measures from the City's Vision Zero Road Safety Plan and will involve:

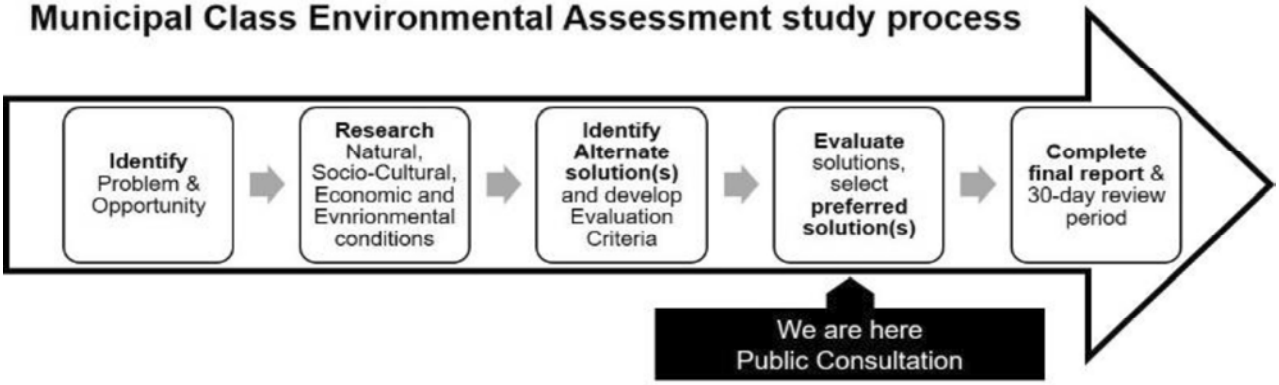
- reducing corner radii to slow the turning speed of vehicles, improve the visibility of people walking
- building out the curb at the southwest corner to replace the temporary painted area and bollards
- adjusting the alignment of the northbound and southbound through lanes and left turn lanes.

4. Watermain Replacement

The existing watermains are over 75 years old, have a history of leaks, and need to be brought to a state of good repair. The segment north of Mimico Creek to south of Savalon Court, and the segment from Rathburn Road to Lorraine Gardens will be replaced within the road right-of-way. The new watermain will be 300 mm in diameter and connect into the existing water supply network.



A Municipal Class Environmental Assessment study is required to determine a new alignment for the watermain where it will pass under Mimico Creek. This study will follow the 'Schedule B' process, an approved planning process under the Ontario Environmental Assessment Act, which includes opportunity for public input as shown below.

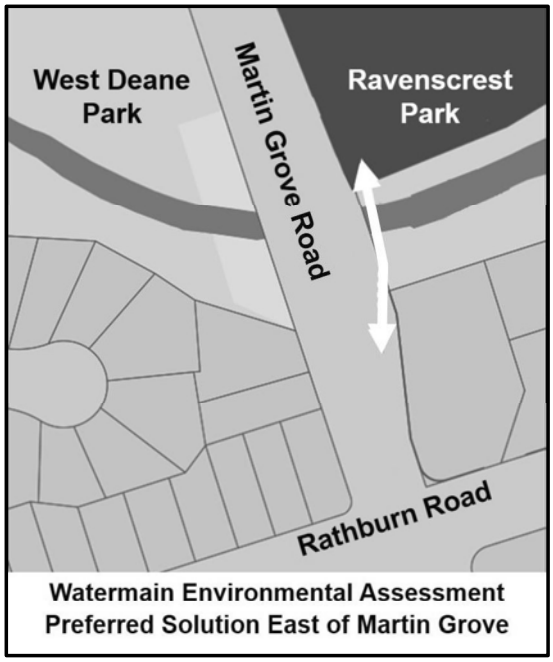


Preferred Solution: East of Martin Grove Road

The City has evaluated three alternative solutions for the alignment of the watermain. Following an evaluation of the solutions, the City is recommending that the watermain be installed to the east of Martin Grove Road, under Mimico Creek. aThis option:

- poses the fewest construction risks and impacts
- has an alignment within the recommended use of a specialized drill
- does not impact the bridge's structure or maintenance
- does not impact other underground utilities

The solution may require the removal of up to five trees (which will be replaced) and may require intermittent closures or detours around the work site in Ravenscrest Park (details to be confirmed after study completion).



Watermain Environmental Assessment
Preferred Solution East of Martin Grove

Questions or comments?
Contact Public Consultation staff:

Road Safety: Stephanie Gris Bringas 416-392-3643
Watermain: Kate Kusiak 416-392-1932
Mail: 55 John Street, 19th Floor, Toronto, ON M5V 3C6
E-mail: MartinGrove@toronto.ca

Information will be collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record.

TORONTO Building a great city – *together*

Call 3-1-1

The City of Toronto holds public consultations as one way to engage residents in the life of their city. We invite you to get involved.

Martin Grove Road Watermain Replacement

Notice of Study Commencement & Virtual Public Meeting

The City is holding a Virtual Community Consultation meeting to present alternative solutions and identify the preferred solution to replace the aging watermains below Mimico Creek at Martin Grove Road. Please join us, ask questions and submit your feedback.

December 7, 2020: 7:30 p.m. to 8:30 p.m. Presentation and Questions
(This is the second session of a joint consultation with road safety starting at 6:30 p.m.)

Join by smart phone, tablet or computer: register at toronto.ca/martingrove

Join by phone (audio only): Dial 416-915-6530, Access Code: 177 192 6456

Background

The existing watermains are over 75 years old, have a history of breaks and leaks and need to be brought to a state of good repair. The segment of watermain that will cross below Mimico Creek requires a study following the Municipal Class Environmental Assessment 'Schedule B' process. The presentation and feedback form is also available on the project webpage.

We would like to hear from you

Tel: 416-392-1932
Fax: 416-392-2974
Email: martingrove@toronto.ca
Visit: toronto.ca/martingrove

Kate Kusiak
Public Consultation Coordinator
Metro Hall, 55 John Street, 19th Floor
Toronto, ON M5V 3C6

Virtual Public Information Centre
Monday, December 7, 2020; 6:30 p.m. to 8:30 p.m.

Introductions

Watermain Replacement:
Aaron Bell, P.Eng., R.V. Anderson Associates Limited
Tomas Ycas, P.Eng. Engineering & Construction Services
Amir Gafoor, P.Eng., Engineering & Construction Services
Kate Kusiak, Public Consultation Unit

Road Safety Improvements:
Adam Popper, Cycling & Pedestrian Projects
Bill Tsomokos, Vision Zero
Stephanie Gris Bringas, Public Consultation Unit

Watermain Replacement on Martin Grove Road

Environmental Assessment

Study to cross Mimico Creek

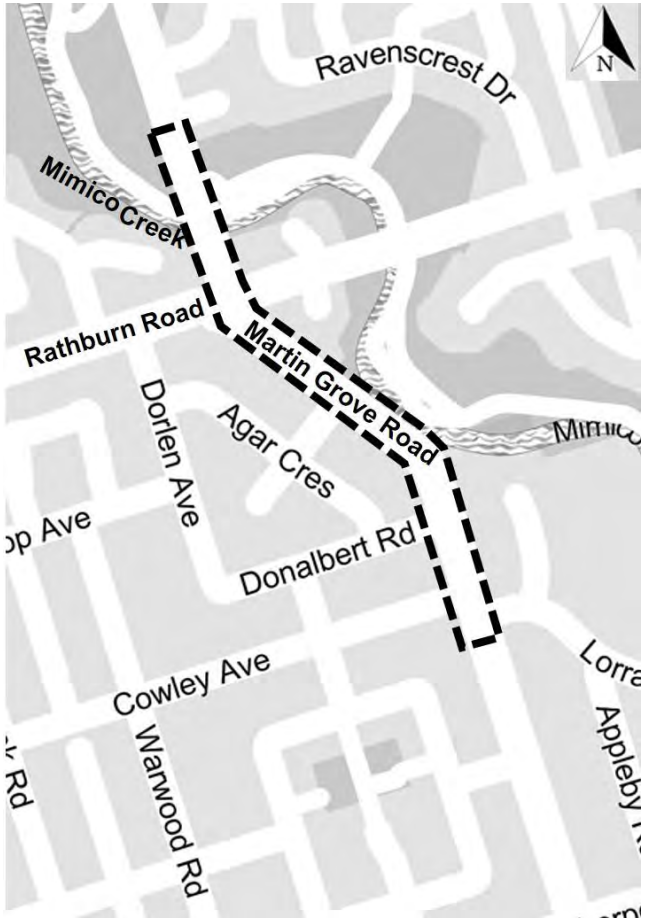
Virtual Public Information Centre
Monday, December 7, 2020; 6:30 p.m. to 8:30 p.m.

Watermain Replacement

Study Purpose

To replace the existing 88- and 75-year-old watermains on Martin Grove Road south of Savalon Court to Lorraine Gardens. The new watermain will be 300 mm diameter.

- Watermains from Eglinton Avenue to south of Savalon Court were replaced in 2019



Watermain Replacement

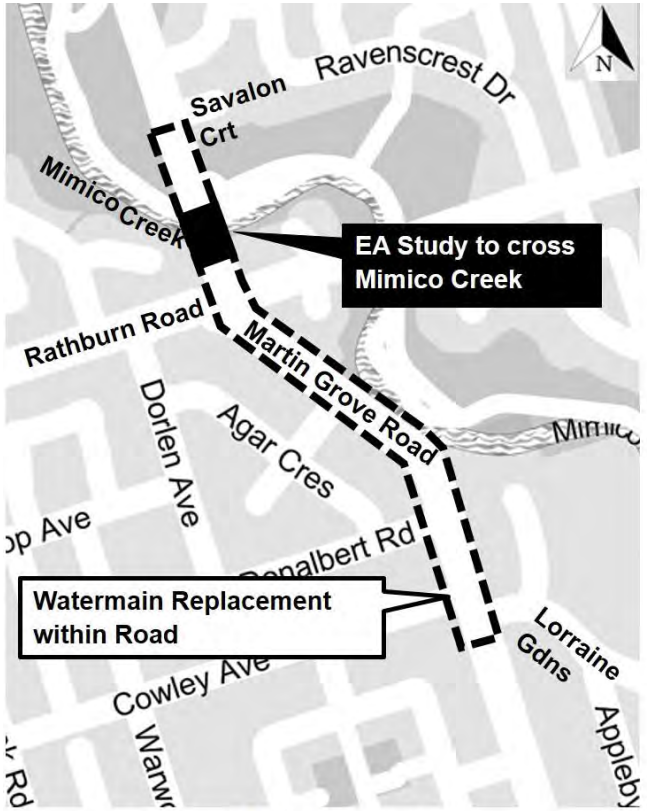
- A history of breakages and leaks since 2010:
  - 2010
  - 2011
  - 2015 (2 events)
  - 2016 (2 events)
  - 2018 (3 events)
  - 2019 (2 events)
- Existing watermains are at end of service and require to be brought to a state of good repair

Watermain break on Martin Grove between Saralou Court and Rathburn Road. *"Watermain Break Floods Street In Etobicoke" July 12, 2015; CTV News Toronto*

Environmental Assessment

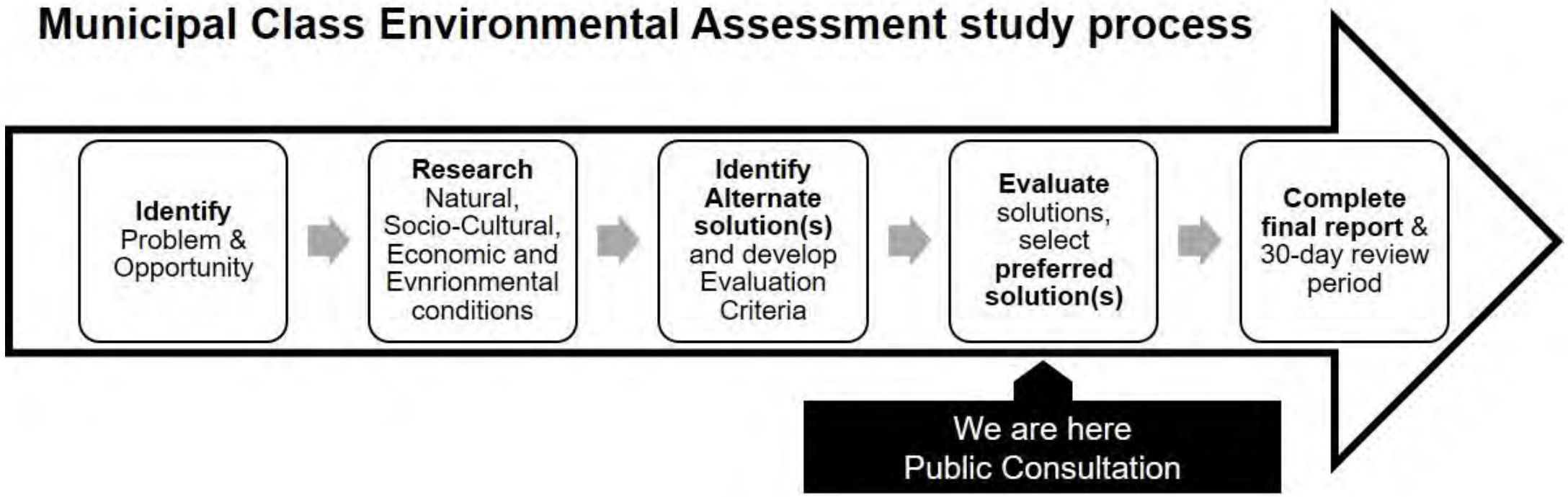
A Municipal Class Environmental Assessment (EA) study is being undertaken to select an alignment for the watermain to cross below Mimico Creek.

The new watermain from Mimico Creek to south of Savalon Court and from 30 m north of Rathburn Road to Lorraine Gardens will be installed within the road right-of-way and does not require an EA study.



Martin Grove
Waterman Replacement Map

Environmental Assessment



Existing Conditions

The following environmental conditions are taken into consideration to determine alternative solutions and select the preferred solution.

- Natural and Environmental
  - Infrastructure & Utilities
  - Property
- Archaeological Resources
- Public Use of Park/Ravine
- Economic
  - Costs

Ravencrest Park, facing the Mimico Creek (centre) and Martin Grove Bridge (right)

Existing Conditions

Conditions	Summary
Natural & Environmental	• Mimico Creek supports warmwater aquatic habitats • A mix of native and non-native trees with some at-risk/significant species (Butternut, Cedar, Oak) • Wildlife highlights includes waterfowl stopover and staging areas in creek; nearby bat habitats and maternity colonies; bird surveys include local nestings under bridge • Subsoils are predominantly sand and sandy silt • Water table is generally at creek level
Infrastructure	• Martin Grove Road is a 2-lane arterial road with bike lanes • The bridge is concrete structure built in the early 1960's
Property	• An existing easement west of the bridge contains the following utilities: natural gas (Enbridge) trunk watermain (City of Toronto) • Ravenscrest Park is owned by the Toronto & Region Conservation Authority (TRCA)
Archaeological Resources	• Archaeological assessment shows low potential due to former pumping station and reservoir
Park Access / Public Use	• Ravenscrest Park has public access off Martin Grove • West Deane Park has access from Ravenscrest Park

Pre-Screening of Solutions

The project team considered a number of options to replace the watermain:

- **Abandon the watermain & upgrade watermain system elsewhere**
  - This option reduces the redundancy in the watermain network and creates a dead-end, which would create water quality concerns, additional maintenance and does not comply with Toronto Water policies.
- **Attach Watermain to the side of the bridge**
  - This option would require the watermain to be insulated and heat-traced to prevent from freezing which will add maintenance and is not preferred by Toronto Water from an operational perspective. The structural integrity of the bridge would also need to be reviewed.
- **Replace the watermain in the existing alignment**
  - This option would require open trench to replace the watermain pipe in the same alignment which is not preferred due to the significant environmental disturbance this would cause.

These options were not carried forward as they were not feasible.

Pre-Screening of Construction Methods

A variety of construction methods can be used for watermain construction. The project team reviewed the following methods and selected one that best works for the area.

Screened out:

- **Open Trench**: Excavation would require a temporary coffer dam and significant pumping of water to work in the dry and environmental disturbance
- **Micro-tunnel and auger boring:** Tunneling / boring requires deep shafts on either side of the creek. Depths of tunnel and shafts would need to be installed in bedrock shale and below the water table requiring pumping of water to work in the dry.
- **Cement mortar / structural lining**: Trenchless relining of the existing watermain from within the pipe using cement mortar or plastic structural liner is not an option due to bends in the existing watermain crossing Mimico Creek.

Carried forward:

- **Horizontal Directional Drilling:** Standard directional drilling practice is anticipated and involves a drill machine set-up a distance back from the creek and drilling ‘horizontally’ into the ground surface to get below the bottom of the creek to beyond the other side of the creek.

Evaluation Criteria

The following three criteria will be used to evaluate each alternative solution:

1. **Constructability & Impacts**
   - Potential impacts with other underground utilities and bridge structure
   - Technical challenges due to ground conditions
   - Technology limitations of construction equipment
2. **Natural & Environmental**
   - Tree injuries and removals
3. **Socio-Cultural**
   - Impacts to park use and access, park features and amenities

Alternative Solution #1: Do Nothing

1. No constructability concerns or impacts
2. No tree impacts
3. No impacts on park use

This alternative does not resolve the maintenance and operations issues of breaks and may continue to experience watermain breaks and service disruptions in the future. Therefore, this option is screened out.

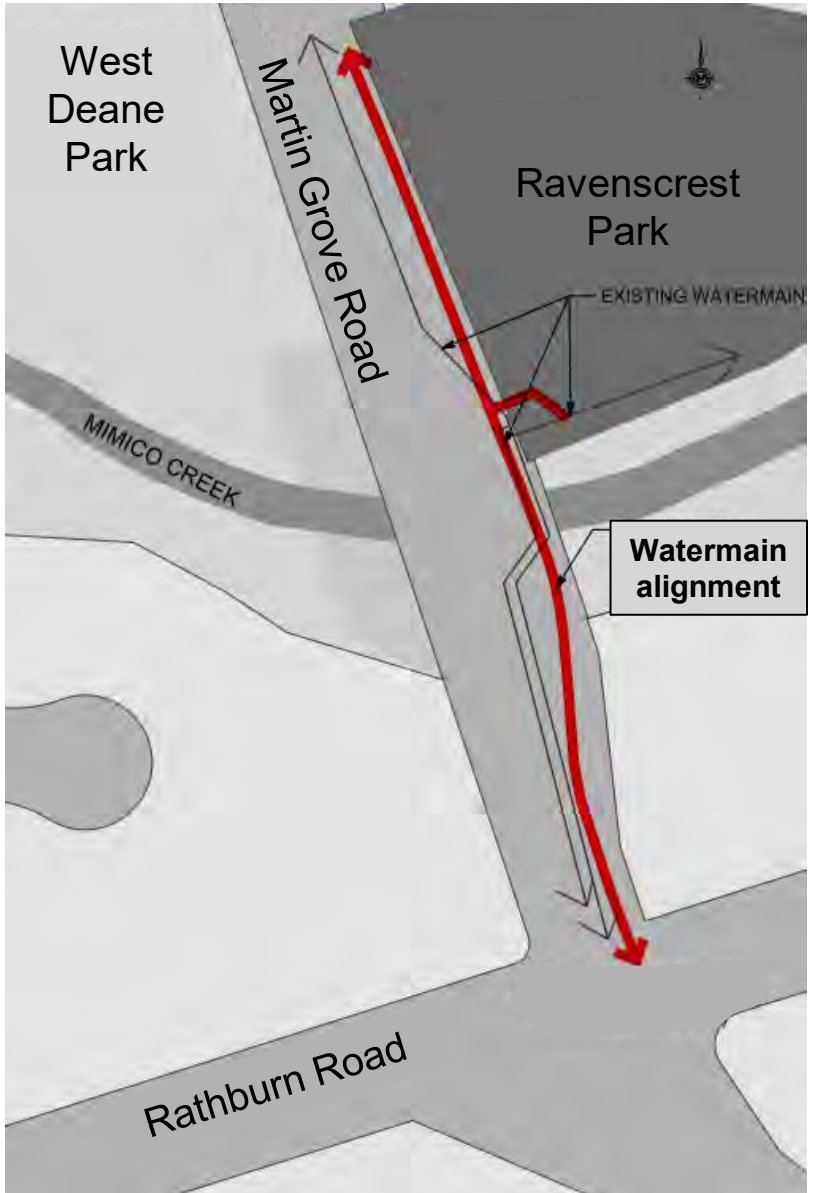
Alternative Solution #2: Watermain aligned Below Bridge & Inside Road Right-Of-Way

1. Complex construction method to extend the drill below the bridge foundation and piles into shale bedrock. Significant risk of drill failure (stuck within bedrock, conflict with piles) will require the equipment to be abandoned.

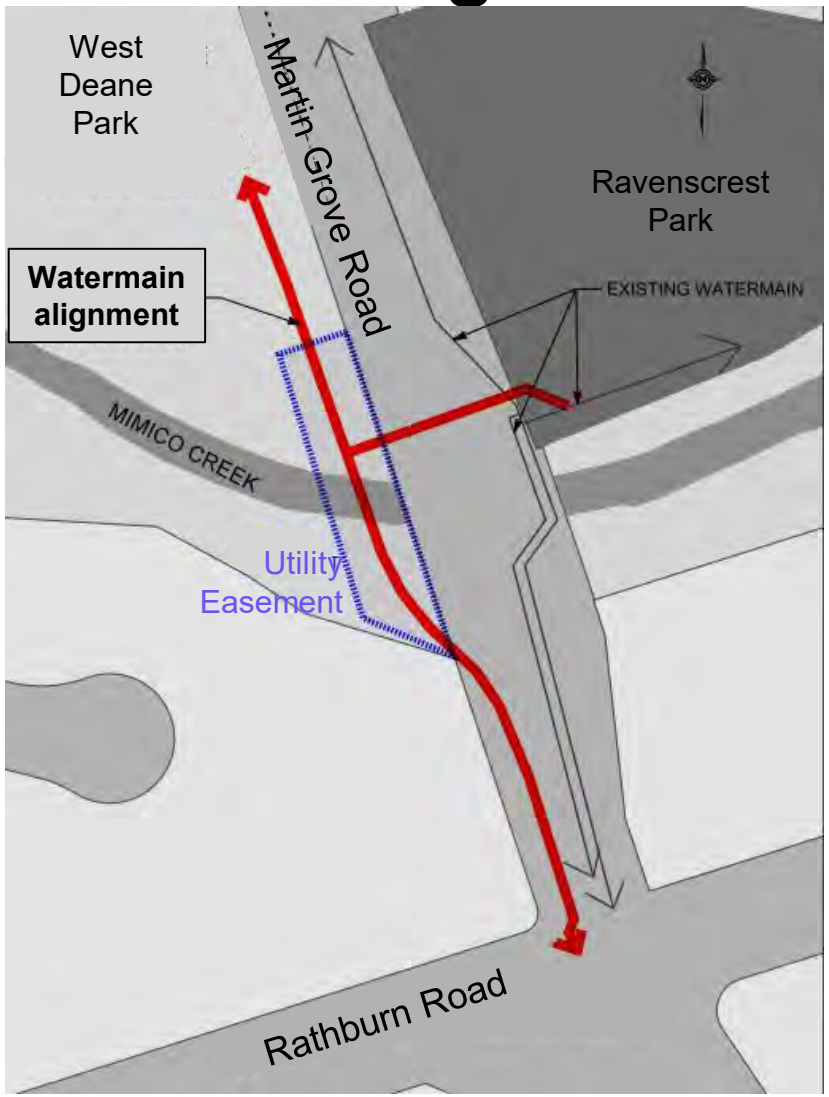
- To ensure the bridge and structure is protected from watermain breaks and risks, the watermain must be installed inside a larger sized casing. A larger casing requires a larger drill to reach deeper depths below the piles. The deeper depths require a larger working area at a greater distance back from the creek to avoid severe curves.

2. Up to 10 trees may need to be removed for staging area. Trail entrance off Martin Grove may need to be detoured for construction access and work site.

This alternative solution has an overall high level of complexity and risk of failure.



Alternative Solution #3: Watermain aligned West of Martin Grove Road/Bridge



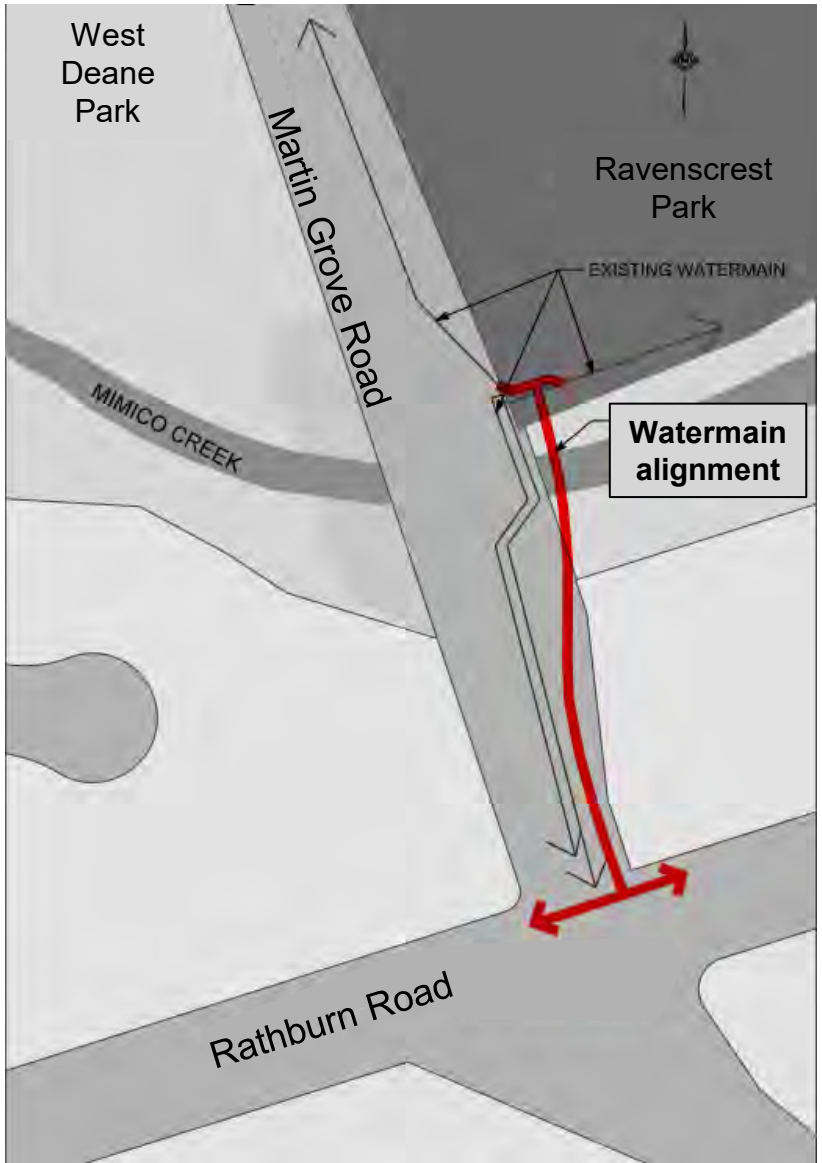
1. Significant conflicts with existing underground utilities:
   - Natural Gas (Enbridge)
   - Trunk Watermain
- Sharp curves in alignment would exceed the drill manufacturer's recommended use leading to an unacceptable high constructability risk
2. 10 to 20 trees expected to be removed
3. No impacts on park use

This alternative solution has an overall high level of complexity and an unacceptable risk of failure .

Preferred Solution #4: Watermain aligned East Side of Martin Grove Road/Bridge

1. Acceptable construction impacts and alignment:
   - Curves in this alignment are within the drill manufacturer's recommended use
   - No conflicts with bridge structure or maintenance
2. Up to 5 trees may need to be removed for staging area. Tree restoration will be developed as part of the detailed design stage.
3. Trail entrance off Martin Grove may need to be detoured around the construction area

Overall acceptable construction complexity and risks. **This is the preferred solution to construct new replacement watermain.**



Evaluation of Alternative Solutions

Alternative Alignments	Natural & Environmental	Socio-cultural	Technical (Constructability, Alignment & Impacts)	Economic	Summary
#2 Below Bridge & Inside ROW	Moderate impact	Moderate impact	Highest Risk	Highest Cost	Significant potential of equipment failure resulting in additional costs
#3 West of Martin Grove Road Bridge	Greatest impact	Least impact	High Risk	High Cost	Affects the most trees and includes high risk of equipment failure resulting in additional costs
#4 East of Martin Grove Road Bridge	Least impact	Moderate impact	Low Risk	Lowest Cost	Moderate tree and park access impacts. Construction method is capable of constructing this alignment

Tell us what you think

Your Feedback

1. Do you have any concerns with the **preferred alignment** (watermain east of Martin Grove Road/Bridge)?
2. Do you have any concerns with the **evaluation**?
3. Do you have any concerns with the **criteria** used?

Submit your feedback by **December 21, 2020**

Online survey link **www.toronto.ca/martingrove**

Email: **martingrove@toronto.ca** Phone: 416-392-1932

Next Steps

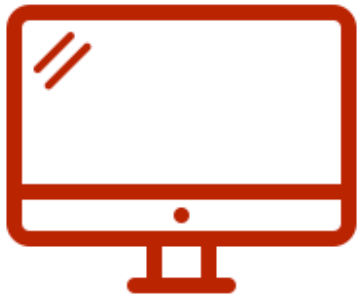
Winter 2021:

1. Receive and summarize Community Feedback
2. Issue Notice of Completion and 30-day public comment period on the Project File Report (final report)
3. Complete construction tender

Spring & Summer 2021:

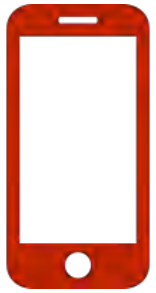
1. Issue and award tender
2. Begin construction late Summer (Notices will be issued to community in advance)
3. Complete construction by December 2021
4. Site Restoration Spring 2022 (Notices will be issued to community in advance)

Questions?



Computer/smart phone/tablet:

- Use Q&A box to type questions OR
- ‘Raise hand’ function for verbal questions



Phone (call-in) participants:

- Press *3 to raise your hand
- The facilitator will let you know when you are unmuted

TORONTO

Feedback Form

Physical Separation on Rathburn Road, Separated Bike Lanes on Martin Grove Road & Watermain Replacement at Mimico Creek

The City is proposing infrastructure and safety improvements on Martin Grove Road and on Rathburn Road:

1. Adding physical separation in the buffer area of the existing bike lane on Rathburn Road from Martin Grove Road to approximately 100 metres east of The East Mall in 2021;
2. Installing new separated bike lanes on Martin Grove Road from Rathburn Road to approximately 100 metres north of Burnhamthorpe Road in 2022;
3. Realigning the watermain under Mimico Creek at Martin Grove Road in 2021.

Complete this form to provide feedback on the options that are being considered for each of these projects. More information is available on the project web page: toronto.ca/MartinGrove.

Please return this form by mail or e-mail by **December 21, 2020**. Questions? Email MartinGrove@toronto.ca

1. Physical separation on Rathburn Road

Two design options are being proposed to improve safety for all road users:

Option A: Pre-cast concrete curbs with flexible posts (bollards)

Option B: Pre-cast concrete low profile barriers with reflectors and hazard bollards

With both options:

- The pre-cast curbs and low profile barriers would be spaced to ensure that residents can safely access driveways and solid waste can be collected at every address.
- The City is proposing to reduce the speed limit from 50km/hr to 40km/hr from The East Mall to Edenwood Drive
- Snow in the bike lane would be plowed separately from the road; snow would be stored in the buffer and at the curb.

Please indicate which design option you prefer for physical separation on Rathburn Road:

☐ Option A: Pre-cast concrete curbs with flexible posts (bollards)

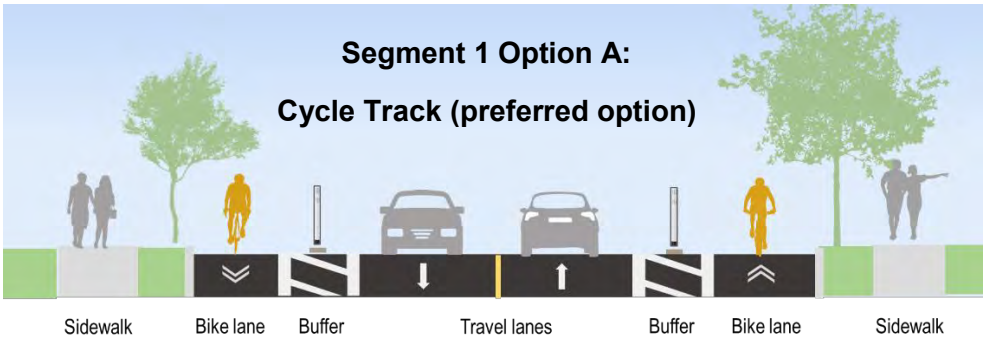
☐ Option B: Pre-cast low profile barriers with reflectors and hazard bollards

☐ No preference

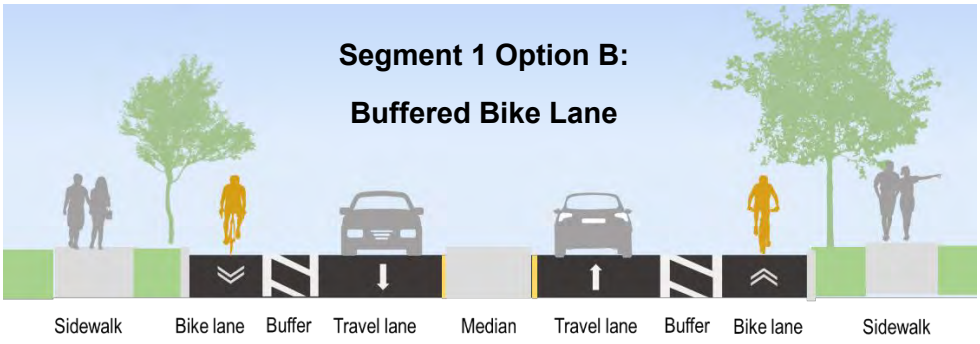
Please explain your preference or share additional comments about the proposed physical separation:

2. Separated bike lanes on Martin Grove Road, Segment 1

The City is considering two design options for Martin Grove Road from Rathburn Road to Donalbert Road



- A painted buffer with concrete curbs and flexible posts (bollards) would separate people cycling from people driving
- Road and bike lane plowed separately; snow would be stored in the buffer and at the curb
- Existing centre painted median and islands would be removed



- A painted buffer would separate people cycling from people driving
- The centre painted median and three of the four concrete islands would remain
- Road and bike lane would be plowed together; snow would be stored at the curb

With both options the existing 'No Parking' regulation would become 'No Stopping'.

Option A (Cycle Tracks) is the preferred design option for this segment of Martin Grove Road. It is anticipated to have a greater traffic calming effects than Option B, and would provide greater safety for people cycling.

A detailed plan showing the proposed locations of the pre-cast curbs is posted on the project web page.

Please indicate which design you prefer for separated bike lanes on Segment 1 of Martin Grove Road:

- ☐ Option A: Cycle Track (pre-cast concrete curbs with flexible posts)
- ☐ Option B: Buffered Bike Lanes (painted buffer)
- ☐ No preference

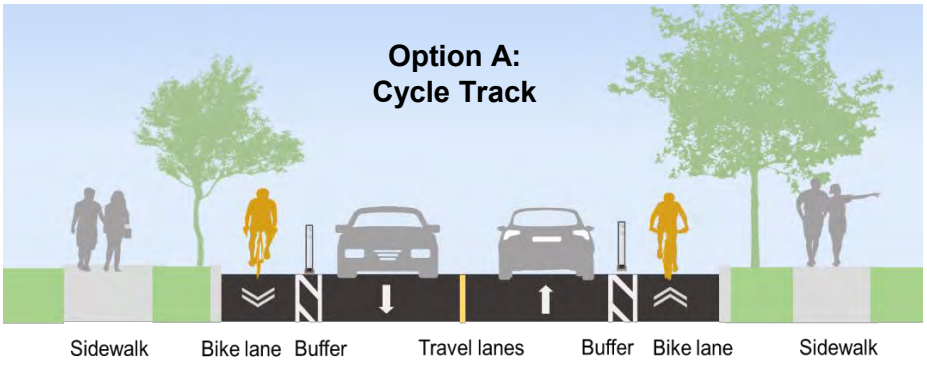
Please explain your preference _____

_____

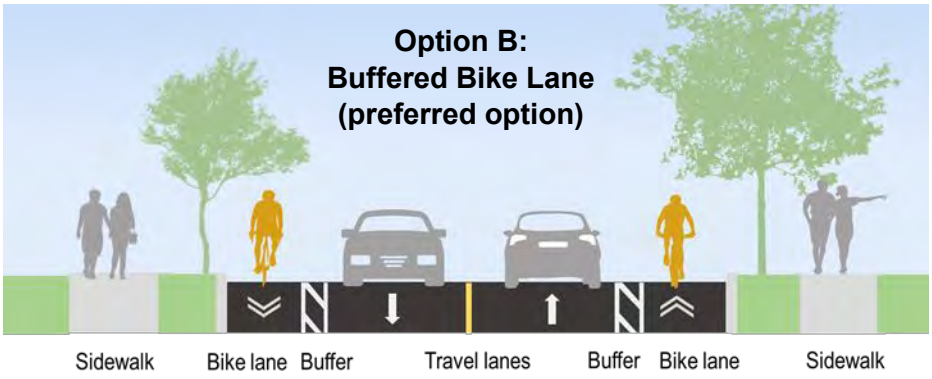
_____

3. Separated bike lanes on Martin Grove Road, Segment 2

The City is considering two design options to improve safety on Martin Grove Road from Donalbert Road to approximately 100 metres north of Burnhamthorpe Road (Segment 2).



- A painted buffer with pre-cast concrete curbs and flexible posts would separate people cycling from motor vehicles
- Curbs would be spaced to ensure that residents can safely access driveways and solid waste can be collected.
- The road and bike lane would be plowed separately; snow would be stored in the buffer and at the curb.



- A painted buffer would separate people cycling from motor vehicles
- The road and bike lane would be plowed together; snow would be stored at the curb.

With both design options, the existing 'No Parking' regulation on this section of Martin Grove Road would become 'No Stopping'.

Option B (Buffered Bike Lanes) is the preferred design for Segment 2 because the proposed buffer would not be wide enough to easily accommodate snow storage. The curb-to-curb width of the road in Segment 2 (about 10 metres) would limit the width of the buffer to 0.5 metres.

Please indicate which design you prefer for separated bike lanes on Martin Grove Road (Segment 2):

☐ Option A: Cycle Track (pre-cast concrete curbs with flexible posts)

☐ Option B: Buffered Bike Lanes (painted buffer)

☐ No preference

Please explain your preference: _____

_____

_____

4. Do you have any additional comments about the proposed design options or road safety on Martin Grove Road or Rathburn Road?

_____

_____

_____

_____

_____

Watermain Replacement at Mimico Creek

5. Do you have any concerns with the preferred solution, #4 East of Martin Grove Road?

_____

_____

_____

_____

6. Do you have any concerns with the evaluation?

_____

_____

_____

7. Do you have any concerns with the criteria used?

_____

_____

_____

8. Do you have any additional comments? _____

_____

_____

_____

About You (Optional)

What are the first three characters of your postal code? _____

Please describe your perspective. (Check one)

__ I live on Martin Grove Road, north of Rathburn Road
__ I live on Martin Grove Road between Rathburn Road and Donalbert Road
__ I live on Martin Grove Road between Donalbert Road and Burnhamthorpe Road
__ I live on Rathburn Road between Martin Grove Road and The East Mall
__ I live on Rathburn Road, east of Martin Grove Road
__ I live in the area of the project
__ I live outside the area of the projects
__ Other (please specify) _____

How do you typically travel on Martin Grove Road and/or Rathburn Road (Select all that apply)

__ I walk
__ I cycle
__ I use a mobility device
__ I drive
__ I take TTC
__ I take Wheel Trans
__ I use taxis/rideshare services
__ Other: _____

About the Virtual Public Meeting

If you attended the Virtual Public Meeting, help us to improve by sharing your thoughts about the event.

	Strongly disagree	Disagree	Neutral/ Undecided	Agree	Strongly Agree
The information presented was clear and easy to understand.					
Staff were able to answer my questions.					
There was an opportunity to share my comments and opinions.					

Do you have any additional comments about the Virtual Public Meeting?

TORONTO

Feedback Form

Questions? Contact Us:

Road safety improvements: Stephanie Gris Bringas Tel.: 416-392-3643 **Watermain replacement**: Kate Kusiak Tel.: 416-392-1932	Email: MartinGrove@toronto.ca Mail: City of Toronto - Public Consultation Unit 55 John Street, Metro Hall, 19th Floor Toronto, ON M5V 3C6

The information on this form is collected under the City of Toronto Act, 2006, s. 136(c) and the Municipal Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record. Questions about this collection can be directed to the Manager, Public Consultation Unit, Tracy Manolakakis: 416-392-2990.

Martin Grove Watermain Replacement and Road Safety Improvements
Question and Answer Summary
Webex Public Consultation Meeting: December 7, 2020

The purpose of this summary is to provide a broad overview of questions that were asked and to include response from staff for residents who were not able to join the meeting or for attendees who did not have their question answered. About 190 questions and comments were received in the Webex Q&A Panel, so staff were not able to address them all.

Please Note: Some attendees submitted their comments and opinions into the Q&A panel, which will be moved into the consultation summary and not included in this document. All identifiable information has been removed in accordance with the MFIPPA guidelines.

Watermain

1. Is there a need to increase the diameter of the water main? Could relining of existing mains be a possibility?

The City has not identified the need to increase the diameter of the watermain. Relining of the existing mains below Mimico Creek would require excavations within the creek area due to the location and number of bends in the existing pipe, and has been ruled out on this basis.

2. When will the water main replacement be done. There is a history of "promises" to when this will be done?

The teams are working towards a timeline to start construction in late summer 2021 to December 2021 with site restoration in Spring 2022.

3. We have had three poorly executed projects recently - the water main on Kipling, the water main work in Echo Valley Park and the bridge on Rathburn Road. Does the city really have the capability to manage this project so that it comes in on time, on budget?

Yes we are working with consultants to complete design and start tendering process for a contractor to carry out the work. The previous work on the sewer trunk sewer on Kipling in Echo Valley Park required different construction approach to re-line an existing large diameter trunk sewer. In a previous email reply to this resident, staff indicated that the flooding experienced in the park was separate from that construction work and was observed/pre-existing before that construction started. Parks staff have been notified to follow up and review the drainage in that park early next year.

4. Was the age of the watermain the primary cause of the historical pipe break failures? What did the forensic analysis of the breaks indicate? Were failures mainly in one area? Perhaps relining of a specific stretch of pipeline would be an alternative.

Age is one of many factors that could contribute to a watermain break. Other possible contributors include soil condition, soil movement due to seasonal temperature changes, and pipe-wall thickness. Further information on why watermains break is provided here: https://www.toronto.ca/services-payments/building-construction/infrastructure-city-construction/understanding-city-construction/water-sewer-mains/

The watermain breaks on Martin Grove occurred in various, spread-out locations with different effects or outcomes. Watermain replacement or rehabilitation projects are based on pipe condition, and priority, location, and funding availability to schedule them. Using current technology, the lifespan of a new watermain would be much longer than that of a relined pipe, making replacement a greater benefit for a similar cost and construction duration.

5. Has the recent sewer upgrade along Martingrove and Rathburn to Lorraine Gardens As-Built Drawings been shared with RV Anderson from CH2M Hill in design perimeters?

The design teams are aware of CH2M Hill's sewer replacement work in the area and are coordinating to obtain and incorporate pertinent design information accordingly.

6. What construction approach will be used to install under Mimico Creek?

The preferred construction method to instal the new watermain under Mimico Creek is horizontal directional drilling.

Martin Grove Watermain Replacement – EA Comment Tracking

#	Date	Comment	Reply
1.	Nov 27	Just to add...why in this day and age is it not proposed to use Directional Drilling, or torpedo in order to install the new watermains, everywhere, to avoid any disruptions and to avoid removing any trees anywhere? Today I received in the mail the Notice of Public Consultation. One of the items is re the watermain replacement. I am deeply saddened and disappointed that in this time, when we have so many climate change issues, that the city would prefer a route which calls for the removal of mature trees. It states up to 5 trees. What it does not point out is that these are huge mature trees which provide shade to people using the park, and shelter and food for the park wildlife. Replacement trees are small trees which would take decades to reach the size of the ones being removed. This on top of the other proposal further north which shockingly wants to remove almost 400 trees! I am very disappointed that our city cannot come up with less invasive and less destructive ways of achieving infrastructure changes/upgrades. We need to stop looking at trees as something in our way that we can just easily cut down and replace. They are extremely important and should be protected, not have removing them considered an 'easy' route when desired. We should be putting more protection for existing trees and not constantly removing them, on public and private property. For instance our evergreen trees have no protection right now, and these are some of the most critical for wildlife with climate change which is causing winds, freezing rain, snow and heavy rain like we have not had in the past. These also support birds which are insectivores and actually remain here during the winter and are their only food source, where already only about 1 in 6 survive, without us constantly removing their very limited food and shelter sources. We must strive to do better!	Hello Elena, Thank you for your email and your interest in these projects. We will try to address each concern you've raised. Use of Directional Drill We are recommending the use of directional drill to install the watermain below Mimico Creek. See slide #39 (link to Pdf) that indicates the Horizontal Directional Drill method will be carried forward in the alternative solutions (#2 to #4). However, the use of this drill does come with associated impacts on the space required for the work zone around it including public safety. Tree Replacement It is an unfortunate but common impact that trees are impacted by construction work needed to replace, maintain or upgrade essential services, especially ones located underground. The current assessment of tree impacts is at a preliminary stage, based on a count of trees that are near the anticipated work area. A certified arborist is carrying out the tree inventory which will be used to assess impacts of the final work area. Until we have confirmed the location of the work areas it is possible that anywhere between zero and five trees may be impacted by the work. In the following weeks, once the tree inventory is completed, we will review the work activities with our colleagues in Parks to determine if the trees can sustain minor injury or if they require removal. Parks staff may have additional strategies that we can utilize if it is possible to reduce the number of tree removals, mitigate tree injuries, or shift work area towards a tree that is an invasive species (away from non-invasive/local tree species) as well. They will also review and ensure that any tree impacts follow the federal guidelines to protect bird migration and nesting. Finally, we will be developing a replanting plan that will be reviewed by Urban Forestry staff to uphold or exceed the required minimum ratios. Park trees are replaced 1:1 and any trees located within the ravine boundary are replaced 1:3. We will also be speaking with the consultant and Parks staff about any further opportunities to improve the tree canopy. We understand your concerns about how this project impacts this park and in the broader environmental/climate change scope. We will continue to work with our consultants and colleagues to minimize the impacts of this work and mitigate its impacts.
2.	Nov 30	I'd like to submit the attached information as input for the virtual public meeting to be held on Monday, December 7, to discuss the proposed bike lanes on Rathburn Rd. and Martin Grove Rd. Thank you. Content: Input for consideration by the City of Toronto public consultation staff	Stephanie is off for the holiday and will respond in the new year to your emails you sent yesterday. Regarding your last pages in your attachment, we contacted the project manager on the STS at Kipling and Burnhamthorpe. He took a look at the photo on the last slide – and couldn't recall where it was exactly in or near the work sites of that project. He also noted that there were pre-existing ponding issues before the work started.

Martin Grove Watermain Replacement – EA Comment Tracking

#	Date	Comment	Reply
		Proposal #4: Watermain Replacement It was not so long ago (2017 2018) that rehabilitation work took place on the sanitary trunk sewers (STS) from Echo Valley Park, near Wingrove Hill and Kipling Avenue, to the Islington Golf Course. After the work was completed, the gradient of the land beside the path that runs along the Mimico creek in Echo Valley Park failed to allow for adequate water run off. As a result there is severe flooding across the path whenever there is heavy rain. See photo on next slide If the Echo Valley Park is anything to go by, I just don't believe that the city staff have the expertise/capability to manage a project of this magnitude. 	I have reached out to staff in the Parks, Forestry & Recreation and they let me know that they will revisit the park in the spring and reassess. I have also contacted our colleagues in Toronto Water to see if have any plans to visit this park and determine if the ponding is related to other infrastructure located near this park. You can also contact the City's 311 service and speak to an operator for maintenance and improvements including the City's parks: www.toronto.ca/311 call 311 (or 416-392-2489) or email 311@toronto.ca and they will provide a service ticket to track your request.
3.	Dec 4	Hello, Thank you for your reply! I am encouraged and hopeful that the trees in the park can indeed be saved. Just to point point out I am replying merely to the notice sent out, which has no slides re directional drilling, and only mentions a 'specialized' drill. I am happy that the city is indeed pursuing using more modern technology.	N/A
4.	Dec 8	Kate, when they are doing the water main project, does it include upgrading the size of supply line to the houses. Most older homes I believe have a 1/2" supply. I realize if possible the line stops at the beginning of the property. Please advise. Thank you.	Hi Tony, Sorry about this. According to old City records the service connection to your home is 13 mm copper but will required to be confirmed once construction starts. You should receive a pre-construction notice about 2 months before the anticipated construction start date and another notice about 2-3 weeks beforehand. Once construction starts, the contractor will determine the service connection is 13 mm copper, and may consider it to be sub-standard and replaced with 19 mm copper service connection to your property line. If you are interested in upgrading the portion of the water service connection line from the property line to your home, you can coordinate your contractor's work with the City's contractor. There will be a field ambassador contact info provided on the notices as well as 311 who can help you as well. I also found these webpage links to provide some more details: Water Service, but I think this 311 webpage (And this one) has more information that is relevant to your case.
5.	Dec 14	Good afternoon Kate. A few days ago while I was talking to Stephanie on the phone regarding bike lanes, at the tail end of our discussion, I mentioned about the main line replacement if the actual supply lines that are 1/2"in diameter going to the houses will be upgraded to 1". You must have been in office at that time and your response was it's not been finalized as to this. There are lots of older homes on the street with this inadequate 1/2" size and would it not be advisable to consider this when ripping up the road to have this major line replaced to have this done at the same time. Every time an older home is replaced by a new one the road has to be dug up to upgrade line. Please run this by your committee and give it a serious look. Thank you	

#	Date	Comment	Reply
			In addition, my personal experience when road work was taking place in front of my home about 4 years ago, I elected to pay separately to upgrade the water connection from the property line to my home and it was fairly straightforward as the contractor seemed to be quite familiar with this process. I hope this provides some more information. Each home owner will be responsible to choose to upgrade if their water connection service is considered sub-standard and then coordinate with the contractor (tender for the construction work will be issued after this study is completed – see slide #48 in the presentation). If you have other concerns, please let me know.
6.	Dec 14	Thank you Kate. This information very helpful. I fully understand that if city went ahead with upgrades, I would be responsible for my end, ie, property line to house. I still think it's better to proceed with all upgrade rather than deciding on a quick decision then and there by either contractor or field engineer. The lines are easy 70 years old and possibly collapsed in areas restricting flow. Note: on certain times of day, due to demand by homeowners, pressure is way down.	Hi Tony, I will pass your note regarding upgrading all connections instead of by the individual/home connection. However, I do not believe that this established process for contractors will change for this project. If you or neighbours are experiencing low pressure, please go through these 5 steps to check the pressure: https://www.toronto.ca/services-payments/water-environment/your-water-pipes-meter/water-related-help-advice/no-water-or-low-water-pressure/ The No Water Map (link is within the webpagage above) is constantly updated, and there doesn't seem to be any work near your home that would affect the pressure. Nevertheless, please contact 311 to submit a request to Toronto Water when this does happen along with any details (ie. time of day, which days, etc).
7.	Dec 14	Kate, thank you for quick responses. Yes, I do believe the process for evaluation has been tried and tested regarding decision made on spot but sometimes it's easier to say, "let it go until next time". I have often heard those words. Again, thanks. Tony.	n/a
8.	Dec 18	4. Watermain.. Will watch for coming information and hope it leads to a more attractive Creek. The waterflow obviously has been reduced which is affecting the beauty of Mimico Creek especially from Martingrove and under the Rathburn Road Bridge.	Hi Jeannine, I have shared your comments regarding the road safety options with the team. For your 4th comment, I'd like to clarify that the watermain work will go below the creek to avoid it and the bridge structure. There are no plans to beautify the creek or the ravine/park area as part of this work to replace aging/breaking watermains. I will pass on this comment to my colleagues in Parks, Forestry and Recreation for any future considerations.
9.	Dec 23	Greetings, I am a resident of Etobicoke and writing to express my strong support of the project titled, "Watermain Replacement on Martin Grove Road & Proposed Road Safety Improvements on Rathburn Road and Martin Grove Road".	n/a

Watermain Replacement on Martin Grove Road at Mimico Creek
Comment Forms Received
As of December 20, 2022

Number	Respondent	10. Do you have any concerns with the preferred solution #4 East of Martin Grove Road/Bridge?	10. Do you have any concerns with the preferred solution #4 East of Martin Grove Road/Bridge? - other	11. Do you have any concerns with the evaluation ?	11. Do you have any concerns with the evaluation ? - other	12. Do you have any concerns with the criteria?	12. Do you have any concerns with the criteria? - other	13. Any other comments?
1	19	No - I have no concerns		No - I have no concerns		No - I have no concerns		
2	21	No - I have no concerns		No - I have no concerns		No - I have no concerns		
3	22	No - I have no concerns		No - I have no concerns		No - I have no concerns		
4	25	No - I have no concerns		No - I have no concerns		No - I have no concerns		
5	35	No - I have no concerns		No - I have no concerns		No - I have no concerns		
6	40	No - I have no concerns		No - I have no concerns		No - I have no concerns		No
7	46	No - I have no concerns		No - I have no concerns		No - I have no concerns		
8	48	No - I have no concerns		No - I have no concerns		No - I have no concerns		
9	61	No - I have no concerns		No - I have no concerns		No - I have no concerns		
10	77	No - I have no concerns		No - I have no concerns		No - I have no concerns		
11	80	No - I have no concerns		No - I have no concerns		No - I have no concerns		
12	82	No - I have no concerns		Yes - My concerns include: (Please indicate which alternative(s) in your comments below)	The credibility of the surveys depends entirely on its independence from politicians and decision makers.	Yes - My concerns include:	Criteria can be tailored to produce desired results. The survey needs to be done by an independent body.	
13	84	No - I have no concerns		No - I have no concerns		No - I have no concerns		
14	85	No - I have no concerns		No - I have no concerns		No - I have no concerns		
15	115	Yes - My concerns include:	Nothing in this survey explains what solution #4 is.	Yes - My concerns include: (Please indicate which alternative(s) in your comments below)	Nothing in this survey explains the evaluation.	Yes - My concerns include:	What are the criteria?	You need to include information about the water main if you expect feedback
16	118	No - I have no concerns		No - I have no concerns		No - I have no concerns		
17	135	No - I have no concerns		No - I have no concerns		No - I have no concerns		
18	136	No - I have no concerns		No - I have no concerns		No - I have no concerns		
19	143	No - I have no concerns		No - I have no concerns		No - I have no concerns		
20	163	No - I have no concerns		No - I have no concerns		No - I have no concerns		I hope that the priority is limiting impacts on the environment and helping the contractor complete work as quickly as possible.
21	178	No - I have no concerns		No - I have no concerns		No - I have no concerns		
22	188	No - I have no concerns		No - I have no concerns		No - I have no concerns		
23	193	Yes - My concerns include:	I have concerns about the removal of up to 5 trees. How big are these trees/how old? What type of trees are they? Are they otherwise healthy? Will they be replaced on a one-to-one basis? How big will the replacement trees be? Considering tree planting is one of the easiest ways of helping to fight the climate crisis I am against any option that would require the removal of large, healthy trees	No - I have no concerns		No - I have no concerns		
24	208	No - I have no concerns		No - I have no concerns		No - I have no concerns		
25	210	Yes - My concerns include:	Does the city have the inhouse expertise to ensure that this project is completed on-time and on-budget, unlike others recently carried out in this area.	No - I have no concerns		No - I have no concerns		I understand that this work is definitely needed, so I support the proposal, but the execution worries me.
26	212	No - I have no concerns		No - I have no concerns		No - I have no concerns		
27	221	No - I have no concerns		No - I have no concerns		No - I have no concerns		
28	226	No - I have no concerns		No - I have no concerns		No - I have no concerns		Please add reflectors to bollards
29	239	Yes - My concerns include:	Where are the alignments??	Yes - My concerns include: (Please indicate which alternative(s) in your comments below)	Where are the alignments??	Yes - My concerns include:	Where are the alignments??	Where are the alignments??
30	244	No - I have no concerns		No - I have no concerns		No - I have no concerns		
31	246	No - I have no concerns		No - I have no concerns		No - I have no concerns		
32	255	No - I have no concerns		No - I have no concerns		No - I have no concerns		
33	287	No - I have no concerns		No - I have no concerns		No - I have no concerns		
34	298	Yes - My concerns include:	I don't know what the #4 is I don't see it anywhere	Yes - My concerns include: (Please indicate which alternative(s) in your comments below)	That there is no info here on #4	Yes - My concerns include:	Where is the water main bridge info	
35	299	No - I have no concerns		No - I have no concerns		No - I have no concerns		
36	302	No - I have no concerns		No - I have no concerns		No - I have no concerns		
37	303	No - I have no concerns		No - I have no concerns		No - I have no concerns		
38	305	No - I have no concerns		No - I have no concerns		No - I have no concerns		
39	306	No - I have no concerns		No - I have no concerns		No - I have no concerns		I don't know too much about watermain, so I don't raise concerns
40	318	No - I have no concerns		No - I have no concerns		No - I have no concerns		

Ken P. Wallace

From: Liu, Chunmei (MECP) <Chunmei.Liu@ontario.ca>
Sent: December 8, 2020 10:15 AM
To: Kate Kusiak
Cc: Amir Gafoor; Tomas Ycas; Papageorgiou, Agni (MECP); Caicedo, Jimena (MECP)
Subject: RE: City of Toronto Watermain Replacement
Attachments: A Proponent's Introduction to the Delegated Aspects of Consultation with.pdf

Morning Kate,
The ministry agrees that the list for the Martin Grove Project is the same as the Mimico Creek. Based on information provided to date and the Crown`s preliminary assessment, the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Mississaugas of the Credit First Nation;
- Six Nation of the Grand River (Both the Six Nations Elected Council and Haudenosaunee Confederacy Chiefs Council); and
- Huron-Wendat Nation (only if there are potential archeological impacts)

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process".
Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments
Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information.
The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances subsequent to initial discussions with the communities identified by the ministry:
- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation with Indigenous communities or other stakeholders has reached an impasse
- A Part II Order request is expected on the basis of impacts to Aboriginal or treaty rights

The ministry will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.
If you have any questions regarding these comments, please let us know.
Best regards,

Chunmei Liu | Regional EA and Planning Coordinator
Environmental Assessment Branch, Ontario Ministry of the Environment, Conservation and Parks Chunmei.Liu@ontario.ca | Website: http://www.ene.gov.on.ca/
If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

From: Kate Kusiak
Sent: November-20-20 12:58 PM
To: Liu, Chunmei (MECP) ; Papageorgiou, Agni (MECP)
Cc: Amir Gafoor ; Tomas Ycas
Subject: RE: City of Toronto Watermain Replacement

Hi Chunmei,

We are looking to issue a notice of commencement for Martin Grove Watermain next week. For another City of Toronto project, Mimico Creek Geomorphic Systems Master Plan which extends from Lake Ontario to Highway 427, you provided us with the following Indigenous Groups:

1. Mississaugas of the Credit First Nation
2. Six Nations of the Grand River
3. Haudenosaunee Confederacy Chiefs Council; and
4. Huron-Wendat Nation (only if there are potential archaeological impact)

The Martin Grove Watermain Replacement extends over Mimico Creek as well. Can you let me know if these four communities also apply to the Martin Grove Road Watermain Replacement?
Thank you,
Kate

Kate Kusiak
Senior Public Consultation Coordinator
City of Toronto
Metro Hall, 55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932

From: Kate Kusiak
Sent: October 15, 2020 12:46 PM
To: 'Liu, Chunmei (MECP)' <Chunmei.Liu@ontario.ca>; Papageorgiou, Agni (MECP) <Agni.Papageorgiou@ontario.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>
Subject: RE: City of Toronto Watermain Replacement
Hi Chunmei,
Yes, please send a list of Indigenous communities for this project. We are looking at mid-November Notice.
Thank you,
Kate

From: Liu, Chunmei (MECP) [mailto:Chunmei.Liu@ontario.ca]
Sent: October 15, 2020 12:30 PM
To: Kate Kusiak <Kate.Kusiak@toronto.ca>; Papageorgiou, Agni (MECP) <Agni.Papageorgiou@ontario.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>
Subject: RE: City of Toronto Watermain Replacement
Hi Kate,
Thank you very much for letting us know about this initiation. As the Class EA is the proponent driven process, we would like to know what kind of assistance will you like us to provide at this stage, such as do you need us to provide a list of indigenous communities now?
Thank you, Chunmei

From: Kate Kusiak <Kate.Kusiak@toronto.ca>
Sent: October-14-20 9:51 AM
To: Liu, Chunmei (MECP) <Chunmei.Liu@ontario.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>
Subject: City of Toronto Watermain Replacement

Hi Chunmei,
Please find attached the letter concerning the initiation of a Municipal Class EA study being undertaken by the City of Toronto for Martin Grove and Rathburn Road near Mimico Creek.
If you have any questions about this study, please contact me.
I look forward to receiving your correspondence.
Kate

Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Metro Hall
55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932
www.toronto.ca/covid-19

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;

- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;

- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant information;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigate any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

From:	Kate Kusiak
To:	"Luka Medved"
Cc:	Tomas Ycas; Amir Gafoor
Subject:	RE: Thank you for attending the Watermain Replacement & Road Safety Improvements on Martin Grove Road and Rathburn Road
Date:	December 9, 2020 3:17:00 PM

Hi Luka,
Renee Afoom Boateng received a copy of the Notice of Commencement. We won't be revising the presentation based on permitting issues – please send a letter or directly contact the Engineering Leads (CC'd here and contact info below) to discuss permitting. The road safety improvements are within the City's road right of way and are also not part of the Watermain EA.

Kate
Public Consultation

Tomas Ycas, 416-392-4956
Amir Gafoor, 416-392-8323

From: Luka Medved [mailto:Luka.Medved@trca.ca]
Sent: December 9, 2020 8:26 AM
To: Kate Kusiak <Kate.Kusiak@toronto.ca>
Subject: RE: Thank you for attending the Watermain Replacement & Road Safety Improvements on Martin Grove Road and Rathburn Road

Hello Kate,

Please find below general comments in relation to the December 7, 2020 presentation and the proposed works:

- The City of Toronto has identified a Schedule B Class Environmental Assessment (EA) will be completed for the Watermain Replacement on Martin Grove Road project. Staff note that no formal Notice of Commencement was received prior to the public meeting. TRCA staff will be reviewing the Class EA document once available and will provide comments on the evaluation completed. If possible, please provide the Class EA document in advance to provide staff with as much time as possible to review.
- Staff note that permitting was not identified on the presentation slide deck shared or identified during the meeting when timelines were discussed. The slide deck should be revised to indicate permitting will follow the Class EA process to ensure realistic timelines are accounted for. Slide 48 indicates a construction tender will be obtained following completion of the final report review, however a permit from TRCA for the proposed watermain works will be required and potentially for works proposed in Segment 1 of the road safety improvements based on the design selected.
- Please confirm whether works outside of the existing road right-of-way will be required to facilitate the road safety improvements in Segment 1.

Should you have any questions please contact me.

Thanks,

Luka Medved, MEM, PMP
Planner
Infrastructure Planning and Permits I Development and Engineering Services Division

T: 416.661.6600 ext. 5766
E: Luka.Medved@trca.ca
A: 101 Exchange Avenue, Vaughan ON L4K 5R6

Toronto and Region Conservation Authority (TRCA) | trca.ca

From: Kate Kusiak, City of Toronto <messenger@webex.com>
Sent: Tuesday, December 8, 2020 3:31 PM
To: Luka Medved <Luka.Medved@trca.ca>
Subject: Thank you for attending the Watermain Replacement & Road Safety Improvements on Martin Grove Road and Rathburn Road

Hello Luka Medved,

Thank you for attending the Watermain Replacement & Road Safety Improvements on Martin Grove Road and Rathburn Road virtual public consultation meeting on Monday, December 7, 2020 using WebEx.

If you have comments or questions, please contact your host, Kate Kusiak, at: kate.kusiak@toronto.ca

We will be posting a brief summary of questions and answers on the project webpage for neighbours who weren't able to join us yesterday. For attendees who called in and didn't get their question answered, please email us at martingrove@toronto.ca or contact us directly by phone:

- Stephanie Gris Bringas, Public Consultation contact for Road Safety Improvements, phone 416-392-3643
- Kate Kusiak, Public Consultation contact for Watermain Replacement, phone 416-392-1932

Send us your comments by December 21, 2020: by email, phone or online survey

https://www.webex.com

From:	Kate Kusiak
To:	"Stacey.LaForme@mncfn.ca"; "Mark.LaForme@mncfn.ca"; "Fawn.Sault@mncfn.ca"; "doca@mncfn.ca"; "Darin.Wybenga@mncfn.ca"
Cc:	Tracy Manolakakis; Tomas Ycas
Subject:	Toronto EA Notification - Martin Grove Watermain Replacement (Mississaugas)
Date:	December 17, 2020 4:32:00 PM
Attachments:	City-of-Toronto-Martin-Grove-Mississaugas.pdf City-of-Toronto-Martin-Grove-Presentation-.pdf City-of-Toronto-Martin-Grove-Notice-.pdf 2020-07-16-(notice) Screening results MC20-04-.pdf

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Hello Chief R. Stacy LaForme,

The City of Toronto is carrying out the Martin Grove Watermain Replacement. The purpose of the study is develop a final alignment for the replacement watermain to cross Mimico Creek at Martin Grove Road.

I've attached a copy of the Notice of Commencement, the recommended solution in the public meeting presentation, as well as a pre-screening summary.

Further information about the study can be found at Toronto.ca/martingrove and click on the top of the page "Learn more about the watermain replacement along Martin Grove Road."

Please contact me with any questions or concerns.

Thank you,
Kate Kusiak

_____
Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

Tracy Manolakakis
Manager, Public Consultation

Policy, Planning,
Finance & Administration

Program Support
Metro Hall, 19th Floor
55 John Street
Toronto, ON M5V 3C6

Reply to: Kate Kusiak
Public Consultation Unit
Tel: 416-392-1932
Fax: 416-392-2974
TTY: 416-338-0889
Email: kate.kusiak@toronto.ca

December 17, 2020

Mississaugas of the Credit First Nation
Department of Consultation and Accommodation (DOCA)
4065 Hwy 6
Hagersville, ON N0A 1H0

Re: PIC – Recommended Solution – Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process

Hello Mississaugas of the Credit First Nation,

The City of Toronto is carrying out a Municipal Class Environmental Assessment Study (Schedule B) for the Martin Grove Road Watermain Replacement. The purpose of the study is to develop a final alignment for the replacement watermain to cross Mimico Creek at Martin Grove Road.

This study will document input and comments from all interested stakeholders to determine the final alignment for this replacement watermain. All stakeholders will be provided with an opportunity to review, comment on and discuss all options.

For your reference, we have enclosed:

- A copy of the Notice of Commencement and Virtual Public Meeting which includes a study area map, dated November 19, 2020
- A copy of the Presentation that was provided at the Virtual Public Meeting, which includes the identification of the recommended design alternative (Starts on Slide #31). This recommendation has been developed through an evaluation of constructability, impacts and natural environment, park access and overall cost.
- A copy of the Toronto Region and Conservation Authority "Re: Archaeology Screening Record: MC20-04 Martin Grove Watermain Replacement" dated July 16, 2020.

Please note, a Stage 1 Archaeological Assessment is being undertaken as part of this study and a draft copy will be provided at a later date.

Further information about the study can be found at toronto.ca/martingrove

The City of Toronto will continue to notify you about the study as it progresses.

Your input is important. If you require additional information or would like to meet with the City to discuss this project further, please contact me at your earliest convenience.

Sincerely,

Kate Kusiak
Senior Public Consultation Coordinator
Public Consultation Unit
City of Toronto
Email: Kate.kusiak@toronto.ca
Telephone: 416-392-1932

CC: Tomas Ycas, P.Eng., Engineering & Construction Services, City of Toronto
Tracy Manolakakis, Manager, Public Consultation Unit, City of Toronto

From:	Kate Kusiak
To:	"markhill@sixnations.ca"; "lonnybomberry@sixnations.ca"
Cc:	Tracy Manolakakis; Tomas Ycas
Subject:	Toronto EA Notification - Martin Grove Watermain Replacement (Six Nations)
Date:	December 17, 2020 4:33:00 PM
Attachments:	City-of-Toronto-Martin-Grove-Six-Nations-Grand-River.pdf 2020-07-16-(notice) Screening results MC20-04-.pdf City-of-Toronto-Martin-Grove-Notice-.pdf City-of-Toronto-Martin-Grove-Presentation-.pdf

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Hello Chief Mark Hill and Lonny Bomberry,

The City of Toronto is carrying out the Martin Grove Watermain Replacement. The purpose of the study is develop a final alignment for the replacement watermain to cross Mimico Creek at Martin Grove Road.

I've attached a copy of the Notice of Commencement, the recommended solution in the public meeting presentation, as well as a pre-screening summary.

Further information about the study can be found at Toronto.ca/martingrove and click on the top of the page "Learn more about the watermain replacement along Martin Grove Road."

Please contact me with any questions or concerns.

Thank you,
Kate Kusiak

_____
Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

TORONTO

Tracy Manolakakis
Manager, Public Consultation

Policy, Planning,
Finance & Administration

Program Support
Metro Hall, 19th Floor
55 John Street
Toronto, ON M5V 3C6

Reply to: Kate Kusiak
Public Consultation Unit
Tel: 416-392-1932
Fax: 416-392-2974
TTY: 416-338-0889
Email: kate.kusiak@toronto.ca

December 17, 2020

Six Nations of the Grand River
2498 Chiefswood Road
PO Box 5000
Ohsweken, ON N0A 1MO

Re: PIC – Recommended Solution – Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process

Hello Six Nations of the Grand River,

The City of Toronto is carrying out a Municipal Class Environmental Assessment Study (Schedule B) for the Martin Grove Road Watermain Replacement. The purpose of the study is to develop a final alignment for the replacement watermain to cross Mimico Creek at Martin Grove Road.

This study will document input and comments from all interested stakeholders to determine the final alignment for this replacement watermain. All stakeholders will be provided with an opportunity to review, comment on and discuss all options.

For your reference, we have enclosed:

- A copy of the Notice of Commencement and Virtual Public Meeting which includes a study area map, dated November 19, 2020
- A copy of the Presentation that was provided at the Virtual Public Meeting, which includes the identification of the recommended design alternative (Starts on Slide #31). This recommendation has been developed through an evaluation of constructability, impacts and natural environment, park access and overall cost.
- A copy of the Toronto Region and Conservation Authority "Re: Archaeology Screening Record: MC20-04 Martin Grove Watermain Replacement" dated July 16, 2020.

Please note, a Stage 1 Archaeological Assessment is being undertaken as part of this study and a draft copy will be provided at a later date.

Further information about the study can be found at toronto.ca/martingrove

The City of Toronto will continue to notify you about the study as it progresses.

Your input is important. If you require additional information or would like to meet with the City to discuss this project further, please contact me at your earliest convenience.

Sincerely,

Kate Kusiak
Senior Public Consultation Coordinator
Public Consultation Unit
City of Toronto
Email: Kate.kusiak@toronto.ca
Telephone: 416-392-1932

CC: Tomas Ycas, P.Eng., Engineering & Construction Services, City of Toronto
Tracy Manolakakis, Manager, Public Consultation Unit, City of Toronto

From:	Kate Kusiak
To:	"1749resource@gmail.com"
Cc:	Tracy Manolakakis; Tomas Ycas
Subject:	Toronto EA Notification - Martin Grove Watermain Replacement (Haudenosaunee)
Date:	December 17, 2020 4:34:00 PM
Attachments:	City-of-Toronto-Martin-Grove-Haudenosaunne.pdf 2020-07-16-(notice) Screening results MC20-04-.pdf City-of-Toronto-Martin-Grove-Notice-.pdf City-of-Toronto-Martin-Grove-Presentation-.pdf

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Hello Secretary Hohahes Leroy Jock Hill,

The City of Toronto is carrying out the Martin Grove Watermain Replacement. The purpose of the study is develop a final alignment for the replacement watermain to cross Mimico Creek at Martin Grove Road.

I've attached a copy of the Notice of Commencement, the recommended solution in the public meeting presentation, as well as a pre-screening summary.

Further information about the study can be found at Toronto.ca/martingrove and click on the top of the page "Learn more about the watermain replacement along Martin Grove Road."

Please contact me with any questions or concerns.

Thank you,
Kate Kusiak

_____
Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

TORONTO

Tracy Manolakakis
Manager, Public Consultation

Policy, Planning,
Finance & Administration

Program Support
Metro Hall, 19th Floor
55 John Street
Toronto, ON M5V 3C6

Reply to: Kate Kusiak
Public Consultation Unit
Tel: 416-392-1932
Fax: 416-392-2974
TTY: 416-338-0889
Email: kate.kusiak@toronto.ca

December 17, 2020

Haudenosaunee Confederacy Chiefs Council
2634 Sixth Line
Ohsweken, ON N0A 1M0

Re: PIC – Recommended Solution – Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process

Hello Haudenosaunee Confederacy Chiefs Council,

The City of Toronto is carrying out a Municipal Class Environmental Assessment Study (Schedule B) for the Martin Grove Road Watermain Replacement. The purpose of the study is to develop a final alignment for the replacement watermain to cross Mimico Creek at Martin Grove Road.

This study will document input and comments from all interested stakeholders to determine the final alignment for this replacement watermain. All stakeholders will be provided with an opportunity to review, comment on and discuss all options.

For your reference, we have enclosed:

- A copy of the Notice of Commencement and Virtual Public Meeting which includes a study area map, dated November 19, 2020
- A copy of the Presentation that was provided at the Virtual Public Meeting, which includes the identification of the recommended design alternative (Starts on Slide #31). This recommendation has been developed through an evaluation of constructability, impacts and natural environment, park access and overall cost.
- A copy of the Toronto Region and Conservation Authority "Re: Archaeology Screening Record: MC20-04 Martin Grove Watermain Replacement" dated July 16, 2020.

Please note, a Stage 1 Archaeological Assessment is being undertaken as part of this study and a draft copy will be provided at a later date.

Further information about the study can be found at toronto.ca/martingrove

The City of Toronto will continue to notify you about the study as it progresses.

Your input is important. If you require additional information or would like to meet with the City to discuss this project further, please contact me at your earliest convenience.

Sincerely,

TORONTO

Kate Kusiak
Senior Public Consultation Coordinator
Public Consultation Unit
City of Toronto
Email: Kate.kusiak@toronto.ca
Telephone: 416-392-1932

CC: Tomas Ycas, P.Eng., Engineering & Construction Services, City of Toronto
Tracy Manolakakis, Manager, Public Consultation Unit, City of Toronto

From:	Kate Kusiak
To:	"eanotification.cregion@ontario.ca"
Subject:	City of Toronto, MEA Class EA, Martin Grove (at Mimico Creek/south of Savalon Crt to Rathburn Rd)
Date:	December 21, 2020 11:42:00 AM
Attachments:	Martin Grove combined notice FINAL_Greyscale.pdf 2020-Streamlined-EA-Project-Information-Form-MartinGrove-Watermain-Replace.xlsx

Hi Chunmei,
Please find attached the notice of Commencement and Project Information Form for the Martin Grove Watermain Replacement.
If you have any questions or concerns to discuss, please contact me at kate.kusiak@toronto.ca or 416-392-1932 at your earliest convenience.
Regards,
Kate

Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Metro Hall
55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

From:	Kate Kusiak on behalf of Martin Grove
To:	"bell.joe.bevacqua@bell.ca"
Subject:	City of Toronto - Environmental Assessment for Watermain Replacement on Martin Grove/Mimico Creek
Date:	December 22, 2020 5:40:00 PM
Attachments:	Martin Grove combined notice FINAL_Greyscale.pdf

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Hi Joe,
The City of Toronto is consulting the public as part of an Environmental Assessment for watermain replacement along Martin Grove Road under Mimico Creek (just north of Rathburn Road). This consultation also includes planned road improvements along Rathburn Road and on Martin Grove Road.

- Public Meeting Presentation
- Webpage

Please contact me with any questions.

Kate

_____
Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Metro Hall
55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

From:	Kate Kusiak on behalf of Martin Grove
To:	"john.wellsbury@canadapost.postescanada.ca"
Cc:	Jonathan Lam
Subject:	City of Toronto - Environmental Assessment for Watermain Replacement on Martin Grove/Mimico Creek
Date:	December 22, 2020 5:58:00 PM
Attachments:	Martin Grove combined notice FINAL_Greyscale.pdf

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Hi John,

The City of Toronto is consulting the public as part of an Environmental Assessment for watermain replacement along Martin Grove Road under Mimico Creek (just north of Rathburn Road). This consultation also includes planned road improvements along Rathburn Road and on Martin Grove Road.

- Public Meeting Presentation
- Webpage

Please contact me with any questions.

Kate

_____

Kate Kusiak

Senior Public Consultation Coordinator
City of Toronto
Metro Hall
55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

From:	Kate Kusiak
To:	"jesus.cerna@sun-canadian.com"
Cc:	Jonathan Lam
Subject:	City of Toronto - Environmental Assessment for Watermain Replacement on Martin Grove/Mimico Creek
Date:	December 22, 2020 5:59:00 PM
Attachments:	Martin Grove combined notice FINAL_Greyscale.pdf

Hi Jesus,

The City of Toronto is consulting the public as part of an Environmental Assessment for watermain replacement along Martin Grove Road under Mimico Creek (just north of Rathburn Road). This consultation also includes planned road improvements along Rathburn Road and on Martin Grove Road.

- Public Meeting Presentation
- Webpage

Please contact me with any questions.

Kate

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Senior Public Consultation Coordinator
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55 John Street, 19th Floor
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Kate.kusiak@toronto.ca
416-392-1932

www.toronto.ca/covid-19

Ministry of Heritage, Sport, Tourism and Culture Industries

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 613-242-3743

Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto, ON M7A 0A7
Tél: 613-242-3743

Ontario

January 6, 2021 EMAIL ONLY

Kate Kusiak
Public Consultation Unit
City of Toronto
martingrove@toronto.ca

MHSTCI File	**:**	**0013523**
Proponent	**:**	**The City of Toronto**
Subject	**:**	**Notice of Public Consultation**
Project	**:**	**Watermain Replacement at Mimico Creek**
Location	**:**	**The City of Toronto**

Dear Kate Kusiak:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of public consultation for the above-referenced project. MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

Project Summary
The watermain segment north of Mimico Creek to south of Savalon Court, and the segment from Rathburn Road to Lorraine Gardens will be replaced within the road right-of-way. This study will follow the 'Schedule B' process, an approved planning process under the Ontario Environmental Assessment Act.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
This EA project may impact archaeological resources and should be screened using the MHSTCI *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at *archaeology@ontario.ca*. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MHSTCI for review.

Built Heritage Resources and Cultural Heritage Landscapes
The MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact cultural heritage resources. If potential or known heritage resources exist, MHSTCI recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MHSTCI for review, and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MHSTCI on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, do not hesitate to contact me.

Sincerely,

Joseph Harvey
Heritage Planner
Joseph.harvey@Ontario.ca

Copied to: Aaron Bell, Project Engineer, R.V. Anderson Associates Limited

From:	Kate Kusiak
To:	"Harvey, Joseph (MHSTCI)"
Cc:	ABell@rvanderson.com; Barboza, Karla (MHSTCI); Amir Gafoor; Tomas Ycas
Subject:	RE: File 0013523: City of Toronto - Virtual Public Consultation - Mimico Creek Watermain Crossing (Martin Grove and Rathburn Road)
Date:	February 18, 2021 4:18:00 PM
Attachments:	OMTCS Evaluation Form-RVAfinal2.pdf Martin Grove Rd at Mimico Creek - Large Scale.pdf Martin Grove Rd at Mimico Creek - Lots, Concessions and Parcel Numbers M....pdf Martin Grove Rd at Mimico Creek - Municipal Addresses Map.pdf Martin Grove Rd at Mimico Creek - Small Scale.pdf P439-0132-2020_19Jan2021_RE_St1.pdf P439-0132-2020_19Jan2021_SD_St1.pdf Martin-Grove-Watermain-EA-Study-Map.jpg

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Hi Joseph

Thank you for getting in contact with us. We've reviewed your attached letter and would like to provide the following:

Project Summary

- To clarify, the study area for this environmental assessment is between the two locations: from north of Mimico Creek to Rathburn Road as the potential and recommended solutions of the replacement watermain are outside of the road right-of-way.
- The remaining segments of the replacement watermain are within the road right-of-way and are excluded from the environmental assessment: from north of Mimico Creek to Savalon Court and from Rathburn Road to Lorraine Gardens. I've attached a map (jpg) to illustrate this.

Cultural Heritage Resources

- The Ministry of Environment, Conservation and Parks provided us with a list of First Nations to contact for this study. We have provided them with a Notice of Commencement by email along with a reminder email. We will continue to notify them and engage with them if they express any interest or concern related to cultural resources or any other topic.
- We do not plan to contact local historical societies or heritage organizations as part of this watermain replacement study since there should not be any trigger for a review of this type of resource due to the site not being located on, or adjacent to a listed or designated property nor is it within an identified cultural heritage landscape.

Archaeological Resources

- We have retained a consultant (Archeoworks Inc.) to carry out the requirements for a Stage 1 Archaeological Assessment and will provide the draft report to all stakeholders including the First Nations contacts and the Ministry of Heritage, Tourism, Sport and Culture Industries. We have also forwarded your email including links and the attached letter to the consultant for further consideration to ensure they will fulfil requirements.
- Attached to this email is the Stage 1 Archaeological Assessment.

Built Heritage Resources and Cultural Heritage Landscapes

- See attached checklist form titled “Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes” completed for this project which

reveals low potential for built heritage or cultural heritage landscape on the property.

Environmental Assessment Reporting

- We will continue to notify stakeholders including the Ministry of Heritage, Tourism, Sport and Culture Industries. If any concerns and recommendations are received we will follow up.

I hope this covers the relevant points in your letter.

Regards,

Kate Kusiak
Public Consultation Unit
City of Toronto
Kate.kusiak@Toronto.ca
416-392-1932

CC: Amir Gafoor and Tomas Ycas, City of Toronto, Engineering & Construction Services

List of Attachments:

- EA Study Map
  - Martin-Grove-Watermain-EA-Study-Map.jpg
- Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes, A Checklist for Non-Specialist
  - OMTCS Evaluation Form-RVAfinal2.pdf
- Requested Maps
  - Martin Grove Rd at Mimico Creek - Municipal Addresses Map.pdf
  - Martin Grove Rd at Mimico Creek - Large Scale.pdf
  - Martin Grove Rd at Mimico Creek - Lots, Concessions and Parcel Numbers Map.pdf
  - Martin Grove Rd at Mimico Creek - Small Scale.pdf
- Stage 1 Archaeology Reports
  - P439-0132-2020_19Jan2021_RE_St1.pdf
  - P439-0132-2020_19Jan2021_SD_St1.pdf

Kate
416-392-1932

From: Harvey, Joseph (MHSTCI) [mailto:Joseph.Harvey@ontario.ca]
Sent: January 6, 2021 2:16 PM
To: Kate Kusiak <Kate.Kusiak@toronto.ca>
Cc: ABell@rvanderson.com; Barboza, Karla (MHSTCI) <Karla.Barboza@ontario.ca>
Subject: File 0013523: City of Toronto - Virtual Public Consultation - Mimico Creek Watermain Crossing (Martin Grove and Rathburn Road)

Kate Kusiak,

Please find attached MHSTCI's comments on the above referenced project notice.

Please do not hesitate to contact me if you have any questions.

Regards,

Joseph Harvey | Heritage Planner (A)
Heritage, Tourism and Culture Division | Programs and Services Branch | Heritage Planning Unit
Ministry of Heritage, Sport, Tourism and Culture Industries
401 Bay Street
17th Floor, Suite 1700
Toronto, ON M7A 0A7
613.242.3743
Joseph.Harvey@ontario.ca

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

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

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

Ontario

January 13, 2021

File No.: EA 01-06-11

Kate Kusiak (BY EMAIL ONLY)
Senior Public Consultation Coordinator
Metro Hall, 19th Floor, 55 John Street
Toronto, ON M5V 3C6
E-mail: yellowcreek@toronto.ca
Tel: 416-392-1932

Re: **Physical Separation in the Buffer on Rathburn Road, New Separated Bike Lanes on Martin Grove Road & Watermain Replacement at Mimico Creek**
City of Toronto
Municipal Class EA
Response to Notice of Commencement

Dear Ms. Kusiak,

This letter is in response to the Notice of Commencement for the above noted projects. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the City of Toronto (proponent) has indicated that the study is following the approved environmental planning process for a Schedule B project under the Municipal Class Environmental Assessment (Class EA).

The **updated** attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please identify the areas of interest which are applicable to the project and ensure they are addressed. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. **Further information is provided at the end of the Areas of Interest document relating to recent changes to the Environmental Assessment Act through Bill 197, Covid-19 Economic Recovery Act 2020.**

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

-Mississaugas of the Credit First Nation

-Six Nation of the Grand River (Both the Six Nations Elected Council and Haudenosaunee Confederacy Chiefs Council)

-Huron-Wendat Nation (only if archeological impacts)

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process". Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances subsequent to initial discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation with Indigenous communities or other stakeholders has reached an impasse
- A Part II Order request is expected on the basis of impacts to Aboriginal or treaty rights

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

Please ensure a copy of the final notice is sent to the ministry's Central Region EA notification email account (eanotification.cregion@ontario.ca).

Should you or any members of your project team have any questions regarding the material above, please contact me at chunmei.liu@ontario.ca.

Yours truly,

Chunmei Liu
Regional Environmental Assessment Coordinator – Central Region

cc Solange Desautels, Supervisor, Environmental Assessment Services, MECP
Jimena Caicedo, Manager, Toronto District Office, MECP

Attach: Areas of Interest
A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities

AREAS OF INTEREST

It is suggested that you check off each applicable area after you have considered / addressed it.

☐ **Species at Risk**

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

☐ **Excess Materials Management**

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled "On-Site and Excess Soil Management" (O. Reg. 406/19) to support improved management of excess construction soil. 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 set to come into effect on January 1, 2021. Please visit https://www.ontario.ca/page/handling-excess-soil.

- Activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014).

- All waste generated during construction must be disposed of in accordance with ministry requirements

☐ **Planning and Policy**

- Parts of the study area may be subject to the **A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)**, Oak Ridges Moraine Conservation Plan (2017), Niagara Escarpment Plan (2017), Greenbelt Plan (2017) or Lake Simcoe Protection Plan (2014). Applicable policies should be referenced in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.

- Additionally, if the project is located within the boundaries of the Lake Simcoe Protection Plan, we also strongly recommend that the project team review the information and resources available on the province's website related to protecting Lake Simcoe found here: https://www.ontario.ca/page/protecting-lake-simcoe, including the Lake Simcoe phosphorus reduction strategy.

- The **Provincial Policy Statement (2020)** contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.

- **Source Water Protection (all projects)**

The *Clean Water Act*, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**

    - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.

    - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- In order to determine if this project is occurring within a vulnerable area, proponents can use this mapping tool: http://www.applications.ene.gov.on.ca/swp/en/index.php.The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.

- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

More Information
For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

Climate Change

Ontario is leading the fight against climate change through the Climate Change Action Plan. Recently released, the plan lays out the specific actions Ontario will take in the next five years to meet its 2020 greenhouse gas reduction targets and establishes the framework necessary to meet its long-term targets. As a commitment of the action plan, **the province has now finalized a guide, "Considering Climate Change in the Environmental Assessment Process" (Guide).**

The Guide is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. **Proponents should review this Guide in detail.**

- The MECP expects proponents to:

    1. Consider during the assessment of alternative solutions and alternative designs, the following:
        a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
        b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
    2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "Community Emissions Reduction Planning: A Guide for Municipalities" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas

emissions into municipal activities of all types. We encourage you to review the Guide for information.

Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, an air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**

- **If a quantitative Air Quality Impact Assessment is not required for the project, the report should still contain:**

    - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
    - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
    - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
    - A discussion of potential mitigation measures.

- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities*. report prepared for Environment Canada. March 2005.

- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
    - Areas of Natural and Scientific Interest (ANSIs)
    - Rare Species of flora or fauna
    - Watercourses
    - Wetlands
    - Woodlots

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, you may consider the provisions of the Rouge Park Management Plan if applicable.

Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:

    - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
    - Watershed information, drainage conditions, and other relevant background information
    - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
    - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be

reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.

- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

Contaminated Soils

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites.

- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- The report should identify any underground transmission lines in the study area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

Servicing and Facilities

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with the Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's environmental land use planning guides to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Mitigation and Monitoring

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout the planning process. The report should also include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

Class EA Process

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference).**

- If this project is a Master Plan: Any identified projects should also include information on the MCEA schedule associated with the project.

- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate

mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.

- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, and approvals under the *Impact Assessment Act*, 2019.

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy. We encourage you to review all the available guides and to reference any relevant information in the report.

Amendments to the EAA through the Covid-19 Economic Recovery Act, 2020

Once the EA Report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the Proponent. The Notice of Completion must be sent to the appropriate MECP Regional Office email address (eanotification.cregion@ontario.ca).

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Part II Order requests on those matters should be addressed in writing to:

Minister Jeff Yurek
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Please note the proponent cannot proceed with the project until at least 30 days after the end of the comment period provided for in the Notice of Completion.

Further, the proponent may not proceed after this time if:

- a Part II Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, or
- the Director has issued a Notice of Proposed order regarding the project.

The public has the ability to request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once

the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project.

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;
- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by

the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;
- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant documentation;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigates any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

MISSISSAUGAS OF THE CREDIT FIRST NATION
DEPARTMENT OF
CONSULTATION AND ACCOMMODATION

January 15,2021

VIA EMAIL

Kate Kusiak
Senior Public Consultation Coordinator
City of Toronto
kate.kusiak@toronto.ca

Dear Kate,

RE: MCFN Response to Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process

Confirmation of Receipt

I am writing on behalf of the Mississaugas of the Credit First Nation ("MCFN") to acknowledge that we have received your above named communication, dated December 17,2021.

Outline of MCFN Rights and Territory

In 1805 , the Crown and MCFN entered into Toronto Purchase Treaty, No. 13 (1805) regarding the lands in which your project is situated.

The Mississaugas of the Credit First Nation are the descendants of the "River Credit" Mississaugas. The undisputed Territory of the MCFN is defined as a Territory commencing at Long Point on Lake Erie thence eastward along the shore of the Lake to the Niagara River. Then down the River to Lake Ontario, northward along the shore of the Lake to the River Rouge east of Toronto then up that river to the dividing ridges to the head waters of the River Thames then southward to Long Point, the place of the beginning. Our Territory encompasses the lands and waters that were used and occupied by our Ancestors. Territories are usually large tracts of land that reflect the breadth required for seasonal activities and habitation and changes in those movement patterns through time. Through Treaties with the Crown, MCFN agreed to share our Territory with newcomers. However, not all of MCFN's Territory has been dealt with through a Treaty.

With the exception of a small part of the Credit River, our Treaties with the Crown did not deal with the water parts of our Territory. We have not agreed to share any part of our waters with settlers. We formally gave notice to the Crown of this claim in 2016. We note that any lands that have been artificially created on our waters have also not been dealt with by any Treaty.

Like our ancestors before us, we continue to use the lands, waters, and watershed ecosystems within our Territory for a variety of livelihood, harvesting, ceremonial and spiritual purposes. We have always exercised governance functions and stewardship in order to protect our Territory, conserve the fish and wildlife that depend upon it, and ensure its ongoing ability to sustain our people. We assert that our Aboriginal and treaty rights fundamentally entitle us to continue to act as stewards of our Territory, to be involved in decisions that affect it, and to participate in the ongoing, responsible management of the resources it provides.

Duty to Consult and Accommodate

As you will know, the Crown has a constitutional duty to consult and accommodate MCFN in respect of any decisions that might affect its asserted or proven Aboriginal and/or Treaty Rights. We expect that, consistent with the Crown's constitutional duty, no approval should be issued to this project until MCFN has been sufficiently consulted and accommodated. Nothing in this letter shall be construed as to affect our Aboriginal and/or Treaty Rights and hence shall not limit any consultation and accommodation owed to MCFN by the Crown or any proponent, as recognized by section 35 of the Constitution Act, 1982.

MCFN has the right to free and informed consent prior to the approval of any project or any planning decision adversely impacting its Territory and to benefit economically from resource development within its Territory.

MCFN has formed the Department of Consultation and Accommodation ("DOCA") to represent its interests in consultation and accommodation matters. It is DOCA's mandate to ensure that we are directly involved in all planning and development that impacts the integrity of our Territory. In this regard, DOCA will assess and help alleviate impacts on our rights, land claims, and ways of life by building relationships with governments and private sector proponents. We share a mutual interest in ensuring that projects in the Territory are planned, reviewed, and developed in a manner which ensures healthy communities, ecological protection, and sustainable development for present and future generations in the Territory.

MCFN is not opposed to development, but MCFN must to be involved in development decision making. MCFN has a deep connection to its Territory and we have a stewardship responsibility for our land. By engaging with us, a project proponent can learn our perspective on how to care for this land and we can work together to shape the project to mitigate damaging effects to our land and perhaps even work to improve our environment. MCFN is the only party who shall determine whether there are impacts to our Aboriginal and treaty rights.

One of the ways we require proponents to engage with us is in providing transparency during the environmental survey and archaeological assessment process. The best way to accomplish this is by having Field Liaison Representatives ("FLRs") on location while fieldwork is occurring, who can ensure that the Nation's special interests and concerns are respected and considered during fieldwork. The cultural and natural resources in question are part of MCFN's territory and heritage and it is our responsibility to ensure their protection, on behalf of the Nation. MCFN's stewardship of its territory extends through the life of any development project and beyond.

DOCA Project Registration

DOCA has completed an initial intake review of the project communication you have provided. This file has been assigned DOCA Project 2020-0013 ; please use this number in all future communications.

We respectfully ask you to immediately notify us if there are any changes to the project.

Referral to DOCA Units

Following DOCA's initial intake review of the project communication, the file has been referred to the following DOCA Units for additional follow-up.

	Unit Identification	Primary Contact	Email Address
✔	Archaeology	Megan DeVries	megan.devries@mncfn.ca
	Cultural/Historical	Darin Wybenga	darin.wybenga@mncfn.ca
✔	Environment	Fawn Sault (Temp)	fawn.sault@mncfn.ca
✔	FLR Participation	Megan DeVries	megan.devries@mncfn.ca
	Governance	Mark LaForme	mark.laforme@mncfn.ca
	Economic Development	Director	SED.Director@mncfn.ca

If you have not been contacted by the indicated DOCA Units within fourteen days following receipt of this letter, please let me know.

Request for Missing Information

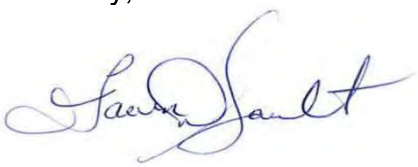
In order to proceed with our follow-up review, we ask you to ensure that all available information relating to the project has been transmitted to us. We have identified the following general information as missing from your initial project communication:

	Outstanding Project Information
	Name of person or body undertaking the action or decision.
	Contact information for the person or body undertaking the action or decision.
✔	List of documents pertaining to the proposed action/decision that are available for MCFN to review.
✔	Description of what other information is expected to become available before the proposed action/decision is undertaken.
✔	Deadlines or filing dates pertaining to the action/decision.
✔	The Crown or Municipal review/ approval that is required for the project.
✔	How the proposed action or decision may affect and/or benefit MCFN, its rights and territory.

Closing

We ask that you respond with the above requested information within fourteen days following receipt of this letter. We thank you in advance for your attention to our requirements and we look forward to working with you further to shape the planning for development in our Territory.

Sincerely,



Fawn Sault
Consultation Coordinator
fawn.sault@mncfn.ca

Ken P. Wallace

From:	Megan DeVries <Megan.DeVries@mncfn.ca>
Sent:	January 19, 2021 10:23 AM
To:	Fawn Sault; Kate Kusiak
Cc:	Mark LaForme
Subject:	RE: 2021-0013 Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process
Attachments:	DOCA Project Response Letter re Archaeological Review [2020].pdf; DOCA Project Response Letter re FLR Participation [2020].pdf; MCFN FLR Participation Agreement [2020].docx; DOCA Archaeological Review Agreement [2020].docx; MCFN Standards and Guidelines for Archaeology [2020].pdf

Good morning,

Please find attached a letter from the Mississaugas of the Credit First Nation ("MCFN") regarding the upcoming assessment for Martin Grove Watermain Replacement, as identified below.

Please note that, in order to continue maintaining DOCA capacity for fulsome project participation, DOCA charges for technical review of project information. In the exercise of its stewardship responsibility, DOCA seeks to work together with project proponents and their archaeological consultants to ensure that archaeological work is done properly and respectfully. DOCA has retained technical advisers with expertise in the field of archaeology. These experts will review the technical aspects and cultural appropriateness of the archaeological assessments and strategies associated with your project. Upon completion of these reviews, MCFN will identify, if necessary, mitigation measures to address any project impacts upon MCFN rights. For cultural materials and human remains, DOCA may advise that this includes ceremonies required by Anishinaabe law, as well as request adjustments to the proposed fieldwork strategy.

The proponent is expected to pay the costs for MCFN to engage in a technical review of the project. DOCA anticipates at this time that all archaeological review will be undertaken by in-house technical experts, but will advise the proponent if an outside peer-review is required. Please find attached the agreement that covers MCFN's inhouse technical review of the archaeological assessments and strategies associated with your project(s). If you could please fill in the additional required information, highlighted in yellow, and return to us a signed copy, that would be greatly appreciated. After we have received it, we can execute the contract on our end and return the completed contract to you. Afterwards, I can arrange scheduling and other related matters directly with the consultant if you prefer.

Sincerely,
Megan.

Megan DeVries, M.A. (she/her)
Archaeological Operations Supervisor

Department of Consultation and Accommodation (DOCA)
Mississaugas of the Credit First Nation (MCFN)
4065 Highway 6 North, Hagersville, ON N0A 1H0
P: 905-768-4260 | M: 289-527-2763

http://www.mncfn.ca

From: Fawn Sault
Sent: Friday, January 15, 2021 12:27 PM
To: kate.kusiak@toronto.ca
Cc: Mark LaForme ; Megan DeVries
Subject: 2021-0013 Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process

Dear Kate,

Please see the attached letter as our response to your project Martin Grove Watermain Replacement Municipal Class EA Study "Schedule B" Process.

Miigwech,

Fawn Sault
Consultation Coordinator
Mississaugas of the Credit First Nation
4065 Hwy. 6, Hagersville, N0A 1H0
Website: http://mncfn.ca/
Ph: 905-768-4260
Cell:289-527-6580

DEPARTMENT OF
CONSULTATION AND ACCOMMODATION

January 19,2021

VIA EMAIL

Kate Kusiak
Senior Public Consultation Coordinator
City of Toronto

Dear Kate Kusiak,

RE: MCFN Archaeological Review for

Martin Grove Watermain Replacement Municipal Class EA

Confirmation of Receipt
I am writing in follow up to the letter of response dated January 15,2021 by Fawn Sault , Consultation Coordinator , from the Department of Consultation and Accommodation ("DOCA") on behalf of the Mississaugas of the Credit First Nation ("MCFN") to acknowledge that we have received your above named communication , dated December 17,202.

Outline of MCFN Rights and Territory
In 1805 , the Crown and MCFN entered into Toronto Purchase Treaty, No. 13 (1805) regarding the lands in which your project is situated.

MCFN has formed the Department of Consultation and Accommodation ("DOCA") to represent its interests in consultation and accommodation matters. In this regard, it is DOCA's mandate to ensure that we are directly involved in all planning and development that impacts the integrity of our Territory. DOCA will assess and help alleviate impacts on our rights, land claims, and ways of life by building relationships with governments and private sector proponents. We share a mutual interest in ensuring that projects in the Territory are planned, reviewed, and developed in a manner which ensures healthy communities, ecological protection, and sustainable development for present and future generations in the Territory.

MCFN has a stewardship responsibility over its Territory and asserts that our Aboriginal and treaty rights fundamentally entitle us to preserve our culture and heritage, including

archaeological materials and human burials. Our Territory is the source of our identity as a First Nation and the basis for many cultural activities and spiritual ceremonies. It is home to sacred sites, burial grounds, traditional teachings and meeting places, and sites of profound archaeological and historical significance. We assert that our Aboriginal and treaty rights fundamentally entitle us to preserve our cultural and heritage.

Too much of our cultural objects and the remains of our ancestors have been lost already through development of the most intensely urbanized lands in Canada and we have a strong interest in ensuring that no more of it becomes bulldozed and desecrated.

MCFN *Standards and Guidelines for Archaeology*

In April 2018, MCFN Chief and Council adopted the MCFN *Standards and Guidelines for Archaeology*, a document aimed to provide guidance to consultant archaeologists, proponents, governments, etc. who are conducting archaeological assessment activities within MCFN's Territory. It sets out, in MCFN's own words, what engagement with our Nation should entail for archaeology as well as technical expectations for fieldwork, in relation to the provincial regulations which were created without our input and feedback. It is important to note that MCFN holds all archaeological resources present within its Territory as of interest to the Nation as part of their cultural patrimony. Resources, regardless of size, frequency, condition, etc., should not be interpreted by non-MCFN representatives in such a way as to remove the requirement for engagement with our Nation.

We are attaching a copy for your reference. We expect compliance with these *Standards and Guidelines* as any fieldwork you will be conducting will have the potential of disturbing MCFN's cultural artifacts or its ancestors' remains.

MCFN Expectations Regarding Ancestors' Remains

MCFN has obligations under Anishinaabe law to protect burials within its Territory and MCFN maintains its right to do so. Our ancestors buried their loved ones in our Territory with the understanding that they would not be disturbed.

We would also like to draw your attention to our expectation that at any time that ancestral remains are encountered during fieldwork, we expect all activities on site to stop and that MCFN be contacted immediately to determine a proper course of action.

Technical Review

In the exercise of its stewardship responsibility, DOCA seeks to work together with project proponents and their archaeological consultants to ensure that archaeological work is done properly and respectfully. DOCA has retained technical advisers with expertise in the field of archaeology. These experts will review the technical aspects and cultural appropriateness of the archaeological assessments and strategies associated with your project. Upon completion of these reviews, MCFN will identify, if

necessary, mitigation measures to address any project impacts upon MCFN rights. For cultural materials and human remains, DOCA may advise that this includes ceremonies required by Anishinaabe law, as well as request adjustments to the proposed fieldwork strategy.

The proponent is expected to pay the costs for MCFN to engage in a technical review of the project. DOCA anticipates at this time that all archaeological review will be undertaken by in-house technical experts, but will advise the proponent if an outside peer-review is required. Please find attached the agreement that covers MCFN's in-house technical review of the archaeological assessments and strategies associated with your project. Please fill in the additional required information, highlighted in yellow, and return to us a signed copy.

Please note that capacity at DOCA is limited. We maintain the right to review all material that comes to our office as part of our consultation process. If you have specific filing deadlines, please advise us as soon as possible. However, it is MCFN's assertion that part of the process of meaningful engagement is allowing our Nation a reasonable amount of time to review, reflect upon, and respond to reports and recommendations. On average, this process can be accomplished in 4-6 weeks. It is our position that no archaeological assessment – but especially Stage 4 mitigation – should begin until DOCA has completed our review and is in agreement that with the proposed strategy for fieldwork.

<u>Request for Missing Information</u>
In order to complete our project record, we ask that you provide the following information:

1. Is an archaeological assessment required for this project? If no, why not?
2. Have any archaeological assessments already been completed for this project and/or its study area? If yes, please provide all documentation including reports, supplementary documentation, etc.
3. Has the MHSTCI issued a letter of entry into register for some or all of the study area? If yes, please provide all documentation, including letter, communications to and from MHSTCI, etc.
4. Is there any archaeological activity (e.g. assessment, excavation, monitoring) that has not yet been completed for the project?
5. If the answer to #4 is yes, please provide the following:
    a. A description of the outstanding archaeological activity/activities.
    b. Anticipated date of the activity/activities.
    c. The appropriate contact person overseeing the archaeological activity/activities.

Closing

The review of project-related archaeological assessments is only one part of the consultation process that may be required for your development. Please contact DOCA's Consultation Coordinator, Fawn Sault, if you have any questions about the process.

We ask that you respond with the above requested information and executed agreement within fourteen days following receipt of this letter. We thank you in advance for your attention to our requirements and we look forward to working with you further to shape the planning for development in our Territory.

Sincerely,

Megan DeVries
Archaeological Operations Supervisor
megan.devries@mncfn.ca

Attachment(s) MCFN *Standards and Guidelines for Archaeology* [2018]
DOCA Archaeological Review Agreement [2020]

DEPARTMENT OF
CONSULTATION AND ACCOMMODATION

January 19,2021

VIA EMAIL

Kate Kusiak
Senior Public Consultation Coordinator
City of Toronto

Dear Kate Kusiak,

RE: MCFN FLR Participation for

Martin Grove Watermain Replacement Municipal Class EA

Confirmation of Receipt
I am writing in follow up to the letter of response dated January 15,2021 sent by Fawn Sault, Consultation Coordinator, from the Department of Consultation and Accommodation ("DOCA") on behalf of the Mississaugas of the Credit First Nation ("MCFN") to acknowledge that we have received your above named communication, dated December 17,202.

Outline of MCFN Rights and Territory
In 1805 , the Crown and MCFN entered into Toronto Purchase Treaty, No. 13 (1805) regarding the lands in which your project is situated.

MCFN has formed the Department of Consultation and Accommodation ("DOCA") to represent its interests in consultation and accommodation matters. In this regard, it is DOCA's mandate to ensure that we are directly involved in all planning and development that impacts the integrity of our Territory. DOCA will assess and help alleviate impacts on our rights, land claims, and ways of life by building relationships with governments and private sector proponents. We share a mutual interest in ensuring that projects in the Territory are planned, reviewed, and developed in a manner which ensures healthy communities, ecological protection, and sustainable development for present and future generations in the Territory.

One of the ways we require proponents to engage with us is in providing transparency during the environmental survey and archaeological assessment process. The best way

to accomplish this is by having Field Liaison Representatives ("FLRs") on location while fieldwork is occurring, who can ensure that the Nation's special interests and concerns are respected and considered during fieldwork. The cultural and natural resources in question are part of MCFN's territory and heritage and it is our responsibility to ensure their protection, on behalf of the Nation. MCFN's stewardship of its territory extends through the life of any development project and beyond.

It is our expectation that no project-related fieldwork will take place without the participation of our FLRs. MCFN considers it disrespectful of our rights as Indigenous peoples if our natural and cultural heritage is interfered with without our involvement.

FLR Participation

DOCA deploys FLRs to be boots on the ground so that fieldwork by a proponent and their consultants/contractors is carried out with appropriate care, thoroughness, and respect. In the context of MCFN's Territory, where so much natural and cultural heritage has already been lost or destroyed, MCFN's monitoring of fieldwork is of utmost importance to ensure that the trail of desecration stops. FLRs are deployed to observe fieldwork, provide cultural advice, act as a direct link back to DOCA and MCFN, and assist with compliance.

FLRs are MCFN band members who have received training in environmental and archaeological assessments, traditional medicine identification and use, Anishinaabe burial practices, and more throughout their employment with DOCA.

DOCA requires, at minimum, FLR participation during the following project-related studies and/or activities:

- ecological and natural heritage technical studies
- archaeological assessments (Stages 2 through 4) and site visits
- monitoring of activities within 50m of areas of special concern (e.g. waterways and wetlands, archaeological sites, species at risk)
- post-construction remediation activities and follow-up impact monitoring

Agreement for FLR Participation

The cost for the participation of our FLRs is covered by the proponent, not the consultant, whom we view as having the ultimate responsibility to consult with, and accommodate, the Nation. Therefore, please find attached the agreement that covers MCFN's participation in the upcoming fieldwork. The costs associated with this involvement reflect a number of expenses not visible at first glance: payment for the FLRs themselves, operational costs for DOCA, and efforts to engage the community to garner feedback on development projects. If you could please fill in the additional required information, highlighted in yellow, and return to us a signed copy so that we may arrange for FLR participation on your project, that would be greatly appreciated.

Once a signed agreement is in place, DOCA generally arranges scheduling and other related matters directly with the consultant conducting the fieldwork, unless you prefer otherwise.

Please note that MCFN requires two of its FLRs to be on location whenever fieldwork is taking place within its territory. The reason for this is so that FLRs can provide support and security for each other in the field. This has become a requirement in light of uncommon, but unfortunate, occurrences when FLRs have felt pressured or intimidated from external persons while at work locations. We ask that you would respect this request.

Request for Missing Information

In order to complete our project record, we ask that you provide the following information:

1. Please provide a list of all completed technical studies for the project, their date of completion, and the contact information of the consultant who completed each study.
2. Please provide a list of all incomplete and/or upcoming technical studies for the project, the anticipated date of fieldwork for each, and the contact information for the consultant who will complete them.
3. Are there any short-term and/or long-term avoidance and protection strategies currently in place for the natural and/or cultural resources in the study area for this project? If yes, what are they?

Closing

The participation of FLRs in project fieldwork is only one part of the consultation process that may be required for your development. Please contact DOCA's Consultation Coordinator, Fawn Sault, if you have any questions about the process.

We ask that you respond with the above requested information and executed agreement within fourteen days following receipt of this letter. We thank you in advance for your attention to our requirements and we look forward to working with you further to shape the planning for development in our Territory.

Sincerely,

Megan DeVries
Archaeological Operations Supervisor
megan.devries@mncfn.ca

Attachment(s) MCFN *Standards and Guidelines for Archaeology* [2018]
FLR Participation Agreement [2020]

MISSISSAUGAS OF THE CREDIT™ FIRST NATION

STANDARDS AND GUIDELINES FOR ARCHAEOLOGY

Revised February 27, 2020

MISSISSAUGAS OF THE CREDIT FIRST NATION

STANDARDS AND GUIDELINES FOR ARCHAEOLOGY

Direction to archaeologists working on the

Treaty Lands and Traditional Territory of the

Mississaugas of the Credit First Nation.

Prepared by the

DEPARTMENT OF CONSULTATION AND ACCOMMODATION

MISSISSAUGAS OF THE CREDIT FIRST NATION

2018

MCFN Standards and Guidelines for Archaeology

Respect for the Treaty relationship must be expressed through engagement in archaeological assessment and collaboration in the responsible stewardship of archaeological resources and cultural heritage values.

Mississaugas of the Credit First Nation (MCFN) are the traditional stewards of the land, waters and resources within the Treaty Lands and Territory. Confirmed under Treaty, this stewardship role extends to cultural and archaeological resources. This Aboriginal and Treaty right must be respected by planners, developers and archaeologists practicing in the Treaty area. Respect for the traditional stewardship role should embrace two precepts:

> MCFN have the right to be consulted on archaeological practice that affects our cultural patrimony, including the interpretation of archaeological resources and recommendations for the disposition of archaeological artifacts and sites within the Treaty area, and;
>
> Archaeological practice must include thoughtful and respectful consideration of how archaeological techniques can be used to reveal not only the data traditionally surfaced by archaeologists, but also culturally important data valued by MCFN.

Acting with respect will initiate change within contemporary archaeological assessment practice. However, the direction of this change is already embodied in existing policy direction. Restructuring the relationship between MCFN and archaeology begins with a renewed emphasis on engagement between MCFN and archaeologists, and compliance with the Standards and Guidelines that direct contemporary archaeological practice.

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1.0 Introduction

This document seeks to reinforce a number of important objectives in the emerging relationship between archaeologists and Indigenous peoples worldwide. These objectives can be achieved within the Mississaugas of the Credit First Nation (MCFN) Treaty Lands and Territory when there is a commitment by archaeologists to communicate with the First Nation, support MCFN participation in fieldwork and analysis, and to be open to opportunities for mutual education. Communication, participation and education are all rooted in the principle of respect. There must be respect for the Treaties and the rights and duties that flow from them. Respect for the Mississauga people to determine the value of their archaeological and cultural heritage, and the appropriate treatment of this heritage in archaeological assessment. Respect also extends to the existing legislation, policy, and professional standards governing archaeological practice. Respect will support the necessary growth of all Treaty partners toward a future archaeological practice that is more inclusive and expressive of the interests of the Mississauga people.

The MCFN Standards and Guidelines require that there is an ongoing and timely flow of information among everyone participating in archaeological assessment. MCFN expect the Ministry of Heritage, Sport, Tourism, and Culture Industries (MHSTCI), consultant archaeologists, development proponents, and approval authorities to be forthcoming with early notification of new projects, and to maintain open communication as work progresses, becomes stalled or where problems that do or may affect the archaeology arise. As capacity allows, MCFN will provide information, raise or address concerns, and express support for specific practices or recommendations that support our interest in the archaeological site or development property. The Department of Consultation and Accommodation (DOCA) will lead on this engagement, through the work of department staff and Field Liaison Representatives (FLRs).

MCFN must be actively engaged in archaeological assessments within the Treaty Lands and Territory area to the extent we determine is necessary. The requirements for engagement are described in the MHSTCI S&Gs, and expanded in this document to better articulate MCFN's stewardship obligations. FLRs, who are deployed to observe fieldwork, provide cultural advice, and assist with compliance in archaeological assessment, are key partners in engagement. As engagement is a requirement of the S&Gs, DOCA will reserve the option of intervening in report review if consultant archaeologists fail to fully engage MCFN during assessment.

There is a widespread belief expressed by consultant archaeologists that First Nation 'monitors' should not question the professional judgment of project archaeologists or field directors; however, this belief is based in a misunderstanding of the FLR's role. The FLR is present to represent MCFN's stewardship interest in the archaeological resources and cultural heritage values present on a property, and this role cannot be devolved to an archaeologist on the basis of academic qualification. In the field, stewardship of the archaeological resource is expressed in interaction. FLRs should be invited to participate in some aspects of fieldwork and provided with specific information on the project status, fieldwork strategies and objectives through ongoing interaction and exchange. FLRs may monitor adherence to the quantitative standards set out in MTCS direction and advice on the

qualitative assessment of resources to provide meaningful cultural context for analysis and interpretation. On-site exchanges provide valuable opportunities for learning on diverse topics such as sampling and cultural awareness. To be clear, continuous learning is envisioned for both archaeologists and FLRs.

1.1 MCFN Standards and Guidelines for Archaeology

This document sets out the MCFN standards and guidelines for archaeology. The standards provide guidance to consultant archaeologists carrying out archaeological assessments within the MCFN Treaty Lands and Territory. They build on existing direction in the MHSTCI *Standards and Guidelines for Consultant Archaeologists* (S&Gs), clarifying and expanding areas where the existing direction does not direct archaeologists to the levels of care required by MCFN as stewards of the resource. While primarily directed at archaeologists, they also include direction for development proponents, and provincial and municipal government agencies as participants in the archaeological assessment process.

Frequent reference is made to the MHSTCI S&Gs. The S&Gs should be read together with the guidance in this document to gain a more complete understanding of an archaeologist's obligations when practicing on the MCFN Treaty Lands and Territory.

These standards provide clarification where the S&Gs are incomplete on issues that archaeologists may encounter in their work, but are of great concern to MCFN. The principal changes include expanded direction on engagement, and a renewed focus on compliance with professional standards. The standards also discuss human remains, intangible values, and sacred and spiritual sites.

The MCFN S&Gs introduce the following clarifications:

- Human remains – the current MHSTCI S&Gs are silent on treatment of human remains, beyond referring consultants to the *Coroners Act*, and the *Funeral, Burial and Cremation Services Act* protocols. MCFN S&Gs introduce clear expectations for the treatment of all remains, including burials and isolated elements. All human remains, regardless of their nature or association with a visible evidence of a burial site, must be treated with the same high level of care. The presence of human remains on a property indicates a high likelihood of burials on the property, even if the traces of the burial have been obscured. Burials must be treated in the same manner as the legislation requires, but the discovery of any human remains should initiate these actions. FLRs will direct the disposition of remains at each site.

- Intangible values – the current S&Gs are silent on intangible values associated with archaeological sites and how they overlap with cultural heritage places. MCFN S&Gs introduce expectations that archaeological landscapes, site context, and intangible values are considered in analysis, reporting, and making recommendations for archaeological resources. This direction applies to all stages of assessment.

- Sacred and Spiritual sites – the current S&Gs require engagement to identify sacred, secret, and spiritual sites, and provide for their use in evaluating archaeological potential. The S&Gs also provide for the

protection of these values; however, they are largely silent on how to proceed where these values are identified. As this document describes, engagement is the basis for identifying these values, defining the necessary protocols and procedures for analyzing archaeological data to identify sacred or spiritual dimensions to an archaeological site, and for developing appropriate mitigation strategies when sites of cultural importance are identified by FLRs or other band members.

One theme of these guidelines is that consultant archaeologists are asked to *do more*. This is an invitation to move beyond basic compliance to producing value-added outcomes to archaeological assessment work. When the S&Gs are simply viewed as a series of targets to hit in assessment, the potential contribution of any one assessment to increasing our understanding of the archaeology and culture history of the Treaty lands and traditional territory is diminished.

This document is organized in three sections which discuss the policy context of archaeological practice, engagement, and compliance with the S&Gs. The section on engagement discusses when and how MCFN, as stewards of the archaeological resource, should be engaged. Currently, the S&Gs identify engagement as largely optional, even at points in the process where archaeologists, proponents or approval authorities are making decisions that may infringe on Aboriginal or Treaty rights. In the guidance provided here, engagement is required at each assessment stage. Engagement is expressed as an active participation by DOCA and FLRs in property evaluations, fieldwork and analysis, and in developing recommendations on the disposition of archaeological resources.

Compliance with the S&Gs is overseen by MHSTCI through the review of archaeological assessment reports. Reports that address all relevant standards are deemed compliant. The standards – requirements that consultant archaeologists *must* follow, are "the basic technical, process and reporting requirements for conducting archaeological fieldwork". They are the minimum acceptable levels of effort required to recover data and stabilize archaeological resources as they are lost to development pressures. MCFN's call for better compliance with the existing standards, and the identification of new standards of practice in fieldwork and engagement, will ensure that archaeological assessment is not simply an exercise in hitting regulatory targets, but actively supports MCFN's stewardship of the archaeological resource.

MCFN is committed to monitoring the implementation experience with these standards, and they will be updated and revised periodically as required.

1.2 Territorial Acknowledgement

Archaeological assessment reports for fieldwork within the Mississaugas of the Credit First Nation Treaty Lands and Territory should include a territorial acknowledgement, such as:

> The archaeological assessment reported here was undertaken on the Treaty Lands and Territory of the Mississaugas of the Credit.[1]

Greater detail may be included in the acknowledgement, although the wording may require approval from MCFN. For example, a statement such as the following extends the acknowledgement to underscore the stewardship role of MNFN on our Treaty Lands and Territory:

> We acknowledge that the archaeological fieldwork reported here was undertaken within the Treaty Lands and Territory of the Mississaugas of the Credit First Nation. The Mississaugas of the Credit First Nation are the stewards of the lands, waters and resources of their territory, including archaeological resources and cultural heritage values.

Recognition of other descendant groups who show a connection to archaeological resources within the Treaty area may also be presented following the MCFN territorial acknowledgment.

1.3 An Archaeological Perspective

Anishinabek culture resides in the land and water. It resides in people, stories, songs, memories and traditions. It resides in objects, books, reports and records. Places on the landscape hold cultural knowledge. Culture and heritage resides in, and is expressed by, the interaction of people with the land through their traditional practice.

The majority of archaeological sites in Ontario are 'pre-contact', meaning that these resources represent traditional Indigenous culture, land use and occupation exclusively. These resources mark places that are, or can be associated with traditional narratives or cultural practices. The narratives or practices may relate to specific locations, more generally to resource use, traditional work, ceremonies and cultural observance, or simply to the basic business of everyday life. Archaeological sites are places where archaeological resources – the material traces of past occupations – are located. But they are also traditional and cultural places. Archaeological resources cannot be separated from the place where they are deposited without severing the intangible connections between culture and the land. Cultural places root contemporary Mississauga culture in the land. As such, they should be viewed as still being 'in use' or 'occupied'. Working to remove the resources from the land is a significant action and must be undertaken with integrity and attention to the actual costs and consequences of this work.

Archaeological resources are finite. While it is true that new archaeological sites – the sites of the future – are being created through ongoing human use and occupation of the land, this use overwrites earlier occupations, distorting or destroying them. Ongoing use of a landscape does not restore or renew archaeological sites. Ongoing use of the landscape erases cultural and traditional places where Indigenous culture is embedded.

Archaeological practice can also distort or destroy archaeological sites. While the inventory, assessment and excavation of the resource preserve valuable archaeological data for future use and study, it can also be said that

[1] Mississaugas of the Credit Treaty Lands and Territory Recognition Statement and Logo Usage Policy, April, 2017. http://mcfn.ca/wp-content/uploads/2017/05/treaty-lands-and-territory-statement-December-2017-a.pdf

archaeological practice creates a new resource that displaces the original cultural and traditional place. Archaeological resources are the raw material from which sites, artifacts and archaeological narratives are manufactured. Archaeological collections, when combined with documentation of engagement, fieldwork and analysis, represent the resource in an archaeological narrative about the site, how it was identified, excavated and interpreted. But the site is gone, and the collections and documentation provide only an incomplete picture of the cultural values that once existed in that place.

Archaeologists must remain aware that the actual resource – archaeological resources *in situ*, is diminishing and growing smaller with each excavation. One more collection means one less site in the ground. Each new site identified must be considered in this context: it is an increasingly rare thing. In the minds of many experienced archaeologists it may seem that new *archaeological* insight will be difficult to achieve from more excavation and collection at sites of a certain type. More broadly, however, new, meaningful and important *cultural* knowledge is available. Cultural knowledge can be obtained by asking new questions of the resource, although it may not be within the archaeologist's existing skill set to ask – or to answer – these questions at present.

Archaeology maintains a tight focus on material remains, and may not venture to address traditional land use or cultural patterns that are not visible in artifacts and features. But cultural and traditional insights are recoverable through alternative techniques and approaches to site investigation. These include community engagement and adopting diverse perspectives on archaeological resources, including seeking understanding of the intangible values of a place, and the consideration of sites in their wider landscape context. These insights cannot be gained by simply tacking Indigenous knowledge and narratives onto archaeological sites after the archaeological work is complete. Indigenous perspectives must be integrated into assessment and research designs from the outset.

Recognizing and holding space for MCFN's stewardship role in archaeological assessment is a critical first step in the work of reconciling the archaeologist's and the Anishinaabe perspectives on archaeology.

1.4 Policy context

The protection and conservation of archaeological resources is enacted through a range of law and policy in Ontario. Principal among these is the Ontario Heritage Act, which regulates archaeological practice and archaeological resource protection. Additional protection is provided under a range of other legislation and policy that governs specific areas of development planning, such as the Planning Act and the Environmental Assessment Act.

Archaeology law is primarily directed to the material aspects of archaeology, such as archaeological sites and artifacts. Guided by applicable statute and policy, the assessment, protection and excavation of archaeological sites impact real property, and generate collections of material objects that are held, in trust, for future generations of scholars and citizens. However, when viewed as property, archaeological site protection can reduce the nature, contents and meaning of archaeological sites to the material remains alone. To many descendant groups

archaeological and cultural heritage sites contain much more than material resources, including traditional, cultural, sacred, and spiritual values that are difficult, if not impossible to capture using standard archaeological techniques. In this way, statute and policy governing interaction with archaeological resources are deficient to the extent that they do not recognize and protect the full array of cultural heritage values that reside in the sites, artifacts, and places that mark past occupation of the land. It is notable that there is no comparable statute or policy – apart from policy direction concerning human remains, that addresses Indigenous interests in archaeological resources and cultural heritage values.

1.4.1 Ontario Heritage Act

Under the Ontario Heritage Act, archaeological resources are all of the material traces of past human occupation or use of a place, while archaeological sites and artifacts are a subset of these resources, specifically those which hold cultural heritage value or interest (CHVI). Criteria for determining CHVI of archaeological resources are presented in the *Standards and Guidelines for Consulting Archaeologists* (S&Gs).

The Ontario Heritage Act (OHA)[2] defines and sets out the measures required conserving the heritage resources of Ontario. Archaeological practice and access to archaeological resources is regulated under the terms of the Act, regulations to the Act, terms and conditions of licensing, and standards and guidelines developed by MHSTCI. Achieving the conservation objectives of the Act is a shared responsibility between the ministry and other regulatory agencies. Archaeological practice is regulated directly by MHSTCI, while regulatory review of development proposals by other agencies to 'trigger' archaeological assessments is directed by policy created under the authority of other statue, such as the Environmental Assessment Act, Planning Act, and Aggregates Resources Act, among others.

The conservation of resources of archaeological value[3] is described in Part VI (Sections 47 to 66) of the Act, and concerns two categories of activity: archaeological practice, and archaeological site alteration. The OHA views these two categories as linked: a licence is required to alter a site, and alteration without a license is a violation of the Act. Thus, the regulatory mechanism for achieving archaeological resource conservation is through the regulation of practice.

Preparing and submitting reports of archaeological fieldwork is a key condition of licensing. Apart from the preservation of artifacts, the primary public benefit arising from archaeology is the creation of archaeological reports and data. Section 65.1(1) of the Act stipulates that reports prepared under license are entered into the Ontario Public Register of Archaeological Reports (the Register). In Section 66, the Act states that the minister may

[2] RSO 1990, c. O18

[3] Resources of archaeological value are described in Regulations to the Act. However, Part VI defines "property" as "real property, but does not include buildings or structures other than ruins, burial mounds, petroglyphs and earthworks" (R.S.O. 1990, c. O.18, s. 47.). In this definition two site types which include intangible cultural value, (petroglyphs [a representational form created using an arrangement of stones on the ground] and burial mounds), are identified as archaeological sites.

direct archaeological collections to a public institution, "held in trust for the people of Ontario". While the Act identifies the province as stewards of the archaeological resource, it is silent on the question of ownership.

Archaeological resources are generally considered objects that can be transported (easily) from one location to another. The resource is not directly defined in the text of the Act; however, in Section 47 a distinction is drawn between types of heritage property, real properties exclusive of "buildings or structures other than ruins, burial mounds, petroglyphs and earthworks". Since structures and buildings are the concern of Part IV and V of the Act, ruins, burial mounds, petroglyphs and earthworks remain behind as archaeological resources. Ontario Regulation 170/04 defines an archaeological site as "any property that contains an artifact or any other physical evidence of past human use or activity that is of cultural heritage value or interest". Artifacts are defined as "any object, material or substance that is made, modified, used, deposited or affected by human action and is of cultural heritage value or interest" (O. Reg. 170/04, s. 1). The inclusion of burial mounds and petroglyphs as archaeological sites signals that the boundaries between archaeology and cultural, sacred or spiritual places are less distinct than the Act presents. For this reason, this document refers to both archaeological resources and cultural heritage values, which includes all of the material and intangible values present at archaeological sites and other places of cultural significance.

1.4.2 Other legislation

Human remains are to be expected in a range of archaeological contexts, including habitation sites and as isolated graves. Laws pertaining to human remains include the Coroners Act,[4] the Funeral, Burial and Cremation Services Act,[5] and the Ontario Heritage Act. Buried human remains are within the jurisdiction of the Registrar of Cemeteries, authorized under the Funeral, Burial and Cremation Services Act. By locating concern for human remains outside of the Ontario Heritage Act the law acknowledges that human remains are not archaeological resources and require special treatment and handling upon discovery.

The Funeral, Burial and Cremation Services Act requires any person who uncovers a burial containing human remains to immediately stop work and contact the appropriate authorities, such as the police or Coroner. The Coroner, authorized under the Coroners Act, will determine whether the person whose remains were discovered died under any of the circumstances set out in Section 10 of the Coroners Act. If the remains or burial is determined to be of no forensic interest, control of the process returns to the Registrar of Cemeteries, who then determines the origin of the burial site, and declares the site to be an aboriginal people's burial ground, a burial ground, or an irregular burial site.[6] Upon making the declaration, a site disposition agreement is negotiated among representatives of the landowner and the deceased. MCFN, as stewards of the archaeological resources and cultural heritage values of the Treaty area, would be party to the disposition agreement as a representative of

[4] R.S.O. 1990, c. C.37

[5] S.O. 2002, Chapter 33

[6] S.O. 2002, Chapter 33, c. 34

the deceased. Disinterment of human remains under the terms of a site disposition agreement must be completed by a licensed archaeologist.

Development planning is addressed in a number of provincial laws. The Planning Act [7] directs the development of land by ensuring, among other things, that land use planning is led by provincial policy, and that matters of provincial interest are considered in planning. The Act directs that planning will be conducted with "regard to, among other things… the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest" (Section 2(d)). Cultural, historical and archaeological features extend the range of elements that approval authorities and developers must have regard to, including a range of cultural heritage values of interest to MCFN. The Act also empowers local authorities to make by-laws prohibiting development on properties containing significant archaeological resources (Section 34), allowing for avoidance and long term protection.

The Planning Act seeks to ensure that 'various interests' are considered in planning, and devolves the responsibility for planning decisions to accountable municipal authorities, although the overall authority of the Minister remains intact. Under regulations to the Planning Act, a complete application for subdivision must include information on the archaeological potential of the property, and a determination of whether any restrictions on development related to archaeological resources exist. Where development is permitted, properties with archaeological potential also require a completed archaeological assessment, and a conservation plan for any archaeological resources identified in the assessment (O.Reg. 544/06, Sched. 1). Generally, a draft plan is initially submitted, and archaeological assessment is completed prior to final plan submission. The timing of the archaeological work is not defined in the Act or Regulation, nor is the excavation and removal of the site from the property part of this direction. It is reasonable to assume that the evaluation of archaeological potential, archaeological assessment, and decisions concerning the disposition of archaeological resources on a development property should actively involve MCFN.

The Environmental Assessment Act (R.S.O. 1990 Chapter E.18) provides for the wise management of the environment in Ontario. It is the principle legislative process for major development that does not primarily involve the subdivision of land or extraction of a specific resource. Under the Act, the environment includes the social environment, including "social, economic and cultural conditions", and "any building, structure, machine or other device or thing made by humans" (R.S.O. 1990 Chapter E.18, s. 1(1)). Class environmental assessments may be declared where development of a number of projects are planned or anticipated, and where the planning and anticipated effects are generally similar. Each environmental assessment or project under a class environmental assessment must address terms and conditions to approval, which include requirements to complete an archaeological assessment, and identify conservation measures for any archaeological resources identified within the project area. The Act also requires that the proponent consult "with such persons as may be interested" in the undertaking when preparing the Terms of Reference.

[7] R.S.O. 1990, c. P.13

2.0 Engagement

The MCFN *Consultation and Accommodation Protocol* [8] sets out expectations for engagement in archaeological assessment. The Protocol describes the MCFN stewardship of archaeological resources and cultural heritage values, and unequivocally asserts "that our Aboriginal and Treaty rights fundamentally entitle us to preserve our culture and heritage". The Protocol further clarifies that DOCA is the body that leads all engagement, and that "MCFN expects to be engaged with the Crown and/or Proponents early in the project development and assessment process". The Protocol also states that "MCFN is the only party who shall determine whether there are impacts on out Aboriginal or Treaty rights". The last point is especially important in relation to evaluating archaeological potential, determining cultural heritage value or interest, and formulating Stage 4 mitigation strategies. Neither licensing nor the technical work of archaeological assessment grants to a consultant archaeologist the privilege of speaking on behalf of the First Nation regarding actual or potential development impacts to archaeological or cultural resources.

Engagement is the key to successful archaeological assessment. For archaeological assessment projects on the Treaty Lands and Territory, early and ongoing engagement is expected. Engagement is necessary at all stages of archaeological assessment, and extends to the period before and after an assessment is formally constituted. The requirement to engage is not limited to the consultant archaeologist, but includes approval authorities, proponents and others who may make decisions that hold the potential to infringe on the Aboriginal or Treaty rights of MCFN. Engagement in archaeological assessment may be viewed as an aspect of consultation, but does not relieve the Crown of its duty to consult and accommodate MCFN on the development project.

In conformance with the MHSTCI Bulletin, Engaging Aboriginal Communities in Archaeology, MCFN will determine the form for engagement.

Positive, collaborative engagement is more than a data exchange or transfer of information from MCFN to the archaeologist. Rather, it is a means of developing relations of trust among all parties to the development project that continue throughout the span of an assessment, and may carry over into subsequent projects. In this document, engagement requirements exceed the standards described in the MHSTCI S&Gs. Some consultant archaeologists may wish to engage only at Stage 3, as required by the S&Gs; however, as set out in the following section, engagement is a cumulative process and allowing engagement responsibilities to accumulate until Stage 3 may lead to unanticipated delays in project timelines. Late engagement may oblige DOCA to schedule extra time to review earlier fieldwork results and recommendations to ensure that MCFN stewardship concerns have been addressed before moving to engagement on Stage 3 questions.

The S&Gs require that the engagement process and outcomes must be summarized in an Aboriginal engagement report, a required part of each assessment report. These reports may be audited by DOCA to ensure that they

[8] Department of Consultation and Accommodation. n.d. Consultation and Accommodation Protocol. Mississaugas of the Credit First Nation, Hagersville.

conform to DOCA's records of engagement. Serious shortcomings in engagement or inaccuracies in the Aboriginal engagement report may be referred to MHSTCI with a request that the report be flagged for detailed review or revision.

2.1 Engagement in Archaeological Assessment

Archaeological assessment proceeds from the review of the original development proposal, through to the final decisions on the mitigation of development impacts and the long term curation of collections. Engagement will ensure that important cultural considerations are incorporated into fieldwork and analysis, and the recommendations that are offered for development properties and archaeological sites.

The format of this section follows the general sequence of actions undertaken for a typical development project, including the four formal stages of archaeological assessment. The timing and nature of engagement through this sequence is highlighted and discussed. Note that MCFN expect engagement throughout this planning and assessment process.

2.1.1 Project concept and planning stage

This task primarily involves the proponent and the approval authority.

Most land-use planning and development processes in Ontario identify the conservation of archaeological resources as a provincial interest. A completed archaeological assessment, including a compliance review by MHSTCI, is a common condition of project approval and is rarely a 'late addition' to the list of required studies. Since archaeological assessment can be anticipated as a requirement of approval, DOCA notification should be an essential and automatic early phase activity for approval authorities and proponents.

Proponents should engage with DOCA to introduce the project, and identify the proposed schedule for background studies, archaeological assessment, site preparation and their anticipated start of construction. DOCA review of the project concept will allow approval authorities and development proponent's time to evaluate the anticipated impacts of the project relative to Aboriginal and Treaty rights. Project redesign, where necessary, will also be simpler at this early stage. Notification to DOCA should, at a minimum, include basic information on the proposed development, including the type of development and the associated regulatory process, project location, proponent identity and contact information, and any key milestones in the project plan. Early and ongoing contact with DOCA will aid in building positive working relationships that will benefit the proponent going forward.

Approval authorities can facilitate positive engagement by including DOCA notification as standard practice, and advising proponents to communicate with DOCA early in the process.

Of equal importance, the MHSTCI S&Gs reference the MHSTCI "Criteria for Evaluating Archaeological Potential" checklist, which was developed for non-specialists such as approval authority staff. A completed checklist is meant to provide planners with a basic tool for evaluating archaeological potential of a development property. The checklist includes a number of considerations that cannot be addressed using only cartographic information,

registered archaeological site data or knowledge of local history. Approval authority staff responsible for completing the checklist must engage DOCA for input concerning points 5, 6, 7, 9 and 11 of the checklist, at a minimum, to ensure that the checklist is completed comprehensively.

2.1.2 Project award / Filing a PIF

This task primarily involves the consultant archaeologist and MHSTCI.

Project Information Forms (PIF) is required by MHSTCI to track archaeological fieldwork. A PIF must be submitted at least 5 days, but no more than 15 business days before the start of fieldwork, as stated on the form. All PIFs are processed, and a file number assigned, within 5 business days of receipt.

Filing a PIF with the ministry is a term and condition of licensing. The PIF file number is used by the ministry to track archaeological fieldwork, and sets the dates for report submission. A completed PIF includes the project location, and identifies the approval authority and proponent. The S&Gs note that the PIF must be received by the ministry, and a PIF number assigned before fieldwork begins (S&Gs 7.1, s.1).

At the time that a PIF is submitted, notice should also be made to DOCA, providing the information contained in the PIF application, including the proposed start date for fieldwork, location of the subject property, and the name and contact information of the proponent and approval authority staff. This information will allow DOCA to open a file on the project, and assist in managing engagement, workflow and FLR deployment.

DOCA will work toward an agreement with MHSTCI to ensure that accurate PIF information for archaeological assessment projects proposed for the Treaty area is transmitted to DOCA in a timely manner. DOCA may advise MHSTCI of PIFs that have or appear to have been incorrectly filed in advance of the 15 day window, or where engagement has not been initiated by a licensee.

DOCA staff will determine whether the potential impact of the proposed development will be high or low. For low impact projects, information sharing may be sufficient. For high impact projects, high impact undertakings, DOCA work directly with the proponent to determine the requirement for FLRs during the fieldwork portion of the archaeological assessment, and identify accommodation requirements to protect Aboriginal and Treaty rights relating to archaeological resources and cultural heritage values.

2.1.3 Stage 1 Background study and evaluation of potential

This task primarily involves the consultant archaeologist and the proponent.

Engagement at Stage 1 is required. The guidelines (Section 1.1, guideline 1, bullet 3, and Section 1.4.1, guideline 1), should be treated as standards for the purposes of Stage 1 assessment within MCFN Treaty Lands and Territory. The basis for this is the requirement for engagement at Stage 3, as described in Section 3.4, s. 2 of the S&Gs, which states:

> Aboriginal communities must be engaged when assessing the cultural heritage value or interest of an Aboriginal archaeological site that is known or appears to have sacred or spiritual importance, or is associated with traditional land uses or geographic features of cultural heritage interest, or is the subject of Aboriginal oral histories. This will have been determined through background research in Stage 1, detailed documentary research on the land use and occupation history early in Stage 3, and/or analysis of artifacts and other information recovered through archaeological field work.

In this standard, information on a range of traditional and cultural concerns is identified as the basis for decision-making, and this information is noted as having "...been determined through background research in Stage 1". MCFN is the only party who can determine if a property holds cultural heritage value or interest based on the criteria expressed in the standard. The Stage 3 standard refers to actions taken and information gathered during Stage 1. From this, it is clear that the process of evaluating the CHVI of an archaeological site is an ongoing process that begins in Stage 1. This process must actively engage MCFN participation.

For properties with archaeological potential, Stage 2 property assessment is required (Section 1.3, s. 1). In some cases, the consultant may recommend reducing the Stage 2 fieldwork requirements based on the evaluation of low potential on parts of the development property (Section 1.4.1, guideline 1). A guideline to this section recommends engagement "to ensure that there are no unaddressed Aboriginal cultural heritage interests", which would necessarily require engagement. The results of engagement may also lead to the expansion of the area of Stage 2 fieldwork. The MHSTCI Aboriginal Engagement Bulletin suggests that one method of addressing community interest in a development property is to "extend a Stage 2 survey to include lands that have been identified as of interest to the Aboriginal community, even though those lands may have low potential".[9] For this to happen, engagement must be undertaken, and a clear understanding of the nature of the interest, and appropriate techniques to address them must be achieved prior to fieldwork.

A copy of the Stage 1 assessment report, including the Aboriginal engagement report, must be provided to DOCA at the time it is submitted to MHSTCI for review. DOCA may review the report for accuracy, and transmit the result of this review to MHSTCI.

2.1.4 Stage 2 Property Assessment

This task primarily involves the consultant archaeologist and proponent.

Stage 2 is directed towards identifying all of the archaeological resources present on the development property. Engagement at Stage 2 includes the participation of FLRs in fieldwork. DOCA, and FLRs funded by the proponent, will work with the consultant archaeologist to represent MCFN's stewardship interest, to support compliance with the S&Gs Section 2.1, and to provide advice and information on cultural heritage values.

[9] MHSTCI. 2011. Engaging Aboriginal Communities in Archaeology: A draft technical Bulletin for consultant archaeologists in Ontario. Ministry of Tourism and Culture, Toronto.

Engagement must include providing a daily briefing to FLRs ('tailgate talk') outlining the work schedule for the day in the context of the overall assessment, and a summary review at the end of each work day. Allowance for FLRs to record finds, unusual or diagnostic artifacts, and related information should be made throughout the workday. Information sharing builds relations of trust, and demonstrates respect for the FLR's role in the assessment.

For sites with human remains (Section 2.2, s. 2(e)), engagement will be a required part of the on-site interaction with the FLRs. FLRs will provide direction regarding the handling and disposition of the remains.

In Section 2.2, the S&Gs recommend that consultant archaeologists engage on two questions: if the Aboriginal interest in archaeological resources found during Stage 2 is correctly determined and if there are no other Aboriginal archaeological interests in the subject property. The engagement described in Section 2.2, guideline 1 of the S&Gs must be treated as a standard. DOCA must be engaged regarding the analysis of the Stage 2 fieldwork results.

It is also important to remember that the fieldwork and analysis at Stage 2 leads to the separation of 'artifacts' and 'archaeological sites' from among the archaeological resources identified on the subject property. Stage 3 assessment is only required for sites holding CHVI, and all other resources may be considered sufficiently assessed and documented.

It is important that at MCFN interests are addressed before making final decisions concerning the CHVI of archaeological resources. DOCA must be engaged when determining Stage 3 requirements for archaeological resources identified in Stage 2 fieldwork. Section 2.2, guideline 1 must be treated as a *standard* within the Treaty Area. The guideline states, in part, that "the consultant archaeologist may engage … Aboriginal communities to determine their interest (general or site specific) in the … archaeological resources found during Stage 2 and to ensure there are no unaddressed … archaeological interests connected with the land surveyed or sites identified". Engagement when determining CHVI and the requirement for further assessment at Stage 3 will ensure that the results of the assessment and the observations of the FLRs correctly reflect MCFN's role in archaeological resource stewardship.

Generally, the quantitative targets found in Section 2.2, s. 1 do not override MCFN interests regarding resources.

The outcome of Stage 2 property assessment includes the identification of all archaeological resources on the subject lands and a preliminary determination of CHVI for some archaeological sites. Reports, which should detail the basis for the conclusions and recommendations, must be provided to DOCA for review and comment. DOCA may choose to review the report, and it may be necessary to revise reports based on the review. The results of the DOCA review may also be transmitted to MHSTCI.

2.1.5 Stage 3 Site-specific assessment

Stage 3 involves the consultant archaeologist and proponent.

Stage 3 site-specific assessment establishes the size and complexity, and CHVI of archaeological sites identified at Stage 2. The Stage 3 report includes detailed recommendations for Stage 4 mitigation of development impacts.

The S&Gs require engagement at Stage 3. Specifically, the historical documentation research required in Section 3.1, s. 1(a), 1(b) and 1(e), cannot be completed without engagement. MCFN is the only party who can determine whether an archaeological site is sacred to the Nation, and must be engaged. The limitation to engagement included in the text of the standard (research sources "when available"), should be viewed as direction to engage DOCA to confirm the availability of the information necessary to comply with Section 3.1, s. 1(b) and 1(e). Note that engagement is in addition to diligent archival, historical and online research by the consultant archaeologist.

For compliance with Section 3.4, including the application of the criteria and indicators listed in Table 3.2, engagement is required. Note that Section 3.4, s. 1(a), concerning human remains, engagement in the field at the time of discovery is required through the FLRs on-site. Section 3.4, s. 2 requires engagement in the analysis of archaeological sites, and indicates that this engagement must be the culmination of an ongoing practice between the consultant archaeologist and DOCA. Engagement throughout Stage 3 is required, and consultant archaeologists entering into a Stage 3 assessment must engage DOCA for the subject lands overall. Preferably, this engagement starts at Stage 1.

Engagement at Stage 3 also includes the participation of FLRs in fieldwork. DOCA, and FLRs funded by the proponent will work with the consultant archaeologist to represent MCFN's stewardship interest, to support compliance with the S&Gs Sections 3.2 and 3.3, and to provide advice and information on cultural heritage values. Engagement must include providing a daily briefing to FLRs ('tailgate talk') outlining the day's work objectives, progress of the assignment, and a review at the end of each work day. Allowance for recording finds, features, unusual or diagnostic artifacts, and related information should be made throughout the work day. Information sharing builds relations of trust, and demonstrates respect for the FLR's role in the assessment.

Determining Stage 3 strategies based on direction found in Section 3.3 requires engagement with FLRs who will observe and report on compliance with the technical standards and the agreed strategy. In support of this, it is expected that the consultant archaeologists will review the Stage 2 data, and the rationale for the site being assigned to a particular Table 3.1 category with the FLRs. It is not appropriate to assume that DOCA or individual FLRs have reviewed earlier reports, or additional unreported facts that may be available to the consultant.

MCFN asserts an interest in the disposition of all archaeological sites on the Treaty Lands and Territory. Determining whether an archaeological site requires Stage 4 mitigation, and the form this mitigation will take has significant consequences for archaeological resources and cultural heritage values. For this reason, DOCA must be actively engaged in the deliberations leading to Stage 3 recommendations.

Section 3.5, s. 1 sets out the requirements for engagement when formulating Stage 4 mitigation strategies. Section 3.5, s. 1(f) requires engagement for all "sites previously identified as being of interest to an Aboriginal community". MCFN have asserted the Aboriginal and Treaty right of stewardship of all archaeological resources and cultural

heritage values on the Treaty Lands and Territory of MCFN, whether or not these sites are known prior to assessment. This requirement is not limited by Section 3.5, guideline 1 which suggests that engagement in planning Stage 4 mitigation strategies is discretionary. Engagement is required in developing all Stage 3 recommendations, including recommendations that a site is considered completely documented at the end of Stage 3.

The preamble to Section 3.5 notes that:

> The avoidance and protection of sites is always the preferred approach to the Stage 4 mitigation of impacts to archaeological sites. Where Stage 4 is recommended, the consultant archaeologist will need to review the viability of Stage 4 protection options with the client.

While this text is not a standard under the S&Gs, it is important to note that these discussions hold the potential to infringe on the asserted Aboriginal and Treaty right of MCFN to act as stewards of the archaeological resources of the traditional and Treaty area. Therefore, DOCA must be provided the opportunity to participate in these discussions to ensure that the evaluation of the opportunities for site avoidance and protection were evaluated correctly, and to clarify the Stage 4 requirements alternatives. Where it is deemed necessary, the approval authority or relevant Crown agency should also be included in these discussions.

The outcomes of Stage 3 site-specific assessment include a determination of CHVI for all archaeological sites on the subject lands, and detailed recommendations for Stage 4 mitigation of development impacts, or that the site is fully documented and no further work is required (Section 7.9.4). Note that MCFN is the only party who can determine whether an archaeological site holds cultural heritage value beyond the archaeological value determined through Stage 3 assessment, and this recommendation must be subject to engagement. Reports, including the analysis and supporting data leading to the conclusions and recommendations, must be provided to DOCA for review. DOCA may choose to review the report, and it may be necessary to revise reports based on the review.

2.1.6 Stage 4 Mitigation of development impacts

Stage 4 involves the consultant archaeologist, proponent and the approval authority.

Stage 4 mitigation of development impacts may include either avoidance and protection (Section 4.1), or excavation and documentation (Section 4.2) of the archaeological site. In some cases a combination of avoidance and excavation (partial long term protection) is possible (Section 4.1.6).

During fieldwork, FLRs should be briefed daily on the work schedule for the day and overall progress of the assessment relative to expectations. A daily summary review at the end of each work day should be provided as well. Field directors should also advise FLRs when significant changes in fieldwork strategies are impending (such as decisions to begin mechanical topsoil stripping of a site) with as much lead time as possible. FLR work recording finds, features, and related information should be supported.

In avoidance and protection, FLRs will attend fieldwork for setting buffers and monitoring activity near the sites as required ensuring compliance with the S&Gs and site specific agreements. In Stage 4 excavation, engagement includes the work of FLRs who will observe and report on compliance with the technical standards found in Section 4.2 during fieldwork, and any additional requirements set out in the Stage 4 recommendations. This includes specific recommendations regarding undisturbed archaeological sites (Section 4.2.9), and rare archaeological sites (Section 4.2.10). If it was not completed at Stage 3, FLRs will advise on the necessary requirements for determining the extent of excavation. FLRs will also advise on specific practices, such as handling human remains and managing artifacts in back dirt when mechanical site stripping is employed.

The S&Gs state that the outcome of Stage 4 avoidance and protection, or excavation and documentation is a final report including a detailed account of the fieldwork, artifacts and features recovered and analyzed and a statement that the archaeological site "has no further cultural heritage value or interest" (Section 7.11.4, s. 1). It is necessary to stress that MCFN is the only party who can determine whether an archaeological site holds cultural heritage value beyond the archaeological value addressed through Stage 4 excavation.

Stage 4 excavation reports must be provided to DOCA at the time it is submitted to MHSTCI for review. Based on FLR reports or other factors, DOCA may choose to review the report for accuracy or to determine if remaining cultural heritage value is correctly identified in the recommendations to the report. Where necessary, DOCA may request that the report is revised, or communicate directly with MHSTCI and the approval authority regarding a continued interest in the property or site.

2.1.7 Long Term Protection

MCFN stewardship of archaeological resources and cultural heritage values does not end with at the conclusion of the archaeological assessment. DOCA must be engaged at Stage 4 for planning and fieldwork relating to avoidance and protection. Providing the option of participating in planning long term protection strategies, will ensure that these strategies meet MCFN's stewardship obligations and cultural expectations for the treatment of the site. This concern must be included in the long-term protection agreement / mechanism formulated under Section 4.1.4. The agreement mechanism should address access to the site for cultural purposes, and require DOCA engagement in the future whenever changes to the agreement or removal of archaeological restrictions are considered in the future.

2.1.8 Report submission and review

This task involves the consultant archaeologist, MHSTCI and approval authorities.

Reports are required for each stage of archaeological fieldwork, although Stages 1 to 3 may be combined in a single report. Archaeological assessment reports are due 12 months from the date that the PIF number was assigned. For Stage 4 reports, the report are due 18 months from the date of the PIF number was assigned. Each report submitted is screened for completeness before being accepted for review. This screening required up to 10 business days to complete, and is included within the 12 or 18 month submission period. Incomplete reports are

returned to allow the missing information to be included. MHSTCI customer service standards allow up to 60 business days for report review. Reports that have been revised and resubmitted are reviewed within 15 days. In some circumstances, a consultant archaeologist may request expedited review of specific reports on the basis of external time pressures. Where a report is submitted and an expedited review granted, the timeline for screening is 5 business days, and review is within 20 business days of clearing screening.

The ministry does not commit to reviewing all reports received. Once report packages are screened for completeness, reports are considered 'filed' with the ministry. These reports are then either entered into the Register directly, or sent for technical review by an Archaeology Review Officer (ARO). Report review triage is based on the perceived risks that may arise to the archaeological resource by deferring review. Where higher risks of adverse impact exist, the ministry undertakes a full technical review. Filed reports may also be subject to technical review at a later date, if required.[10] Regardless of review status, "mandatory standards for Aboriginal engagement remain unchanged, and [remains]… subject to ministry review. *This review includes a look at whether community feedback was considered when engagement informs the development of a mitigation strategy*" [emphasis added].[11]

Based on the foregoing, archaeological assessment reports may be submitted and MHSTCI reviews completed more than a year after the completion of fieldwork. In cases where consultant archaeologists do not engage FLRs during fieldwork, and fail to provide information on fieldwork and copies of their reports to DOCA, this delay creates an infringement on MCFN's stewardship of the archaeological resources within the Treaty Lands and Territory by limiting our ability to participate in the disposition of archaeological resources. While engagement is not a requirement of report submission and review, it is important that MHSTCI and consultant archaeologists recognize their obligation to provide this information to MCFN, through DOCA in a timely manner. It is also important that approval authorities recognize that final decisions regarding land dispositions may fall short of the Crown's duty to consult and accommodate when the submission and review process is used to conceal information about the assessment from the First Nation.

Further, DOCA reserves the right to intercede in ministry review where DOCA believes it holds information of value to the review. This information will be communicated to MHSTCI at DOCA's discretion. This is most likely to occur where DOCA believe that critical aspects of fieldwork were non-compliant with the S&Gs, where the report does not adequately reflect MCFNs stewardship objectives, or that engagement with DOCA was inadequate or misrepresented in the report. In particular, the Aboriginal Engagement Report, required in Section 7.6.2, may be reviewed to ensure that is accurately represents the engagement completed and any agreed outcomes.

[10] Additional detail is available on the MTCS website:
http://www.mtc.gov.on.ca/en/archaeology/archaeology_report_requir.shtml#developmentproponents

[11] http://www.mtc.gov.on.ca/en/archaeology/archaeology_report_requir.shtml#addresses

Table 1, below, summarizes when, who and how engagement should occur in a typical archaeological assessment.

Timing	Engagement by	Form of engagement
Draft plan review	Approval authority Proponent	Information sharing Engage DOCA when applying the Criteria for Evaluating Archaeological Potential Advise DOCA of development application and project details Agreement on FLR participation in assessment
PIF	Consultant archaeologist MHSTCI	Information sharing Engage DOCA to advise on award of contact, identification of regulatory trigger, project location, proponent information, scheduled dates for fieldwork
Stage 1	Consultant archaeologist Proponent	Information sharing Engage DOCA on background study (Section 1.1, g. 1, bullet 3; Sec. 1.3.1, bullets 5 – 8; Sec. 1.4.1, g. 1) FLRs may attend Stage 1 property inspection
Stage 2	Consultant archaeologist Proponent	Facilitate FLR engagement and field review of S&G compliance, cultural inputs. Engage DOCA in review of analysis leading to proposed recommendations (Sec. 2.2, s. 1(b)(e); Section 2.2, g. 1)
Stage 3	Consultant archaeologist Proponent Approval Authority	Engage DOCA on historical documentation (Sec. 3.1, s. 1(a), 1(b) and 1(e)) Facilitate FLR engagement and field review of compliance with standards in Sections 3.2 and 3.3 Engage DOCA on Section 3.3 decisions, and analysis (Sec. 3.4, s. 1(a), s. 2, and Sec. 3.4.1, g. 1) Engage DOCA on application of criteria and indicators in Section 3.4.3, Table 3.2 Work with DOCA when formulating Stage 4 strategies (Sec. 3.5, s. 1(f), g. 1) Include DOCA in the Section 3.5 “viability review” of Stage 4 avoidance and protection options with proponent
Stage 4	Consultant archaeologist Approval Authority Proponent	Facilitate FLR engagement and field review of compliance with standards Engage DOCA on long term protection strategies, protection and cultural access considerations
Report review	MHSTCI	DOCA may advise MHSTCI of any concerns with fieldwork, engagement, reporting or recommendations DOCA may advise MHSTCI of concerns with Aboriginal engagement report.

3.0 Compliance

Stewardship of archaeological resources and cultural heritage values within the Treaty Lands and Territory includes support for the technical guidance provided in the S&Gs. In this section, existing direction in the S&Gs is presented in relation to MCFN's archaeological resource stewardship objectives. In most cases, the direction is for compliance with existing standards. In others, additional detail or new direction is offered where increased effort in archaeological assessment will benefit the archaeological resource and address MCFN concerns.

It is important to note that MCFN's stewardship of resources extends to *all* archaeological resources and cultural heritage values within the Treaty Lands and Territory, regardless of CHVI or whether or not these sites are known to archaeologists or the ministry prior to assessment. Compliance with the S&Gs requires that MCFN is engaged and afforded the opportunity to consider the cultural heritage value or interest of all archaeological resources encountered during assessment, prior to defining a subset of these resources as 'artifacts' and 'archaeological sites'.

It is also important to note that the rules set out by the Funeral, Burial and Cremation Services Act regarding human remains should not be seen as overriding MCFN's assertion that all human remains are important and sacred, and must be subject to special consideration and treatment. All remains, including those not immediately identifiable as being associated with a burial or grave location should be considered to mark interments until archaeological evidence demonstrates otherwise.

3.1 MHSTCI Standards and Guidelines Stage 1

The S&Gs state that the purpose of the Stage 1 background study and property inspection is to gather and analyze information about the geography, history and current condition of a property, and to obtain information on prior archaeological fieldwork on or adjacent to the property. This data, including field observations of current conditions, is used to evaluate archaeological potential. This evaluation provides support for recommendations requiring Stage 2 assessment of all or parts of the property, including appropriate fieldwork strategies.

A thorough understanding of the full range of potential archaeological resources and cultural heritage values that may be present on a property is impossible without engagement.

3.1.1 Section 1.1[12]

Within the Treaty area, MCFN must be engaged as part of the Stage 1 background study for all archaeological assessment projects carried out within the Treaty Area. This requires that S&Gs Section 1.1, guideline 1, bullet 3 is

[12] The subsection headings are in reference to the section of the MTCS S&Gs that are being discussed.

treated as a *standard* within the Treaty Area. The guideline states, in part, that the background study "may also include research information from … Aboriginal communities for information on possible traditional use areas and sacred and other sites on or around the property…" For the purpose of Stage 1 engagement, it is important to note that DOCA is not simply a source of research information, but should be viewed as a partner to the development of a comprehensive background study for the archaeological assessment.

In order to develop this partnership, consultants conducting background research on a property should conduct thorough documentary research at Stage 1. This may result in research products that not only address the requirements of the S&Gs, but also make a positive contribution to archaeological and cultural heritage research within the Treaty Area. This contribution may be in various forms, including new insight into archaeological research, historical occupations, or Anishinaabe place names on or near the subject lands.

For the purpose of developing a reasonable perspective on cultural practices and traditional use overlying the subject property it may be necessary to take a broader view of the surrounding landscape for context. For example, areas where numerous small archaeological sites have been recorded may need to be evaluated in aggregate within the wider landscape to determine if they are arrayed along a travel route. Similarly, areas of low site density within wider landscapes of generally high densities should be evaluated to determine whether the distribution is based on the quality of effort in past archaeological assessments that may have skewed available site data, or earlier cultural phenomena. Review of archaeological reports from areas beyond the recommended 50m radius is encouraged (Section 1.1, s. 1, bullet 2).

Notwithstanding the limiting nature of the language used in Section 1.1, guideline 1, bullet 3, MCFN assert that Stage 1 engagement should address all archaeological resources and cultural heritage values that may be present on the property. This approach better reflects the understanding that archaeological sites do coexist with places of sacred or spiritual importance, traditional use, or that are referenced in oral histories. Data relevant to Section 1.1, guideline 1, bullets 8 – 12 require engagement, and the results incorporated into the assessment report.

The timing and integrity of the approach to DOCA for background information will be recorded in the project file.

3.1.2 Section 1.2

The direction in this section applies as written.

3.1.3 Section 1.3 Analysis and Recommendations: Evaluating archaeological potential

S&Gs Section 1.3.1 provides general direction on evaluating archaeological potential. Features of archaeological potential are presented as a bullet point list, with no ranking of features. Bullets 1 – 4 are physical landscape characteristics that can be evaluated using maps or field observation. Bullet 9 concerns municipal or provincial designation and this can also be determined using available documentation.

Bullets 5 – 8 and 10 include information that will be available only through engagement. Specifically, "special or spiritual places" (bullet 5), or "resource areas" of value to the Nation (bullet 6) cannot be determined solely on the

basis of physical indicators. Further, historical settlement features described in bullets 7, 8 and 10 should not be construed as automatically describing European settler landscape elements, given the continuous and ongoing occupation of the Treaty area by Anishinaabe people.

In some areas, archaeological potential models or archaeological master plans are the basis for determining the requirement for assessment. As these models / plans are renewed, DOCA will seek engagement to ensure that the datasets considered in the development of the model / plan, and the output produced is a reasonable representation of archaeological site distributions and MCFN traditional use within the Treaty Lands and Territory.

3.1.4 Section 1.4.1

Section 1.4.1 describes the process for reducing the area that will be subject to Stage 2 test pit survey.

For areas that will be test pitted, reporting on Section 1.4.1, s. 1(c) (iii) and (iv), and Section 1.4.1, s. 1(e) (iii) and (iv), must clearly articulate how MCFN input was gathered and considered in the evaluation of potential.

DOCA must be engaged in the evaluation that leads to a reduction in areas to be subject to test pit survey. This requires treating S&Gs Section 1.4.1, guideline 1 as a *standard*. The guideline states, in part, that "the consultant archaeologist may wish to engage with Aboriginal communities to ensure there are no unaddressed cultural heritage interests".

In other cases, the area to be examined at Stage 2 may be increased to incorporate MCFN input, as described in the MHSTCI Bulletin on Engaging Aboriginal Communities, Section 3.3.

3.1.5 Stage 1 reporting

For Stage 1 assessment reports, the direction found in Sections 7.5.1 to 7.5.12, and 7.7.1 to 7.7.6 applies as written, with the following exceptions, additions or clarifications.

The results of the research conducted for the background study must be reported in the Stage 1 assessment report. Section 7.7.1, s. 1 states that the research must be clearly described and information sources documented. The report content must also clearly demonstrate that the standards for background research were met.

In addition to the Aboriginal engagement documentation required by Section 7.6.2, it will be necessary to provide a clear and accurate report of the information obtained through engagement, and how it was applied to the assessment functions required by Sections 1.1, 1.3 and 1.4.1.

3.2 MHSTCI Standards and Guidelines Stage 2

The S&Gs state that the purpose of the Stage 2 property assessment is to inventory the archaeological resources on a property, and to determine "whether any of the resources might be artifacts and archaeological sites with cultural heritage value or interest". The distinction between archaeological resources, on the one hand, and artifacts and archaeological sites on the other derives from the definitions found in O.Reg. 170/04.

Section 2 of the S&G set out the *minimum* standards for fieldwork at Stage 2. The standards form the basis for professional practice in archaeological assessment. As such, MCFN expect strict compliance with the standards for assessments undertaken within the Treaty Area. As most of the standards are quantitative targets, FLRs will assist consultant archaeologists in meeting compliance expectations, and can collect data on the conditions that led to the exercise of professional judgment to deviate from the standards. Planned deviation from the standards, based on professional judgment and permitted by the S&Gs should be discussed as part of the ongoing engagement with DOCA, and described clearly in resulting reports.

3.2.1 Section 2.1

Section 2.1 sets out the technical requirements for Stage 2 property survey, including pedestrian survey (Section 2.1.1), test pit survey (Section 2.1.2), intensification when archaeological resources are identified (Section 2.1.3), and fieldwork under special conditions (Sections 2.1.4 to 2.1.9).

The direction in Section 2.1 sets out the general and specific *minimum* requirements for Stage 2 fieldwork and analysis. The direction in this section applies as written. DOCA will work with proponents to ensure that FLRs participate in fieldwork to assist in meeting compliance with the standards.

3.2.2 Section 2.2

Section 2.2 sets out the process for determining whether archaeological resources hold cultural heritage value or interest and require further assessment at Stage 3. Notwithstanding the limiting nature of the language used in the Section 2.2 preamble (box text), Stage 2 analysis must address all archaeological resources present on the property. Engagement must address MCFN's stewardship interest in the archaeological resources and cultural heritage values on the property before final recommendations are formulated.

The fieldwork requirements of Stage 2, including intensification when resources are identified must be completed prior to analyzing the results of fieldwork and determining the CHVI of the resources. This determination should not be made 'on the fly' in the field, especially as MCFN have asserted an interest in all archaeological resources within the Treaty area. DOCA may choose to review FLR reports compiled during Stage 2 fieldwork to ensure that the data used in addressing Section 2.2, s. 1, and guidelines 1 to 4 was compliant with the S&Gs and supports the conclusions drawn.

It is important that the direction in Section 2.2, s. 1 is carried out in the context of the local or regional archaeological record. The report of the analysis must include a review of typical or expected artifact densities for sites of different time period or ascribed function regionally.

To clarify Section 2.2, s. 1(b), Stage 3 assessment is required when human remains are identified on a property. For the purposes of compliance with this direction, all human remains, regardless of element or quantity (including fragments, teeth, phalanges, etc.) must be recommended for Stage 3. This direction should not be construed as conflicting with, or limiting the requirement to comply with the Funeral, Burial and Cremation Services Act (SO 2002, c. 33). FLRs will advise on the treatment of the remains.

In Section 2.2 there are a number of considerations that must be taken into account when evaluating the cultural heritage value or interest of an archaeological site, such as the representativeness of the sample obtained through Stage 2 fieldwork. For example, a single artifact recovered from an average test pit may represent an artifact count equal to or higher than the 'cut-off' proposed for excavation in Stage 3 and 4 directions. Similarly, CSPs conducted under sub-optimal conditions will present a reduced certainty that the sample collected is representative. Reports maintained by FLRs during fieldwork can assist in ensuring that places where additional data, or corrected conclusions may be required.

In the discussion of Stage 1 guidance, it was noted that MCFN hold the view that archaeological potential needs to consider factors beyond the simple presence or absence of artifacts to include landscape considerations and the understanding of how ancestral populations used the land and the resources available. Similarly, in determining cultural heritage value or interest of archaeological resources, it is important to move beyond artifact counts. Highly mobile populations would not necessarily leave extensive and artifact rich sites behind. Analysis of archaeological resources should include the consideration of all archaeological resources as potentially informing the reconstruction of Anishinaabe history, with individual small sites analyzed in aggregate to reflect use of the broader landscape. To clarify, this direction directs the exercise of professional judgment as described in Section 2.2, guidelines 2 and 3 to recommend Stage 3 for low artifact count sites.

3.2.3 Stage 2 reporting

For Stage 2 assessment reports, the direction found in Sections 7.5.1 to 7.5.12 and 7.8.1 to 7.8.7 applies as written, with the following exceptions, additions or clarifications.

Section 7.8.1, s. 1 sets out the documentation requirements for areas *not* surveyed at Stage 2. For areas determined to be of no or low potential at Stage 1, a summary of the engagement on this evaluation must be included. For areas determined during Stage 2 fieldwork to hold low potential, a statement must be provided confirming that the decisions were taken in consultation with DOCA. Specifically, the statement should address the information and reasoning used in the field to satisfy the direction in Section 2.1, s. 2 (a), (b) or (c), confirm that FLRs were advised, and that their input was considered, as part of the decision making.

Section 7.8.1, s. 2 sets out the documentation requirements for Stage 2 property assessment generally. It is recommended that any available DOCA file reference for the project is included in the documentation. Any difference in opinion on fieldwork practices between the consultant archaeologist and FLRs that relate to standards set out in Sections 2.1, 2.1.1 and 2.1.2 should be summarized, including decisions to reduce the area surveyed (Section 7.8.1, s. 2 (c) and (d)).

Section 7.8.3 requires a summary of Stage 2 findings, including a clear statement concerning the assessment of the entire property and each archaeological site. The summary required in Section 7.8.3, s. 1 must include a discussion of all archaeological resources, including those which were determined to hold low CHVI and were not recommended for further assessment. In addition, the analysis and conclusions required in Section 7.8.3, s. 2 must

include a summary of DOCA engagement or FLR input as applicable. This should summarize the nature and timing of the engagement, the data provided in support of the discussions, and the input received from DOCA.

Section 7.8.2 requires that non-archaeological cultural heritage features, including cultural landscapes should not be documented. As noted in comments made in reference to Section 1.3 and Section 2.2, archaeological sites must be considered in their broader landscape context. The direction in Section 7.8.2 must not be seen as limiting the inclusion of landscape or cultural heritage considerations used in building a complete and accurate understanding of the development property or archaeological resources requiring additional assessment. For example, the discussion of archaeological sites identified at Stage 2, Section 7.8.2, s. 1(b) requires a description of the "area within which artifacts and features were identified", which may extend to wider landscapes as necessary.

Notwithstanding the direction of Section 7.8.4, s. 2, recommendations for Stage 3 assessment must include a requirement to consider the landscape context of archaeological sites, as appropriate.

Recommendations made in the Stage 2 report set out how all archaeological resources identified on the subject property will be addressed. Stage 3 strategies for sites with CHVI (Section 7.8.4, s. 1(c)), must include recommendations for engagement and FLR participation in fieldwork among the "appropriate Stage 3 assessment strategies".

Section 7.8.5, s. 1 recommendations for partial clearance must include requirements for engagement and including FLRs in excavation and monitoring.

3.3 MHSTCI Standards and Guidelines Stage 3

The purpose of Stage 3 site-specific assessment is to assess the cultural heritage value or interest of archaeological sites identified at Stage 2 in order to determine the need for mitigation of development impacts. The two key components to Stage 3 site specific assessment are historical research and archaeological site assessment. The outcome of Stage 3 is a clear understanding of whether each site has been sufficiently documented, or if further work is required to protect or fully document the site.

The direction in Section 3 of the S&Gs set out the *minimum* standards for additional background research and for fieldwork at Stage 3. While efforts in excess of the S&Gs are supported, strict compliance with the standards will be expected. DOCA will work with proponents to ensure that FLRs participate in fieldwork to assist in meeting compliance.

Stage 3 also includes a significant engagement component, and DOCA will serve as the primary contact for archaeologists and proponents. Engagement is specifically required as a standard in compiling additional historical documentation (Section 3.1, s. 1(a) and 1(b)), in the evaluation of CHVI (Section 3.4, s. 2), and in formulating Stage 4 strategies (Section 3.5, s. 1). As noted previously, MFCN assert that all archaeological sites should be considered as being of interest to the Nation (Section 3.5, s. 1(f)).

3.3.1 Section 3.1 Historical documentation

Section 3.1 sets out the requirements for additional research to supplement and expand the research carried out in Stage 1. The additional documentary information must be considered in Stage 3 and Stage 4 fieldwork and analysis. Documentary research should be sufficient to ensure that the consulting archaeologist has a good understanding of the recent occupation history, as well as clear knowledge of the landscape and traditional occupation of the local landscape surrounding the site.

Section 3.1, s. 1(a) requires that, "when available", research regarding "features or information identifying an archaeological site as sacred to Aboriginal communities" is completed. Further, Section 3.1, s. 1(b) requires research relating to "individuals or communities with oral or written information about the archaeological site". To meet the requirements of this direction, MCFN expect that research will be commenced as part of the Stage 1 background study, will require engagement, and in reporting should reflect a serious effort to identify information relating to the local area, property, or site especially as it pertains to past occupation by Mississauga or other Indigenous peoples. As part of the background research, Section 3.2, s. 1 requires that the consultant archaeologist review "all relevant reports of previous fieldwork" prior to commencing fieldwork. If a new licensee assumes responsibility for the archaeological assessment at Stage 3, this review must include contacting DOCA for a summary of engagement and FLR reports on Stage 1 and 2.

3.3.2 Section 3.2

Section 3.2 sets out the standards for Stage 3 site-specific assessment fieldwork, including controlled surface pickup (Section 3.2.1) and test unit excavation (Section 3.2.2). Section 3.2. 3 and Table 3.1 describe the how the number and distribution of test units is determined.

The direction in this section applies as written, with the exceptions, additions or clarifications noted below. In all instances, DOCA will work with proponent to ensure that FLRs are available to support compliance during fieldwork.

The identification and treatment of features encountered at Stage 3 is discussed in Section 3.2.2, s. 6. Feature identification should be conservative, as it is preferable to overestimate the number of features at Stage 3, rather than lose data or create complications for fieldwork at Stage 4. On sites where a high proportion of the features appear equivocal as to cultural origin (forest fire or hearth?), these features must be preserved, and a sample excavated and reported at Stage 4 to create a record for the benefit of future archaeological fieldwork. Alternately, this sampling can be completed under the direction in Section 3.2.2, g. 3.

Selecting screen aperture during Stage 3 fieldwork (Section 3.2.2, guideline 1), should also take a conservative approach. The consultant archaeologist should exercise professional judgment and move to screening with 3mm mesh whenever small artifacts (seed beads, retouch flakes) are anticipated or noted.

Section 3.2.3 and Table 3.1 set out the technical requirements for placement and number of test units. Critical to the success of Stage 3 fieldwork is establishing site boundaries. Site boundaries must be set beyond the edge of

the artifact concentration, plus a reasonable buffer within which solitary artifacts separated from the main site by post-depositional disturbance may be anticipated. While the guideline (Section 3.2.3, guideline 1) allows for discretion in determining site boundaries, determining boundaries on the basis of low artifact frequency (guideline 1(b)), or typical site characteristics (guidelines 1(c) and 1(d)), must be supported by both data and a clear rationale. For example, determining that a site boundary can be set based on "repetitive low yields" requires additional testing beyond this boundary to ensure that additional concentrations not identified at Stage 2 are recorded. Low yields at the periphery of a site may indicate a weakly defined boundary, but may also represent a much larger, diffuse site marking a low intensity, repeated occupation of a place.

Sterile units mark the boundary of archaeological sites, clearly demonstrating that no further archaeological resources occur within a reasonable distance from the site boundary. It is recommended that sterile units to *at least* ten meters from the site area (i.e. two consecutive sterile test units on the five meter grid), are recorded. This will ensure that isolated sterile units marking a low-count region within a site are misattributed as marking the site boundary. In reporting, the decisions made regarding site boundaries, including the rationale and supporting data should be clearly documented. This summary should note the input received from FLRs.

3.3.3 Section 3.3

Section 3.3.1 describes alternative strategies for determining the extent and complexity of large (Section 3.3.1 and 3.3.2) or deeply buried archaeological sites (Section 3.3.3).

The direction in this section applies as written, with the following exceptions, additions or clarifications. DOCA will work with proponent to ensure that FLRs are available to assist with compliance during fieldwork.

Section 3.3.2 outlines an optional strategy of using topsoil stripping to determine site boundaries, and is not the preferred approach to excavation by MCFN. It is necessary to note that mechanical topsoil removal is not intended to be applied within the site area. Mechanical excavation must begin outside the archaeological site boundary working in toward the centre (Section 3.3.2, s. 3), and must be suspended once cultural features or the previously mapped extent of surface artifacts is encountered (Section 3.3.2, s. 4).

Prior to scheduling mechanical stripping, the consultant archaeologist must establish an on-site protocol for the proposed mechanical stripping with FLRs. The protocol must confirm the extent of the site as determined by artifact distributions and test unit results to establish where trenching will commence and be suspended. The protocol must also cover terminating or suspending trenching when artifacts or features are identified, and for treating cultural features in subsoil, and artifacts from disturbed soil or back dirt, including how back dirt will be processed to recover artifacts from excavated soil.

3.3.4 Section 3.4

Section 3.4 provides direction on how the information gathered in the archaeological assessment up to the end of Stage 3 fieldwork is used to assess the CHVI of each archaeological site. In turn, CHVI will determine whether the site is sufficiently documented, or if Stage 4 mitigation of development impacts is required.

To comply with the requirements of Section 3.4, consultant archaeologists must work with DOCA to determine CHVI and Stage 4 mitigation strategies for each site. This requires that concise documentation demonstrating that the site has been assessed to the level of care set out in the S&Gs is provided in a timely manner, and that any concerns previously expressed by DOCA or individual FLRs were addressed. The documentation should include the historical background research conducted in Stage 1 and Stage 3, a record of engagement with DOCA, and a summary of the artifact and site analysis. DOCA may also review FLR reports on fieldwork, or determine if band members hold specific or general knowledge of the site or development property. In the absence of earlier engagement, it may be necessary to provide additional resources to support the DOCA review.

The S&Gs state that Stage 4 mitigation is required for specific classes of site, including "…sites identified as sacred or as containing burials" (Section 3.4, s. 1(a)). Sites of sacred or spiritual importance may include places on the landscape that do not contain archaeological resources in sufficient quantity to allow a clear determination of the site's CHVI. Alternately, ceremonial space may be clearly expressed through the features and objects recovered archaeologically. Burial sites, graves and human remains (including isolated elements) must also be considered sacred. As reflected in Section 3.5, s. 1(b), all human remains require special treatment. They are culturally important as they may represent interments or signal a sacred or spiritual value at the site. Ultimately, MCFN is the only party who can determine whether an archaeological site is sacred to the Nation, and as such, DOCA must be engaged.

The description of 'sacred' sites in the S&Gs is limiting. Sacred sites may include sites of cultural or historical importance, places associated with traditional land use or activities, or places features in traditional narratives (Section 3.4, s. 2). In most cases, 'sacred' sites will be those identified by the Nation, and FLRs will be the source of much of this information. Where specific knowledge of an individual archaeological site does not exist in the Nation's current knowledge base, the CHVI of the site may be co-determined by the Nation and consultant archaeologist.

Note that the underlying cultural interest in a site or development property, or the basis of the identification of sacred or spiritual places will not be disclosed in all cases. The Nation will not assume the position of research subject.

Small or diffuse lithic scatters must not be automatically determined to hold low CHVI (Section 3.4.1). Anishinabeg traveled extensively throughout the Treaty area and beyond, and one aspect of this lifestyle was traveling light, with individuals and groups carrying only a small amount of material goods. As a result, loss rates were low and the archaeological sites associated with this cultural pattern will be smaller, low artifact count sites. Therefore, small sites with low artifact frequencies may hold a higher cultural significance than would be determined on the basis of artifact count. The analysis of small sites requires consideration of the wider landscape setting of the site and relationship to other local sites. For many of these smaller sites it is recommended that the consultant archaeologist exercise professional judgment, and follow the direction in Section 3.4.1, guideline 1(c).

Section 3.4.3 provides additional criteria for determining CHVI of individual archaeological sites. For archaeological sites in the Treaty area, the criteria in Table 3.2 must be reviewed by the consultant archaeologist to determining CHVI and formulating Stage 4 strategies. The consulting archaeologist must clarify in reporting how each of the criteria is or is not met for the archaeological site.

In terms of the 'information value' of a site, consideration of the related indicators must look beyond the concept of archaeological information, to include consideration of how the information contained in the site can contribute to building a more complete history of cultural and traditional land use patterns within the Treaty area.

3.3.5 Section 3.5

Developing Stage 4 mitigation strategies requires engagement at Stage 3 (Section 3.5, s. 1). This engagement should be the culmination of an ongoing engagement that began at Stage 1 (or earlier). Engagement will include contributing to the "careful consideration" leading to a decision to excavate, as required in Section 3.5, s. 2, and to document any "unusual circumstances" indicated in Section 3.5, s.3.

Contrary to the presentation in the S&Gs, the recommended Stage 4 strategies *must* reflect MCFN input. For compliance with Section 3.5, s. 2, documentation must include records of all communications, meetings, presentation materials, and resolutions arrived at between the consultant archaeologist and DOCA, and between the consultant and the proponent where mitigation was discussed. Where the recommended strategy is at variance with MCFN's position, the basis for the decision must be clearly articulated in the final report of Stage 3 fieldwork.

Some sites, where Indigenous occupation is not indicated by Stage 1 to 3 assessments, may be excluded from engagement by mutual agreement.

The formulation of Stage 4 strategies must anticipate operational decisions that may be made during Stage 4. Section 4.2.1, g. 1, allows for sampling strategies to reduce the "degree or intensity of the archaeological fieldwork". Incomplete excavation of an archaeological site promotes archaeological interests over the stewardship interest of MCFN. Sampling must only be considered after a detailed review of the sampling strategy and potential consequences for information recovery from the site is completed. Details of the proposed sampling strategies must be described in detail in the recommendations to the Stage 3 report, and the justification and research supporting the recommendations should be clearly articulated in the analysis and conclusion sections. Stage 4 recommendations should also provide a specific commitment to engage DOCA when sampling decisions are made in the field, including a time allowance to consider the decision, and a process for incorporating DOCA input into the decision making.

3.3.6 Stage 3 reporting

For Stage 3 assessment reports, the direction found in Sections 7.5.1 to 7.5.12 and 7.9.1 to 7.9.7 applies as written, with the following exceptions, additions or clarifications.

The description of the field methods required in Section 7.9.1, may be supplemented by reference to the FLR reporting on the fieldwork, as applicable.

Section 7.9.3, s. 3 requires that the analysis and conclusions of the report are compared to current archaeological knowledge. This must include current research, and not simply rely on other consulting reports and standards references. In addition, this research must consider the direction set out in this document, and the results of engagement. Section 7.9.4, s. 1(a) requires that reporting on Section 3.5 include a discussion and summary of engagement. A clear and detailed discussion of engagement is required in Section 7.9.4, s. 2, and this discussion must include the rationale for proposing any actions that is contrary to the stated position of DOCA. For example, decisions made to excavate or terminate an assessment (Sec. 7.9.4, s. 3 or s. 5), where that differs from the DOCA position, then a clear statement of this difference, including the dissenting position, must be provided in the report.

3.4 MHSTCI Standards and Guidelines Stage 4

Archaeological sites holding cultural heritage value or interest require Stage 4 mitigation of development impacts. Impacts may be mitigated by either avoidance and protection, or excavation and documentation. Avoidance and long term protection is the preferred approach to mitigation. Avoidance allows the archaeological site to be preserved intact for future use as an archaeological resource and cultural heritage value in addition to preserving a range of material and intangible values not directly recoverable through the application of archaeological techniques.

The S&Gs articulate that avoidance and protection are "most viable when the cultural heritage value or interest of the archaeological site is determined early in the planning stages of the development". This supports the position taken in this document that early engagement with DOCA is beneficial for all parties to the assessment, and to the archaeological resource.

3.4.1 Section 4.1 Avoidance and Protection

The direction in Section 4 sets out the general and specific *minimum* requirements for Stage 4 fieldwork and analysis. The direction in this section applies as written, with the following exceptions, additions and clarifications. DOCA will work with proponents to ensure that FLRs participate in fieldwork to assist in meeting compliance.

Section 4.1, s. 1 requires that protection must follow completion of Stages 2 and 3. Where DOCA has not been engaged previously on the assessment, the process permitted under Section 4.1 is considered premature and must not proceed. This also applies in cases where the Stage 3 engagement is ongoing, or if a response to a concern raised by DOCA to MHSTCI or some other party to the development process has not been received.

The buffers signified in Section 4.1, s. 2 are minimums. Larger buffers based on local topographic or development conditions must be identified where they will enhance long-term protection. Elements of the surrounding landscape beyond the minimum buffers should be adapted into the protection area to ensure that the site

remains in a naturalistic setting. This requires working with the proponent and the approval authority early in the process to build agreement in principle with the idea, and to facilitate moving to a satisfactory outcome. In a similar manner, where a number of sites are present in close proximity, protection strategies that include protection of a larger area enclosing all of the sites should be considered.

Section 4.1.3 concerns temporary avoidance. The standard requires that the commitment from the proponent that "the archaeological site will not be impacted in the short term, and a plan to carry out full excavation in the future" is included in the report package. The avoidance and protection strategy requires approval authority agreement. DOCA must be provided with notice of the temporary avoidance and protection strategy and excavation timeline, and provided an opportunity to comment.

Section 4.1.4 concerns the mechanisms required to ensure effective long term protection of the archaeological site. The avoidance and protection strategy must include DOCA engagement, and an opportunity to participate in the long term protection. MCFN has the capacity to provide stewardship and oversight to the long term protection of archaeological sites beyond that provided by other corporate bodies and municipalities; therefore DOCA must be included in the drafting of long term protection mechanisms.

Section 4.1.4, s. 1 directs that the protection mechanism "sets out how protection of the archaeological site is to be addressed as a prerequisite to any proposed removal of the archaeological restrictions on the land in the future". The mechanism must recognize the Treaty rights and the stewardship role of MCFN, and require engagement regarding any future review of the protected status of the archaeological site for development or excavation. This recognition must form part of the long-term protection mechanism, and should not be part of a sub-agreement or other agreement that may not continue in force over time.

The identified restrictions on uses of the archaeological site (Section 4.1.4, s. 2) must not prohibit or infringe the right of MCFN to carry out any cultural or ceremonial activities that may be required. MCFN stewardship and DOCA participation in any future work at the site must be referenced in the "document confirming… awareness of" obligations for the archaeological site required in Section 4.1.4, s. 3.

3.4.2 Section 4.2 Excavation

Section 4.2 sets out the requirements for excavation and documentation. As the introduction to Section 4.2 states, "protection in an intact state is always the preferred option" for archaeological sites with CHVI. The S&Gs confirm that conversion of archaeological sites into archaeological data results in the "loss of contextual information". As noted previously, archaeological techniques are insufficient to capture the range of cultural heritage values the archaeological site may contain, including intangible values such as the sacred or spiritual elements that are referenced throughout the S&Gs. Nevertheless, conflict between contemporary development pressures and archaeological sites inevitably leads to a large proportion of archaeological sites being scheduled for destruction.

The direction in Section 4.2 sets out the general and specific requirements for Stage 4 fieldwork and analysis. The direction in this section applies as written, with the following exceptions, additions and clarifications. Within the

Treaty Lands and Territory, FLRs must participate in fieldwork, and will assist in meeting compliance. Stewardship of the archaeological resources and cultural heritage values require that archaeological sites will be completely excavated by hand (i.e. no mechanical topsoil stripping) and artifact recovery will be maximized, when excavation and documentation is considered the only mitigation alternative.

Before commencing fieldwork, the consultant archaeologist is required to review "all relevant reports of previous fieldwork" (Section 4.2.1, s. 2). If a new licensee assumes responsibility for the archaeological assessment at Stage 4, this review must include a review of engagement from the preceding stages. This review should also include reports of fieldwork on adjacent properties or the local area for context.

Section 4.2.1, g. 1 allows for sampling of archaeological sites "as a means of reduc[ing] the degree or intensity of archaeological fieldwork while still accomplishing the objectives for Stage 4 excavation". Sampling must be pursued with caution, in limited instances and following a detailed review of the strategy and potential consequences to archaeological and cultural data recovery. Sampling is generally only acceptable where it has been recommended in the Stage 3 report, and had been a focus of engagement.

Section 4.2.2 concerns excavation by hand. The preamble to Section 4.2 states, "All archaeological sites for which Stage 4 excavation is carried out…must be excavated partly or completely by hand. Hand excavation is the preferred method for removing topsoil because topsoil stripping destroys any evidence of later site formation processes and leaves behind displaced artifacts". This clarifies that hand excavation is preferred, and signals a concern that stripping may lead to archaeological data and features being overlooked or artifacts left behind at the site. The section continues, stating that on completing Stage 4 excavations "the site no longer exists in the ground [and] archaeological concerns under land use planning and development processes can be considered addressed". This creates the uncomfortable outcome that archaeological data, artifacts and other cultural heritage objects may remain at the location after the site has been declared to no longer exist. This loss of site context and artifacts compound the cumulative impact to cultural heritage values of importance to MCFN and other indigenous communities.

Mechanical topsoil stripping is discussed in Section 4.2.3. As the S&Gs note, "the rationale for topsoil stripping is that the careful documentation of intact archaeological resources…offsets the loss of fragmentary information in the topsoil layer". Mechanical stripping presents considerable risk to archaeological resources and must be considered an exceptional practice in the absence of a compelling rationale. Any proposal to mechanically strip a site must be a key topic of discussion during engagement at Stage 3. FLRs will be available to advice in the field on compliance with the S&Gs and any agreements reached in engagement.

As set out in the S&Gs, mechanical topsoil stripping is only acceptable under specific circumstances (Section 4.2.3). The archaeological site must have been subject to ploughing for many years, be a single component site, be "large", be a Woodland period site or later, and there must be a representative artifact collection from Stage 2 and Stage 3 surface collection and test unit excavation. Analysis of earlier fieldwork must be completed to the point where the site can be demonstrated to be a single component.

The judgment on the size of the site and adequacy of the artifact collection, and whether the site represents a single component, must be discussed in the Stage 3 report and raised during engagement. During fieldwork, stripping must not extend below the topsoil/subsoil interface (Section 4.2.3, s. 3), and only the area that can be cleared and examined at the time of stripping should be exposed (Section 4.2.3, s. 4). It is critical that the Stage 4 recommendations and on-site protocols support the role of FLRs in identifying compliance shortfalls during mechanical topsoil stripping. Work at variance with the S&Gs must be stopped as soon after being identified to the project archaeologist or field director as possible.

Section 4.2.4 provides direction on the excavation of Woodland period archaeological sites. This direction notes that Woodland sites are 'usually' excavated using a combination of hand and mechanical excavation. As mechanical topsoil stripping increases the risks to archaeological sites, use of the technique must be limited and justified on a site by site basis. It is strongly recommended that the area mechanically excavated is minimized, with hand excavation expanded beyond the limits set out in the S&Gs (Section 4.2.4, s.1, and 4.2.4, s. 5, augmented by guidelines 1 to 3). In all instances of mechanical topsoil stripping, provision for recovering any artifacts displaced to back dirt piles must be made. It is preferred that back dirt is screened to facilitate full artifact recovery.

For large lithic scatters and lithic quarry sites, compliance with Sections 4.2.5 and 4.2.6 will require that Stage 3 analysis is complete prior to engagement, and that the results of analysis are provided during engagement with DOCA. When finalizing the Stage 4 recommendations and strategies for Stage 4, (specifically Sec. 4.2.5, s. 1(b) and Sec. 4.2.6, s. 2), this analysis must be available, meaning that the Stage 3 results must have been analyzed from this perspective.

Requirements for the treatment of undisturbed archaeological sites are described in Section 4.2.9. The preamble of the section states that "every effort must be made to ensure" that undisturbed sites are avoided and protected. Further, "any recommendation to excavate must have been made in consideration of feedback from engagement…and a careful review of the viability of preservation options". MCFN support avoidance and long term protection of archaeological sites, and are emphatic that consultant archaeologists advocate strenuously that undisturbed sites are protected from adverse impact, including excavation. All undisturbed sites must be brought to the attention of DOCA as early in the assessment process as possible, and engagement on the Stage 4 recommendations for the site is required. FLR reports concerning earlier stages of fieldwork, and specifically indications of past disturbance, may be reviewed to ensure that undisturbed sites are appropriately represented in Stage 3 deliberations.

Undisturbed sites that cannot be avoided and protected must be completely excavated by hand. FLRs will be available to support compliance with the direction on excavating undisturbed sites. This will include ensuring that the additional units indicated in Section 4.2.9, s. 4 are sterile, and that features are investigated as directed in Section 4.2.9, s. 5. While not specified in the S&Gs, recording and collecting non-diagnostic artifacts and informal tools, collection must be to 0.25m^2 quadrant and level at a minimum. As with the direction on undisturbed sites, developing a mitigation plan for rare archaeological sites (Section 4.2.10) will require engagement and FLR participation in fieldwork.

3.4.3 Section 4.3

The goal of excavation and documentation is complete recovery of the archaeological information contained within the site. Sampling suggests that the contents of sites are generally consistent between sites, and that the information potential of any given site is predictable. However, this gives the impression that the site being assessed is of a lesser value than those that have been excavated previously. Cumulative effects to the overall archaeological record will accrue under this process, and shortcomings of historical research amplified. This perspective may also lead to acceleration in the rate of site loss over time, and excavated collections are increasingly viewed as additional and redundant data. For these reasons, sampling or reducing the extent of excavation at Stage 4 should only be pursued under exceptional circumstances, and then only after detailed research to support the decision to sample has been completed and presented in engagement. In all cases, excavation must include units within a 10m buffer (at Stage 3 or Stage 4) surrounding the site to ensure that site boundaries are accurately located and unit-yield counts do not increase in adjacent areas.

Table 4.1 in Section 4.3 of the S&Gs provides direction on determining the extent of Stage 4 excavations. In hand excavation, the unit-yield serves as an indicator of when the limits of a site have been reached. Units with fewer than 10 artifacts per unit mark the boundary of the site. Excavation must continue where at least two formal or diagnostic artifacts, fire cracked rock, bone or burnt artifacts are present. In the interest of complete recovery and correct boundary placement, it is recommended that excavation continue for at least two contiguous units at low counts (<5) before the site boundary or limits to excavation are declared.

Table 4.1 also provides direction for undisturbed site excavation limits, indicating that counts of ten or fewer artifacts mark the limit of excavations. However, undisturbed sites provide an opportunity to gather information on site formation processes as well as a "complete" inventory of materials and features. For this reason, 100% excavation and artifact recovery is required for these sites. Two consecutive units with zero artifacts must be excavated at the periphery of the site to ensure that excavation has captured the entire site.

For large, dense lithic scatters where individual unit counts are high, Table 4.1 allows that excavation can be terminated where unit counts drop to 10% of the highest yield at the core of the site. This guidance must be applied with caution, and excavations must continue where the nature of the artifact recoveries at the proposed boundary differ from those in the core of the site. For example, where a high count area comprised of smaller pressure flakes is used to define the centre of the site, and a lower count area comprised of larger early stage block reduction is positioned on the 'periphery', this may indicate the overlap of two different functional areas, and not the site boundary. This reinforces the direction in Table 4.1 that areas of lower concentration adjacent to the areas of higher density must be examined to ensure that they do not mark discrete components, habitation or activity areas. Lithic quarry sites require complete excavation of all discrete areas. There are no unit-yield measures for determining limits to excavation.

Table 4.1 also provides direction that for sites subject to mechanical topsoil stripping, excavation is considered complete when all cultural features have been exposed and excavated. The stripping must extend at least 10m

beyond all cultural features. Unit yields are not applicable as the artifacts from the plough zone are in the back dirt. As noted previously, measures must be taken to recover artifacts from the stripped topsoil to approach complete artifact recovery.

3.4.4 Stage 4 reporting

For Stage 4 excavation reports, the direction found in Sections 7.5.1 to 7.5.12 and 7.11.1 to 7.11.6 applies as written, with the following exceptions, additions or clarifications. Stage 4 avoidance reports follow the direction found in Sections 7.10.1 to 7.10.3.

Section 7.11.1, s. 1(c) requires that decisions made in the field regarding unit placement is documented. For compliance with this standard, the engagement, including in-field discussions with FLRs and any divergent opinions on how to proceed must be reported. Section 7.11.4, s. 1 requires that a recommendation of "no further cultural heritage value or interest" remains for the site. This recommendation should not be made if disputes regarding the completeness of the excavation have been raised by DOCA and are unresolved. Recommendations should also note that the outcome of the archaeological assessment may not remove a cultural heritage place, defined on the basis of cultural or intangible values at the site by MCFN, regardless of the archaeological assessment status.

3.5 Aboriginal Engagement Reporting (Section 7.6.2)

The Aboriginal engagement report supplements the information provided in the body of the report. As the guidance in this document sets out, MCFN expect to be engaged at all stages of archaeological assessment. Therefore, Aboriginal engagement reports should be prepared for all stages of assessment. Engagement includes timely notification of all assessment-related fieldwork to be undertaken on MCFN Treaty Lands and Territory, the participation of FLRs, clear communication regarding fieldwork decisions and recommendations, and acknowledgement of MCFN's role as stewards of archaeological resources within the Treaty Lands and Territory.

Section 7.6.2 provides direction on the required contents of the Aboriginal engagement report. Each report must include the identification of who was engaged, and how the engagement was carried out. For assessments on MCFN Treaty Lands and Territory, engagement will be with DOCA and the FLRs participating in the fieldwork (Section 7.6.2, s. 1(a)). This document will represent the protocol for engagement (Section 7.6.2, s. 1(b)). To compile a complete record of engagement, the report must also include information on the timing of engagement and, for Stage 2 to 4 assessments, whether engagement had been carried out in earlier stages. DOCA, as part of their administration and coordination of the engagement response, will provide a reference number for each engagement. The report should note this reference and the dates of engagement (Section 7.6.2, s. 1(c)). This will assist DOCA in tracking the assessment, and provide MHSTCI reviewers with assurance that the documentation reflects the approach, process and outcome clearly and accurately.

Documentation for the engagement process must also outline and give reasons for the strategies used to incorporate input from DOCA and FLRs into fieldwork decisions, and how the results of the assessment were

reported back to the Nation. The outline required by Section 7..2, s. 1(d) must include a description of how DOCA was approached for input to the assessment, including background information at Stage 1 and Stage 3, field direction from FLRs at Stages 2 through 4, and DOCA participation in preparing or reviewing recommendations made at Stage 1 through 4. Acknowledging that points of difference may occur, it is important that the report clearly articulate where DOCA direction varied from S&Gs direction, where the consultant archaeologist chose not to implement direction from DOCA or FLRs, or where recommendations made were at variance with the position taken by DOCA or FLRs. Finally, a statement on when and how the final report of each stage of assessment was transmitted to DOCA must be included (Section 7.6.2, s. 1(e)). Reporting back must include providing a copy of the final report of the assessment to DOCA in a timely manner, including the completed Aboriginal engagement report.

The direction provided in Section 7.6.2, s. 2, applies as written; however, it is important to note places or values holding cultural sensitivity may be identified on any property. In these cases, DOCA will work with the consultant archaeologist to identify boundaries, restrictions, or fieldwork practices that will address the cultural concern, even if detailed information on the underlying value is not provided. This will be the practice when, in the view of DOCA, providing MHSTCI or the consultant archaeologist details of the exact nature of the underlying cultural value is not required to achieve protection.

In reference to Section 7.6.2, g. 1, it is important to note that MCFN hold that all archaeological resources present within the Treaty Lands and Territory are of interest to the Nation as part of their cultural patrimony. Resources, regardless of size, frequency or condition should not be interpreted in such a way as to remove the requirement for engagement.

3.5.1 Supplementary Documentation

Section 7.3.4 notes that supplementary documentation is required to improve the clarity of archaeological assessment reports… "For the purposes of review, the ministry may require supplementary documentation to verify that fieldwork was conducted according to [the MHSTCI] standards and guidelines."

Section 7.6.2 provides standards and guidelines for Aboriginal engagement and is applicable to all stages of archaeological assessment reporting. The section clarifies that "critical information arising from Aboriginal engagement that affected fieldwork decisions, documentation, recommendations or the licensee's ability to comply with the conditions of the license" should be documented and included in the body of the report. Additional details and data resulting from engagement should be provided in supplementary documentation to the report. This includes "copies of any documentation arising from the process of engagement".

DOCA administrative processes and FLR reports do not constitute additional documentation to be included in the supplementary documentation to an archaeological report. The documentation will not be provided, as the licensee's own records should provide sufficient detail regarding engagement. These records may be made available to and approval authorities if required to address an unresolved disagreement between MCFN, the consultant, proponent, or approval authority. MCFN expect that a complete record of engagement will be

maintained for any work within the Treaty Lands and Territory, and that MHSTCI and approval authorities will consider the substance and outcome of engagement when reviewing assessment reports or development proposals.

4.0 Additional Direction

4.1 Collections management

The disposition of archaeological collections remains of interest to MCFN. All disposition agreements entered into at the end of an archaeological assessment must recognize MCFN's role as stewards of the resource, and provide explicit direction that MCFN may assume control over collections under the following circumstances:

- When the curatorial facility is derelict in its responsibility to care for the collections, including providing for appropriate cultural protocols, or,
- When MCFN develop a curatorial facility for the purpose of long term curation of archaeological collections.

When the license holder fails to make arrangements for the long term care of archaeological collections within a reasonable period of time after the conclusion of an archaeological assessment, MCFN may intervene with MHSTCI to require that the collection is transferred to an appropriate facility with the costs of the transfer being assumed by the ministry or archaeologist.

Note: We recognize that MHSTCI will be developing collections management direction in the near future. MCFN will be actively engaged in the deliberations leading to this policy as it progresses.

4.1.1 Costs

Archaeological fieldwork is directed to the identification and recovery of archaeological resources, primarily material objects indicating past cultural activity. Through excavation and documentation the cultural legacy contained in archaeological sites is imperfectly translated from the material remains into collections and documents that represent the site as data.

At the early stages of archaeological assessment, artifact collections may be relatively modest; however, excavation of archaeological sites can lead to sizeable collections, including artifacts and documentary records. Excavated collections must be cared for. The Ontario Heritage Act is clear that the initial cost to curate collections falls to the licensed archaeologist responsible for the fieldwork. These costs include cleaning, cataloguing, analysis, packing and storage. The OHA also provides for collections to be transferred to a public institution or repository, which may also involve a cost. The cost for maintaining collections remains with the licensee until alternate arrangements are made. If provisions for the long term curation are not addressed during the assessment, the license holder may be liable for the cost of long term curation as well, unless the collection is abandoned or a public or private institution is willing to assume responsibility.

It is important that costs relating to short and long term curation are identified to the proponent early in the assessment process. This will reinforce that archaeological site excavation is a serious undertaking. If excavation is carried out, proposals for the work must include costs for packing and transferring the collections to a repository, and a timeline for this transfer to be effected. A commitment to complete the transfer must be included in the final report.

Another significant concern arising from the creation of archaeological collections is the cultural cost of reducing the rich cultural legacy that can reside in an archaeological site to collections and data formulated in a way that privileges standard archaeological practice and view of the past. The OHA and S&Gs provide little direction and do not compel any licensee to address First Nations' concerns with investigation, collection or excavation at archaeological sites.

Additional costs may be encountered when curating an archaeological collection to culturally specific standards, including additional cultural requirements for artifact handling, storage and treatment. Storage conditions may require that collections are made available from time to time for traditional observance or cultural ceremony, or the collections and facility itself may require ongoing cultural maintenance. This will increase costs above the basic cost of 'dead storage' space, and must be anticipated in funding.

A hidden cost in curation is the cumulative impact of archaeological practice on the remaining archaeological sites. Collections currently managed for long term use as research and educational material far exceed the capacity for new research to address. However, the value of archaeological collections to communities has not been thoroughly explored. Given that MCFN stewardship over the archaeological resource does not end with excavation and reporting, the potential for long term community management of archaeological collections should be identified. A provision that MCFN retain the right to transfer collections or specific artifacts from archaeological sites Treaty Lands and territory to MCFN designated or operated facilities at some time in the future should be included in the final report of the assessment.

For this, and a variety of other reasons, it is vitally important to MCFN that the archaeological collections that are removed from the ground are treated in a manner that conforms to the OHA, and allows MCFN to exercise our inherent right to act as stewards of our cultural patrimony.

4.2 Human remains and burials

Human remains are not archaeological resources. They are the remains of ancestors who were interred, or died without burial, at or near the location where they are discovered. All human remains identified during archaeological fieldwork are of interest to MCFN, and appropriate treatment of human remains is of considerable importance to the Nation.

The Funeral, Burial and Cremation Services Act and the Coroners Act direct the treatment of human remains upon discovery. While there is variation in the language used in the legislation and the S&Gs (burials, graves, human remains), it is preferred that a uniform approach is followed. When human remains are identified in the field first contact should be to the Coroner or police. Protocol should also dictate that DOCA or the FLR on site, and the Registrar of Cemeteries area also advised of the discovery. Once the police determine that the remains have no forensic interest, the Registrar, the proponent or landowner, MCFN and others representing the deceased will negotiate a site disposition agreement. MCFN prefer that the remains are re-interred as close as possible to the location where they were found. Depending on the quantity of human remains, the nature of the development, and the local availability of undisturbed lands that will not be impacted by development, re-interment may occur on the development property. If this is not possible, then interment at another location suitable to the purpose and acceptable to MCFN (and others) should be pursued.

The nature of this document is to put into practice pre-emptive engagement with DOCA and the ongoing presence of FLRs on location during archaeological assessments. For this reason, there should be no circumstances in which decision-making around the current and future treatment of human remains should bypass MCFN. However, if the protocols within this document have not been respected and a discovery of human remains is made without FLR presence on site, it is the responsibility of the consultant archaeologist or other party responsible for this discovery to immediately notify DOCA.

Human remains that were interred at an archaeological site signify that cultural practice was carried out at that location. The practice imbues the location with intangible values that must be protected. Isolated elements, such as teeth or smaller bones or fragments of bone, may not be immediately associated with an archaeological feature, such as a grave shaft; however, this does not diminish the cultural importance of the remains, or signal that the burial and associated cultural practice were absent. A variety of post-depositional effects may lead to the erasure of the grave site, and loss of skeletal material and it is important that archaeological fieldwork includes investigating the original position of the remains. Where human remains are identified, but no grave location is evident, it is incumbent on the archaeologist to make a reasoned argument about why this may be the case. If post-depositional disturbance from, for example, ploughing and soil erosion caused the remains to be displaced, then this would be a consideration for the analysis of the entire site. If, on the other hand, there is a belief that the body originally lay on or near the ground surface, then this also has an influence on the analysis of the sites, and should be the focus of additional engagement and documentary research.

It is important to note that scientific research on human remains, apart from the collection of the data necessary to satisfy the information requirements of the Coroner, must not be undertaken without the express consent of the representatives of the deceased. It is also important to note that the discovery of human remains on an archaeological site or development property signal the presence of intangible cultural heritage values which cannot be captured by standard archaeological techniques. Additional engagement on the analysis of the site, the conclusions reached and the final recommendations regarding the disposition of the site at the end of the archaeological assessment will require additional engagement with MCFN.

In addition to the directives provided herein, all applicable parties including the consultant archaeologist, the Registrar, and/or the proponent/landowner will be expected to follow MCFN's protocol for the discovery of human remains, which is available as a stand-alone document.

5.0 Glossary[13]

approval authority

In the land use and development context, this includes any public body (e.g., municipality, conservation authority, provincial agency, ministry) that has the authority to regulate and approve development projects that fall under its mandate and jurisdiction (e.g., *Planning Act, Environmental Assessment Act, Aggregate Resources Act*).

archaeological assessment

For the defined project area or property, a survey undertaken by a licensed archaeologist within those areas determined to have *archaeological potential* in order to identify archaeological sites, followed by evaluation of their *cultural heritage value or interest*, and determination of their characteristics. Based on this information, recommendations are made regarding the need for mitigation of impacts and the appropriate means for mitigating those impacts.

archaeological potential

The likelihood that a property contains archaeological resources.

archaeological resources

In the context of the Standards and Guidelines, objects, materials and physical features identified by licensed archaeologists during a Stage 2 archaeological assessment as possibly possessing *cultural heritage value or interest*.

archaeological site

Defined in Ontario regulation as "any property that contains an *artifact* or any other physical evidence of past human use or activity that is of cultural heritage value or interest".

artifact

Defined in Ontario regulation as "any object, material or substance that is made, modified, used, deposited or affected by human action and is of *cultural heritage value or interest*".

cultural feature

The physical remains of human alteration at a given location that cannot be removed intact and are not portable in the way that artifacts can be removed and are portable. Typically, a cultural feature must be documented in the field, although samples can be taken. Examples include post molds, pits, living floors, middens, earthworks, and various historic structural remains and ruins.

cultural heritage value or interest

For the purposes of the *Ontario Heritage Act* and its regulations, archaeological resources that possess cultural heritage value or interest are protected as archaeological sites under Section 48 of the act. Where

[13] Definitions as found in: MHSTCI 2011. Standards and Guidelines for Consultant Archaeologists. Ministry of Heritage, Sport, Tourism and Culture Industries.

analysis of documented artifacts and physical features at a given location meets the criteria stated in the Standards and Guidelines, that location is protected as an archaeological site and further archaeological assessment may be required.

community

For the purpose of these Standards and Guidelines, the use of "Aboriginal community" is used only in the context of citing such use by the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries in their Standards and Guidelines

diagnostic artifact

An artifact that indicates by its markings, design or material the time period it was made, the cultural group that made it, or other data that can identify its original context.

formal tool

Most often a stone artifact with a form or design that indicates the reason it was made, like a stone spearpoint or hide scraper. Contrasted with an informal tool, like a chert flake used for cutting.

lithic scatter

A loose or tight concentration of stone flakes and tools resulting from the manufacture and sometimes the use of one or more stone tools.

nation

Refers to the Mississaugas of the Credit First Nation.

project area

The lands to be impacted by the project, e.g.: the area of a development application under the *Planning Act*; the area to be licensed under the *Aggregate Resources Act*; the area subject to physical alteration as a result of the activities associated with the project. This may comprise one or several properties, and these properties may or may not be adjoining. However, all properties must be part of one project that is being undertaken by one proponent.

Project Information Form (PIF)

The form archaeological license-holders must submit to the Ministry of Heritage, Sport, Tourism and Culture Industries upon decided to carry out fieldwork.

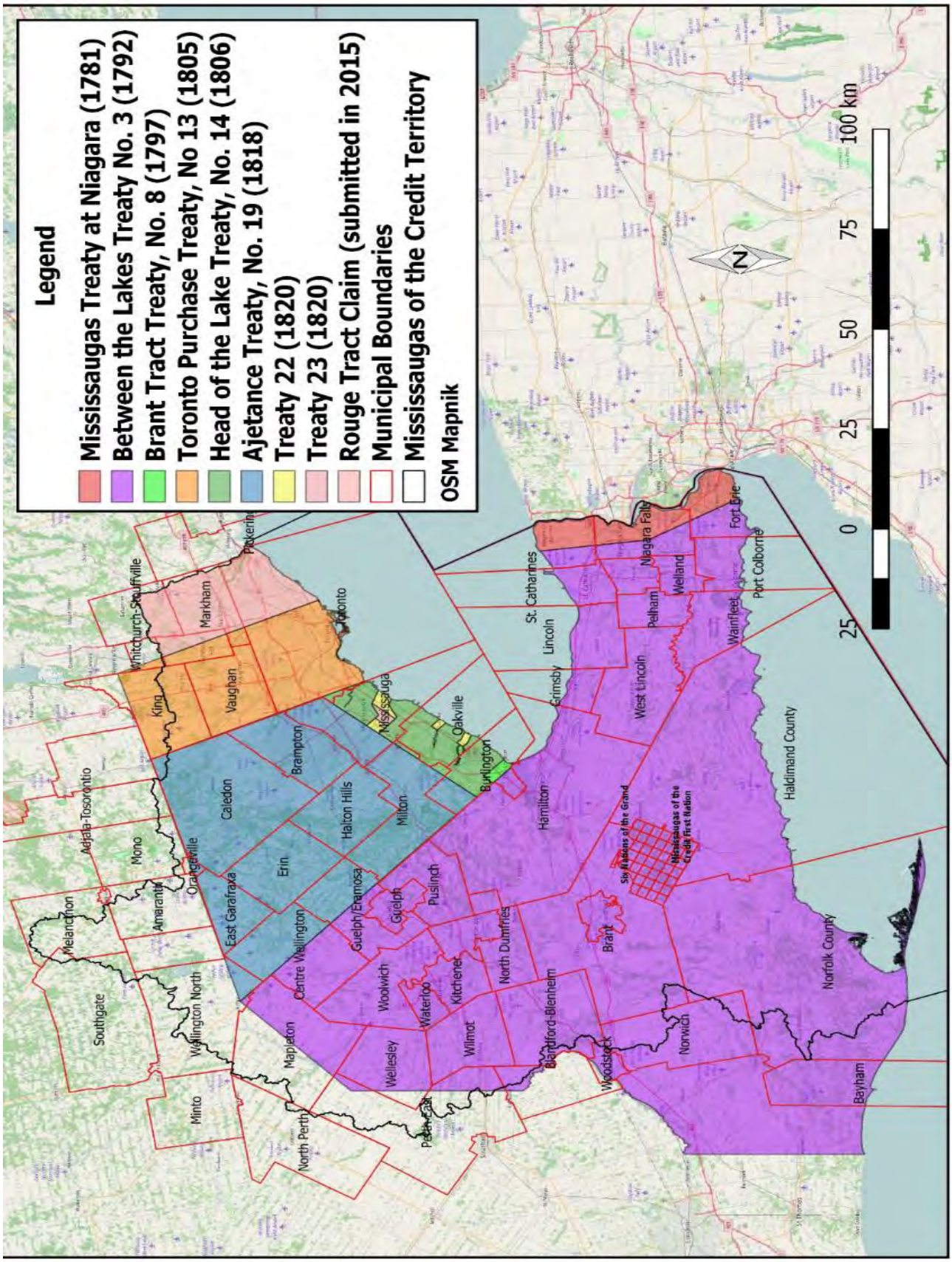
protection

Measures put in place to ensure that alterations to an archaeological site will be prevented over the long-term period following the completion of a development project.

traditional

The word "traditional" refers mainly to use of land, e.g. "traditional lifeways" while all references to MCFN's land are to be construed as the MCFN Treaty Lands".

6.0 Map of the Treaty Lands and Territory



Front page artwork is from the MCFN Lloyd S. King Elementary School Art Mural.

Artists include:

Philip Cote – Principal Coordinating Artist

Rebecca Baird – Artist

Tracey Anthony – Artist

Rachele King – Student

Eric Laforme – Student

Jocelyn Hill – Student

Carolyn Cote – Artist

Mississaugas of the Credit First Nation

Department of Consultation & Accommodation

4065 Hwy 6

Hagersville, ON N0A 1H0

Tel: 905-768-4260

http://mncfn.ca/doca-2/

MCFN Looks To Our Anishinaabe Roots To Guide Our Vision For The Future As A Strong, Caring, Connected Community Who Respects The Earth's Gifts And Protects The Environment For Future Generations. MCFN Identity And Heritage Includes Our History, Language, Culture, Beliefs And Traditions.

Ken P. Wallace

From:	Tomas Ycas <Tomas.Ycas@toronto.ca>
Sent:	January 28, 2021 11:31 AM
To:	Ken P. Wallace
Cc:	Amir Gafoor; Bavendan Paramsothy; Varathan Shanmuganathan; Senuri Jayasekara; Kate Kusiak
Subject:	FW: 21ECS-LU-05SU - Ravenscrest Park (Martin Grove Road) Stage 1 Archaeological Report

Hi Ken,

Please see below from Eric Beales regarding the Stage 1 Arch Report.

Please ensure that these are included appropriately in the report.

Tomas

Tomas Ycas, P.Eng.
Engineer, Standalone Undergrounds
Design & Construction, Linear Underground Infrastructure
Engineering & Construction Services
City of Toronto
Metro Hall, 20th Floor
55 John Street
Toronto, Ontario M5V 3C6
P: 416-392-4956
E: tomas.ycas@toronto.ca

TORONTO Engineering & Construction Services

From: Eric Beales
Sent: January 27, 2021 2:03 PM
To: Tomas Ycas <Tomas.Ycas@toronto.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Yasmina Shamji <Yasmina.Shamji@toronto.ca>; Kate Kusiak <Kate.Kusiak@toronto.ca>
Subject: RE: 21ECS-LU-05SU - Ravenscrest Park (Martin Grove Road) Stage 1 Archaeological Report

Hi Tomas,

I have reviewed the report titled "Stage 1 Archaeological Assessment for the Proposed Martin Grove Watermain Replacement Within the Road Allowance between Concession 1 and 2 Fronting on the Humber River and Within Part of Lot 12, Concession 1 Fronting on the Humber River Geographic Township of Etobicoke, Historical County of York Now the City of Toronto, Ontario" dated 19 January 2021 and completed by Archeoworks Inc. Heritage Planning concurs with the recommendations of the report, and has the following advisory comments:

1. In the event that deeply buried and/or previously undocumented archaeological remains are encountered on the property during construction activities, the Archaeology Programs Unit of the Ministry of Heritage, Tourism, Sport and Culture Industries must be notified immediately at (416) 212-8886 as well as the City of Toronto, Heritage Planning Unit at (416) 338-1095.
2. In the event that human remains are encountered during construction, the contractor shall immediately stop work and contact both the Ministry of Heritage, Tourism, Sport and Culture Industries, and the Registrar of Burial Sites, War Graves, Abandoned Cemeteries and Cemetery Closures, of the Ministry of Government and Consumer Services, (416) 212-7499, and Heritage Planning shall be copied on any written correspondence.
3. If any expansions to the boundaries of the study area are proposed, further archaeological assessment work may be required.

While it appears that the present work will not impact any areas associated with the former Bigham Family Cemetery, there is not enough information at present to evaluate where the original cemetery was located in relation to 190 and 194 Rathburn Road. Therefore, there is a small risk that human remains could be recovered in a secondary context during this work. Please ensure that the contractors are aware of this possibility and have the contact information provided here should anything be found.

Additionally, please ask the consultant archaeologist to include my information as approval authority when submitting the report to the Ministry of Heritage, Sport, and Culture Industries.

Please feel free to get in touch if you have any other questions.

Sincerely,

Eric Beales, MA
Heritage Planner, Archaeology
City Planning: Urban Design/Heritage Planning
City of Toronto
Toronto City Hall, 17E |100 Queen Street West |Toronto, ON M5H 2N2
416-338-1095
eric.beales@toronto.ca

From: Tomas Ycas
Sent: January 21, 2021 9:10 PM
To: Eric Beales <Eric.Beales@toronto.ca>
Cc: Alison Torrie-Lapaire <Alison.Torrie-Lapaire@toronto.ca>; Amir Gafoor <Amir.Gafoor@toronto.ca>; Yasmina Shamji <Yasmina.Shamji@toronto.ca>; Kate Kusiak <Kate.Kusiak@toronto.ca>
Subject: 21ECS-LU-05SU - Ravenscrest Park (Martin Grove Road) Stage 1 Archaeological Report

Good Morning Eric,

I was provided with your contact information as the individual to contact regarding Archeological reports within the City.

Attached is a Stage 1 Archaeological Report completed for Contract 21ECS-LU-05SU for an Environmental Assessment that is underway. It was indicated that your group receives all Stage 1 Reports for potential review and/or comment.

This report will also be circulated and submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI); as well as the appropriate FN communities.

Aside from your review/comment (if any), I was hoping for your input regarding the circulation of this document at your earliest convenience.

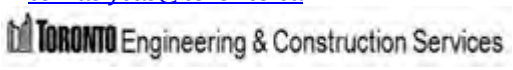
- Would you happen to know if there are additional groups/individuals within the City that should receive this document (I have copied Yasmina Shamji from Heritage Preservation Services) for review?
- Does the document have to be reviewed by yourself or others at the City, prior to distribution to the FN communities (by January 29, 2021 at the latest) and MHSTCI or may it happen concurrently?

If there is anything else pertinent that it appears I have missed, please let me know.

Many Thanks,

Tomas

Tomas Ycas, P.Eng.
Engineer, Standalone Undergrounds
Design & Construction, Linear Underground Infrastructure
Engineering & Construction Services
City of Toronto
Metro Hall, 20th Floor
55 John Street
Toronto, Ontario M5V 3C6
P: 416-392-4956
E: tomas.ycas@toronto.ca



Ken P. Wallace

From:	Ken P. Wallace
Sent:	January 29, 2021 8:53 AM
To:	Luka Medved
Cc:	Bavendan Paramsothy; Amir Gafoor; Kate Kusiak; Senuri Jayasekara; Varathan Shanmuganathan; Alistair Jolly; Tomas Ycas; Manujaa Thilageswaran
Subject:	RE: PM6A2 (21ECS-LU-05SU) - Martin Grove Stage 1 Archaeological Report
Attachments:	21ECS-LU-02SU - Screening Reports
Categories:	Filed by Newforma

Hi Luka

Thanks you for brining this to our attention. Although it is unfortunate that the Stage 1 report did not cover a broader area, we note that TRCA had already provided a screening of the project area per attached. We trust that this should cover that.

Regards,

Ken
416-497-8600x1336
647-262-9604 cell

From: Luka Medved <Luka.Medved@trca.ca>
Sent: January 25, 2021 7:50 AM
To: Tomas Ycas <Tomas.Ycas@toronto.ca>
Cc: Ken P. Wallace <kwallace@rvanderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>; Amir Gafoor <Amir.Gafoor@toronto.ca>; Kate Kusiak <Kate.Kusiak@toronto.ca>; Senuri Jayasekara <SJayasekara@rvanderson.com>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Alistair Jolly <Alistair.Jolly@trca.ca>
Subject: RE: PM6A2 (21ECS-LU-05SU) - Martin Grove Stage 1 Archaeological Report

Hello Tomas,

Please note that where works are proposed on TRCA property that archaeological screenings and/or assessments are to be completed by TRCA archaeological services. From the information provided it appears TRCA archaeology staff were not engaged prior to the completion of this assessment.

I will circulate this to our archaeology team for review and comment. In my quick review of the area assessed it appears only the proposed alignment has been assessed. Please be aware that should any access routes, staging areas and/or other disturbance areas be proposed on TRCA property outside the area assessed that additional screenings and/or assessments will be required.

Thanks,

Luka Medved, MEM, PMP
Planner
Infrastructure Planning and Permits I Development and Engineering Services Division

T: 416.661.6600 ext. 5766
E: Luka.Medved@trca.ca
A: 101 Exchange Avenue, Vaughan ON L4K 5R6

Toronto and Region Conservation Authority (TRCA) | trca.ca

From: Tomas Ycas <Tomas.Ycas@toronto.ca>
Sent: Friday, January 22, 2021 2:44 PM
To: Luka Medved <Luka.Medved@trca.ca>
Cc: Ken Wallace (kwallace@rvanderson.com) <kwallace@rvanderson.com>; Bavendan Paramsothy - RVA (BParamsothy@rvanderson.com) <BParamsothy@rvanderson.com>; Amir Gafoor <Amir.Gafoor@toronto.ca>; Kate Kusiak <Kate.Kusiak@toronto.ca>; 'Senuri Jayasekara' <SJayasekara@rvanderson.com>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>
Subject: PM6A2 (21ECS-LU-05SU) - Martin Grove Stage 1 Archaeological Report

Good Afternoon Luka,

We are coming closer to the completion of the EA, easement agreements, etc. with the Martin Grove Watermain Replacement project part of the City's Contract 21ECS-LU-05SU.

As part of the process, we have completed the Stage 1 Archaeological Report (attached). After speaking with a colleague of mine, it was recommended to pass the report along to TRCA for your records, and to see if the TRCA archaeological department wanted to review prior to filing the report to the Ministry.

This report will also be circulated and submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI); the appropriate FN communities; as well as go through the City's internal review.

Could you please let me know if TRCA would like to review as well?

Many Thanks,

Tomas

Tomas Ycas, P.Eng.
Engineer, Standalone Undergrounds
Design & Construction, Linear Underground Infrastructure
Engineering & Construction Services
City of Toronto
Metro Hall, 20th Floor
55 John Street
Toronto, Ontario M5V 3C6
P: 416-392-4956
E: tomas.ycas@toronto.ca
TORONTO Engineering & Construction Services

Ken P. Wallace

From: Alistair Jolly <Alistair.Jolly@trca.ca>
Sent: December 1, 2020 7:53 AM
To: Senuri Jayasekara
Subject: RE: PM6A2 - Submission for TRCA Archaeological Screening

Good morning Senuri. The screening record is not a Stage 1 report and we have not produced any other documents at this time. A Stage 1 report is normally a rather robust document that determines archaeological potential across a larger project area. It also requires a licence from MHSTCI. The screening record is part of our internal process and provides reasoning to the proponent why or why not an archaeological assessment may be required. As the document notes, TRCA has no archaeological concerns with the project area. However, if this is part of a larger EA and a Stage 1 is required to satisfy the EA permitting, you may need a standalone Stage 1. Feel free to give me a call if you want to discuss further. Thanks.

Alistair Jolly, M.A.
Supervisor, Archaeology
Professional Services | Restoration and Infrastructure

T: (416) 661-6600 ext. 6405
C: (416) 771-2004
E: alistair.jolly@trca.ca
A: 1229 Bethesda Sideroad, Richmond Hill, ON L4E 1A2 | trca.ca

Toronto and Region Conservation Authority

From: Senuri Jayasekara
Sent: Monday, November 30, 2020 6:30 PM
To: Alistair Jolly
Cc: Tomas Ycas ; Amir Gafoor ; Varathan Shanmuganathan ; Bavendan Paramsothy ; Aaron Bell ; Manujaa Thilageswaran
Subject: FW: PM6A2 - Submission for TRCA Archaeological Screening
Importance: High

Hi Alistair,

Just following up with some clarifications regarding the Martin Grove screening results that were provided to us back in July 2020. Could you please provide confirmation regarding the following:

a) Does the Screening replace a Stage 1 report for the portions within city ROW as well as TRCA lands?
b) If the screening is only to meet TRCA requirements, would a Stage 1 report be required?

c) We understand that only a screening has taken place at this time, however is there a report of any kind to share (apart from the Screening results)?
    i) If so, can it be shared with the indigenous communities for the purposes of the EA/PIC?

We would appreciate your urgency in this request.

Thank You.

Regards,

Senuri Jayasekara, EIT
Project Designer

P: (416) 497-8600 ext. 1302

R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300 Toronto, ON M2J 4Z8

rvanderson.com

From: Alistair Jolly <Alistair.Jolly@trca.ca>
Sent: July 16, 2020 12:24 PM
To: Senuri Jayasekara <SJayasekara@rvanderson.com>
Subject: RE: PM6A2 - Submission for TRCA Archaeological Screening

Hello Senuri. TRCA Archaeology has completed a screening of the project area as identified in the attached document have no further archaeological concerns. However, if there is any deviation from the agreed upon project area, additional assessment may be necessary. Furthermore, in the unlikely event that any deeply buried deposits or human remains are encountered, all activities will cease and the TRCA Archaeology as well as the proper authorities will be contacted immediately. Please note, you will be invoiced a review fee of $565.00 + HST. Please contact me if you have any questions or concerns. Thank you.

Alistair Jolly, M.A.
Supervisor, Archaeology
Professional Services | Restoration and Infrastructure

T: (416) 661-6600 ext. 6405
C: (416) 771-2004
E: alistair.jolly@trca.ca
A: 1229 Bethesda Sideroad, Richmond Hill, ON L4E 1A2 | trca.ca

Toronto and Region Conservation Authority

From: Senuri Jayasekara <SJayasekara@rvanderson.com>
Sent: Wednesday, July 15, 2020 6:41 PM
To: Alistair Jolly <Alistair.Jolly@trca.ca>
Cc: Amir.Gafoor@toronto.ca; Tomas.Ycas@toronto.ca; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>; Ali Modiri <AModiri@rvanderson.com>; Adrian Croos <Adrian.Croos@rvanderson.com>
Subject: RE: PM6A2 - Submission for TRCA Archaeological Screening

Good evening Alistair,

Thank you for your follow-up. We just wanted to advise you that since our previous submission to you, we have revised our Option 1 alignment slightly, however the excavation areas are still within the limits of the same excavation area provided to you previously, please see the revised PDF. You may also already be aware but just wanted to iterate that the land to the east side of Martin Grove Rd (same side of Option 1 and 2), close to Mimico Creek crossing was possibly already disturbed/excavated for the old pump house and reservoir. Please see attached MC 2014 as-built.

With regards to your question, yes we would like you to look at the areas that are not on TRCA lands as well. Furthermore, we would also like to find out if your team will also be responsible for performing the Stage 2 investigation, if required? and also when we can expect to be notified of the screening results?

Please let us know if you need any further clarification.

Thank You and Regards,

rva

RVA IS GROWING!
Our NEW Halton and Halifax offices are now open.

Senuri Jayasekara, EIT
Project Designer

P: (416) 497-8600 ext. 1302

R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300 Toronto, ON M2J 4Z8

rvanderson.com

RVA celebrates the summer season from June 26th to September 4th. Our offices will be closed at 2 pm each Friday.

From: Alistair Jolly <Alistair.Jolly@trca.ca>
Sent: July 8, 2020 10:07 AM
To: Senuri Jayasekara <SJayasekara@rvanderson.com>
Subject: RE: PM6A2 - Submission for TRCA Archaeological Screening

Hi Senuri. Thanks for the submission. I just wanted to clarify a couple of things. I've simplified your pdf to the attached graphic. The yellow polygons represent the excavation and staging areas. Is this the extent of the work? Also, the green polygon shows TRCA property limits. Would you like us to look at the areas that are not on TRCA lands as well? Thank you.

Alistair Jolly, M.A.
Supervisor, Archaeology
Professional Services | Restoration and Infrastructure

T: (416) 661-6600 ext. 6405
C: (416) 771-2004
E: alistair.jolly@trca.ca
A: 1229 Bethesda Sideroad, Richmond Hill, ON L4E 1A2 | trca.ca

Toronto and Region Conservation Authority

From: Senuri Jayasekara <SJayasekara@rvanderson.com>
Sent: Tuesday, June 30, 2020 3:19 PM
To: Alistair Jolly <Alistair.Jolly@trca.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>; Adrian Croos <Adrian.Croos@rvanderson.com>
Subject: PM6A2 - Submission for TRCA Archaeological Screening
Importance: High

Hi Alistair,

Please find attached our submission for Archaeological Screening on Martin Grove Road from Rathburn Road to north of Mimico Creek crossing as shown on the attached plan. The Martin Grove Watermain Replacement project is part of PM6A2 (2021) Program. Our City Project Managers for this contract are Tomas Ycas and Amir Gafoor. Luka Medved provided your information as the TRCA point of contact for Archaeological screening.

The attached preliminary drawing shows the extent of disturbance (including staging, stockpiling areas etc.) and other necessary information required for your review.
Please let us know if a fee will need to be made prior to the start of assessment/screening and if any further information is required.

Your promptness in the matter is greatly appreciated!

Thank You and Regards,
Senuri Jayasekara
Engineer In-Training

RVA's Toronto office has moved. You can now find us at:

R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300
Toronto, ON M2J 4Z8

T 416 497 8600 x 1302 | F 416 497 0342

website | facebook | twitter | linkedin
Please consider the environment before printing this email.

From: Luka Medved <Luka.Medved@trca.ca>
Sent: June 24, 2020 1:55 PM
To: Senuri Jayasekara <SJayasekara@rvanderson.com>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>
Subject: RE: PM6A2 - REQUEST FOR YOUR AVAILABILITY - Martin Grove TRCA Site Meeting

Hello,

As per our meeting please find below permit submission requirements and the contact information of our archaeologist.

In general, please submit the following as part of the electronic copy permit application package:

- Completed and signed permit application form.
- Landowner Authorization for the works;
- A cover letter or statement explaining the scope of work;
- Electronic copies of drawings/plans showing the location and details of construction, details of erosion and sediment control measures (including dewatering and typical details), standard notes, access routes, limits of disturbance, construction sequencing, staging/stockpile areas, tree protection measures, vegetation removals and restoration plan of any disturbed areas.
- Copies of any reports;
- The permit fee for the project will be identified once the application has been received.

As indicated in the preliminary drawings provided, portions of the proposed project fall within TRCA owned property. Ground disturbance on TRCA property may necessitate an archaeological assessment, which must be cleared prior to any construction. In order to verify archaeological potential, please contact TRCA archaeology staff (Alistair Jolly at

Alistair.Jolly@trca.ca or ext. 6405). Please note that a fee may be required for the archaeological screening and/or assessment.

Thanks,

Luka Medved, MEM
Planner
Infrastructure Planning and Permits I Development and Engineering Services Division

T: 416.661.6600 ext. 5766
E: Luka.Medved@trca.ca
A: 101 Exchange Avenue, Vaughan ON L4K 5R6

Toronto and Region Conservation Authority (TRCA) | trca.ca

From: Senuri Jayasekara <SJayasekara@rvanderson.com>
Sent: Wednesday, June 24, 2020 10:40 AM
To: Luka Medved <Luka.Medved@trca.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>
Subject: RE: PM6A2 - REQUEST FOR YOUR AVAILABILITY - Martin Grove TRCA Site Meeting

Hi Luka,

We just wanted to obtain quick clarification from you regarding the ownership of the land shown in Part 2 of 64R-3977.

In our design drawings, you will notice that we have labelled this land as TRCA land (north of Mimico Creek crossing) as advised by the City, however we just wanted to double check that this land is owned by TRCA (Ravenscrest Park sign states park maintenance is by the City). Similarly, we also wanted to know if TRCA has any information regarding any existing easement agreements with the City or anything that would help confirm whose jurisdiction this land around Mimico creek at Martin Grove currently belongs to.

We can discuss further at the meeting today, however just wanted to give you a headsup!

Thank You and Regards,
Senuri Jayasekara
Engineer In-Training

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R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300
Toronto, ON M2J 4Z8

T 416 497 8600 x 1302 | F 416 497 0342

website | facebook | twitter | linkedin

From: Luka Medved <Luka.Medved@trca.ca>
Sent: June 22, 2020 7:27 AM
To: Senuri Jayasekara <SJayasekara@rvanderson.com>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>
Subject: RE: PM6A2 - REQUEST FOR YOUR AVAILABILITY - Martin Grove TRCA Site Meeting

[CAUTION EXTERNAL EMAIL] Make Sure that it is legitimate before Replying or Clicking on any links

Hello Senuri,

Based on the location and nature of the proposed works I would suggest a virtual meeting be held rather than a site visit.

TRCA staff would be available for a teams meeting either June 24 at 1:00 pm or June 25 at 1:00 pm. Please advise if either of the dates and times could be accommodated. If so, please send me a teams meeting invite.

Thanks,

Luka Medved, MEM
Planner
Infrastructure Planning and Permits I Development and Engineering Services Division

T: 416.661.6600 ext. 5766
E: Luka.Medved@trca.ca
A: 101 Exchange Avenue, Vaughan ON L4K 5R6

Toronto and Region Conservation Authority (TRCA) | trca.ca

From: Senuri Jayasekara <SJayasekara@rvanderson.com>
Sent: Thursday, June 18, 2020 5:55 PM
To: Luka Medved <Luka.Medved@trca.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>; Tomas Ycas <Tomas.Ycas@toronto.ca>; Varathan Shanmuganathan <VShanmuganathan@RVAnderson.com>; Bavendan Paramsothy <BParamsothy@rvanderson.com>
Subject: PM6A2 - REQUEST FOR YOUR AVAILABILITY - Martin Grove TRCA Site Meeting

Good Evening Luka,

R.V. Anderson Associates Ltd. has been retained by the City of Toronto to provide design, program management and construction services for the Coordinated Toronto Water and Transportation Services Program Assignments for PM 6A2 & 6B2. We are currently in the preliminary design stage for Martin Grove Road (Watermain replacement scheduled for 2021 construction) and would like to get TRCA involved early on in the project due to the complexity and sensitivity of this particular assignment.

We have tried our best to avoid TRCA land area, however, our proposed watermain north of Rathburn intersection close to the Mimico Bridge Crossing will be in TRCA land as shown in the attached plan. It will be by HDD method in order to minimise impact as much as possible. However, in order to incorporate and address all TRCA concerns as well as avoid

permitting issues later on, we would like to request for a joint site visit to be conducted with yourself and any other TRCA representatives together with ECS and RVA staff for sometime in the next week, June 23-26.

Please provide us your availability for any of the dates between June 23 and June 26th and we will arrange accordingly. The site meeting should only take around 1hr to wrap up and although a site meeting is preferred, we can alternatively arrange for an online Microsoft Teams teleconference if that is your preference.

Please provide us with your availability at your earliest by end of day tomorrow preferably so that we can plan accordingly and capture and address TRCA concerns as much as possible before our preliminary submission to the city.

Kind Regards,
Senuri Jayasekara
Engineer In-Training

RVA's Toronto office has moved. You can now find us at:
R.V. Anderson Associates Limited
2001 Sheppard Avenue East, Suite 300
Toronto, ON M2J 4Z8

T 416 497 8600 x 1302 | F 416 497 0342

website | facebook | twitter | linkedin
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July 16, 2020

RE: Archaeology Screening Record: MC20-04 Martin Grove Watermain Replacement

Project Proponent: Senuri Jayasekara – R.V. Anderson
Project Planner: Luka Medved - TRCA

Your project area has been evaluated to determine whether an archaeological assessment is required. This includes all areas that may be impacted by project activities, including – but not limited to: the main project area, temporary storage, staging and working areas, temporary access roads and detours. It has been determined that the project area will **not require an archaeological assessment - see Section 2 for justification.**

REVIEW RESULTS
SECTION 1 – Evidence of Archaeological Potential
☐ Review of archaeological potential model ☐ TRCA *Includes: Elevated topography, pockets of well-drained sandy soil,* ☐ Regional/Municipal *distinctive land formations, resource areas, water sources* ☐ Known archaeological sites on or within 300 metres of the project area ☐ Early historic settlements ☐ Early historic transportation routes ☐ Historic aerial photography ☐ Indigenous or local knowledge of archaeological sites on or within 300 metres of the project area ☐ Indigenous knowledge or historically documented evidence of past Indigenous use on or within 300 metres of the project area ☐ Known burial site or cemetery on or adjacent to the project area ☐ The project area has been recognized for its cultural heritage value ☐ Potentially intact deeply buried archaeological resources
SECTION 2 – Survey Exemptions

☐ Previously assessed and has no further archaeological concerns ☒ Evidence for deep and extensive land alterations (i.e. major grading below topsoil, building footprints, sewage/infrastructure development, quarrying) ☐ Steep slope (greater than 20 degrees) ☐ Permanently wet ☐ No subsurface disturbance or heavy machinery on TRCA land ☐ Other: Describe/List Reasons For (or No) further work.
Additional Comments
Due to disturbance associated with the channelization of Mimico Creek and the Martin Grove Pumping Station, native soils have been impacted within the proposed project area. Aerial photographs dating to 1957 and 1961 indicate the level of disturbance (see attached). The pumping station was removed by 1977 (see attached). **Accordingly, TRCA Archaeology has no further archaeological concerns. However, if there is any deviation from the agreed upon project area, additional assessment may be necessary. Furthermore, in the unlikely event that any deeply buried deposits or human remains are encountered, all activities will cease and the TRCA Archaeology Resource Management Services as well as the proper authorities will be contacted immediately. Please contact me if you have any questions or concerns. Thank you.**

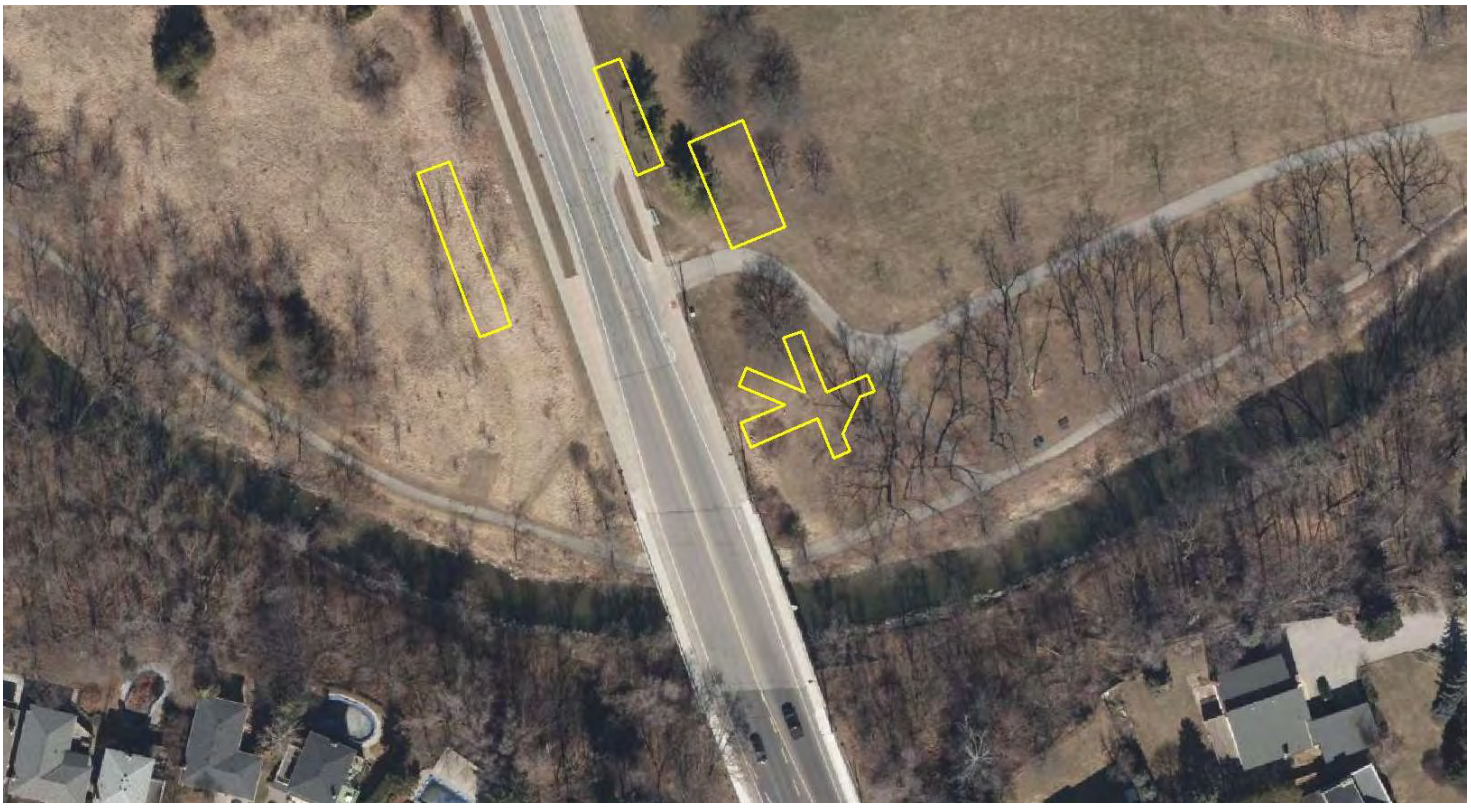
If there is any deviation from the agreed upon project area (see attached, yellow polygon), additional archaeological assessment may be necessary.

Please contact me if you have any questions or concerns.

Thank you,

Alistair R. Jolly, M.A.
Supervisor, Archaeology
Archaeology and Cultural Heritage
Restoration and Infrastructure
Toronto and Region Conservation Authority
Tel: (416) 661-6600 ext. 6405
Cell: (416) 771-2004

/attached



Project Area

1957

1961

1977

H.C.M. STATION	EASTING	NORTHING	ELEVATION
B.M. STATION			

HORIZONTAL \ VERTICAL CONTROL MONUMENTS

SURVEY(Year) XXXXXX.dgn
DESIGN XXXXXX.dgn, XXXXXX.dgn
UTILITY XXXXXX.dgn
MAPPING XXXXXX.dgn
STREETLINE XXXXXX.dgn

DIGITAL INFORMATION

No.	DATE	REVISIONS	INITIAL	SIGNED

TORONTO Engineering & Construction Services

arva R.V. Anderson Associates Limited
engineering • environment • infrastructure

CONSULTANTS

MARTIN GROVE

WATERMAIN REPLACEMENT ACROSS MIMICO CREEK
WATERMAIN REPLACEMENT

DESIGN		DRAWN		CHECKED		CONTRACT No.	CONTRACT NUMBER
SCALE	HORIZONTAL 1:200 VERTICAL 1:100			DRAWING NUMBER			SHEET
DATE	JUNE 26, 2020						

R:\2019\194398 - Coordinated Water & Trans. – PM6A\O CADD\2021\45,46-Martin Grove Rd\0-MARTINGROVE\DESIGN\20-02970_WM-vs-trca.dgn

Ken P. Wallace

From: EA Notices to CRegion (MECP) <eanotification.cregion@ontario.ca>
Sent: February 19, 2021 1:06 PM
To: Kate Kusiak; Shirali, Nisha (MECP)
Cc: Desautels, Solange (MECP); Caicedo, Jimena (MECP)
Subject: RE: City of Toronto, MEA Class EA, Martin Grove (at Mimico Creek/south of Savalon Crt to Rathburn Rd)

Thanks for clarification, Kate. I'll update the file record for this project.
Best regards,
Chunmei

From: Kate Kusiak
Sent: February-18-21 4:35 PM
To: EA Notices to CRegion (MECP) ; Shirali, Nisha (MECP)
Cc: Desautels, Solange (MECP) ; Caicedo, Jimena (MECP)
Subject: RE: City of Toronto, MEA Class EA, Martin Grove (at Mimico Creek/south of Savalon Crt to Rathburn Rd)

Hello Chunmei,
Thank you for sending your letter and attachments.
I would also like to draw your attention and clarify that the Notice of Commencement was combined with another project "Physical Separate in the Buffer on Rathburn Road, New Separated Bike Lanes on Martin Grove Road" which does not require an Environmental Assessment.
Also my email address for this project is kate.kusiak@toronto.ca or martingrove@Toronto.ca but yellowcreek@toronto.ca (noted in your attachment's header) is for a geomorphic systems master plan which is separate from this project.
The Municipal Class EA is specifically for the Watermain Replacement at Mimico Creek.
Regards,
Kate

Kate Kusiak (she/her)
Senior Public Consultation Coordinator
City of Toronto
Metro Hall
55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932
www.toronto.ca/covid-19
www.toronto.ca/getinvolved

TORONTO

From: EA Notices to CRegion (MECP) [mailto:eanotification.cregion@ontario.ca]
Sent: January 13, 2021 11:26 AM
To: Kate Kusiak <Kate.Kusiak@toronto.ca>; Shirali, Nisha (MECP) <Nisha.Shirali@ontario.ca>
Cc: Desautels, Solange (MECP) <Solange.Desautels@ontario.ca>; Caicedo, Jimena (MECP) <Jimena.Caicedo@ontario.ca>
Subject: RE: City of Toronto, MEA Class EA, Martin Grove (at Mimico Creek/south of Savalon Crt to Rathburn Rd)
Please find the attached letter as the ministry's general comments for the above noted projects. If you have any questions, please let me know.
Thank you,

Chunmei Liu | Regional EA and Planning Coordinator
Environmental Assessment Branch, Ontario Ministry of the Environment, Conservation and Parks Chunmei.Liu@ontario.ca | Website: http://www.ene.gov.on.ca/
If you have any accommodation needs or require communication supports or alternate formats, please let me know.
Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

From: Kate Kusiak <Kate.Kusiak@toronto.ca>
Sent: December-21-20 11:43 AM
To: EA Notices to CRegion (MECP) <eanotification.cregion@ontario.ca>
Subject: City of Toronto, MEA Class EA, Martin Grove (at Mimico Creek/south of Savalon Crt to Rathburn Rd)

Hi Chunmei,
Please find attached the notice of Commencement and Project Information Form for the Martin Grove Watermain Replacement.
If you have any questions or concerns to discuss, please contact me at kate.kusiak@toronto.ca or 416-392-1932 at your earliest convenience.
Regards,
Kate

_____

Kate Kusiak
Senior Public Consultation Coordinator
City of Toronto
Metro Hall
55 John Street, 19th Floor
Toronto, ON M5V 3C6
Kate.kusiak@toronto.ca
416-392-1932
www.toronto.ca/covid-19

Date: March 19, 2021 CFN 64294

BY E-MAIL ONLY (Tomas.Ycas@toronto.ca)

Tomas Ycas
Engineer, Standalone Undergrounds
Design & Construction, Linear Underground Infrastructure
Engineering & Construction Services
City of Toronto
Metro Hall, 20th Floor 55 John Street
Toronto, Ontario M5V 3C6

Dear Mr Ycas,

Re: Response to Draft Project File Report
City of Toronto Watermain Replacement on Martin Grove Road
Class Environmental Assessment – Schedule B
Mimico Creek Watershed; City of Toronto; Etobicoke York Community Council Area

Toronto and Region Conservation Authority (TRCA) staff received the draft Project File Report (PFR) dated for the above-noted project on February 5, 2021

PROJECT OVERVIEW

Staff understands that the draft PFR involves the investigation of alternatives for the need to replace the existing 300 mm and 400 mm diameter watermains located within Martin Grove Road. The material of these watermains are cast / ductile iron and were installed between 1930 and 1950. The existing watermain north of Savalon Court was recently replaced in 2019. The watermain south of Savalon Court at Rathburn Road has experienced over ten breaks since 2010. The existing watermains are at the end of their service life and require to be brought to a state of good repair. The existing watermain crossing Mimico Creek are of a similar age and is one of the last segments remaining that needs to be replaced / rehabilitated.

The City of Toronto developed alternative solutions to replace the subject watermain that crosses Mimico Creek including:

- Do nothing.
- Install watermain along a new alignment below the bridge structure and inside Martin Grove road right-of-way.
- Install watermain along a new alignment west of the Martin Grove bridge and outside of the Martin Grove road right-of-way, but within an existing utility easement.
- Install watermain along a new alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way.

PROJECT REVIEW

Staff understands the preferred alternative selected for implementation involves Alternative #4 – installing the new watermain by Horizontal Directional Drilling (HDD) along an alignment east of the Martin Grove bridge and outside of the Martin Grove road right-of-way, within Ravenscrest Park. While staff has no objection in principle to the preferred alternative based on the provided assessment in the Draft PFR, the following concerns identified in Appendix A must be addressed in the final EA document. Detailed comments are provided in Appendix A. These comments should be included as an appendix in the final EA report.

RESUBMISSION REQUIREMENTS

Please ensure TRCA receives a copy of the Notice of Study Completion, as well as a digital copy of the Final PFR for staff review and comment. The final EA document should be accompanied by a covering letter which uses the numbering scheme provided in this letter and identifies how these comments have been addressed. Digital materials must be submitted in PDF format. Materials may be submitted via e-mail (if less than 25 MB), or through file transfer protocol (FTP) sites (if posted for a minimum of two weeks).

REVIEW FEES

Please be advised that this application is subject to a $10, 300 (Schedule B, Standard) application review fee as per our 2018 Fee Schedule. Please note:

1. **To ensure accurate processing of your fee, please ensure your accounting department references CFN 64294 when making any payments.**
2. Payment method and timing must be noted in your covering letter response.
3. Payments can be made by:
   a. Cheque: please attach the cheque to your resubmission. Alternatively, if sending separately through your accounting department, please request your accounting department submit the cheque to the attention of Oxana Stanislavskaya - Accounting Clerk, Finance Corporate Services, TRCA.
   b. Credit Card: please contact Oxana Stanislavskaya at extension 6442 for payments made over the phone.
   c. Electronic Fund Transfer: this option may be available through your accounting department.

Should you have any questions or require any additional information please contact me at extension 5310 or at zack.carlan@trca.ca.

Regards,

Zack Carlan
Senior Planner, Infrastructure Planning and Permits
Development and Engineering Services

Attached: Appendix A

BY E-MAIL

cc:

City of Toronto	Amir Gafoor, City of Toronto
Consultant:	Ken Wallace, RV Anderson
TRCA:	Sharon Lingertat, Senior Manager, Infrastructure Planning and Permits

APPENDIX A: TRCA COMMENTS AND PROPONENT RESPONSES

ITEM	TRCA COMMENTS (March 19, 2021)	PROPONENT/CONSULTANT RESPONSE
1.	Staff have no objection in principle to the preferred alternative #4. However, please note that TRCA requires the watermain to be a minimum of 2 m below the invert of the creek which must be shown in subsequent submissions as part of detailed design. This is a requirement of the detailed design process and future permit application to TRCA.	
2.	Please note the proposed work associated with preferred alternative 4 is located within the regulatory floodplain on the north side of Mimico Creek. As part of the detailed design stage, please ensure a flood contingency is developed and provided as part of the permit submission package. The design drawing should also include all TRCA standard flooding notes.	
3.	Please note the proposed watermain and work for the preferred alternative is proposed on TRCA property (under management agreement with the City of Toronto) as is understood by the City of Toronto and identified in the draft EA document. Please be advised of the following. a) TRCA Property requirements will be required to be finalized prior to permit issuance which includes the requirement for a permanent easement for proposed infrastructure on TRCA property. A permanent easement for infrastructure on TRCA property requires TRCA board approval and lead time prior to construction. Following the filing of the EA, it is requested that City staff continue to consult with TRCA staff regarding the detailed design and permit application submission in addition to TRCA property timelines. Staff request that following the filing of the EA, when available, the City of Toronto provide the permit application for review with the proposed watermain alignment and all necessary information so that technical staff can review and provide comment on the proposed permanent alignment of the watermain infrastructure on TRCA property to allow the permanent easement process to proceed. TRCA technical, planning and property staff will need to be appropriately satisfied prior to the permanent easement process proceeding and the easement being provided for board approval. b) For the TRCA permit process, please note that TRCA Archaeology screening will be required for any ground disturbance associated with construction on TRCA property that has not already been previously screened through TRCA archaeology process. Staff note a previous screening for the geotechnical investigation associated with this project. Staff will continue to coordinate with City of Toronto staff for next steps on this requirement.	

4.	Please advise on any requirement to complete work on the south slopes of Mimico Creek, east of Martin Grove, north of Rathburn Road, within TRCA regulated area. The alternatives and preliminary drawings appear to show that the alignment will pass through this area but it is unclear if there is any work or ground disturbance required at this location. Please confirm and revise the EA document, if there will be any disturbance to the south slope/regulated area associated with Mimico Creek – additional TRCA requirements will apply.	
5.	It is noted in the public consultation records that there are road improvements for Martin Grove Road which includes bike lanes, sidewalk improvements filed within the EA document. Please confirm that these proposals are not a part of the proposed EA.	
6.	The EA document (as noted in Natural Sciences Report) also indicates that there may be additional watermains proposed south of the Mimico Creek crossing and Rathburn Road extending past Saralou Court (*within Table 6 Project Description Activity Summary Overview*). If this additional area is required for this watermain scope (particularly near Saralou Court – as this area is also regulated by TRCA), please revise the EA document to better reflect the proposed watermain alignment and the extent. Note that the permit required for this work will also need to account for any watermain proposed within the regulated area near Saralou Court. Please revise the EA document to reflect this, if this is the case.	
7.	Throughout the EA document (including the last page – conceptual design drawing) appear to contain additional "options" for the proposed alternative – please see final page in draft EA which appears to be conceptual design, page 5 of LGL's natural sciences report, etc. Please clarify if these options line up with the formally proposed alternatives or are more detailed options for the preferred alternative #4.	
8.	Please be advised that the subject property appears to fall within the Highly Vulnerable Aquifers (HVA), vulnerable areas under the Credit Valley - Toronto and Region - Central Lake Ontario Source Protection Plan (CTC SPP).	
9.	Please be advised that TRCA Erosion Risk Management (ERM) staff are currently in the process of implementing the "Mimico Creek behind 2 Kevi Lane and 194 Rathburn Road Slope Stabilization and Erosion Control Project." This project is being planned to undertake remedial works within the subject area and to provide long term erosion protection to the adjacent properties at these specific locations. City coordination may be required with the internal TRCA project depending on timelines. Although the TRCA project is not proposed for implementation until after 2022 please ensure this project is taken into account considering the study areas overlap. Note the TRCA Project Manager is Jaya Soora (jaya.soora@trca.ca Ext. 5533) if additional information is required.	
10.	Please engage TRCA staff for additional permitting requirements as part of detailed design, prior to submitting a permit application for the works. Staff will also identify timelines and required fees for the permit application at that time.	

11.	It appears there may be additional property potentially required for the watermain installation in addition to TRCA property and the City ROW when the watermain will ultimately cross Mimico Creek. Note that as part of detailed design and TRCA permit application, landowner authorization will be required for any work on private property.	
12.	It is noted that the existing watermain is located below Mimico Creek and within the Right of Way (ROW). Please advise on the plan for the existing watermain and whether it will be removed, abandoned, etc. as part of this project.	

Ken P. Wallace

From: Tomas Ycas <Tomas.Ycas@toronto.ca>
Sent: May 13, 2021 2:45 PM
To: 'Zack Carlan'
Cc: Amir Gafoor; Bavendan Paramsothy; Varathan Shanmuganathan; Senuri Jayasekara; Ken P. Wallace
Subject: RE: CFN 64294 - Watermain Replacement on Martin Grove Road (Schedule B EA) - TRCA Response to Draft PFR March 19, 2021
Attachments: Appendix - Draft PFR Comments CFN 64294-RVAresponse20210511.pdf

Hi Zack,

Following up our meeting a couple of weeks ago and the email below, please find enclosed a table response matrix for your review that addresses each of the TRCA comments from the March 19, 2021 letter.

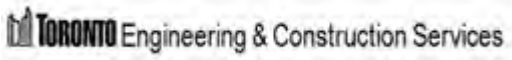
I will have to provide the updated report in a subsequent email due to the large file sizes that includes the response matrix and updated main body addressing the comments.

If there are any questions, please let me know.

Thanks,

Tomas

Tomas Ycas, P.Eng.
Engineer, Standalone Undergrounds
Design & Construction, Linear Underground Infrastructure
Engineering & Construction Services
City of Toronto
Metro Hall, 20th Floor
55 John Street
Toronto, Ontario M5V 3C6
P: 416-392-4956
E: tomas.ycas@toronto.ca



From: Zack Carlan [mailto:Zack.Carlan@trca.ca]
Sent: March 19, 2021 5:10 PM
To: Tomas Ycas <Tomas.Ycas@toronto.ca>
Cc: Amir Gafoor <Amir.Gafoor@toronto.ca>
Subject: CFN 64294 - Watermain Replacement on Martin Grove Road (Schedule B EA) - TRCA Response to Draft PFR March 19, 2021

Hello Tomas,

Please see attached for TRCA response to the Draft PFR for the above-noted project.

Thank you,

Zack Carlan
Senior Planner
Infrastructure Planning and Permits | Development and Engineering Services

T: (416) 661-6600 ext. 5310
E: zack.carlan@trca.ca
A: 101 Exchange Avenue, Vaughan, ON, L4K 5R6 | trca.ca

APPENDIX A: TRCA COMMENTS AND PROPONENT RESPONSES

ITEM	TRCA COMMENTS (March 19, 2021)	PROPONENT/CONSULTANT RESPONSE (May11/21)
1.	Staff have no objection in principle to the preferred alternative #4. However, please note that TRCA requires the watermain to be a minimum of 2 m below the invert of the creek which must be shown in subsequent submissions as part of detailed design. This is a requirement of the detailed design process and future permit application to TRCA.	A minimum of 2 m depth from the invert of the creek will be provided and shown in the permit submission drawings.
2.	Please note the proposed work associated with preferred alternative 4 is located within the regulatory floodplain on the north side of Mimico Creek. As part of the detailed design stage, please ensure a flood contingency is developed and provided as part of the permit submission package. The design drawing should also include all TRCA standard flooding notes.	RVA will provide the details in the permit submission drawings
3.	Please note the proposed watermain and work for the preferred alternative is proposed on TRCA property (under management agreement with the City of Toronto) as is understood by the City of Toronto and identified in the draft EA document. Please be advised of the following. a) TRCA Property requirements will be required to be finalized prior to permit issuance which includes the requirement for a permanent easement for proposed infrastructure on TRCA property. A permanent easement for infrastructure on TRCA property requires TRCA board approval and lead time prior to construction. Following the filing of the EA, it is requested that City staff continue to consult with TRCA staff regarding the detailed design and permit application submission in addition to TRCA property timelines. Staff request that following the filing of the EA, when available, the City of Toronto provide the permit application for review with the proposed watermain alignment and all necessary information so that technical staff can review and provide comment on the proposed permanent alignment of the watermain infrastructure on TRCA property to allow the permanent easement process to proceed. TRCA technical, planning and property staff will need to be appropriately satisfied prior to the permanent easement process proceeding and the easement being provided for board approval. b) For the TRCA permit process, please note that TRCA Archaeology screening will be required for any ground disturbance associated with construction on TRCA property that has not already been previously screened through TRCA archaeology process. Staff note a previous screening for the geotechnical investigation associated with this project. Staff will continue to coordinate with City of Toronto staff for next steps on this requirement.	A pre-consultation meeting will be arranged with the TRCA prior to applying for formal TRCA approval.
4.	Please advise on any requirement to complete work on the south slopes of Mimico Creek, east of Martin Grove, north of Rathburn Road, within TRCA regulated area. The alternatives and preliminary drawings appear to show that the alignment will pass through this area but it is unclear if there is any work or	The proposed watermain will be installed by HDD. Excavations and

	ground disturbance required at this location. Please confirm and revise the EA document, if there will be any disturbance to the south slope/regulated area associated with Mimico Creek – additional TRCA requirements will apply.	disturbances will be limited to under the road.
5.	It is noted in the public consultation records that there are road improvements for Martin Grove Road which includes bike lanes, sidewalk improvements filed within the EA document. Please confirm that these proposals are not a part of the proposed EA.	The road improvements are not part of this EA.
6.	The EA document (as noted in Natural Sciences Report) also indicates that there may be additional watermains proposed south of the Mimico Creek crossing and Rathburn Road extending past Saralou Court (*within Table 6 Project Description Activity Summary Overview*). If this additional area is required for this watermain scope (particularly near Saralou Court – as this area is also regulated by TRCA), please revise the EA document to better reflect the proposed watermain alignment and the extent. Note that the permit required for this work will also need to account for any watermain proposed within the regulated area near Saralou Court. Please revise the EA document to reflect this, if this is the case.	The Natural Sciences Report has been revised the EA documents. A permit from the TRVA will be applied for for the entire section.
7.	Throughout the EA document (including the last page – conceptual design drawing) appear to contain additional "options" for the proposed alternative – please see final page in draft EA which appears to be conceptual design, page 5 of LGL's natural sciences report, etc. Please clarify if these options line up with the formally proposed alternatives or are more detailed options for the preferred alternative #4.	The Natural Sciences Report has been revised to match the options in the EA report.
8.	Please be advised that the subject property appears to fall within the Highly Vulnerable Aquifers (HVA), vulnerable areas under the Credit Valley - Toronto and Region - Central Lake Ontario Source Protection Plan (CTC SPP).	Noted. The EA document has been updated to account for this. It is noted that installing a watermain by HDD is not considered a drinking water threat.
9.	Please be advised that TRCA Erosion Risk Management (ERM) staff are currently in the process of implementing the "Mimico Creek behind 2 Kevi Lane and 194 Rathburn Road Slope Stabilization and Erosion Control Project." This project is being planned to undertake remedial works within the subject area and to provide long term erosion protection to the adjacent properties at these specific locations. City coordination may be required with the internal TRCA project depending on timelines. Although the TRCA project is not proposed for implementation until after 2022 please ensure this project is taken into account considering the study areas overlap. Note the TRCA Project Manager is Jaya Soora (jaya.soora@trca.ca Ext. 5533) if additional information is required.	noted
10.	Please engage TRCA staff for additional permitting requirements as part of detailed design, prior to submitting a permit application for the works. Staff will also identify timelines and required fees for the permit application at that time.	A pre-consultation meeting will be arranged with the TRCA prior to applying for formal TRCA approval.

11.	It appears there may be additional property potentially required for the watermain installation in addition to TRCA property and the City ROW when the watermain will ultimately cross Mimico Creek. Note that as part of detailed design and TRCA permit application, landowner authorization will be required for any work on private property.	No additional properties are required.
12.	It is noted that the existing watermain is located below Mimico Creek and within the Right of Way (ROW). Please advise on the plan for the existing watermain and whether it will be removed, abandoned, etc. as part of this project.	The existing watermain will be abandoned by capping at the ends.

Ken P. Wallace

From: Alistair Jolly <Alistair.Jolly@trca.ca>
Sent: September 20, 2021 8:14 AM
To: Tomas Ycas
Subject: RE: Martin Grove Stage 2 TRCA Assessment

Hi Tomas. Thanks for the S1 report. I reviewed the recommendations and aerial photographs and while I would agree the bulk of the area is disturbed, the tree line we are testing seems to be intact throughout the series of aerial photographs. This area is actually east of the area covered in S1 report and is therefore not included in the recommendations. Given the trees appear to be undisturbed, S2 testing remains necessary.

Alistair Jolly, M.A.
Supervisor, Archaeology
Professional Services | Restoration and Infrastructure

T: (416) 661-6600 ext. 6405
C: (416) 771-2004
E: alistair.jolly@trca.ca
A: 1229 Bethesda Sideroad, Richmond Hill, ON L4E 1A2 | trca.ca

Toronto and Region Conservation Authority

From: Tomas Ycas
Sent: Friday, September 17, 2021 9:42 AM
To: Alistair Jolly
Cc: Amir Gafoor
Subject: Martin Grove Stage 2 TRCA Assessment

Hi Alistair,

As discussed, could you provide some quick correspondence regarding the requirement for the Stage 2 Arch Assessment to be added to the EA submission? We just want to demonstrate that we have completed our due diligence as it pertains to any archaeological findings.

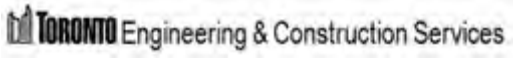
For your reference, I have attached the draft of the stage 1 assessment. It is in "draft" as we have not yet received comments from the MCFN representatives.

Let me know if there are any questions.

Thanks,

Tomas

Tomas Ycas, P.Eng.
Engineer, Standalone Undergrounds
Design & Construction, Linear Underground Infrastructure
Engineering & Construction Services
City of Toronto
Metro Hall, 20th Floor
55 John Street
Toronto, Ontario M5V 3C6
P: 416-392-4956
E: tomas.ycas@toronto.ca



Ministry of Heritage, Sport, Tourism, and Culture Industries

Archaeology Program Unit
Programs and Services Branch
Heritage, Tourism and Culture Division
5th Floor, 400 University Ave.
Toronto ON M7A 2R9
Tel.: (519) 671-7742
Email: Shari.Prowse@ontario.ca

Ministère des Industries du patrimoine, du sport, du tourisme et de la culture

Unité des programme d'archéologie
Direction des programmes et des services
Division du patrimoine, du tourisme et de la culture
5e étage, 400 ave. University
Toronto ON M7A 2R9
Tél. : (519) 671-7742
Email: Shari.Prowse@ontario.ca

Ontario

Nov 25, 2021

Kassandra Aldridge (P439)
Archeoworks Inc.
1029 - 16715-12 Yonge Newmarket ON L3X 1X4

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 1 Archaeological Assessment for the Proposed Martin Grove Watermain Replacement Within the Road Allowance between Concession 1 and 2 Fronting on the Humber River and Within Part of Lot 12, Concession 1 Fronting on the Humber River Geographic Township of Etobicoke Historical County of York Now the City of Toronto Ontario", Dated Feb 19, 2021, Filed with MHSTCI Toronto Office on Oct 25, 2021, MHSTCI Project Information Form Number P439-0132-2020, MHSTCI File Number 0013523

Dear Miss Aldridge:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18.[1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 *Standards and Guidelines for Consultant Archaeologists* set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the Stage 1 assessment of the study area as depicted in Maps 13 and of the above titled report and recommends the following:

1. With archaeological potential having been entirely removed within the study corridor, per Section 1.3.2 and Section 1.4.1, Standard 1.f. of the 2011 S&G, no further archaeological concerns exist. No further work is recommended within the study corridor and it may be considered free of further archaeological concern.

2. Should construction activities extend beyond the assessed limits of the study corridor, further archaeological investigation will be required to assess the archaeological potential of these lands.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 *Standards and Guidelines for*

Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Shari Prowse
Archaeology Review Officer

cc. Archaeology Licensing Officer
Ken Wallace,R.V. Anderson Associates Limited
Eric Beales,City of Toronto

[1] *In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.*

Ken P. Wallace

From: Amir Gafoor <Amir.Gafoor@toronto.ca>
Sent: August 5, 2022 9:13 AM
To: Ken P. Wallace
Cc: Talal Antar
Subject: FW: Martin Grove Road Watermain Replacement EA Study - Archaeological Assessment

[CAUTION EXTERNAL EMAIL] Make Sure that it is legitimate before Replying or Clicking on any links

Hi Ken,

As requested, please see below.

Thank you.

Amir Gafoor
2-8323

From: Tracy Manolakakis
Sent: August 3, 2022 11:22 AM
To: Amir Gafoor <Amir.Gafoor@toronto.ca>
Subject: FW: Martin Grove Road Watermain Replacement EA Study - Archaeological Assessment

No concerns with Stage 1 or 2.

From: Adrian Blake <Adrian.Blake@mncfn.ca>
Sent: August 2, 2022 11:13 AM
To: Tracy Manolakakis <Tracy.Manolakakis@toronto.ca>
Cc: Abby LaForme <Abby.LaForme@mncfn.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Subject: RE: Martin Grove Road Watermain Replacement EA Study - Archaeological Assessment

Tracy,

I can now confirm that we also do not have any questions or concerns for you regarding the portion of the assessment carried out by the TRCA.

Regards,
Adrian Blake, MSc. (he/him)
Field Archaeologist

Department of Consultation and Accommodation (DOCA)
Mississaugas of the Credit First Nation (MCFN)

4065 Highway 6 North, Hagersville, ON N0A 1H0
M: 905-979-3862
http://www.mncfn.ca

From: Tracy Manolakakis <Tracy.Manolakakis@toronto.ca>
Sent: Tuesday, July 26, 2022 4:22 PM
To: Adrian Blake <Adrian.Blake@mncfn.ca>
Cc: Abby LaForme <Abby.LaForme@mncfn.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Subject: RE: Martin Grove Road Watermain Replacement EA Study - Archaeological Assessment

Thank you Adrian for getting back to me. I wanted to confirm no comments on the Stage 1-2 prepared by TRCA which was attached.

Tracy

From: Adrian Blake <Adrian.Blake@mncfn.ca>
Sent: July 15, 2022 2:03 PM
To: Tracy Manolakakis <Tracy.Manolakakis@toronto.ca>
Cc: Abby LaForme <Abby.LaForme@mncfn.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Subject: RE: Martin Grove Road Watermain Replacement EA Study - Archaeological Assessment

Tracy,

Thank you for following up on this one with us. I fell ill and wasn't able to reply to this one as soon as I would have liked.

I searched around and could not find any comments provided by MCFN for this archaeological assessment. Given that, I did a read through and assessed the provided report. After reviewing it, MCFN does not have any questions, concerns of comments regarding this Stage 1 archaeological assessment.

Regards,
Adrian Blake, MSc. (he/him)
Field Archaeologist

Department of Consultation and Accommodation (DOCA)
Mississaugas of the Credit First Nation (MCFN)
4065 Highway 6 North, Hagersville, ON N0A 1H0
M: 905-979-3862
http://www.mncfn.ca

From: Tracy Manolakakis <Tracy.Manolakakis@toronto.ca>
Sent: Monday, June 20, 2022 1:30 PM
To: Abby LaForme <Abby.LaForme@mncfn.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Subject: Martin Grove Road Watermain Replacement EA Study - Archaeological Assessment

Hi Abby and Adam,

One of my staff, Kate Kusiak is no longer working at the City as she recently decided to leave to care for her young family. She was working on the Martin Grove Road Watermain Replacement Environmental Assessment study. I was informed by the consultants that a Stage 1 and Stage 2 archaeological assessment reports were completed in January 2021 and December 2021. Unfortunately, I am unable to confirm if MNCFN had comments on the reports as I can only find Kate's notes in the file that indicate that the MNCFN were contacted about the study.

Would you be able to check your records and confirm if you have any comments?

Thanks,
Tracy

Tracy Manolakakis (she/her)
Manager, Public Consultation Unit
Policy, Planning, Finance & Administration
City of Toronto

Tel: 416-392-2990
Email: tracy.manolakakis@toronto.ca

TORONTO

Ministry of Tourism, Culture and Sport (MTCS)

Archaeology Program Unit
Programs and Services Branch
Heritage, Tourism and Culture Division
5th Floor, 400 University Ave.
Toronto ON M7A 2R9
Tel.: (416) 414-7787
Email: Jessica.Marr@ontario.ca

Ministère du Tourisme, de la Culture et du Sport (MTCS)

Unité des programme d'archéologie
Direction des programmes et des services
Division du patrimoine, du tourisme et de la culture
5e étage, 400 ave. University
Toronto ON M7A 2R9
Tél. : (416) 414-7787
Email: Jessica.Marr@ontario.ca

Aug 8, 2022

Alistair Jolly (P303)
Toronto and Region Conservation Authority
5 Shoreham Downsview ON M3N 1S4

RE: Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT Watermain Replacement on Martin Grove Road (Schedule B EA) Lot 12, Concession Fronting the Humber I, Geographic Township of Etobicoke, Historic York County in the City of Toronto", Dated Aug 5, 2022, Filed with MHSTCI Toronto Office on N/A, MHSTCI Project Information Form Number P303-0632-2021, MHSTCI File Number 0015183

Dear Mr. Jolly:

The above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18, has been entered into the Ontario Public Register of Archaeological Reports without technical review.[1]

Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require further information, please do not hesitate to send your inquiry to Archaeology@Ontario.ca

cc. Archaeology Licensing Officer
Michael Popik,City of Toronto
Lisa Turnbull,Toronto and Region Conservation Authority

1*In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.*