CLASS ENVIRONMENTAL ASSESSMENT FOR REMEDIAL FLOOD AND EROSION CONTROL PROJECTS

Yellow Creek Near Heath Street East

Erosion Control and Slope Stabilization Project

City of Toronto

PROJECT PLAN – FOR REVIEW

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Executive Summary

The purpose of the Yellow Creek Near Heath Street East Erosion Control and Slope Stabilization Project (the "Project") is to provide long-term protection to essential structures identified to be at-risk from the hazards of erosion and slope instability. Managing risks associated with flooding and erosion hazards is one of the primary roles of conservation authorities under the Conservation Authorities Act (R.S.O 1990). Toronto and Region Conservation Authority (TRCA) fulfills this role through multiple natural resource management programs and services, including the Erosion Risk Management Program (ERMP). The proposed work described herein is prioritized and funded through the ERMP and has been planned in accordance with Conservation Ontario's Class Environmental Assessment for Remedial Flood and Erosion Control Projects, amended 2013 (Class EA), the approved planning process for this type of undertaking. Overall, there are three primary objectives for the Project:

- **Risk Mitigation** – to protect human life and property from the hazards of erosion;
- **Naturalization** – to support native terrestrial and aquatic habitat;
- **Compatibility** – to ensure the Project is planned and implemented in context of the surrounding built environment.

The Project site was first identified to TRCA in 2015 by the City of Toronto; however, initial erosion and slope instability issues were reported to have occurred following the July 8, 2013 severe weather event. Following notification by the City, TRCA retained GeoTerre Ltd. (GeoTerre) to undertake a slope stability and erosion risk assessment to determine the extent of risk to essential structures located within the Project's study area. The results of this assessment identified multiple residential dwellings were at long-term risk from the hazards of erosion and slope instability. In 2022, Terraprobe conducted a Geotechnical Investigation and Long Term Stable Slope Crest Update report and confirmed risk to dwellings at top of slope. As such, TRCA has prioritized remedial erosion control and slope stabilization work within the Project area to safeguard life and property.

The Class EA for the Project was initiated on June 8, 2018 with the filing of the Notice of Intent (NOI). The NOI and subsequent project notices were also distributed to Indigenous communities, local community and residential groups, homeowners within the vicinity of the Project, and regulatory agencies including Conservation Ontario (CO), the Ministry of Environment, Conservation and Parks (MECP), the Ministry of Natural Resources and Forestry (MNRF), and the City of Toronto.

As part of the Class EA process, a range of erosion control and slope stabilization solutions were developed and evaluated. Public consultation was coordinated by TRCA to provide opportunities for public and stakeholder participation throughout the planning stages for the Project. TRCA hosted multiple public meetings to receive input on the alternative erosion control and slope stabilization solutions and incorporated this input as part of the evaluation process. The outcome of the Class EA process determined that remedial works, including undertaking soil nailing and localized channel realignment, was the preferred solution to provide long-term protection to the at-risk structures located within the Project area. Secondary benefits of the proposed work include stabilizing City Lands to support reconstruction of a decommissioned pedestrian staircase.

Following the thirty (30) day stakeholder and public review period of this Class EA Project Plan, and the successful resolution of any concerns received during this review, TRCA intends to develop the detailed designs of the selected slope stabilization solution and obtain the necessary approvals to proceed with its implementation.

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Glossary

Crest of slope – the point at which the top of a slope meets the tableland.

Erosion – the displacement of soil particles by the forces of wind or water.

Gabion basket – a type of erosion control structure. It is comprised of a wire cage filled with stone.

Oversteepened – when the angle of a slope is greater than the stable inclination of its composite materials.

Ravine – a type of landform characterized by a low area of land bounded by steep sides. A watercourse typically runs through this feature. Ravines are similar in form to a valley but at a smaller scale.

Riverine – relating to something that is situated adjacent to a watercourse or riverbank, also referred to as riparian.

Seepage – the escape of liquid or gas through a porous material.

Slope stability – the capacity for a slope to withstand movement. Slope stability is dependent on the inclination of a slope and the ability of slope materials to resist loading forces.

Toe of slope – the point at which the bottom of a slope meets the ground.

Undercutting – the act of material being removed from the base of a feature.

Valley – a type of landform characterized by a depression in the Earth's surface that exists in between natural bounding features, such as hills. A watercourse typically runs through this feature.

Watercourse – a natural or artificial channel through which water flows.

Watershed – an area of land where precipitation collects and drains off into a single outlet, such as a river or other body of water. A watershed is also referred to as a drainage basin or catchment area.

1.0 INTRODUCTION

TRCA has undertaken multiple investigations and studies to assess erosion and slope stability hazards within the northern section of the Vale of Avoca Ravine, in the City of Toronto (**Figure 1**). Based on the results of these studies, TRCA has proposed to undertake remedial erosion control and slope stabilization work. This work will be completed as part of the Yellow Creek Near Heath Street East Erosion Control and Slope Stabilization Project (hereafter referred to as "the Project"). The purpose of the Project is to take action to safeguard human life and property from the hazards of erosion and slope instability by providing long-term, low maintenance protection to essential structures located at the top of slope. Due to the nature of the proposed work, the Project is being completed in accordance with Conservation Ontario's Class Environmental Assessment for Remedial Flood and Erosion Control Projects (Class EA), amended 2013.

The Project is located northeast of Yonge Street and St Clair Avenue East within the Don River Watershed. The City of Toronto notified TRCA of slope stability issues below Heath Street East in 2015; however, initial erosion and slope stability concerns were reported to have occurred following the July 8, 2013 severe weather event. Yellow Creek, an active watercourse, runs through the Project area along the toe of the east valley wall. Elevated creek flows and flooding within the creek channel are contributing to slope instability and erosion concerns and necessitate that channel remediation is also undertaken as part of the proposed work for the Project.

This Project Plan documents the decision-making process exercised when selecting the preferred measure(s) for carrying out the proposed remedial work. Accordingly, this Project Plan includes:

- the situation or problem to be addressed, including the cause(s) and history of the problem;
- the preparation of a baseline inventory to provide the information needed to evaluate the alternative measures;
- the examination of a full range of alternative remedial measures and the selection of a preferred alternative. Advantages and disadvantages of each alternative are considered in the analysis, including a "Do Nothing" option;
- the rationale underlying the selection of the preferred alternative method to carry out the remedial work;
- an environmental analysis of the preferred alternative, including a detailed study of the temporary and permanent net impacts of the proposed remedial work;
- identification of methods for avoiding or mitigating negative impacts;
- a record of consultation with interested persons, Indigenous communities, government agencies, and community groups;
- an outline of the monitoring program which will commence upon completion of the work.

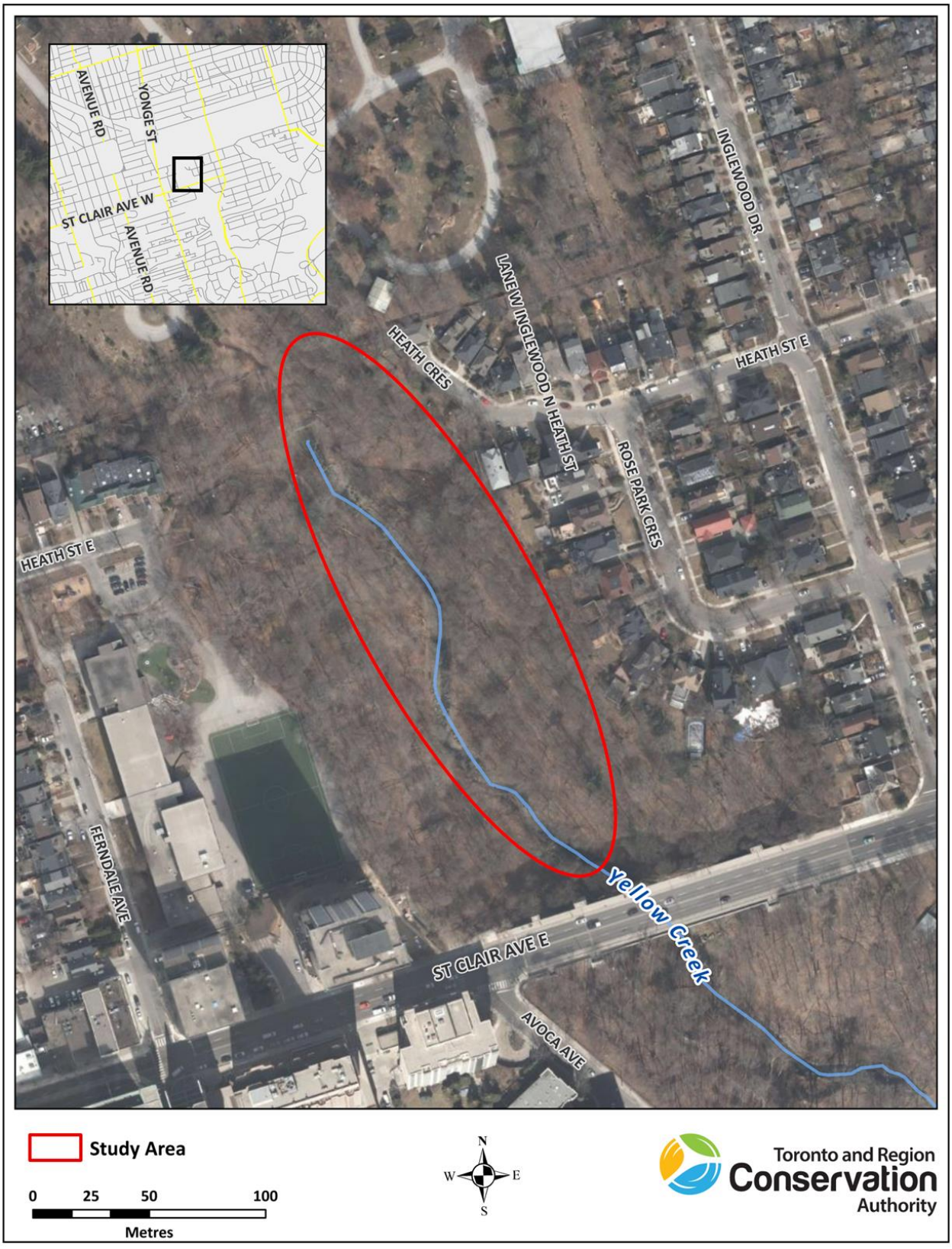

Figure 1: The Project study area. Source: TRCA, 2019.

1.1 Relationship of the Undertaking to the Environmental Assessment Act

TRCA is defined as a public body in Section 3 of Regulation 334/90 in the *Environmental Assessment Act (R.S.O. 1990)* (EA Act) and must conduct its remedial flood and erosion control projects in accordance with said Act.

Recognizing that common elements exist in addressing flood and erosion problems, a coordinated approach to environmental assessments was developed by Conservation Ontario (CO) in 1993 for use by all of the Conservation Authorities (CAs), referred to as the Class Environmental Assessment for Remedial Flood and Erosion Control Projects (Class EA) (amended 2013). This project was completed in accordance with the Class EA process and aligns with the following excerpt from the CO Class EA document:

> *"Remedial Flood and Erosion Control Projects refer to those projects undertaken by Conservation Authorities, which are required to protect human life and property, in previously developed areas, from an impending flood or erosion problem. Such projects do not include works which facilitate or anticipate development. Major flood and erosion control undertakings which do not suit this definition, such as multipurpose projects, lie outside the limits of this Class and require an Individual Environmental Assessment"* (CO, 2013).

Over twenty years of experience have demonstrated that using the Class EA approach is an effective way of complying with the EA Act's requirements. Approval of the Class EA allows CAs to carry out these types of projects without applying for formal approval under the EA Act on the condition that all other necessary federal and provincial approvals are obtained (CO, 2013). A chart illustrating the key steps of the Class EA planning and design process is shown below in **Figure 2.**

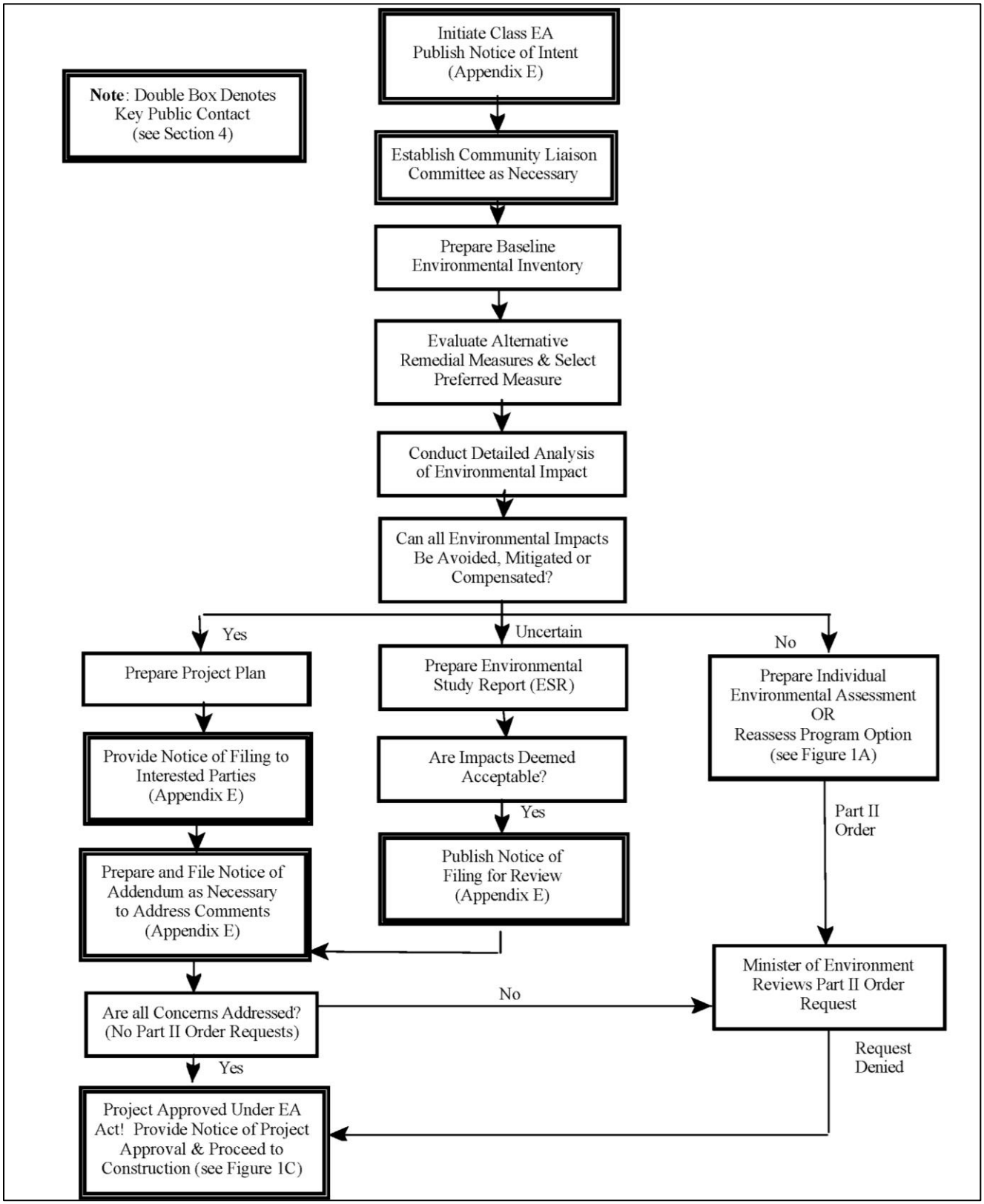

Figure 2: Class EA Planning and Design Process (Conservation Ontario, 2013).

1.2 Purpose of the Undertaking

A. Risk Mitigation

TRCA has proposed to undertake slope stabilization and channel remediation works based on the studies and field investigations completed to date, including the slope stability and erosion risk assessments completed by GeoTerre and Terraprobe (**Appendix A**). Geoterre's, and subsequently Terraprobe's, assessment identified multiple essential structures located at the top of the east valley slope are at risk should no remedial works be undertaken. GeoTerre's findings also confirmed that undertaking slope stabilization was necessary for the City of Toronto to reinstate a municipally owned pedestrian staircase located off of Heath Street East. This staircase has been impacted by slope stability issues and is currently closed to the public due to safety concerns.

The main objective of the Project is to take action to protect at-risk structures from the hazards of riverine and valley erosion. Protection will be provided through the implementation of an effective long-term, low maintenance erosion control and slope stabilization solution. Slope stabilization efforts will also result in secondary benefits to the social environment as it will provide the necessary stabilization required to reconstruct the impacted pedestrian staircase.

B. Naturalization

The second objective of the Project is to implement a solution that will not only stabilize the east valley wall and protect essential structures, but will also strive to improve ravine habitat conditions. The identified preferred solution for slope stabilization, in conjunction with post-construction site restoration, aims to control local populations of invasive species and incorporate native plant species that will:

- Provide increased stabilization to the slope face
- Increase resiliency to erosion forces resulting from rain runoff
- Enhance biodiversity of terrestrial and riparian habitat
- Improve the ecological health of the surrounding community by providing better resiliency to future changes in the environment

C. Compatibility

The third objective recognizes that there are existing essential structures and infrastructure adjacent to the Project which must be considered when developing remedial design alternatives to ensure compatibility between the proposed works and the built environment. Achieving compatibility has been accomplished through the evaluation of a range of conceptual design solutions.

TRCA acknowledges that the City of Toronto is undertaking a Geomorphic Systems Master Plan (GSMP) to identify the root cause of the erosion, flooding, and stormwater management issues prevalent throughout the Vale of Avoca ravine. The objective of TRCA's proposed work is to provide a long-term solution to address the erosion and slope instability hazards identified within the Project area; this work will be incorporated into the GSMP to ensure compatibility with future plans and initiatives undertaken by the City.

1.3 Description of the Study Area

The focus of the Project involves stabilizing a steep segment of eastern valley slope within the Vale of Avoca ravine (**Figure 3**). The Project, located within a core area of the City of Toronto, is surrounded by heavy urban land use (**Figure 4**). Heavily urbanized environments have critical implications on storm water management and typically result in increased erosion issues.

Figure 3: The eastern valley slope where slope stabilization work has been recommended (TRCA, 2016).

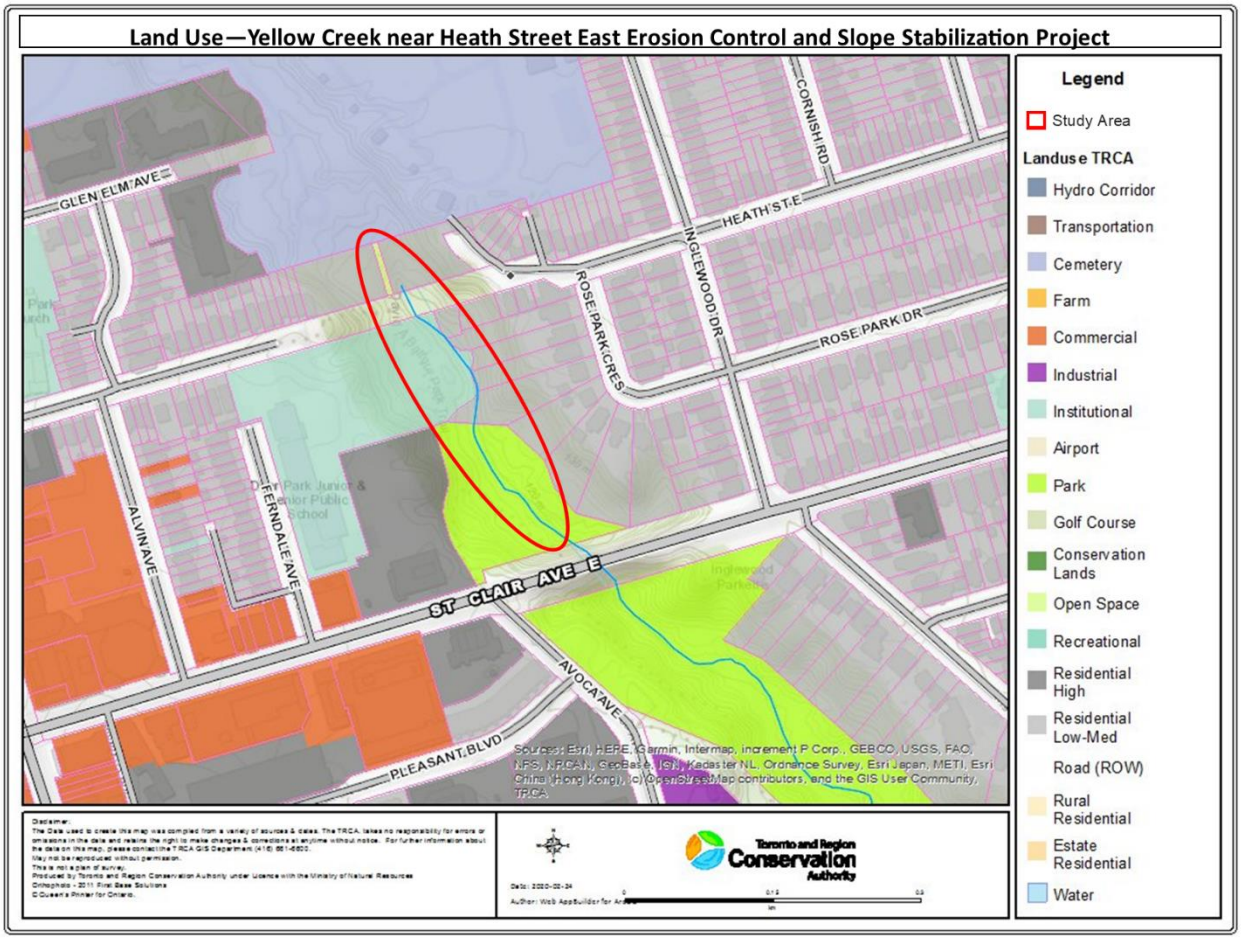

Figure 4: Land use surrounding the Project study area. (TRCA, 2020).

A City of Toronto owned pedestrian staircase located off of Heath Street East is located within the Project area and was reported to have been impacted by slope stability issues following the July 8, 2013 severe weather event. Due to continued slope stability concerns affecting the structural integrity of the staircase, it was closed in 2014 for the protection of public safety. The condition of the staircase prompted the City to undertake multiple investigations, which identified fundamental slope stability issues below the structure. The City subsequently notified TRCA of these findings and TRCA further investigated the east valley slope within the Project area to determine whether slope conditions were presenting a risk to essential structures located along the top of slope. TRCA's investigations identified that slope instability and erosion hazards were prevalent across the entire eastern slope within the Project area, and multiple essential structures at the top of slope were at long-term risk. Examples of erosion and slope instability impacting the eastern valley slope can be seen in **Figure 5****Figure 6** **Figure 7**.

Figure 5: Displacement of soil across the lower landing and leaning guard rails of the municipally owned staircase (TRCA, 2017).

Figure 6: A failing retaining wall below a private residential dwelling can be seen above; the bare upper slope below this property is also indicative of active slope erosion (TRCA, 2016).

Figure 7: Slope instability and active erosion along the east valley wall have caused a property fence to lean and exposed its footings (TRCA, 2016).

In addition to fundamental slope instability along the eastern valley wall, active toe erosion along the base of this slope is contributing to slope stability concerns. As such, channel remediation was identified as an important part of the solution to protect at-risk structures within the Project area (GeoTerre Ltd., 2017). This toe erosion is being caused by multiple factors including groundwater seepage, flooding events, and degraded bank structures along Yellow Creek. At multiple points, Yellow Creek has outflanked existing bank structures and significantly undercut the toe of slope. **Figure 8 – 10** below depict the degradation of the creek and resulting damage at the base of slope caused by erosion.

Figure 8: Looking downstream (south) along Yellow Creek, bank stabilization structures have been degraded and displaced by the forces of erosion (TRCA, 2019).

Figure 9: Undercutting at the toe of slope and active groundwater seepage (TRCA, 2019).

Figure 10: Elevated flows within Yellow Creek have outflanked the existing gabion stone bank structure, impacting a property fence line and eroding the toe of slope behind (TRCA, 2017).

1.4 General Description of the Undertaking

There are four situations in which remedial flood and erosion control projects may be undertaken within the Class EA framework:

- Riverine flooding
- Riverine and valley slope erosion
- Shoreline flooding
- Shoreline erosion

The Project is classified as riverine and valley slope erosion and, in accordance with the Class EA planning process, a full range of alternative solutions were developed, including both traditional and innovative approaches, to address identified erosion and slope stability issues. The type and range of alternative solutions are based on the nature, cause and extent of the problem and are tailored to the individual characteristics of the Project.

The Project examined four remedial alternative solutions to achieve the objectives:

Alternative 1 – 'Do Nothing'

Alternative 2 – Pipe Yellow Creek, Rubble Fill Buttress

Alternative 3 – Channel Realignment, Soil Nailing

Alternative 4 – Channel Realignment, Selective Soil Nailing

In determining the preferred method to remediate erosion and slope instability issues, two major factors were considered: risk to structure(s) and the cause(s) of the hazard. According to TRCA's design criteria, the potential risk to existing structures is the most important factor and subsequently given greater weight than the physical or geological condition associated with the cause of erosion. During evaluation of the preliminary alternatives, preference was also given to alternatives requiring smaller construction footprints and machine access requirements to reduce impacts to the surrounding natural and built environments.

In all cases, the design of slope stability and erosion control works must provide protection compatible with TRCA's Design Criteria, which includes improvements to, or enhancements of, the existing terrestrial and aquatic habitat conditions through natural designs. Upon review, the proposed undertaking described in this Project Plan meets all TRCA planning and policy objectives and satisfies the needs and concerns of the affected property owners and general public based on the input received during the Community Liaison Committee (CLC) and Public Information Centre (PIC) meetings and other outreach initiatives. The decision-making process used in the selection of the preferred remedial solution is documented in detail in **Section 4.0**. A record of consultation activities can be found in **Appendix C.**

1.5 Rationale for the Undertaking

As part of its primary role to manage risks associated with erosion and flooding, TRCA has a long-standing Erosion Risk Management Program (ERMP). Through the ERMP, TRCA monitors erosion hazards within its jurisdiction and plans and implements major maintenance and remedial flood and erosion control works to protect at-risk essential structures. Remedial works are undertaken on a priority basis, and to the limit of available funding each year. Although TRCA is not legally compelled to assist private landowners with erosion control works, TRCA offers this assistance recognizing that staff have considerable experience in hazard management. Out of the hundreds of properties with reported damage following the July 8, 2013 severe storm event, the Project was prioritized for remedial work based on the following factors:

- The location of the projected point of regression along the slope crest in relation to permanent and essential structures at the top of slope;
- The presence of a tributary at the toe of slope with degraded bank protection; and
- The absence of adequate toe protection along the bottom of slope.

The detailed slope stability and erosion risk assessment completed by GeoTerre analyzed the composition and existing conditions of the valley slope within the Project's study area. The data collected as part of this investigation was used to model the anticipated long-term regression of the slope crest. GeoTerre's assessment identified multiple essential structures exist in front of the projected point of slope regression and, therefore, are at long-term risk from the hazards of erosion and slope instability.

Prior to proceeding with a Class EA and plan for remedial action at this site, TRCA evaluated the 'Do Nothing' alternative, which assesses what would happen if no remedial works were undertaken at the Project site. Unchecked toe erosion and continued surficial erosion within the Project area are anticipated to further destabilize the eastern valley slope and precipitate future slope failures. Such failures may result in serious and potentially irreparable damages to essential structures at the top of slope as well as human health and safety. Ultimately, not undertaking remedial erosion control and slope stabilization work would result in ongoing risk to life and property.

Considering the potential risks if a 'Do Nothing' approach was taken, TRCA made the decision to proceed with a Class EA. Upon approval of this Class EA Project Plan, TRCA intends to immediately commence work to design and implement the preferred alternative solution to provide erosion control and slope stabilization measures for the protection of essential structures.

2.0 BACKGROUND

This section provides an overview of the causes and extent of erosion and slope instability hazards impacting the Project site and includes justification for TRCA's involvement and approach to developing a remedial solution. The studies and assessments undertaken by TRCA to evaluate the Project site are listed herein and discussed in further detail under **3.0 BASELINE ENVIRONMENTAL INVENTORY**.

2.1 Justification of Authority Involvement

TRCA has a mandate to carry out remedial erosion control works as set out in **Chapter 27, Section 20** of the *Conservation Authorities Act (R.S.O. 1990):*

> "The objects of an authority are to establish and undertake, in the area which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals (R.S.O. 1990, C.27, s.20)."

As part of this goal, CAs are considered to have prime responsibility over water management in terms of water quantity and related hazards through administrative and regulatory powers. In the 1980 Watershed Plan, TRCA developed and implemented its Erosion and Sediment Control Program (ESCP) with two major directions:

> "To minimize the aggravation or creation of erosion or sediment problems as a result of new development, and to rectify existing problems through protective works" (TRCA, 1980).

These directions are categorized as either preventative or protective, respectively. The Project falls under the protection component of the ESCP, which is designed to protect lives and minimize loss of property through the construction of suitable remedial works. Through annual capital funding from the City of Toronto, TRCA is able to implement a program of major remedial works for slope stabilization throughout the watersheds of the Greater Toronto Area.

2.2 History of the Problem

On the evening of July 8, 2013, a severe storm event in the Greater Toronto Area resulted in widespread flooding, erosion, and slope failures in the west end and downtown areas of the City of Toronto. Flash flooding and accelerated soil erosion resulted in extensive damage to river and valley systems and put many residential properties at risk. The City of Toronto's water and wastewater infrastructure and many park amenities also suffered damage due to the extensive flooding. In the days following the storm, TRCA responded to more than 450 reports of damage to private property that ranged from minor bank erosion and collapsing retaining walls to major landslides.

Based on visual inspections by TRCA staff, additional subsurface investigations were recommended for approximately 150 properties with the most severe damage to determine the extent of risk to existing structures. The purpose of the geotechnical assessments was to assist TRCA to further rank the hundreds of private properties affected by the July 8, 2013 severe storm event based on a variety of factors including risk to human life, property, and essential structures. TRCA retained GeoTerre in 2017 to complete a geotechnical investigation to determine the extent of risk of existing erosion and slope instability hazards (**Appendix A**).

2.3 Planning Documents

In developing the range of alternatives for evaluation under the Class EA guidelines, TRCA incorporated the applicable guidelines from several municipal, provincial, and federal guidance and policy documents, as follows:

Valley and Stream Corridor Management Program (1994)

The Valley and Stream Corridor Management Program (VSCMP) is a guidance document developed by TRCA to direct land use activities and development within valley and steam corridors. The program acknowledges the need for risk management related to flooding, erosion, and slope instability, while ensuring that future policies and criteria govern any change to existing resource-based uses of valley and stream corridors. The program also offers recommendations for the rehabilitation of valley and stream corridors that help to direct short and long-term resource planning activities.

Toronto and Region Remedial Action Plan (1994)

The Toronto and Region Remedial Action Plan (RAP) was developed by all levels of government and other stakeholders. The RAP encompasses a 2,000 km^2 area within TRCA's jurisdiction in the City of Toronto. This area includes the Lake Ontario waterfront and all of the watersheds between Etobicoke Creek in the west and Rouge River in the east. The Toronto RAP is managed by representatives from

Environment and Climate Change Canada, Ontario Ministry of the Environment and Climate Change, Ministry of Natural Resources and Forestry, City of Toronto, and TRCA. The RAP has been working towards the following goals:

- Clean waters
- Healthy habitats
- Science and monitoring
- Sustainability
- Education and involvement

Terrestrial Natural Heritage System Strategy (2006)

TRCA's Terrestrial Natural Heritage System Strategy (TNHSS) was designed to enhance biodiversity and quality of life for residents by increasing the amount of forest and wetland habitats. It uses a science-based analytical tool based on ecological criteria to identify an expanded and targeted land base for inclusion in a terrestrial natural heritage system. TNHSS was designed for the entire TRCA jurisdiction as terrestrial systems and their interactions span watershed boundaries. The target system relates to the terrestrial component of the natural heritage system. TNHSS contains a number of strategic directions including proposed land use planning policies, land management, stewardship and education opportunities, and long-term monitoring.

Planning and Development Procedural Manual (2007)

TRCA's Planning and Development Procedural Manual provides a comprehensive summary of the legislative and policy framework that guides TRCA's decisions and actions with respect to planning and regulatory responsibilities, as outlined in Ontario Regulation 166/06.

The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (2014)

The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (LCP) is a CA policy document that guides the implementation of TRCA's legislated and delegated roles and responsibilities in the planning and development approvals process. Comparable to a combined municipal official plan and zoning bylaw, the LCP represents a compilation of existing plan and permit review policies and practices that have evolved over time. It also contains new policies related to TRCA programs, scientific research, and external planning and development initiatives.

TRCA's main program previously guiding the Authority in its planning and regulatory roles was the VSCMP endorsed by the Authority in October 1994. The LCP supersedes the VSCMP while continuing and expanding on the VSCMP's valuable foundation of principles and policy intent.

Coordinated Watercourse Management Plan (2014)

The Coordinated Watercourse Management Plan (CWMP) outlines the various City of Toronto and TRCA programs and divisions responsible for managing erosion hazards across the valleys, streams, and shorelines within the City of Toronto. The intent of the CWMP is to minimize duplicated efforts and

facilitate a coordinated approach to manage watercourse risks and respond to damages caused by accelerated erosion during intense storm events.

2.4 Supporting Studies and Assessments

2.4.1 Physical Studies

***A) Geotechnical Slope Stability and Erosion Risk Assessment – Yellow Creek Near Heath Street East, Toronto, Ontario* (GeoTerre Ltd., 2017)**

In 2017, a geotechnical investigation was completed by GeoTerre to assess erosion and slope stability hazards and determine the extent of risk to essential structures located at the top of slope. The investigation involved advancing boreholes to collect subsurface soil and groundwater data. This data was subsequently used to model the anticipated regression of the slope based on various erosion and slope stability factors. The results of the investigation are presented in GeoTerre's report and identify risk to multiple residential properties and municipal infrastructure.

The complete geotechnical report is provided in **Appendix A.**

***B) Factual Data Report for Environmental Test Data on Ash Sample Retrieved from Borehole 16-1* (GeoTerre Ltd., 2017)**

The borehole sampling undertaken as part of GeoTerre's 2017 slope stability and erosion risk assessment identified the presence of ash material within two deep borehole locations (BH15-1 and BH16-1). The ash present in BH15-1 was intermixed with fill material; however, BH16-1 was identified to have significantly more ash material. TRCA requested GeoTerre to undertake additional environmental sampling around BH16-1 to analyze the concentrations of Volatile Organic Compounds (VOCs). The results of this sampling identified exceedances in soil contaminant concentrations. It is to be noted, however, that these borehole samples are located beyond the limits of disturbance for the proposed remedial works.

The complete factual data report is provided in **Appendix A.**

***D) Test Pit Excavation at 95 Heath Street East, City of Toronto* (Terraprobe Inc., 2019)**

In May 2019, Terraprobe Inc. (Terraprobe) dug an exploratory test pit in the basement of 95 Heath Street East to determine the type of building foundation existing below the dwelling and assess soil conditions below the foundation. TRCA requested for Terraprobe to undertake this investigation and provide a factual report on their findings to inform TRCA's development of conceptual alternative solutions.

The complete factual report is provided in **Appendix A**.

E) *Evaluation Report – Yellow Creek Near Heath Street East Stabilization Alternatives, City of Toronto, Ontario* (Terraprobe Inc., 2020)

Terraprobe was retained by TRCA to develop and evaluate a range of slope stabilization solutions to address identified slope instability within the Project area and provide long-term protection to at-risk

properties located at the top of slope. Terraprobe's slope stabilization concepts were informed by the subsurface data collected for GeoTerre's slope stability and erosion risk assessment, in addition to other environmental and physical data retrieved for the Project.

The slope concepts report is provided in **Appendix A**.

F) *Yellow Creek Interim Channel Works Alternatives Evaluation & Conceptual Design* (Aquafor Beech Ltd., 2020)
Aquafor Beech Ltd. (Aquafor Beech) was retained by TRCA to develop and evaluate a range of channel remediation works to address on-going toe, channel, and bank erosion. Aquafor Beech worked collaboratively with Terraprobe to develop channel concepts that would integrate and provide necessary toe protection for Terraprobe's alternative slope stabilization solutions.

The channel concepts report is provided in **Appendix A**.

G) *Geotechnical Investigation and Long Term Stable Slope Crest Update* (Terraprobe Inc., 2022)
Terraprobe Inc. was retained by TRCA to provide a peer-review of the 2017 GeoTerre report, advance additional boreholes within an expanded study area, and update the Long Term Stable Slope Crest (LTSSC) to a Factor of Safety (FoS) of 1.3. The data obtained was used to model the LTSSC and confirmed properties and infrastructure at risk at a FoS of 1.3.

The complete report is provided in **Appendix A.**

2.4.2 Biological Studies

A) *Yellow Creek Channel Restoration & Slope Stabilization Background Ecological Summary* (TRCA Environmental Monitoring and Data Management, 2019)
TRCA's Watershed Planning and Ecosystem Science (WPES) team undertook a comprehensive review of the environmental and biological conditions present within the Project's study area and compiled this information into an ecological summary report. Over the course of 2019, WPES conducted various field surveys and sourced additional ecological data and information from TRCA's internal database, various published studies, reports, and other governmental and regulatory agencies. The findings of this report as they relate to the Project are discussed in further detail in **Section 3.1.2** Biological Environment.

The ecological summary report is provided in **Appendix B**.

2.4.3 Cultural Studies

A) *Stage 1 Archaeological Assessment – Yellow Creek Near Heath Street East Erosion Control and Slope Stabilization Project / 30 – 36 Rose Park Crescent Erosion Control and Slope Stabilization Project* (TRCA Archaeology and Cultural Heritage, 2018)
The Project was evaluated for the potential to encounter archaeological resources. The Stage 1 assessment involved a review of historical land use in addition to the geographic and cultural features existing within the vicinity of the Project.

For a full account of the socioeconomic and cultural history within and near the Project limits, please refer to the Stage 1 Archaeological Assessment provided in **Appendix B.**

3.0 BASELINE ENVIRONMENTAL INVENTORY

Once it has been determined that remedial works are warranted at a given site, a baseline inventory is prepared. The baseline inventory provides the information needed to evaluate the alternative options developed through the Class EA process, and to evaluate the types and level of environmental impacts that may result from implementing the preferred alternative.

The inventory involves the examination and documentation of:

- the erosion problem
- existing site conditions, including physical, biological, cultural and socioeconomic characteristics
- engineering/technical aspects to be considered
- previous protective measures that have been implemented within the Project limits
- whether the site falls within a vulnerable area as identified in the local assessment report prepared under the *Clean Water Act*, 2006

This baseline environmental inventory takes into consideration the directly and indirectly affected environment. The areas indirectly affected by the Project include the Vale of Avoca Ravine, Mount Pleasant Cemetery, and other nearby properties including those located adjacent to the Project and those that are located on the opposite side of the ravine.

Baseline environmental data were collected from the following organizations due to their specific expertise relevant to the regional and local Project area:

- City of Toronto
- TRCA
- Ontario Ministry of Natural Resources and Forestry (MNRF)
- Ontario Ministry of the Environment, Conservation and Parks (MECP)
- Environment Canada

3.1 Existing Site Conditions

In accordance with the Class EA process, the broad definition of 'environment' as provided in the *Environmental Assessment Act* is applied to this section. The prepared environmental description is *"an inventory of elements for which a given project is likely to have an impact"* (CO, 2013). The inventory includes an evaluation of the presence and extent of physical, biological, cultural, social, economic, and technical engineering elements applicable to the Project limits.

An existing conditions drawing of the Project area is included in **Appendix B**.

3.1.1 Physical Environment

Unique Landforms

There are no known unique landforms within the Project limits; therefore, there will be no impact as a result of the proposed work.

Existing Mineral/Aggregated Resource Extraction Industries

There are no known existing mineral or aggregated resource extraction industries within the Project limits; therefore, there will be no impact as a result of the proposed work.

Earth Science – Areas of Natural and Scientific Interest (ANSI)

There are no Earth Science Areas of Natural and Scientific Interest within the Project limits; therefore, there will be no impact as a result of the proposed work.

Specialty Crop Area /Agricultural Lands or Production

There are no known specialty crop areas or agricultural lands within the Project limits; therefore, there will be no impact as a result of the proposed work.

Niagara Escarpment/Oak Ridges Moraine

The Project limits do not coincide with the Niagara Escarpment or the Oak Ridges Moraine; therefore, there will be no impact as a result of the proposed work.

Environmentally Significant Areas (ESA) – Physical

The Vale of Avoca is an identified ESA by the City of Toronto. However, this ravine is categorized as an ESA due to the documented presence of various species of concern and not due to its physical features. As such, there will be no impact as a result of the proposed work.

Air Quality

At a local scale there are no significant sources of air pollution within the immediate and surrounding Project limits. No component of this Project is anticipated to significantly degrade air quality or be influenced by local or regional sources of air pollution. Any impacts from machinery and/or vehicles used as part of the construction phase will be temporary and minimal and are therefore deemed insignificant.

Agricultural Tile or Surface Drains

There are no known agricultural tiles or surface drains within the Project limits. Improvements to surface drainage will be made through the design for remedial slope stabilization work and will result in reduced impacts of surficial erosion within the Project limits.

Noise Levels and Vibration

The Project is surrounded predominantly by low-medium density residential and commercial land use. There are no current noteworthy sources of noise or vibration within or near the Project. Most noise is typically associated with vehicular traffic along St Clair Avenue East and Yonge Street. All construction

activities will conform to the City of Toronto's noise bylaw (Toronto Municipal Code, Chapter 591) and will be monitored for vibration as per construction vibration standards (Toronto Municipal Code, Chapter 363, Article 5).

Water Flow Regime (Baseflow conditions and storm conditions)

Yellow Creek is a tributary of the Don River and provides drainage for a heavily urbanized sub-watershed located within a core area in the City of Toronto. Baseflow conditions of the watercourse are generally low flow; however, under storm conditions there is a drastic increase in the volume and velocity of water increasing erosion potential. Active erosion and undercutting result in steepening of natural banks and undermine bank treatments, such as gabion baskets. This range in hydraulic conditions is typical of heavily urbanized watersheds where natural tree and groundcover have been disturbed or converted into impermeable surfaces (Aquafor Beech Ltd, 2020). A discussion of the hydraulic conditions within Yellow Creek can be found in Aquafor Beech's Alternatives Evaluation & Conceptual Design report, found in **Appendix A**.

Existing Surface Drainage/Groundwater Seepage/Groundwater Recharge and Discharge Zones

In GeoTerre's slope stability assessment, it was identified that existing groundwater conditions are contributing to erosion along the bottom of the valley slope. The groundwater table is an area below the surface where underlying material, such as soil and rock, is permanently saturated with water. The groundwater table within the Project area is resting at a higher elevation than the channel and is comprised of 'free draining' material, which allows for water to freely move through it. The height of the groundwater table in conjunction with the free draining nature of its material ultimately allows for water to seep through the slope, resulting in toe erosion. An example of this groundwater seepage can be seen in **Figure 9**. To control this erosion, the proposed channel remediation work will reconstruct the east bank of Yellow Creek to provide suitable toe protection and control active seepage.

Littoral Drift/Other Coastal Processes

The Project limits are not located within a coastal setting; therefore, there will be no impacts to littoral drift or other costal processes as a result of the proposed work.

Water Quality

The quality of water within Yellow Creek is assumed to be poor due to the lack of aquatic life, the level of impact resulting from the extent of urbanization surrounding the Vale of Avoca Ravine, the lack of stormwater control, and combined sewer overflows (TRCA, 2019). The proposed work will help to reduce the amount of sediment within the channel and thereby help to improve water quality. TRCA will also take all reasonable measures to ensure that construction of the proposed work will not result in further detriment to existing water quality. Such measures will include, but are not limited to, installing appropriate temporary erosion and sediment controls throughout the work area for the duration of construction.

Soil/Fill Quality

The geotechnical investigation undertaken as part of GeoTerre's 2017 slope stability and erosion risk assessment, and further confirmed through Terraprobe's 2022 analysis, identified that the upper slope within the Project's study area is oversteepened and comprised predominantly of deep fill material (non-competent soil); the combination thereof ultimately creating unstable slope conditions. Although the lower slope generally consists of competent soils and has a relatively flatter inclination, the instability within the upper slope combined with active toe erosion results in slope stability concerns throughout the Project area. The primary objective of the Project is to stabilize the high risk slope areas to ensure long-term protection is provided to at-risk essential structures.

Contaminated Soils/Sediment/Seeps

Contaminated soils were identified at depth (i.e. not at the surface) during GeoTerre's 2017 slope stability and erosion risk assessment. The proposed work does not involve deep excavation and the locations of contaminated soil are beyond the limits of disturbance for the proposed work; therefore, there will be no risk to exposing this contaminated material as a result of the proposed work.

Existing Transportation Routes

The main transportation routes surrounding the Project are Yonge Street to the west, St Clair Avenue to the south, and Mount Pleasant Road to the east. The Project is bounded by Mount Pleasant Cemetery to the north and, as such, there is no notable transportation route in this direction.

St Clair Avenue East is the closest main transportation route and is located approximately 350 metres away (driving distance). Yonge Street and Mount Pleasant Road are the two major arterial roadways that service the Project area. TRCA's proposed work for the Project will not result in any major alterations or impacts to these transportation routes. However, minor and temporary impacts may affect local roadways as a result of various construction activities, such as site mobilization or delivery of materials. All reasonable efforts will be made to ensure minimal disturbance to the local roadways including installation of proper construction signage and adherence to all applicable roadway restrictions and municipal by-laws.

Constructed Crossings

The Project will likely involve constructed crossings; however, the exact locations of these crossings will be determined when TRCA proceeds with developing detailed designs. Examples of constructed crossings include infrastructure assets such as culverts, buried pipelines, or bridges. When developing detailed designs, a comprehensive mitigation plan will be developed to protect infrastructure existing within the Project area. The mitigation plan will consider loading restrictions and prescribe appropriate protective measures to prevent damage that may result from construction operations.

Geomorphology

The upper section of Yellow Creek flows along the valley bottom within the Project area. Active erosion within this section of the creek has undermined existing bank treatments (i.e. gabion baskets, retaining walls) and undercut the bottom of the east valley slope. This eastern slope is already oversteepened and

unstable; continued erosion along the base of slope will contribute to destabilization of the slope and creates risk to the essential structures located at the top.

3.1.2 Biological Environment

In 2019, TRCA Watershed Planning and Ecosystem Science (WPES) staff conducted a review of the biological environment within the Vale of Avoca ravine to provide Project Management staff with a holistic understanding of the ecological conditions present within and surrounding the Project. The findings, as they relate to the Project, are discussed in detail below. A copy of the complete ecological summary report can be found in **Appendix C**.

Wildlife Habitat

The Project will result in moderate, but temporary, disturbances to local wildlife habitat. Disturbance is anticipated to result through the select removal of trees and vegetation to facilitate construction activities; and increased noise and vibration levels resulting from the operation of heavy machinery. To minimize impacts, all construction activities are selected and planned to have the smallest construction footprint possible and will occur outside of key migration and breeding windows when habitat use is not as crucial. Implementation of a comprehensive restoration plan will follow construction activities to compensate for and remediate disturbance to existing habitat through intensive planting of suitable native species.

Habitat Linkages or Corridors

The Vale of Avoca ravine is part of a fragmented habitat corridor that connects to the Don River valley. Although the Project will result in localized improvements to ravine habitat, there will be no significant impacts to habitat connectivity as a result of the proposed work.

Significant Vegetation Communities

There are two existing vegetation communities of urban concern located near the Project limits: raspberry deciduous thicket and dry-fresh oak-hardwood deciduous forest. However, since these communities are located outside of the limits for the proposed work, they are unlikely to be disturbed.

Environmentally Significant Areas (ESA) – Biological

The Vale of Avoca ravine has been designated by the City of Toronto as an Environmentally Significant Area based on recorded observations of significant flora and fauna species. However, the ravine does not include significant landform, size, species diversity, or ecological function (TRCA, 2019). Although there will be environmental disturbances within the Project area as a result of construction activities, this disturbance will be temporary. The outcome of the Project will contribute to habitat improvements within the ravine through the incorporation of suitable terrestrial and aquatic native plant species and removal of invasive species.

Fish Habitat

Yellow Creek is designated as warm water stream habitat; however, existing instream habitat has been greatly impacted by the level of urbanization surrounding the Vale of Avoca Ravine in addition to a lack

of stormwater control and combined sewer overflows (TRCA, 2019). There also exists several downstream barriers to fish migration. The most notable barrier is the fact that beginning at the southern limit of the Vale of Avoca ravine, Yellow Creek is piped underground for over one kilometre to convey creek flows into the Don River.

On July 16, 2019, WPES staff completed a fish survey in accordance with the Ontario Stream Assessment Protocol. No fish were caught or seen during the survey and no important fish habitat was identified within the Project area. The proposed work, specifically channel remediation, is anticipated to result in improvements to instream habitat by creating suitable habitat features and incorporating native plant species that will contribute to the integrity and resiliency of the aquatic environment.

Species of Concern - Flora

There are no flora Species of Concern within the Project limits; therefore, there will be no impacts as a result of the proposed work.

Species of Concern - Fauna

Although there is no evidence or record of fauna Species of Concern within the Project limits; there is record of certain species of concern within the vicinity of the Project, specifically the Chimney Swift and Eastern Wood-Pewee birds. To limit the potential impact to these species due to habitat disturbance, all construction activities will be planned to occur outside of the bird breeding and migration windows.

Wildlife/Bird Migration Patterns

The breeding bird window occurs annually from April to late July. Any habitat destruction or heavy construction activity resulting in persistent disruption to habitat conditions during this timing window can affect breeding bird activities; birds may abandon their nests at will or choose not to nest in the vicinity at all. The proposed work will affect a localized area within the Vale of Avoca Ravine and will result in minimal impacts to bird habitat through the removal of select canopy trees. Construction activities will only occur outside of the bird breeding window and, as such, the proposed works should not impact breeding bird activities.

Exotic/Alien and Invasive Species

The Project area is dominated by a deciduous forest community comprised of non-native species. During the construction phase of the Project, many non-native and invasive species within the Project area will be removed, including Japanese Knotweed. Following construction, implementation of a comprehensive restoration plan will include planting native species conducive to the local environment. These removals and plantings are anticipated to positively impact the resiliency and quality of habitat within the Project area. An invasive species removal and restoration plan will be developed in conjunction with the detailed design to ensure construction does not facilitate the spread of invasive species within the Project area.

Japanese Knotweed is a highly aggressive and persistent invasive plant species. It degrades wildlife habitat by outcompeting and inhibiting native plant growth (Ontario's Invading Species Awareness Program, 2020). Japanese Knotweed dominates the understory throughout the Vale of Avoca Ravine. It

is present within the Project area and will need to be removed to facilitate construction of the proposed remedial works. In order to prevent the spread of this species during construction and restoration activities, mitigation measures will be developed based on Ontario's best management practices (BMP) for the control of Japanese Knotweed (Anderson, 2012) to ensure that construction operations and the disposal of removed vegetation is conducted appropriately. A copy of Ontario's BMP for Japanese Knotweed can be retrieved from: https://www.ontarioinvasiveplants.ca/resources/best-management-practices/

Wildlife Populations

There are no notable wildlife populations within the Project limits; therefore, there will be no impacts as a result of the proposed work.

Wetlands

There are no wetlands within the Project limits; therefore, there will be no impacts as a result of the proposed work.

Microclimate

There are no known microclimates within the Project limits; therefore, there will be no impact as a result of the proposed work.

Unique Habitats

There are no unique habitats identified within the Project limits, therefore, there will be no impact as a result of the proposed work.

Areas of Natural Scientific Interest - Life Science (ANSI-LS)

There are no Life Science Areas of Natural Scientific Interest (ANSI-LS) within the Project limits; therefore, there will be no impact as a result of the proposed work.

3.1.3 Cultural Environment

Traditional Land Uses

The Project is located within the Traditional Territories and Treaty Lands of the Mississaugas of the Credit First Nation, Williams Treaties First Nations, and the Huron-Wendat Nation. No adverse effects on traditional land uses were identified during engagement with Indigenous communities.

Indigenous Reserve or Community

There are no known Indigenous reserves or communities within the Project limits; therefore, there will be no impact as a result of the proposed work.

Outstanding Native Land Claim or Treaty Rights

The Project is located within the boundaries of the Toronto Purchase Treaty and is adjacent to Yellow Creek, which is subject to the 2016 Water Claim filed by Mississaugas of the Credit First Nation.

Concern regarding potential impacts to archaeological resources was expressed by the Huron-Wendat Nation and Mississaugas of the Credit First Nation. The completed Stage 1 Archaeological Assessment (P1016-0154-2018) was provided and resolved their concerns.

Transboundary Water Management Issues

There are no transboundary water management issues within the Project limits; therefore, there will be no impacts as a result of the proposed work.

Riparian Zone

The riparian zone is the area situated immediately adjacent to a watercourse or waterbody. Healthy riparian zones play an important role in regulating bank erosion and contributing to the quality of the adjacent aquatic habitat. The integrity of the riparian zone within the Project limits, specifically along the top of the east bank of Yellow Creek, is degraded and has been subject to significant erosion resulting from elevated creek flows, groundwater seepage, and a high degree of pedestrian traffic along the top of bank. Although temporary disturbances are anticipated to impact the surrounding riparian zones due to construction operations, completion of the Project will ultimately result in overall improvements as channel remediation works will integrate and promote the establishment of riparian vegetation in addition to providing essential bank protection.

Recreational or Tourist Uses of a Waterbody and/or Adjacent Lands

The Vale of Avoca ravine is a popular City of Toronto ravine and comprises a section of the broader Toronto Beltline Trail. There are multiple access points that allow users to access a system of trails connecting to other recreational spaces including David A. Balfour Park and Park Drive Reservation Lands. During construction, public access along the top of the east bank of Yellow Creek within the limits for remedial works will be prohibited. There may be additional trail restrictions imposed as a result of the proposed work to protect public safety and facilitate construction operations.

A municipally owned staircase exists within the Project area and will need to be removed to facilitate slope stabilization works. This staircase provides access from Heath Street East down the steep valley slope into the Vale of Avoca ravine. This staircase was impacted by slope stability issues following the July 8, 2013 severe weather event and has been closed since 2014 due to risks to public safety. Previous studies undertaken by the City to assess the feasibility of replacing this structure identified the slope below and surrounding the staircase requires stabilization prior to its reconstruction.

The proposed slope stabilization work described in this Project Plan will provide the necessary stabilization required to reconstruct the Heath Street East staircase. TRCA recognizes that reconstruction of the staircase will reinstate a coveted public access point into the ravine and improve the connectivity of the ravine's trail system. As such, TRCA has agreed to work in partnership with the City of Toronto to develop a suitable design for a new staircase and integrate its construction into TRCA's proposed remedial works. Combining construction efforts between the City and TRCA is a cost-effective approach and will minimize disturbance to residents and the surrounding valley lands by reducing the frequency heavy equipment, material, and staff are mobilized to site.

Aesthetic or Scenic Landscapes or Views

The Vale of Avoca ravine is a unique natural feature within the Rosedale-Moore Park City of Toronto neighbourhood. The ravine breaks up the monotony of the surrounding built-up environment and provides ravine users and overlooking properties with a scenic natural landscape. Unfortunately, the impacts of erosion within the ravine have caused significant – and visible – degradation to the creek. Failed channel bank structures (gabion baskets), collapsed property fence lines, and impacts to pedestrian trails detract from the aesthetic value of the ravine. The outcome of the Project will not only provide protection to life and property but will also enhance the aesthetics of the creek and valley slope by reinstating channel, bank, and slope features.

Archaeological Resources, Built Heritage Resources and Cultural Heritage Landscapes

TRCA undertook a Stage 1 Archeological Assessment in 2018 to review the historical land use, and geographic and cultural features within the vicinity of the Project. Mount Pleasant Cemetery (MPC), a listed City of Toronto heritage property, borders the Project to the north. Formally a 200-acre farm, this parcel of land was converted into a cemetery as of 1876 and became a listed heritage property in 1976. Other than a commemorative plaque located at the MPC's western Yonge Street entrance, there are no other registered archaeological resources within a one-kilometre radius of the Project.

Additionally, TRCA will be conducting a Stage 2 Archaeological Assessment within the Project limits prior to undertaking any ground disturbing activities. A Stage 2 Assessment involves a field investigation to confirm the presence or absence of archaeologic resources within the Project area; or to confirm the exemption of areas identified to have low archaeological significance due to existing physiographic features (i.e. permanently wet areas; steep slope, etc.).

Historic Canals

There are no historic canals within the Project limits; therefore, there will be no impact as a result of the proposed work.

Federal Property

There is no federal property within the Project limits; therefore, there will be no impacts as a result of the proposed work.

Heritage River System

Yellow Creek is a tributary of the Don River. As identified in the Stage 1 Archaeological Assessment, the Don River Valley area would have offered rich resources to Indigenous populations who previously occupied the area (TRCA, 2018). As such, there is a high potential for encountering Indigenous sites within the Project area and TRCA will undertake a Stage 2 Archaeological Assessment prior to any ground disturbing activities associated with the proposed remedial works.

A Stage 2 Assessment involves a field investigation to confirm the presence or absence of archaeologic resources. Should an archaeologic site be unearthed, additional archaeological investigation(s) will be completed to determine the cultural and historical significance of the find before construction is authorized to proceed.

3.1.4 Socioeconomic Environment

Surrounding Neighbourhood or Community

The Project is centrally located within the City of Toronto's Rosedale-Moore Park neighbourhood and is surrounded by a combination of low-medium and high-density residential land use and commercial areas. Much of the neighbourhood is comprised of older homes as majority of the registered dwellings were developed prior to 1960 (Statistics Canada, 2016). The community is also significantly populated by an overall aging population, and is notably affluent (City of Toronto, 2018).

Surrounding Land Uses and Growth Pressure

Situated centrally within the City of Toronto, the Project area is subject to significant environmental pressures due to the high level of surrounding urbanization. Urbanization results in a drastic change to the landscape as a significant amount of natural ground cover is replaced with impermeable surfaces (i.e. driveways, roads, sidewalks, permanent built structures, etc.). This alteration in land cover changes the dynamics of the hydrologic cycle and has serious implications on stormwater management, erosion, and pollution. These implications ultimately degrade terrestrial and aquatic habitat and directly impact the health of local and regional ecosystems.

As can be seen in the historical aerial photographs shown in **Figure 11** and **Figure 12**, the area surrounding the Project has been significantly urbanized since 1949 and has been subject to further urbanization in the years following through the development of dense, high-rise buildings and the commercialization of Yonge Street and other surrounding major roadways.

Figure 11: Historical aerial photograph taken in 1949 overlooking the Project area (TRCA, 2020).

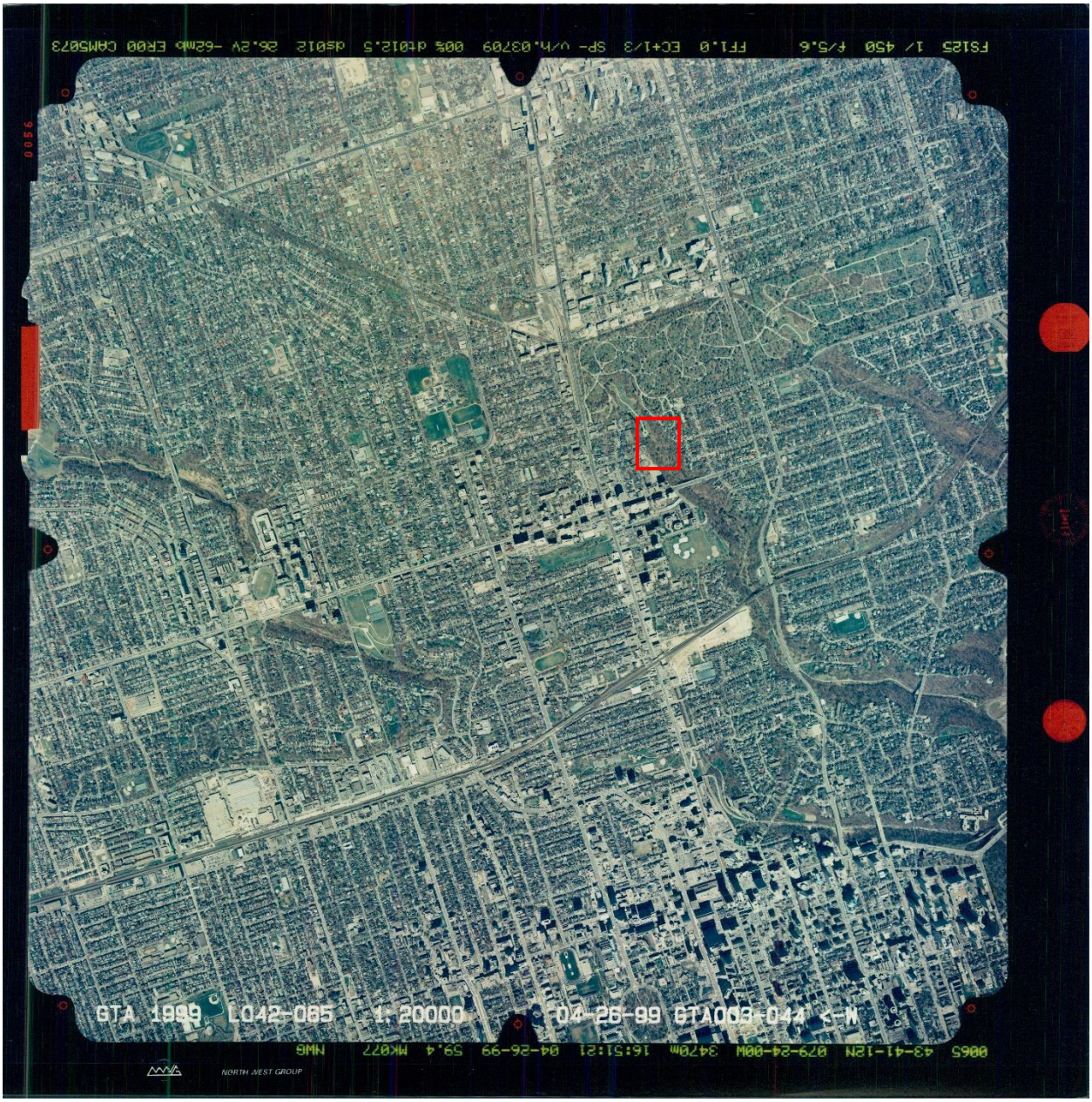

Figure 12: Historical aerial photograph taken in 1999 overlooking the Project area (TRCA, 2020).

Existing Infrastructure, Support Services, Facilities

There are existing municipal sanitary and stormwater infrastructure surrounding the Project. There is potential for localized impacts to stormwater assets as a result of the delivery of material and heavy equipment; however, TRCA will be retaining a qualified engineer to develop a comprehensive mitigation plan that will prescribe appropriate measures to reduce the likelihood of damages that may be incurred during construction operations. The mitigation plan will isolate which assets require protection, calculate the loading restrictions, and take into consideration the type of material, equipment, vehicles, and activities involved in the Project.

Pedestrian Traffic Routes

For the protection of public health and safety, it is anticipated that there will be temporary restrictions to pedestrian traffic routes as a result of the proposed works. The full extent of trail closures or restrictions will be established when TRCA proceeds to developing detailed designs, following approval of this Project Plan. TRCA will communicate all anticipated trail closures and restrictions to the public in advance of construction operations.

Property Values or Ownership

The Project area is comprised of both municipal and private lands. All erosion control assets constructed on municipal lands as part of the proposed work will be owned and maintained by TRCA. Any assets constructed on private property will be the responsibility of the benefiting landowner.

Existing Tourism Operation

There are no established tourism operations within the Project limits; therefore, there will be no impacts as a result of the proposed work.

Property Accessibility

The location of the Project presents a unique situation as the opportunities for site access are extremely limited. Establishing access from the top of slope is likely not feasible due to the steepness and length of the valley slope, the confines of the surrounding residential roadways, and the extent of environmental impact that would result. Site access will be identified during the detailed design phase and will focus on establishing a route through the ravine that results in the least disturbance to the natural ravine setting. Restoration of the site access will be undertaken to restore the area to same or better conditions and specifics will be coordinated during the detailed design and permitting stages.

3.1.5 Engineering/Technical Environment

Rate of Erosion in Ecosystem

The rate of erosion within the Project area is considerable and affected by multiple factors. These factors include environmental pressures from surrounding urban land uses, an oversteepened slope, lack of understory vegetation, and the presence of an active watercourse. Although the Project will not alleviate the broader environmental pressures of the surrounding urban environment, remedial works are anticipated to reduce the overall rate of erosion within the Project area. The proposed slope stabilization solution involves the application of engineered and natural means to reinforce soil material and inhibit slope movement. The proposed channel works will address erosion occurring along the base of slope by better controlling creek flows and dissipating the forces of fluvial erosion.

Sediment Deposition Zones in Ecosystem

There were no identified sediment deposition zones within the Project limits; therefore, there will be no impact as a result of the proposed work.

Flood Risk in Ecosystem

Within the Project area, Yellow Creek's flood plain extends beyond the confines of its channel by several metres. Flood prone areas, specifically riparian areas along the east bank, have been impacted by erosion resulting from elevated creek flows overtopping bank structures. Erosion caused by these flooding events is also causing the channel to widen and cut into the adjacent slope, contributing to further slope instability concerns (Aquafor Beech, 2020). The proposed work will help to alleviate the impacts of flooding within these prone areas by realigning the channel away from the toe of east valley wall, as required, and installing suitable bank and bed treatments to better control creek flows during peak flow events.

Slope Stability

GeoTerre's 2017 slope stability and erosion risk assessment and Terraprobe's 2022 geotechnical report identified instability along the eastern valley slope within the Project area, which is creating risk to essential structures located at the top of slope. Addressing this risk and safeguarding human life and property is the purpose of the Project. Thus, the proposed remedial works described herein will implement a long-term solution to mitigate the rate of erosion, stabilize the subject slope, and protect at-risk structures from the hazards of erosion and slope instability.

Existing Structures

There are multiple existing structures within the Project limits. These structures include multiple at-risk essential structures, a municipal pedestrian staircase off of Heath Street East (currently closed to the public due to safety hazards), a City of Toronto stormwater outfall located at the upstream limit of Yellow Creek, and multiple failed gabion basket erosion control structures within the Yellow Creek channel.

The proposed work involves slope stabilization and channel remediation works and will result in long-term protection to the at-risk essential structures located within the Project area. In order to effectively undertake slope stabilization works, it is necessary for the municipal staircase to be fully removed from the slope; the resulting stability from the proposed works, however, will provide the necessary slope conditions to support a replacement staircase.

In addition to the protection of essential structures, the proposed remedial works will result in new, more robust bank and bed erosion control structures within Yellow Creek. When developing detailed designs for the Project, TRCA will also develop a risk mitigation plan to protect the existing stormwater outfall and other infrastructure assets that lie within the Project's construction footprint.

Hazardous Lands/Sites

Property or land that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock is defined as hazardous lands (Conservation Authorities Act, 1990) and would include the valley slope within the Project area. The proposed slope stabilization and erosion control works involved in the Project will contribute to

fostering a resilient ravine system and provide long-term protection to private properties from the hazards associated with the adjacent ravine lands.

4.0 EVALUATION OF PRELIMINARY ALTERNATIVE OPTIONS

Based on the results of TRCA's investigations, the extent of risk to essential structures within the Project's study area varied due to differences in slope configuration. These differences include the rate of erosion, the condition of existing vegetation communities, and the overall set-back of essential structures along the top of slope. As such, there is notably less risk to essential structures across certain slope segments within the Project area. Due to this variation of risk, TRCA developed preliminary alternative solutions to stabilize areas within the Project area where the risk is highest. The area where TRCA has proposed to undertake remedial works is presented in the Project map shown in **Figure 13**.

Although slope stabilization is not proposed across the entire Project area, properties that lie outside of the limits for slope stabilization work are still anticipated to benefit from the proposed channel works. The proposed channel works will protect the toe of slope and prevent channel migration, which would otherwise exacerbate erosion and slope stability issues affecting these lower risk properties. In addition to the protection provided by the proposed channel works, TRCA intends to monitor the Project's lower risk areas over the long-term and initiate next steps to address slope stability and erosion issues in the event major movement along the slope is observed.

Overall, TRCA developed preliminary alternative solutions for the Project based on extent of risk. The information obtained in the baseline inventory was used in the evaluation of each preliminary alternative, with specific consideration given to the advantages and disadvantages of each method. The preliminary alternative solutions and corresponding evaluation are discussed in further detail below.

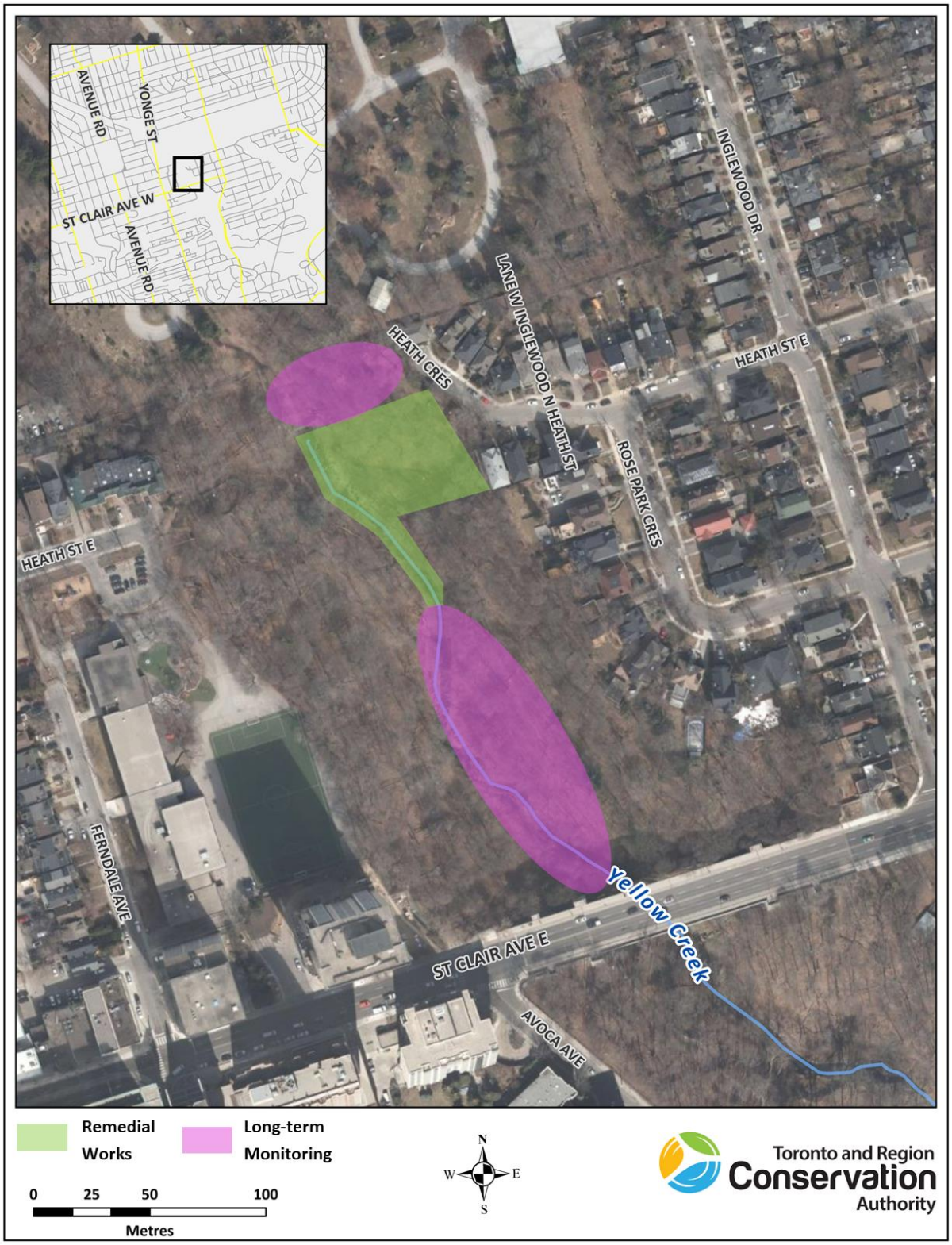

Figure 13: Proposed locations for remedial works and long-term monitoring (TRCA, 2020).

4.1 Description of Preliminary Alternative Solutions

The following are the preliminary alternative solutions that were developed and evaluated as part of the Class EA process to address the slope instability and erosion issues within the Project limits:

Alternative 1 – 'Do Nothing'

Alternative 2 – Pipe Yellow Creek, Rubble Fill Buttress

Alternative 3 – Channel Realignment, Soil Nailing

Alternative 4 – Channel Realignment, Selective Soil Nailing

These alternative options were developed by Terraprobe in conjunction with Aquafor Beech and are based on the topographic data provided by TRCA and the subsurface data collected by GeoTerre for their 2017 detailed slope stability and erosion risk assessment.

The evaluation of each preliminary alternative solution includes an examination of the types and extents of impacts, both positive and negative.

4.1.1 Alternative 1 – 'Do Nothing'

The "Do Nothing" option is a mandatory alternative that must be considered during the Class EA process to justify the need to undertake remedial works. Should the "Do Nothing" option or other Conservation Authority (CA) programs, such as land acquisition, be deemed a more acceptable solution, then there shall be no further consideration for remedial action and the Class EA process terminates.

Prior to making the decision to proceed with remedial action at the Project site, TRCA evaluated the 'Do Nothing' alternative, which assesses the long-term risk at a site if no remedial work is undertaken. If no remedial action is taken at the Project site, it is anticipated that uncontrolled erosion will continue to destabilize the slope and result in on-going risk to life and property, including significant damage to essential structures located at the top of slope.

4.1.2 Alternative 2 – Pipe Yellow Creek, Rubble Fill Buttress

This alternative involves extending an existing box culvert surrounding the City of Toronto outfall located at the upstream limit of Yellow Creek by approximately 67 metres. The existing creek channel would then be backfilled thereby burying the culvert extension and providing suitable protection along the bottom of the eastern slope. To stabilize the remainder of the slope, the eastern slope section falling within the remedial works area identified in **Figure 13** would be regraded to a suitable inclination and treated with angular concrete rubble and/or rip rap, establishing a rubble fill buttress. Gabion stone sourced from the failed bank structures within the Project limits would be incorporated into the buttress, if feasible. The buttress does not require compaction and is self-stabilizing.

Undertaking this slope stabilization approach would require that the existing municipally owned staircase located off of Heath Street East is decommissioned. The resulting slope stabilization, however, would provide the level of stability required to support reconstruction of a new staircase.

It is to be noted that to undertake this approach a substantial amount of fill material will need to be imported to backfill the creek channel, regrade the slope, and construct the buttress. Material importing has implications on cost, carbon emissions, local traffic, and the construction footprint (requires increased area for material storage and use of heavy equipment). Construction of the buttress will also result in a significant loss of vegetation and reduce the overall aesthetic appeal of the ravine slope. The extent of possible restoration techniques across the face of the buttress is also limited; it will not support the establishment of mature trees.

4.1.3 Alternative 3 – Channel Realignment, Soil Nailing

As part of this alternative, the Yellow Creek channel within the limits of the remedial works would be realigned and designed to follow natural channel characteristics. The channel works would begin at the upstream box culvert surrounding the City of Toronto outfall and extend to the southern boundary limit of 14 Rose Park Crescent. If possible, material sourced from existing failed bank structures (i.e. gabion stone) will be repurposed to form channel bed and bank stabilization structures. Reconstruction of the banks along the new channel will also be designed to ensure proper toe protection is provided along the base of the eastern valley slope.

To stabilize the middle and upper sections of the slope above the channel, a soil nailing system will be implemented. A soil nailing system involves applying a synthetic grid (engineered to reinforce the soil) on top of the slope face and physically anchoring it into the slope at regular intervals using deep-seated soil nails. This alternative would require that the municipally owned staircase located off of Heath Street East is decommissioned. In similar stride as Alternative 2, the resulting slope stabilization would provide the necessary support to reconstruct the Heath Street East staircase and TRCA would work in partnership with the City of Toronto to reinstate this public ravine access point.

Although this system tends to be costly, it stabilizes the slope in place and thus provides a low-impact solution with many advantages. Soil nailing will result in minimal vegetation loss and disturbance to the slope. It can be installed around mature trees and areas of established vegetation. It is highly portable and can be installed in areas with restricted or difficult access for traditional construction machines or equipment. There is no significant excavation or filling involved and therefore minimal material transportation is required. Following installation, the slope can be easily restored with topsoil, seeding, live staking, and tree and shrub plantings.

4.1.4 Alternative 4 – Channel Realignment, Selective Soil Nailing

This alternative involves the same slope stabilization mechanisms as stated in Alternative 3, however, stabilization will only occur over the minimum extent of area required to protect essential structures at the top of slope. This alternative also necessitates the removal of the Heath Street East staircase, but due to the reduced stabilization area, it will not provide adequate stabilization to support reconstruction of a new staircase. Overall, the advantages of this alternative are the same as Alternative 3 with the added benefit of having a comparatively reduced cost.

4.2 Evaluation of Preliminary Alternative Options

As part of the Class EA process, each of the identified alternatives is ranked against a consistent set of evaluation criteria set out by Conservation Ontario's Class EA for Remedial Flood and Erosion Control Projects. The evaluation criteria typically include consideration for technical, economic, environmental, and social factors or objectives. The impacts or effects of alternatives on each criterion were evaluated and qualitatively ranked. The evaluation of alternatives for the Project has been summarized in **Table 2** and is based on the ranking scheme as outlined in **Table 1**.

Table 1: Evaluation ranking scheme.

Rank		Relation to the associated criteria
Increasing Positive Rank ↑	**+H**	Most positive, or least negative impact; easiest to implement; lowest cost
	+M	Moderate positive impact; moderate implementation; moderate cost
	+L	Minor positive impact; lesser ease of implementation; high cost
	NIL	Neutral or no impact; no implementation; no associated costs
	-N	Overall negative impact / effect

Table 2: Alternative evaluation matrix using objectives with nested criteria and indicator.

Objective	Criteria	Comment	**Alternative 1** 'Do Nothing'	**Alternative 2** Underground Culvert Extension & Rubble Fill Buttress	**Alternative 3** Channel Realignment & Soil Nailing	**Alternative 4** Channel Realignment & Selective Soil Nailing
Physical and Natural Environment	Flooding	Impact on surface drainage, flooding; meet legislated criteria for flooding and water	**NIL**	**+L**	**+M**	**+M**
	Erosion	Impacts on soils, geology, rate of erosion	**-N**	**+M**	**+M**	**+M**
	Terrestrial Habitat	Impact on connectivity, diversity and sustainability	**NIL**	**-N**	**+M**	**+M**
	Aquatic Habitat	Impact on connectivity, spawning potential, barrier mitigation, habitat quantity	**NIL**	**-N**	**+M**	**+M**
Social/Cultural Environment	Aesthetic Value	Impact on existing and proposed development aesthetic value	**-N**	**+L**	**+M**	**+L**
	Benefit to Community	Access to trails, enjoyment of the valley	**NIL**	**+H**	**+H**	**NIL**
	Archaeological Features	Impacts on existing archaeological features	**NIL**	**NIL**	**NIL**	**NIL**
Technical Criteria	Regulatory Agency Acceptance	Satisfy TRCA, MNRF and DFO criteria	**-N**	**+L**	**+H**	**+H**
	Impact on Existing Infrastructure	Protection or potential exposure of infrastructure (sanitary sewer, maintenance hole, etc.)	**-N**	**+L**	**+L**	**+L**
	Maintenance Requirements	Requirement for regular, irregular or no maintenance activities, such as structural maintenance of vegetation maintenance	**-N**	**+M**	**+H**	**+M**
Financial Criteria	Capital Cost	Rough Order of Magnitude (ROM) capital costs for the Detailed Design, permitting and installation of proposed concept	**NIL**	**+M**	**+L**	**+M**
	Maintenance Costs	Rough Order of Magnitude (ROM) costs to maintain the proposed structure	**NIL**	**+M**	**+H**	**+M**
Constructability	Complexity of Treatment	Requirement for the specialized services to design or install unique or proprietary specifications that must be completed by a certified contractor/consultant	**NIL**	**+L**	**+M**	**+M**
Public Safety	Potential Risks to the Public	Impact to public safety and requirement for safety features (e.g. safety fences)	**-N**	**+M**	**+M**	**+L**
Combined Rank			**-N**	**+L**	**+H**	**+M**

4.3 Selection of the Preferred Alternative Option

Alternative 3 – Channel Realignment, Soil Nailing

The results of the evaluation of alternatives led to the identification of *Alternative 3: Channel Realignment, Soil Nailing* as the preferred alternative for the Yellow Creek near Heath Street East Erosion Control and Slope Stabilization Project. Although Alternative 3 is projected to have a higher implementation cost than the other alternatives, it is a comprehensive solution that will address slope stability and erosion concerns within the Project area, increase the quality and resiliency of existing terrestrial and aquatic habitat, and provides the greatest benefit to the local community.

This selected alternative also meets all three of the Project's objectives:

Objective 1 – Risk Mitigation

The preferred alternative incorporates a comprehensive scope of work that will control identified erosion and slope stability issues within the Project area and provide long-term protection to essential structures located at the top of slope. The proposed work thereby effectively protects properties and human life from the hazards of erosion and slope instability.

Objective 2 – Naturalization

The preferred alternative will improve existing terrestrial and aquatic habitats by increasing biodiversity and resiliency. The preferred alternative will result in the removal of invasive and alien vegetation species and incorporation of suitable native species.

Objective 3 – Compatibility

While evaluating alternatives, preference was given to alternatives which would have a minimal construction footprint and machine access requirements in effort to reduce impacts to the surrounding natural and built environments. Resulting impacts to public safety and overall benefit to the local community were also considered during the evaluation process.

5.0 ENVIRONMENTAL SCREENING

5.1 Detailed Environmental Analysis of the Preferred Alternative Options

To complete the detailed environmental analysis of the preferred alternative, the information collected for the baseline inventory is examined in greater detail to confirm potential impacts, refine methods of mitigation, and to identify any unforeseen impacts. The evaluation of impacts includes both temporary impacts during construction of the undertaking, and permanent impacts due to function and maintenance of the works after construction. **Table 3** evaluates the potential negative and positive effects of the proposed undertaking on the environment during construction and maintenance phases. It includes the consideration of the magnitude, geographic extent, duration, frequency, permanence or reversibility and ecological context of the effects, as well as proposed mitigation measures and any residual effects.

Environmental components that have been identified as potentially having an effect on the environment, both positive and negative, are discussed herein. Those that have been determined as not applicable (N/A) have been omitted from further discussion**.**

Screening of potential effects are considered to be negative (-), neutral (NIL) or positive (+) and are rated as relatively high (H), medium (M), low (L) or not applicable (N/A) (*CO, 2013).*

Table 3: Detailed Environmental Analysis of the Preferred Alternative – Channel Realignment, Soil Nailing.

Screening Criteria	**Rating of Potential Effects**								
	-H	-M	-L	NIL	+L	+M	+H	NA	**Comments**
Physical									
Unique Landforms								•	
Existing Mineral/Aggregate Resources Extraction Industries								•	
Earth Science - Areas of Natural and Scientific Interest								•	
Specialty Crop Areas/Agricultural Lands or Production								•	
Niagara Escarpment/Oak Ridges Moraine								•	
Environmentally Sensitive/Significant Areas (physical)				•					
Air Quality				•					
Agricultural Tile or Surface Drains								•	
Noise Levels and Vibration				•					
Water Flow Regime				•					
Existing Surface Drainage/Groundwater Seepage/ Groundwater Recharge/Discharge Zones						•			

Screening Criteria	Rating of Potential Effects								
	-H	-M	-L	NIL	+L	+M	+H	NA	Comments
Littoral Drift/ Other Coastal Processes								•	
Water Quality					•				
Soil/Fill Quality				•					
Contaminated Soils/Sediment/Seeps (Sediment Quality)				•					
Existing Transportation Routes				•					Impacts will be temporary
Constructed Crossings (e.g. bridges, culverts)				•					
Geomorphology				•					
Biological									
Wildlife Habitat						•			
Habitat Linkages or Corridors				•					
Significant Vegetation Communities				•					
Environmentally Sensitive/ Significant Areas (biological)					•				
Fish Habitat						•			
Species of Concern				•					
Exotic/Alien and Invasive Species					•				
Wildlife/Bird Migration Patterns				•					
Wildlife Population				•					
Wetlands								•	
Microclimate								•	
Unique Habitats								•	
Life Science - Areas of Natural and Scientific Interest								•	
Cultural									
Traditional Land Uses				•					
Indigenous Reserve or Community				•					
Outstanding Native Land Claim or Treaty Rights				•					
Transboundary Water Management Issues								•	
Riparian Uses						•			
Recreational/Tourist Uses of Water Body and/or Adjacent Land							•		
Aesthetic or Scenic Landscapes or Views						•			

Screening Criteria	Rating of Potential Effects								
	-H	-M	-L	NIL	+L	+M	+H	NA	Comments
Culturally Significant Resources				•					
Historic Canals								•	
Federal Property								•	
Heritage River System				•					
Socioeconomic									
Surrounding Neighbourhood or Community						•			
Surrounding Land Uses or Growth Pressure					•				
Existing Infrastructure, Support Services, Facilities				•					
Pedestrian Traffic Routes					•				
Property Values or Ownership					•				
Existing Tourism Operations				•					
Property Accessibility				•					
Engineering/Technical									
Rate of Erosion in Ecosystem							•		
Sediment Deposition Zones in Ecosystem				•					
Flood Risk in Ecosystem				•					
Slope Stability							•		
Existing Structures							•		
Hazardous Lands/Hazardous Sites				•					

6.0 SUMMARY

This section of the Project Plan provides a summary of comments received during the planning and design phases of the Project, a discussion of how these concerns have been addressed, and an outline of the monitoring program once the Project is complete.

Documents related to the public outreach component of this project, including all published notices, meeting materials and minutes, and comment forms, are included in **Appendix C**.

6.1 Public Notifications and Consultation

In accordance with the Class EA process, the first act of public consultation occurred with the distribution of the Notice of Intent (NOI), hand delivered to properties near the Project site on June 8, 2018. The NOI also included an invitation to the Community Liaison Committee meeting held on June 25, 2018. However, TRCA was engaging with the community since April 23, 2018. Subsequent project notices were distributed to stakeholders as TRCA progressed through planning activities for the Project.

Project notices were distributed to local community and residential groups, homeowners in the vicinity of the Project site, Indigenous communities, and government regulatory agencies including Conservation Ontario, Ministry of the Environment Conservation and Parks, Ministry of Natural Resources and Forestry, and the City of Toronto. Since there is no local newspaper that services the community surrounding the Project, notices were not published and instead issued via email and hand delivered to properties within the vicinity of the Project. Distributed notices requested that individuals contact the Project Manager if they wish to participate further in the Class EA process or to be kept informed about the Project's status. Individuals who expressed interest in receiving updates were added to the Project's stakeholder mailing list and received updates via email.

A full account of project notifications and a summary of the individuals and community groups that expressed interest in the Project are presented in the public consultation documents found in **Appendix C**.

6.1.1 Role of the Community Liaison Committee (CLC)

The Project aligns with the following excerpt from CO's Class EA document:

> "*In an effort to facilitate more on-going public involvement at the project level, the Conservation Authority shall, based on its contact group mailing lists and expressions of interest from the local landowners, members of the general public, interest groups, or agencies, establish a Community Liaison Committee (CLC) to assist the Authority by obtaining additional public input concerning the planning and design process of an individual flood and/or erosion control project, and to review information and provide input to the Conservation Authority throughout the process. The Conservation Authority shall strive to ensure that the membership of the CLC is representative of all views respecting a proposed remedial and erosion control project.*
>
> *As the name implies, the function of the CLC, in the Class EA process, will be to assist the Conservation Authority to reach out and maintain contact with community residents, groups, associations and organizations. The CLC will provide direct input into the process. At the end of the process, the entire committee will have been exposed to the entire process, will have understood how decisions have been reached and will have had their questions answered during the process.*
>
> *To fulfill its function, the CLC will:*
>
> - *Identify items of public concern with regard to the impact and design of proposed erosion control alternatives;*
> - *Provide direct input on these concerns to the Conservation Authority to be utilized throughout the planning and design process;*
> - *Co-host, with Authority Staff, meetings organized by the Authority to facilitate the resolution of concerns relating to a proposed remedial work;*

- *Review any Part II Order Requests made by members of the public and attempt to resolve the issues of concern between the Part II Order requesters and the Conservation Authority before the request gets referred to the Minister of the Environment for a decision; and*

- *Where appropriate, submit an assessment to the Conservation Authority, upon project completion, commenting on the effectiveness of the Class EA process for meeting public concerns for the specific project, and where relevant, identify possible improvements (CO, 2013).”*

6.1.2 Public Meeting #1

TRCA held the first public meeting for the Project on April 23, 2018 at the Toronto Public Library – Northern District Branch. This library is located northwest of Yonge Street and Eglington Avenue West, in the City of Toronto. Notice of this meeting was distributed to known stakeholders via email on March 28, 2018, following which, meeting notices were also hand delivered to properties near the Project site.

TRCA hosted the meeting and delivered a presentation that provided an overview of the erosion and slope instability issues below Heath Street East and Heath Crescent, TRCA’s Erosion Risk Management Program, and Conservation Ontario’s Class EA planning process. A question-and-answer session was held following the presentation and attendees were able to ask questions and consult with project management staff on TRCA’s proposed next steps for the Project. A comment form was also circulated to all attendees to gauge understanding of the Project objectives.

Documentation related to this public meeting is contained in **Appendix C**.

6.1.3 CLC Meeting #1

The first CLC meeting was held on June 25, 2018 at the same location as Public Meeting #1, the Toronto Public Library – Northern District Branch. Notice of this meeting was included in the NOI, which was hand delivered to properties within the vicinity of the Project site on June 8, 2018. A follow up reminder for this meeting was sent via email to known stakeholders on June 20, 2018.

TRCA hosted the meeting and delivered a presentation that provided an overview of the preliminary slope stabilization alternatives TRCA was considering as part of the Class EA process for the Project site. This CLC meeting served as a forum for interested residents and stakeholders to learn more about project developments, speak with project staff, inquire about the Class EA process, and provide input on the presented preliminary alternatives.

Feedback pertaining to the preliminary alternatives and planning process was solicited through distribution of a comment form. The comment form provided an opportunity for interested parties to create a record of their feedback and voice any concerns for TRCA’s consideration during the evaluation of alternatives; no notable concerns were raised.

Documentation related to this CLC meeting is contained in **Appendix C**.

6.1.4 PIC Meeting #1

Following the refinement and evaluation of alternatives, TRCA hosted a Public Information Centre (PIC) to present the selected preferred alternative to address erosion and slope stability concerns within the Project limits. The PIC meeting was held on December 12, 2019 at the Toronto Public Library – Deer Park Branch, located northeast of Yonge Street and St Clair Avenue East in the City of Toronto. Notice of this meeting was circulated via email on December 5, 2019 and the Notice of PIC was hand delivered to properties within the vicinity of the Project site on December 6, 2019.

Presentation boards were displayed that highlighted key planning and design aspects of the Project, including providing an update on progress to date and an overview of TRCA's evaluation of alternatives. The PIC allowed interested residents and stakeholders to drop-in at their convenience and engage with TRCA project planning staff and representatives from TRCA's engineering consultants, Terraprobe and Aquafor Beech.

Similar to the 2018 CLC meeting, feedback pertaining to the preferred alternative was solicited through distribution of a comment form. The comment form provided an opportunity for interested parties to create a record of their feedback and voice any concerns regarding TRCA's selection of the preferred alternative. The following concerns were raised:

- The Project needs to compliment other planned initiatives within the ravine
- A strategy needs to be developed for the proper management of Japanese knotweed
- *Alternative 4 – Channel Realignment & Selective Soil Nailing* would result in a negative impact to the local community as it does not support reconstruction of the Heath Street East staircase. The staircase is a popular ravine access point and support for its reconstruction is widespread.
- The Heath Street East staircase should not be reconstructed as it will result in continued degradation to the slope. Examples of this degradation include, but are not limited to:
    - Off-leash pets can access all segments of the slope (lower, middle, upper) and impact the naturalized slope face
    - Due to a limited lifespan, the staircase will eventually degrade and require future maintenance which will likely result in additional impacts to the slope
    - Sufficient access into the ravine already exists

Documentation related to the PIC meeting is contained in **Appendix C**.

6.2 Indigenous Engagement

6.2.1 Indigenous Community Consultation

Prior to the delivery of any notifications, the Ministry of the Environment, Conservation, and Parks (MECP) were contacted for advice and information on the Indigenous communities that should be contacted during the Indigenous Engagement process. Additional Indigenous community contact lists were also considered, including the lists held by TRCA. Communities that were contacted had established or asserted rights and interests in the Project limits, and are listed in **Table 4**.

TRCA began the process of engagement with Indigenous communities on June 8, 2018 by sending out the Notice of Intent, which also included an invitation to the CLC meeting held on June 25, 2018. Communities

were invited to ask questions about and provide feedback on the Project. A follow up email was sent on October 24, 2018 to the nations who had not yet responded. Some interest in the Project was expressed by the Huron-Wendat Nation and Mississaugas of the Credit First Nation.

Table 4: Summary of Indigenous community consultation for the Project.

Community Name	Reason for Consultation	Notification #1: Notice of Intent & Community Liaison Committee Meeting #1	Notification #1 follow up	Notification #2: Notice of Filing
Beausoleil First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Chippewas of Georgina Island First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Chippewas of Rama-Mnjikaning First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Huron-Wendat Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Coordinator, Williams Treaty First Nations	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Curve Lake First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Hiawatha First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Mississaugas of Alderville First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Mississaugas of Scugog Island First Nation	Asserted or established interest	June 8, 2018	October 24, 2018	November 21, 2022
Mississaugas of the Credit First Nation	Asserted or established interest	June 8, 2018	-	November 21, 2022

A full record of Indigenous community consultation including copies of all correspondence can be found in **Appendix C.**

6.3 Discussion of Concerns

6.3.1 Discussion of Public Concerns

TRCA has considered all feedback received during the public consultation phase of the Project. This feedback has been incorporated into the evaluation of alternatives and has helped to inform TRCA's planning decisions related to the Project.

A significant amount of community input was received during the public consultation phase for the Project. It is recognized that this level of public interest in the Project was due to community concerns regarding reconstruction of the Heath Street East municipal staircase. Reconstruction of this pedestrian staircase is beyond the scope of this Class EA; the objective of the Project is to protect essential structures and safeguard human life from the hazards of erosion and slope instability. However, TRCA recognizes the importance of this staircase to the local community and has agreed to combine efforts with the City of Toronto and incorporate its reconstruction into the Project. Combining efforts with the City will minimize costs and environmental impacts associated with mobilizing and demobilizing construction operations and will also reduce the overall disturbance to the surrounding community.

Although concerns were raised about potential negative impacts resulting from the reconstruction of the Heath Street East staircase, it was determined that the added benefits to public safety and the local community outweigh these potential impacts. TRCA and the City of Toronto will work closely to develop a suitable, low-impact and long-term staircase design to reinstate this coveted public access point. At the same time, TRCA will also be actively collaborating with the City to ensure that the Project is compatible with the Yellow Creek Geomorphic Systems Master Plan and other municipal initiatives being planned within the ravine.

Lastly, in effort to prevent the spread of Japanese Knotweed, TRCA is committed to developing a comprehensive management strategy to manage this invasive species during construction operations. This strategy will be developed concurrently with the detailed design and will consider the extent of Japanese Knotweed located within the work area and outline the best approach for its removal, disposal, and control. TRCA will act in accordance with Ontario's best management practices (BMP) for the control of Japanese Knotweed and will also leverage TRCA staff expertise in consultation with the City of Toronto's Parks, Forestry and Recreation division to manage invasive species during construction.

6.3.2 Discussion of Indigenous Community Concerns

The Huron-Wendat Nation and Mississaugas of the Credit First Nation indicated an interest in the archaeological assessment completed for the Project. The completed Stage 1 Archaeological Assessment (P1016-0154-2018) was provided to both nations on June 11, 2018. No additional comments, questions or concerns were provided following circulation of the assessment.

7.0 NOTICE OF FILING AND NOTICE OF PROJECT APPROVAL

As per the requirements of the Class EA document, the Project Plan shall be filed and made publicly available for a thirty (30) day review period.

The Project Plan has also been digitally circulated to all stakeholders who expressed interest in the Project. Hard copies of the Project Plan can be provided upon request by contacting the Project Manager.

Following the 30-day review period of this Class EA report and the successful resolution of any concerns received during the review period, TRCA intends to develop the detailed design of the preferred solution for remedial works and obtain the necessary approvals to proceed with the implementation.

A Notice of Project Approval and a Notice of Project Completion shall be sent to all parties who expressed an interest in the Project, in addition to Conservation Ontario and the MECP.

8.0 MONITORING PROGRAM

Once construction of the remedial works is deemed complete, regular inspections will be completed by staff through TRCA's long-standing Erosion Risk Management Program to ensure the works are performing as expected. These inspections will flag any deficiencies that may require maintenance works. The erosion control and slope stabilization structures shall be included in TRCA's Stream and Infrastructure Database (SEID) where construction specifications, photos, and structure conditions will be documented. Visual inspections will be completed following major storm events for a 1-year period. Site inspections will be conducted annually until a 3-year period has passed, after which, inspections will be adjusted to an appropriate frequency depending on the condition of the structure.

In addition to monitoring the constructed erosion control and slope stabilization structures, TRCA will continue to monitor the long-term monitoring areas identified in **Figure 13**. This monitoring plan will include undertaking visual inspections on an annual basis to measure the rate of erosion and inspect for signs of mass movement across the slope area. In the event major movement is observed, TRCA will initiate discussions with affected property owners to determine viable next steps to address the slope stability issues impacting their property.

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APPENDIX A

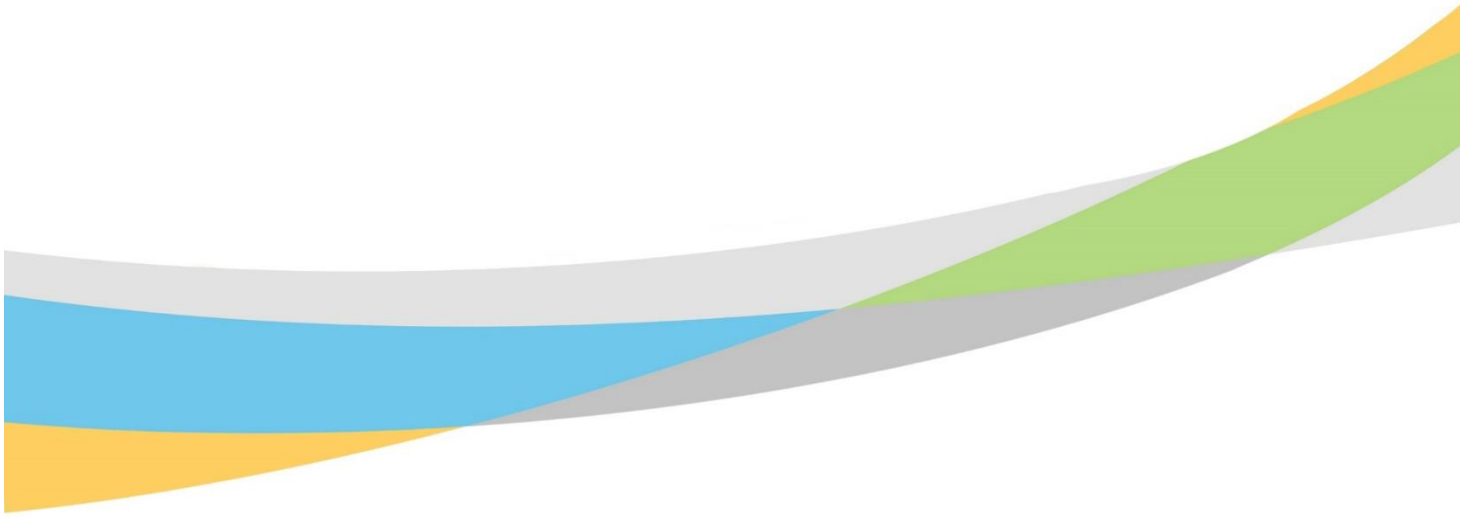
Engineering Studies and Reports

APPENDIX B

Baseline Studies – Biological, Cultural, and Topographic Conditions

APPENDIX C

Public Consultation Records



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