Sheridan Creek Erosion Control Class Environmental Assessment

Project File Report – Volume 1

City of Mississauga

January 16, 2023

→ The Power of Commitment

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List of Acronyms

Acronym	Definition
MCEA	Municipal Class Environmental Assessment
EA	Environmental Assessment
EA Act	Environmental Assessment Act
ESR	Environmental Study Report
PIC	Public Information Centre
QEW	Queen Elizabeth Way
ANSI	Area of Natural and Scientific Interest
NDMNRF	Ministry of Northern Development, Mines, Natural Resources and Forestry
ARA	Aquatic Resource Area
CVC	Credit Valley Conservation
CN Rail	Canadian National Railway
SAR	Species at Risk
MECP	Ministry of Environment, Conservation, and Parks
DFO	Fisheries and Oceans
RGA	Rapid Geomorphic Assessment
RSAT	Rapid Stream Assessment Technique
SARA	Species at Risk Act
ESA	Endangered Species Act
HEC-RAS	Hydrologic Engineering Center River Analysis System
LTSTOS	Long Term Stable Top of Slope
TRCA	Toronto and Region Conservation Authority
AA	Archaeological Assessment
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
IPZ 2	Intake Protection Zone -2
HVA	Highly Vulnerable Aquifers
SGRA	Significant Groundwater Recharge Area
The Guide	*Consideration of Climate Change in Environmental Assessments in Ontario*
GHG	Greenhouse Gas
BMP	Best Management Practices
ELC	Ecological Land Classification
NHIC	Natural Heritage Information Centre
ESC	Erosion and Sediment Control
PFR	Project File Report
US	Upstream
DS	Downstream

Scope and Limitations

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1. Introduction

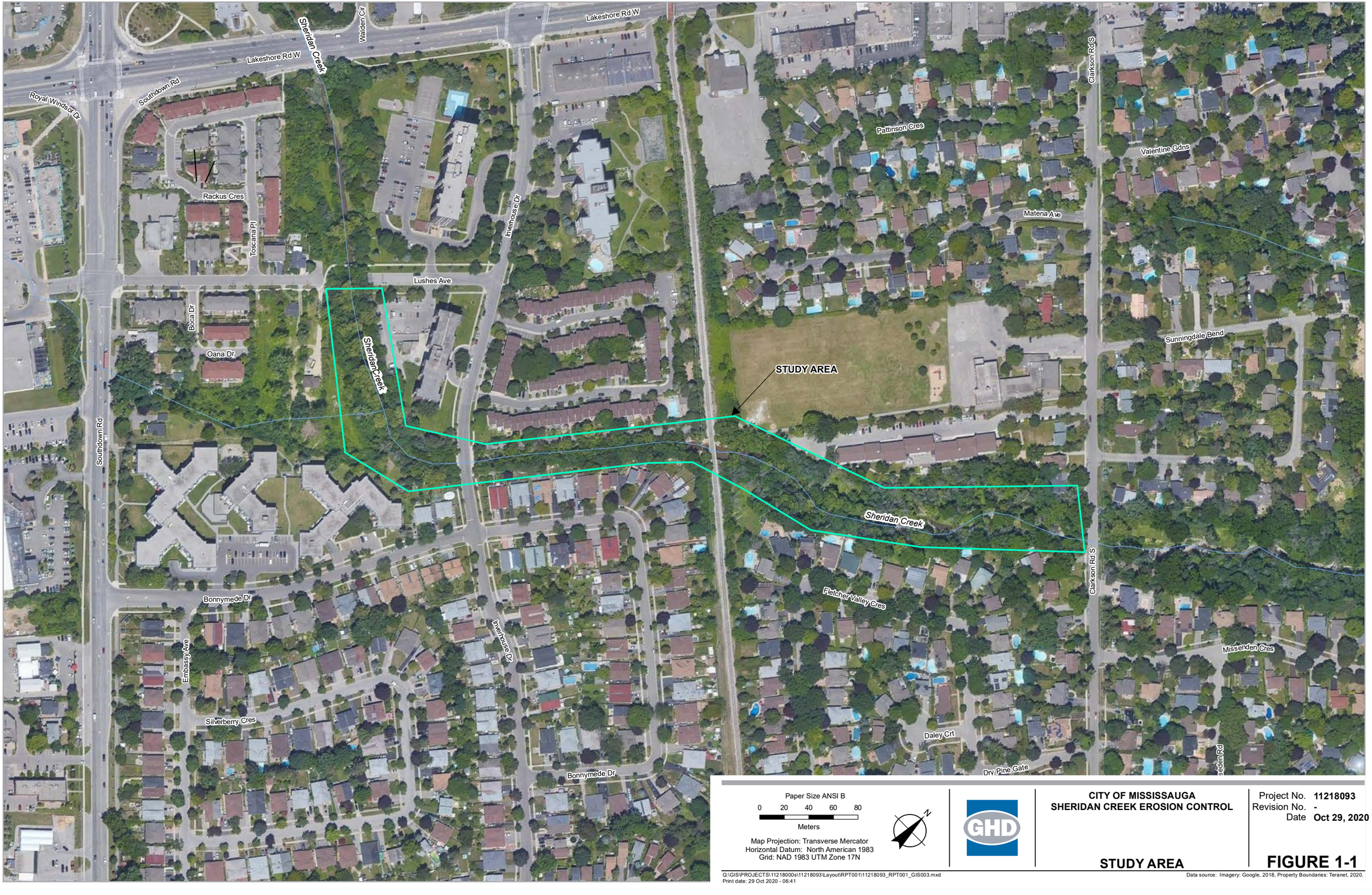
This Project File Report (PFR) documents the planning process carried out for the Sheridan Creek Erosion Control Class Environmental Assessment (from Lushes Avenue to Clarkson Road South) in the City of Mississauga (City) (Project). As the proponent for the Project, the City is proposing to mitigate the existing erosion problems and ensure long-term stability of Sheridan Creek using natural design techniques, where feasible, while also protecting or enhancing the existing environment within the Project area **(Figure 1-1)**.

The Project is classified as a Schedule B activity in accordance with the Municipal Engineers Association, Municipal Class Environmental Assessment (MCEA), October 2000 (as amended in 2007, 2011 and 2015) (**Section 2**). A Schedule B activity requires the first two phases of the MCEA to be completed. As a result, the problem/opportunity statement for the Project was defined in accordance with Phase 1 of the MCEA (**Section 3**). The section of Sheridan Creek from Lushes Avenue to Clarkson Road South was divided into three reaches based on changes in channel planform and active geomorphological processes, which are directly related to local surficial geology, gradient, hydrology, land use, and riparian vegetation. The reaches are homogenous sections of channel regarding form and function and can therefore, be expected to behave consistently along their length to changes in hydrology and sediment inputs, as well as to other modifying factors.

Next, MCEA Phase 2 was carried out beginning with the identification and description of the alternative solutions for addressing the problem/opportunity statement (**Section 4)**. Overall, four alternative solutions were identified including do nothing, site-based work, reach-scale work, and channel realignment, but were made specific to each of the three reaches. Following this, the environment associated with the Project area was described based on existing available information sources and field investigations.

The four alternative solutions were comparatively evaluated based on several technical, environmental, and financial criteria with the recommended solution being to do nothing for Reach 1 and to complete reach-scale work for Reaches 2 and 3. This recommendation was consulted on with review agencies, Indigenous communities, and the public including hosting an Online Public Information Centre (PIC) prior to confirming it as the preferred solution for the Project. With confirmation of the preferred solution, **Section 5** provides a detailed description and implementation plan for it.

In addition to the PIC, consultation with review agencies, Indigenous communities, and the public was carried out throughout the Project in accordance with the MCEA as documented in **Section 7**. As a result, input was sought and obtained from the involved participants at key decision-making points in the MCEA before moving forward with those decisions in the Project.



Paper Size ANSI B

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

CITY OF MISSISSAUGA
SHERIDAN CREEK EROSION CONTROL

STUDY AREA

Project No. **11218093**
Revision No. **-**
Date **Oct 29, 2020**

FIGURE 1-1

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Data source: Imagery: Google, 2018, Property Boundaries: Teranet, 2020.

2. Municipal Class Environmental Assessment

2.1 Overview

The Sheridan Creek Erosion Control Class Environmental Assessment (Project) was carried out by the City of Mississauga (City) in accordance with the Municipal Class Environmental Assessment (MCEA)1. In Ontario, there are two types of Environmental Assessment (EA) and approval processes for municipal projects to follow prior to being implemented to meet the requirements of the Environmental Assessment Act (EA Act):

i. Individual EAs (Part II of the *EA Act*) – those projects for which a Terms of Reference and an individual EA are carried out and submitted to the Minister of the Environment, Conservation and Parks (Minister) for review and approval.

ii. Class EAs (Part II.1 of the *EA Act*) – those projects that are approved subject to compliance with an approved Class EA process with respect to a class of undertakings. Providing the approved process is followed, a proponent has complied with the *EA Act*.

Thus, the MCEA provides an approved process whereby specified municipal infrastructure projects can be planned, designed, constructed, operated, maintained, rehabilitated, and retired without having to obtain an individual EA approval under the *EA Act*.

2.2 Municipal Class EA

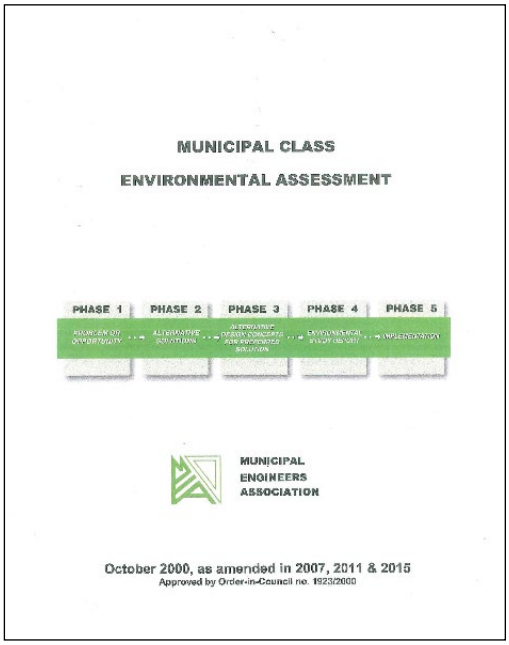
The approved MCEA process consists of five planning and design phases. The five phases are briefly summarized as follows:

Phase 1 - Identify the problem and/or opportunity

Phase 2 - Identify alternative solutions to address the problem or opportunity and establish the preferred solution taking into account the existing environment and review agency, Indigenous community, and public input

Phase 3 - examine alternative methods for implementing the preferred solution and determine the preferred implementation method taking into account the existing environment and additional review agency, Indigenous community, and public input

Phase 4 - document the preceding phases in an Environmental Study Report (ESR) and make it available for comment by review agencies, Indigenous communities, and the public



1 Municipal Engineers Association, Municipal Class Environmental Assessment, October 2000 (as amended in 2007, 2011 and 2015).

Phase 5 - complete contract drawings and documents and proceed to construct the preferred method for implementing the preferred solution

Four Project Classifications

Since projects vary in the significance of the potential adverse environmental effects that might be caused, they are classified in the MCEA in terms of schedules. The schedules are briefly summarized in Table 2-1 and Figure 2-1 illustrates the five phases of the MCEA planning and design process within the context of the preceding four project classifications or schedules.

Table 2-1 Municipal Class Environmental Assessment Project Schedules

Municipal Class EA Schedule	Project Description	Municipal Class EA Requirements
Schedule A projects	Limited in scale Minimal adverse environmental effects Primarily municipal maintenance and operational activities	Exempt from the *Environmental Assessment Act*
Schedule A+ projects	Like Schedule A projects	Same as Schedule A projects, but the public must be notified prior to construction
Schedule B projects	Potential for some adverse environmental effects Primarily improvements and minor expansions to existing facilities	Phases 1 and 2 Consult with review agencies and the public Project File
Schedule C projects	Potential for significant adverse environmental effects Construction of new facilities and major expansions to existing facilities	Phases 1 to 4 Consult with review agencies and the public Environmental Study Report

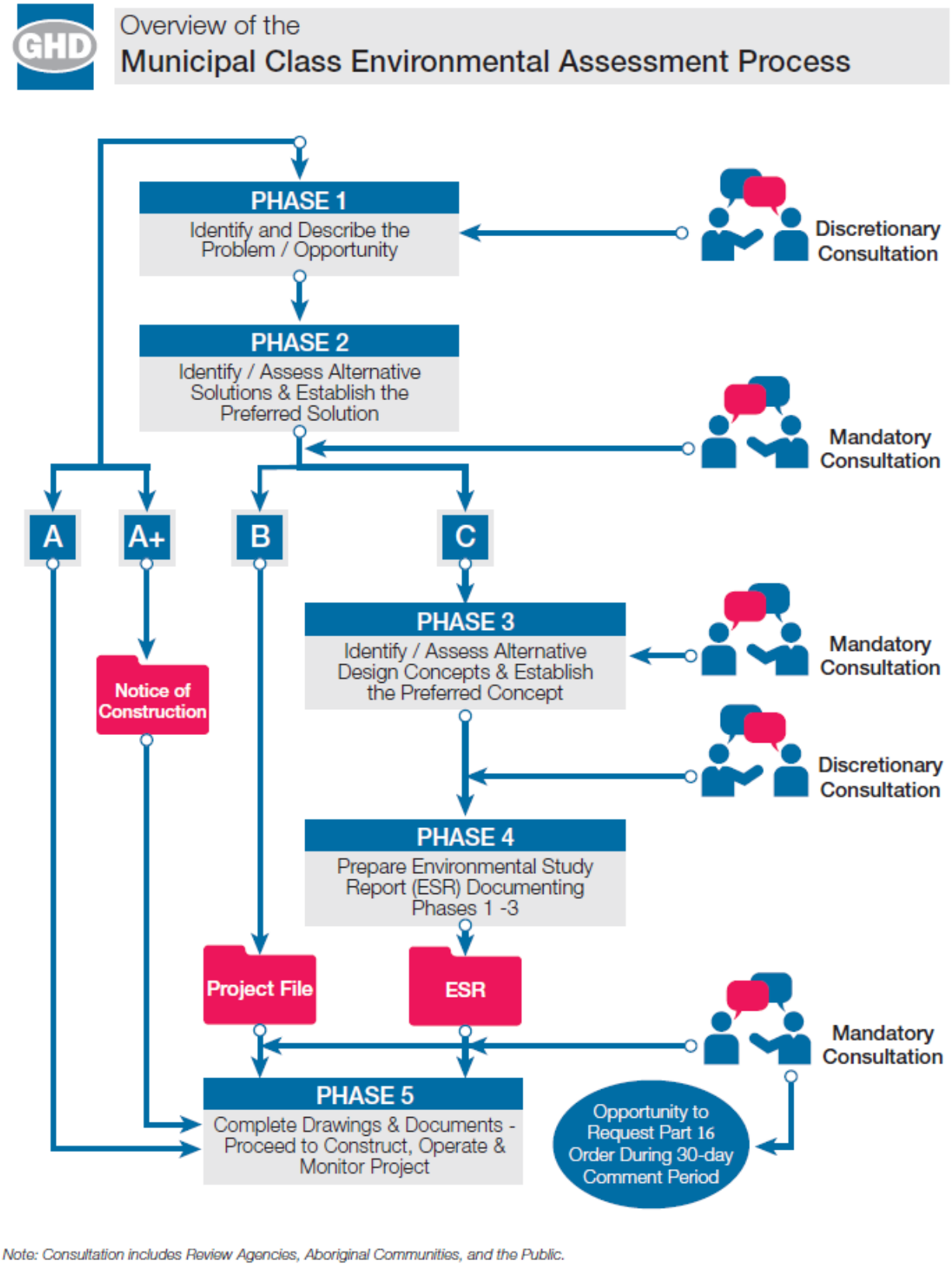


Figure 2-1 Overview of the Municipal Class Environmental Assessment Process

Project Implementation – Schedule Specific

Under Section 16 of the *EA Act* a person or party involved in either a Schedule B or C project may request that the Minister make an order for a project to comply with Part II of the *EA Act* if they feel that there are outstanding concerns that the project may adversely impact constitutionally protected Aboriginal and treaty rights, which cannot be resolved in discussion with the proponent. This is referred to as a Section 16 Order, which addresses individual Environmental Assessments. The person or party can make this request if they feel that their concerns raised cannot be resolved in discussion with the proponent by the end of the mandatory comment period.

In addition, the Minister may issue an order on his or her own initiative within the 30 calendar days after the conclusion of the mandatory comment period. Therefore, a proponent can only implement Schedule B and C projects (Phase 5 - Implementation) if there are no outstanding “Section 16 Order” requests.

2.3 Sheridan Creek Erosion Control Class EA Project Classification

The Project fulfilled the MCEA Schedule B process requirements. The MCEA is a self-assessment process. As such, it is the proponent's responsibility to identify the correct project schedule and meet the appropriate MCEA requirements Failure to do so places the proponent in contravention of the *EA Act*, which is an offence subject to penalties.

The following MCEA planning phases were undertaken as illustrated in **Figure 2-2**:

Phase 1: Problem or Opportunity

– Step 1: Identify the problem and/or opportunity

Phase 2: Alternative Solutions

– Step 1: Identify alternative solutions to the problem and/or opportunity
– Step 2: Carry out an inventory of the environment
– Step 3: Identify the potential impacts of the alternative solutions on the environment and any measures needed to mitigate those impacts
– Step 4: Carry out a comparative evaluation of the alternative solutions and identify a recommended solution
– Step 5: Notify and consult with review agencies and the public by carrying out mandatory consultation
– Step 6: Determine the preferred solution based on the comparative evaluation and feedback received

Once Phase 2 is completed, a proponent is required to document the preceding steps in a report and make it available for the mandatory comment period. To initiate the comment period, a proponent needs to issue a Notice of Study Completion to those consulted as part of the Project.

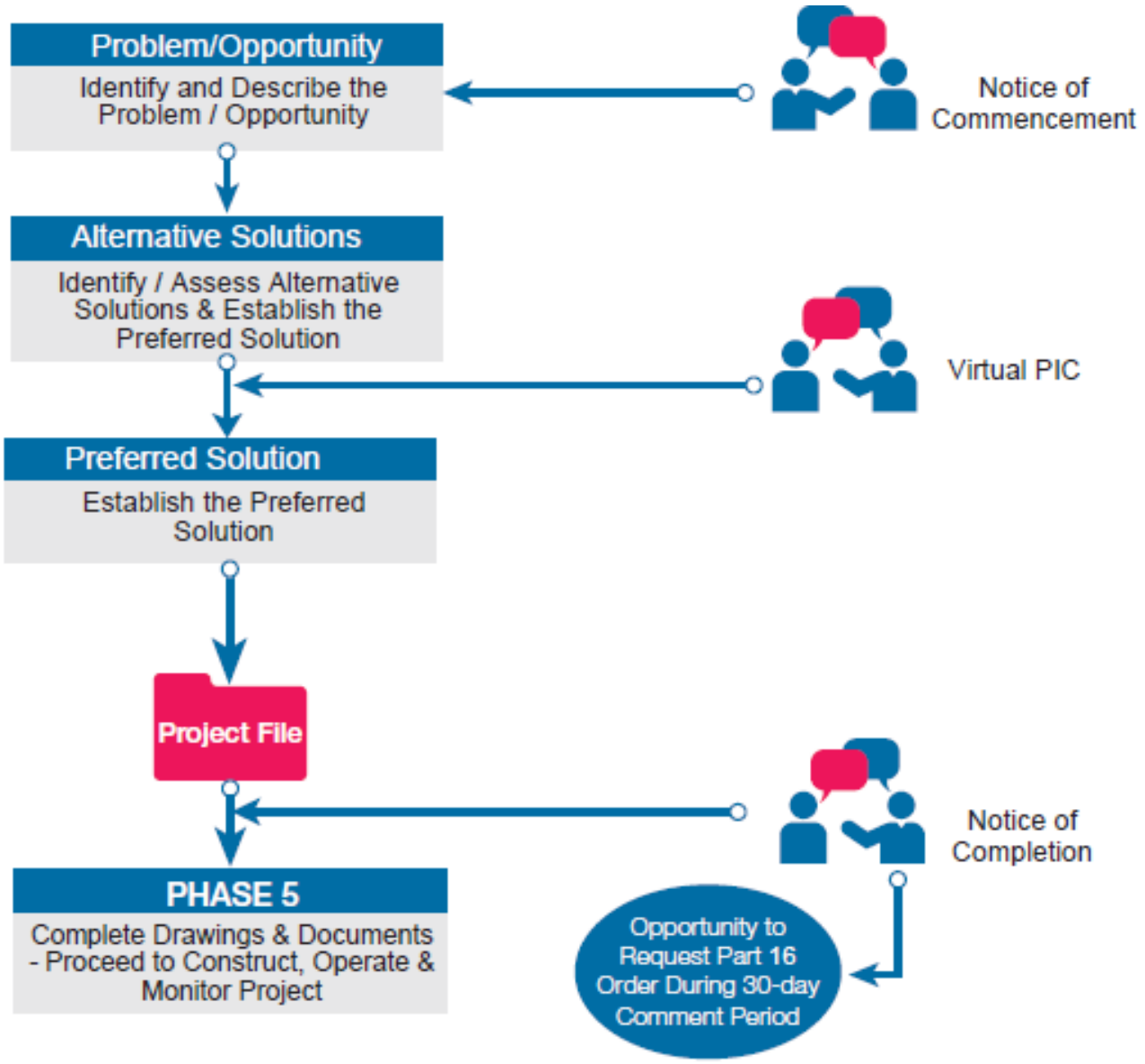


Figure 2-2 Sheridan Creek Erosion Study Class EA Schedule B Process

3. Phase 1 – Problem/Opportunity

3.1 Location and Description of Sheridan Creek

The Sheridan Creek watershed is a narrow, urbanized watershed located on the west side of the City of Mississauga (City). The upper part of the watershed is located north of Queen Elizabeth Way and south of Dundas Street. Approximately 1,035 hectares are drained by the watershed which outlets to Rattray Marsh on Lake Ontario. The headwater zones of the watershed have been largely urbanized and the Creek has been extensively hardened and straightened along much of its length with limited access to its floodplain due to channel bed downcutting, bank hardening works, and general urban encroachment.

Severe erosion in Sheridan Creek has damaged these former stabilization works to the extent that some of the structures have been outflanked and displaced. Ongoing erosion within the valley threatens sanitary, storm, and water infrastructure, but also mature trees and private properties within the urbanized valley system. Based on the preliminary background review, the initial estimate of at-risk infrastructure within the project area includes seven stormwater outfalls with associated storm sewer pipelines, one box culvert at the downstream limit of the watercourse, three watermain crossings, three sanitary sewer crossings, and one storm sewer running adjacent to the creek. Excessive erosion has led to some of the following impacts:

– Bank and valley wall destruction
– Slumping of gabion banks
– Elevated storm sewer outfalls.

3.1.1 Project Reaches

The Project area was divided into three reaches. The reaches are homogenous sections of channel regarding form and function and can therefore, be expected to behave consistently along their length to changes in hydrology and sediment inputs, as well as to other modifying factors. Reach delineation was based on changes in channel planform and active geomorphological processes, which are directly related to local surficial geology, gradient, hydrology, land use, and riparian vegetation (Montgomery et al, 1997; Richards et al, 1997).

Reach analysis was completed utilizing historical aerial photographs. Field verification of reach extents was then undertaken by GHD to confirm the reach extents were appropriate. Reach breaks were located at significant changes in channel armouring corresponding to the upstream and downstream limits of the concrete channel. The reaches are delineated on **Figure 3-1**. Reach 1 spans from the Lushes Avenue pedestrian bridge to just upstream of the Inverhouse Drive crossing, at the upstream limit of the concrete channel. Reach 2 spans from just upstream of the Inverhouse Drive crossing, at the upstream limit of the concrete channel to the CN rail crossing. Reach 3 extends from the CN rail crossing to the Clarkson Road South crossing.

A Historical Assessment was completed through the comparison of aerial photographs from 1966, 1975, 1989, 2000, 2010, and 2017. The results are provided in **Appendix A**.

Paper Size ANSI B

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Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

CITY OF MISSISSAUGA
SHERIDAN CREEK EROSION CONTROL

Project Reach Areas

Project No. 11218093
Revision No. -
Date Mar 25, 2021

FIGURE 3-1

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Data source: Imagery: City of Mississauga, 2020.

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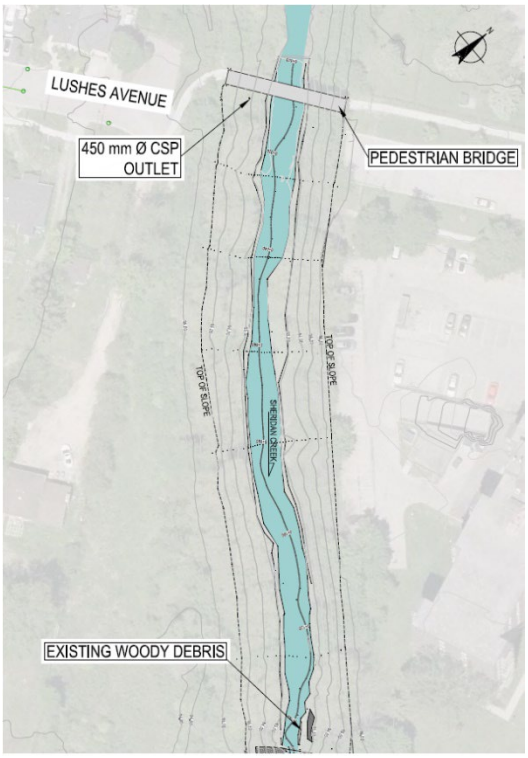
3.1.1.1 Reach 1

Reach 1 spans 120 m from the Lushes Avenue pedestrian bridge crossing to the upstream limit of the concrete channel. **Table 3-1** provides a summary of existing reach conditions and photographs taken in November 2020.

Table 3-1 Reach 1 Existing Conditions

Reach 1			
Upstream Boundary	Lushes Avenue Pedestrian Bridge (0+000)	Downstream Boundary	Upstream Limit of Concrete Channel (0+120)
Channel Length	120 m		
Reach Map			
Channel Conditions (from upstream (US) to downstream (DS))	The reach is natural with no bank or bed armouring aside from the downstream limit. The planform is straight throughout with minor changes in width progressing downstream. The channel is confined by valley walls on both sides. (0+000) Newly constructed pedestrian bridge with wide footings aligned with the top of slope (Photo 1.1). 150 mm watermain and 3000 mm sanitary trunk sewer run under the channel parallel to the bridge. (0+005) Drainage culverts outlet on both the left and right bank of the channel with associated minor drainage swales leading to the watercourse (Photos 1.2 and 1.3)		

<table>
<tr><th colspan="2">Reach 1</th></tr>
<tr><td></td><td>(0+000 to 0+060) Minor erosion along toe of slope with some exposed roots and leaning tress.
(0+065) Large vegetated bar along the left bank of the watercourse. Fallen trees and exposed roots along right bank (Photo 1.4).
(0+070 to 0+115) Minor erosion along toe of slope with some exposed roots and leaning tress.
(0+115) Riprap bank protection embedded along the left bank with displacement of material into the channel (Photo 1.5)
(0+120) Transition to concrete channel with gabion along the slopes. Evidence of minor erosion along the toe of the gabion (Photo 1.6)</td></tr>
<tr><td>Infrastructure</td><td>Watermain (150 mm) crossing under pedestrian bridge (SC-WM1)
Sanitary trunk sewer (3000 mm) crossing under pedestrian bridge (SC-SS1)
Two drainage culvert outlets on left and right bank</td></tr>
<tr><td>Constraints</td><td>Large, mature trees throughout riparian area
Close proximity to residential properties</td></tr>
<tr><td colspan="2">Photographs</td></tr>
<tr><td> 
Photo 1.1 Facing north. Pedestrian bridge crossing.</td><td> 
Photo 1.2 Facing northeast. Drainage outlet and small drainage swale along left bank.</td></tr>
</table>

Reach 1	
 **Photo 1.3** Facing northwest. Drainage outlet and small drainage swale along right bank.	 **Photo 1.4** Facing south. Vegetated bar along left bank of watercourse. Meter bar for scale.
 **Photo 1.5** Facing south. Riprap bank protection along the left bank. Displacement of material into the channel bed was noted.	 **Photo 1.6** Facing south. Gabion along the right slope with minor displacement of gabion material towards the toe of slope.

There is evidence of minor planform adjustment and width changes throughout the reach. The planform was relatively straight through all the aerials, except for a small meander towards the downstream limit in 1966 that was removed between 1966 and 1975 when the artificial stabilization measures were implemented immediately downstream within Reach 2. The channel planform shifted to the northeast between 1966 and 1989 and the width increased.

Intensive urbanization of the area surrounding this area of Sheridan Creek appears to have begun between 1966 and 1975 and resulting increases in overland flow/runoff would have created channel instability and likely caused planimetric form adjustments and width changes to modify channel gradient and dissipate stream power. The planform has remained consistent since 1975 and the channel width has fluctuated. Between 1989 and 2000 the channel width decreased slightly and subsequently increased between 2000 and 2010.

3.1.1.2 Reach 2

Reach 2 spans 292 m from the upstream limit of the concrete channel to the downstream limit of the concrete channel. **Table 3-2** provides a summary of existing reach conditions and photographs taken in November 2020.

Table 3-2 Reach 2 Existing Conditions

Reach 2			
Upstream Boundary	Upstream limit of concrete channel (0+120)	Downstream Boundary	Downstream limit of concrete channel, downstream of CN Rail Crossing (0+412)
Channel Length	292 m		
Reach Map			
Channel Conditions (from US to DS)	Channel is entirely armoured and engineered with a concrete bed and concrete banks. (0+120 to 0+140) Concrete bank protection along the left bank was displaced and gabion was exposed (Photo 2.1). The bed edge where the bed and bank protection intersect along the left bank was outflanked and undercut. The concrete banks along the right bank show evidence of erosion along the top of the bank and have minor cracking. (0+140 to 0+155) Evidence of erosion along the top of bank of both sides of the channel. Concrete bank is elevated relative to gabion below with evidence of erosion along the edges of the top of the concrete banks. Concrete spillway along right slope associated with previous stormwater outfall that has been since decommissioned and removed (Photo 2.2). (0+155 to 0+196) Concrete bed and banks in good condition along with gabion along slope. (0+196) Displaced segment of concrete along left bank. (0+210) SC-OF1 along left bank with failed and displaced concrete spillway. Bed erosion and bank erosion noted within concrete channel along left bank (Photo 2.3). (0+210) to (0+365) Minor cracking of concrete long banks with some leaning trees in the gabion. Some small segments with displaced/deteriorating concrete and exposed internal rebar along left bank. (0+365) SC-2 along left bank. Cracked and eroded concrete bank protection at intersection of concrete bank and concrete spillway (Photo 2.4). (0+365 to 0+385) Concrete channel in good condition, channel width increases at downstream limit with grade drop into larger concrete channel width (Photo 2.5). (0+385 to 0+412) Significant increase in channel width under CN Rail Crossing. Concrete is in good condition with no evidence of failure or displacement. Grade drop at downstream limit of the reach (Photo 2.6).		

Reach 2	
Infrastructure	Two stormwater outfalls and associated storm sewer pipelines (SC-OF1, SC-OF2) Storm sewer parallel to the channel along top of east slope (SC-ST1) Sanitary sewer (250 mm) crossing under Inverhouse Drive (SC-SS2) Watermain (200 mm) crossing under Inverhouse Drive (SC-WM2)
Constraints	Project area access Extensive hardening of channel Large, mature trees throughout riparian area Close proximity to residential properties Private property ownership CN Rail Property
Photographs	

Photo 2.1 Facing south. Upstream limit of concrete channel. Displaced concrete along left bank and exposed gabion.

Photo 2.2 Facing southeast. Elevated concrete banks relative to gabion on slope. Concrete spillway on the slope (red arrow).

Reach 2	
 **Photo 2.3** Facing west. Stormwater outfall on right bank with failing headwall and surrounding armourstone walls. Slope failure behind outfall.	 **Photo 2.4** Facing northeast. Stormwater outfall with cracked spillway and concrete bank protection.
 **Photo 2.5** Facing west. Grade drop and increase in channel width of concrete channel.	 **Photo 2.6** Facing west. Significant grade drop at downstream limit of Reach 2 under CN Rail Crossing.

Reach 2 has experienced the most significant planform change since 1966. The channel through the current Reach 2 previously flowed southeast of the current position by 50 to 60 m and had a meandering planform. Since 1975, the channel has been straight through Reach 2 with one bend at the upstream limit. These changes are not related to natural channel evolution but rather to artificial stabilization structures implemented by the City between 1966 and 1975. A concrete channel was constructed during this period that restricted planform adjustment and controlled channel width. The concrete channel width appears to be slightly smaller than the width of the natural channel in 1965. There have been no changes in channel width or planform through Reach 2 since 1975 due to the hardening of the channel.

3.1.1.3 Reach 3

Reach 3 spans 380 m from the downstream limit of the concrete channel, coinciding roughly with the CN Rail crossing. **Table 3-3** provides a summary of existing reach conditions and photographs taken in November and December 2020.

Table 3-3 Reach 3 Existing Conditions

Reach 3			
Upstream Boundary	Downstream Limit of Concrete Channel (0+412)	Downstream Boundary	Clarkson Road South Culvert (0+745)
Channel Length	333 m		
Reach Map			
Channel Conditions (from US to DS)	(0+412 to 0+430) Exposed bedrock along entirety of channel bed. The northern slope (left bank) is supported by gabion and is three gabion baskets high and the right bank is natural with toe erosion and exposed bedrock.SC-OF3 along right bank with gabion lined outfall channel (Photo 3.1). Gabion along right bank was slumping towards the channel and gabion on the left bank was undermined. SC-OF4 was along the left bank in gabion-supported slope with highly elevated spillway relative to the channel bed elevation (Photo 3.2). Gabion in left bank has minor displacement along the toe (Photo 3.3). (0+430 to 0+490) Undermined and displaced gabion within lower baskets of gabion-lined northern slope. Segments of the gabion are failing and slumping towards the channel (Photo 3.4). Erosion along toe of slope of right bank. Exposed bedrock along the channel bed. SC-OF4 was along the left bank with displaced gabion materials on either side of the outfall (Photo 3.5). (0+490 to 0+520) Gabion along right bank began. Gabion along left bank was failing and significantly slumping into channel (Photo 3.6). The gabion along the right bank appeared to be in good condition. (0+520 to 0+545) Gabion along left bank became stable and gabion along right bank had completely failed and was outflanked. The gabion was significantly slumped towards the channel and the banks upslope of the gabion were exposed with signs of erosion (Photo 3.7) (0+545 to 0+570) Unarmoured, undercut left bank with evidence of toe erosion. Gabion baskets along right bank is generally in good condition (Photo 3.8) (0+570 to 0+650) Gabion mat flush with slope along right bank. Undercut, unarmoured left bank with fallen and leaning trees. Bar development along right bank of watercourse. SC-OF6 with outlet channel along right bank (Photo 3.9, Photo 3.10) (0+650 to 0+680) Only unarmoured segment of Reach 3. Significant erosion and undercuts along right bank with steep slopes above bankfull		

Reach 3	
	level threatening private property (Photo 3.11). Depositional bar along left bank. Debris jam within the channel. (0+680 to 0+720) Gabion baskets along left bank with unarmoured right bank. Gabion baskets are undermined with significant displacement of gabion materials. One segment of left bank is exposed due to failure of gabion basket (Photo 3.12) (0+720 to 0+730) Armourstone wall along right bank with continued gabion along left bank. Minor displacement of armourstone but overall the structure was in good condition (Photo 3.13). Continued displacement of gabion material within gabion on the left bank. (0+730 to 0+745) Armourstone wall continues along left bank but transitions to gabion baskets along right bank. Both bank protections were tied into the road embankment slope as the watercourse flowed under the Clarkson Road South box culvert (Photo 3.14)
Toronto Water Assets	Five stormwater outfalls (SC-OF3, SC-OF4, SC-OF5, SC-OF6, SC-OF7) Sanitary sewer (750 mm) crossing under Clarkson Road South (SC-SS3) Watermain (200 mm) crossing under Clarkson Road South (SC-WM3)
Constraints	Project area access Extensive hardening of channel Steep, unstable ravine slopes Large, mature trees throughout riparian area Close proximity to residential properties Private property ownership
Photographs	

Photo 3.1 Facing south. SC-OF3 in gabion lined outfall channel. Gabion along right bank was slumping towards channel and gabion on left bank was undermined.

Photo 3.2 Facing northeast. SC-OF4 along left bank. Significant evidence of degradation with elevated spillway relative to the channel bed.

Reach 3

Photo 3.3 Facing northeast. Gabion along left bank and natural right bank with evidence of erosion. Gabion slumping towards channel at downstream limit of outfall channel.

Photo 3.4 Facing east. Gabion slumping towards channel and displaced gabion material in lower baskets.

Photo 3.5 Facing northeast. SC-OF5 in left bank. Displaced gabion materials on both sides of culvert and failing gabion immediately downstream.

Photo 3.6 Facing south. Armourstone lined banks with failure on left bank.

Photo 3.7 Facing east. Right bank with failing, outflanked gabion and eroded slope.

Photo 3.8 Facing east. Gabion baskets along right bank and unarmoured left bank.

Reach 3

Photo 3.9 Facing northeast. Undercut left bank with fallen and leaning trees.

Photo 3.10 Facing southeast. SC-OF6 along right bank with concrete headwall.

Photo 3.11 Facing east. Steep valley wall contact along right bank with erosion threatening private property.

Photo 3.12 Facing northeast. Failing gabion along left bank of watercourse with significant material displacement.

Photo 3.13 Facing east. Armourstone walls along banks transitioning to gabion baskets along right bank.

Photo 3.14 Facing east. Clarkson Road South box culvert.

Moderate planform adjustment occurred between 1966 and 1975. The planform shifted north, likely in conjunction with artificial bank treatment installation. The channel width was decreased between 1966 in 1975 in most sections of the reach due to the installed channel bank protection measures. The adjustments primarily occurred in the middle of the reach. Since 1975, the channel has undergone minor variations in planform and width but has not experienced significant planform adjustment. Channel stabilization works were implemented by the City in the late 1960s and 1970s and the artificial bank treatments have limited planform adjustment since installation. The observed minor changes in width and planform can be related to outflanking of the structures.

3.2 Planning Policy Context

Land use planning in Ontario is directly influenced by senior levels of government including the Province of Ontario and Peel Region. The requirements of senior levels of government are reflected in Mississauga's Official Plan.

3.2.1 Provincial Policy

The Provincial Policy Statement, 2020[2], issued under the *Planning Act*, provides principles and policy direction on matters of provincial interest relating to land use planning and development. These matters include building strong communities with an emphasis on efficient development and land use patterns, wise use and management of resources and protecting public health and safety. The *Planning Act* requires that any decisions relating to planning matters shall be consistent with policy statements under the *Act*.

The Provincial Policy Statement (PPS) states in Section 2.1.1 that natural heritage features should be protected for the long term. Further, the PPS states in Section 2.1.2 that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and groundwater features. These policies have been considered as part of the Project and where possible measures to improve natural heritage features and surface water features have been proposed.

The Provincial Growth Plan 2006[3] provides a framework for implementing the Province's vision for building strong, prosperous communities within the Greater Golden Horseshoe to 2031. The Growth Plan provides guidance on a wide range of issues related to growth management, including land use planning, urban form, transportation, infrastructure planning, housing and natural heritage and resource protection. The Growth Plan is premised on the principles of building compact, vibrant and complete communities, developing a strong and competitive economy,

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2 Ontario Government, 2020. Provincial Policy Statement, 2020. Ontario: Ontario Government, pp.https://files.ontario.ca/mmah-provincial-policy-statement-2020-accessible-final-en-2020-02-14.pdf.

3 Ontario.ca. 2022. A Place to Grow: Growth plan for the Greater Golden Horseshoe. [online] Available at: <https://www.ontario.ca/document/place-grow-growth-plan-greater-golden-horseshoe> [Accessed 19 May 2022].

protection and wise use of natural resources and optimizing the use of existing and new infrastructure to support growth in a compact, efficient form.

A new Growth Plan 2019, with a 2041 planning horizon, came into effect on May 16, 2019. An amendment to the Growth Plan 2019 came into effect on August 28, 2020 extending the planning horizon to 2051. The Growth Plan 2019 states in Section 4.2.3 that conservation and flood or erosion control projects are permitted if they have been deemed necessary in the public's interest and after all alternatives have been considered. The Project is deemed necessary due the eroding banks which are adjacent to residential properties and alternatives including do nothing have been considered as part of the MCEA.

3.2.2 Municipal Policy

3.2.2.1 Region of Peel

The Project is located within an 'Urban System' on the Regional Structure – Schedule D of the Region of Peel Official Plan 2021[4]. Under Section 5.3.1 of the Official Plan the general objectives of an 'Urban System' include conservation of the environment and resource attributes of the region as well as to establish healthy complete urban communities that contain living, working and recreational opportunities, which respect the natural environment, resources and the characteristics of existing communities.

The Project aims at restoring the erosion control measures within Sheridan Creek so that the residential properties adjacent to it continue to be protected. In addition, in Schedule A of the Official Plan, the Project area is situated within the designated "Core Areas of the Greenlands System'. Under Section 2.3.2.6, development and site alteration within these areas are permitted for conservation and flood or erosion control projects if they have been demonstrated to be necessary in the public interest and after all reasonable alternatives have been considered, which is consistent with the Provincial Growth Plan 2019.

3.2.2.2 City of Mississauga

The Project is situated within the Clarkson-Lorne Park Neighbourhood and designated 'Greenlands' with a 'Natural Hazards' overlay in the City of Mississauga's Official Plan[5]. Adjacent to where the proposed work will be undertaken, the land is designated 'Residential Low Density I and II', 'Residential Medium Density' and 'Residential High Density'. In Section 16.5.1.1 of the Official Plan, developments within the Clarkson-Lorne Neighbourhood should be compatible with and enhance the character of Clarkson-Lorne Park as a diverse established community by integrating with the surrounding area.

In Sections 11.2.3.1 and 11.2.3.2, lands designated 'Greenlands' are generally associated with natural hazards and therefore restricts development to protect people and property from damage.

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4 Region of Peel Official Plan, Office Consolidations, September 2021 https://www.peelregion.ca/officialplan/download/pdf/office-consolidation-text-2021-sept.pdf

5 City of Mississauga Office Plan, 2021 https://www.mississauga.ca/projects-and-strategies/strategies-and-plans/mississauga-official-plan/

Development associated with flood control and/or erosion management is however permitted within lands designated ‘Greenlands’. The Project aims to address on-going erosion in Sheridan Creek which, as mentioned before, is threatening existing sanitary, storm, and water infrastructure as well as mature trees and private properties. Therefore, the Project is aligned with the Clarkson-Lorne Park Neighbourhood, ‘Greenlands’ and ‘Natural Hazards’ strategies.

3.3 Problem/Opportunity Statement

The Sheridan Creek watershed is a narrow, urbanized watershed located on the west side of the City of Mississauga (City). Sheridan Creek has been extensively hardened and straightened along much of its length and severe erosion has damaged the former stabilization works. Excessive erosion has led to some of the following impacts in the section of Sheridan Creek from Lushes Avenue to Clarkson Road South: bank and valley wall destruction; slumping of gabion banks; and elevated storm sewer outfalls. The City’s on-going erosion monitoring program has identified the need for rehabilitating this section of Sheridan Creek.

Rehabilitation of Sheridan Creek is supported by provincial and municipal policy which aims to improve natural heritage features and surface water features and permits these types of projects deemed necessary in the public’s interest.

As a result, the purpose of the Project is to satisfy the following:

– Provide long term erosion protection that is compatible with the natural tendencies of the creek
– Maintain or improve hydraulic capacity of the creek
– Replace the existing gabion and concrete design with a more ‘natural’ channel design, where feasible
– Provide environmental enhancements wherever possible
– Improve fish habitat and fish passage
– Minimize environmental impacts during and post construction
– Decrease property and infrastructure loss
– Minimize capital and maintenance costs

4. Phase 2 – Alternative Solutions

In accordance with Phase 2 of the Municipal Class Environmental Assessment (MCEA), alternative solutions to the identified problem/opportunity statement have been identified, assessed, and comparatively evaluated leading to the identification of a recommended solution(s) for review by stakeholders.

4.1 Identification and Description of the Alternative Solutions

Alternative solutions were identified specific to each of the three reaches for the section of Sheridan Creek from Lushes Avenue to Clarkson Road South. Three alternative solutions were identified for both Reaches 1 and 2 and four alternative solutions were identified for Reach 3 as the valley depth within this reach allowed for more opportunities for alternative solutions. With these three reaches in mind, the following sections describe the alternative solutions as they have been specifically developed for each reach. For context, remediation objectives and constraints specific to each reach are provided as part of developing the reach-specific alternative solutions.

The alternative solutions are shown in **Appendix B** and described in each section that follows.

4.1.1 Reach 1

Reach 1 spans from the Lushes Avenue pedestrian bridge to just upstream of the Inverhouse Drive crossing, at the upstream limit of the concrete channel. The objectives of the alternative solutions and constraints at Reach 1 are as follows:

Solution Objectives	Constraints
– Maintenance of structural integrity of Lushes Avenue pedestrian bridge crossing – Improvement of terrestrial environments as secondary benefit – Maintenance/improvement of fish passage and fish habitat – Maintain or improve hydraulic capacity of the creek – Maintenance/improvement of channel functions including hydraulic function and sediment transport	– Limited realignment potential due to adjacent private property and Lushes Avenue Road – Steep valley walls – Watermain and sanitary crossing under pedestrian bridge crossing

Three alternative solutions were considered for Reach 1 as part of MCEA Phase 2: Do-Nothing, Site Based Works, and Reach Scale Works. The following briefly describes each of the three alternative solutions for Reach 1 as shown in **Appendix B:**

– Alternative Number 1: Do Nothing – The Do Nothing alternative for Reach 1 would involve the channel remaining in the current planform with no added bank or bed protection.

– Alternative Number 2: Site Based Works – The Site Based Works alternative would consist of the installation of rock weirs and boulders within the channel to direct flow away from the channel banks. The local improvements would aim to improve fish habitat and reduce the potential for bank erosion within the reach.

– Alternative Number 3: Reach Scale Works – The Reach Scale works alternative would involve the development of a more natural riffle-pool sequence within the reach, which is currently dominated by run morphology. The channel would remain in the existing planform and in a natural state given there were no significant erosion concerns noted within the channel.

4.1.2 Reach 2

Reach 2 spans from just upstream of the Inverhouse Drive crossing, at the upstream limit of the concrete channel to the CN rail crossing. The objectives of the alternative solutions and constraints at Reach 2 are as follows:

Solution Objectives	Constraints
– Reduction in geomorphic risk to stormwater outfalls – Maintenance of structural integrity of CN Railway abutments and Inverhouse Drive crossing – Improvement of terrestrial environments as secondary benefit – Improve fish passage and fish habitat – Maintain or improve hydraulic capacity of the creek – Improve channel functions including hydraulic function and sediment transport	– Limited realignment potential due to adjacent private property – CN Railway property constraints at the downstream reach limit – Fully armoured channel with existing bank and bed protection throughout the reach in various states of disrepair – Steep valley walls – Limited construction access points nearby to gain access to the valley floor – Watermain and sanitary crossing under Inverhouse Drive

Like Reach 1, three alternative solutions were considered for Reach 2 as part of MCEA Phase 2: Do-Nothing, Site Based Works, and Reach Scale Works The following briefly describes each of the three alternative solutions for Reach 2 as shown in **Appendix B**:

- Alternative Number 1: Do Nothing – The Do Nothing alternative for Reach 2 would involve the channel remaining in the current planform with the existing concrete channel bed and banks. Displacement and erosion along both the concrete banks and bed would continue. The concrete surrounding the two stormwater outfalls within the reach would remain displaced and failing.
- Alternative Number 2: Site Based Works – The Site Based Works alternative would consist of spot concrete bank and bed repairs where the concrete is currently displaced or damaged. The repairs would involve restoring the concrete to the initially constructed state. The concrete surrounding both of the stormwater outfalls would be replaced. Baffles would be introduced along the bed of the concrete to direct flow away from the banks to protect the banks from additional erosion.
- Alternative Number 3: Reach Scale Works – The Reach Scale works alternative would involve the removal of the concrete channel and the grade drop immediately upstream of the CN rail

crossing. The channel would be reconstructed within the same planform as the concrete channel with an increased bankfull channel width. The banks would be constructed using armourstone walls, potentially with vegetated buttress along the top as a bio-engineering measure to improve the naturalization of the channel. Vortex rock weirs would be installed along the channel bed as grade control measures with pools in between the weirs to establish a more natural channel morphology.

4.1.3 Reach 3

Reach 3 extends from the CN rail crossing to the Clarkson Road South crossing. The objectives of the alternative solutions and constraints at Reach 3 are as follows:

Solution Objectives	Constraints
– Reduction in geomorphic risk to stormwater outfalls – Maintenance of structural integrity of CN Railway abutments – Maintenance/improvement of fish passage – Enhancement of geomorphic function by the removal of failing bank protection structures and stabilization of channel banks with alternative solutions – Improvement of terrestrial environments as secondary benefit – Maintain or improve hydraulic capacity of the creek – Maintenance/improvement of channel functions including hydraulic function and sediment transport	– Limited southern realignment potential due to adjacent private property – Multiple valley wall contacts – Existing bank protection throughout the reach in various states of disrepair – CN Rail property constraints at the upstream reach limit – Steep valley walls – Limited construction access points nearby to gain access to the valley floor

Four alternative solutions were considered for Reach 3 as part of MCEA Phase 2: Do-Nothing, Site Based Works, Reach Scale Works, and Channel Realignment. The following briefly describes each of the four alternative solutions for Reach 3 as shown in **Appendix B**:

– Alternative Number 1: Do Nothing – The Do Nothing alternative for Reach 3 would involve the channel remaining in the current planform and the bank protection measures would continue to erode and threaten private property and stormwater outfalls. Displacement of the existing gabion and erosion along both the concrete banks and bed would continue.
– Alternative Number 2: Site Based Works – The Site Based Works alternative would consist of spot removal of existing slumping gabion and installation of armourstone and/or vegetated buttress bank protection measures. The spot repairs would tie-in with the existing gabion upstream and downstream of the installed treatment. Bio-engineering approaches would be included within the spot repairs, where possible, to create a more natural appearance.
– Alternative Number 3: Reach Scale Works – The Reach Scale works alternative would involve the removal of the existing gabion structures through the reach and replacement with armourstone and/or vegetated buttress bank protection measures. The channel would be hardened in the existing planform. The channel bed elevation would be raised to address the

grade drop immediately downstream of the CN rail crossing. Vortex rock weirs would be installed along the channel bed as grade control measures with pools in between the weirs to establish a more natural channel morphology.

– Alternative Number 4: Channel Realignment – The channel realignment alternative would involve realignment of the channel to increase the sinuosity within the reach and eliminate two of the existing valley wall contacts that currently threaten private property. The channel realignment would follow natural design principles and would involve realign of the channel to the north, through the floodplain within the center of the reach. Bank protection measures would be installed along the entirety of the reach, consisting of either armourstone walls or vegetated buttress. The channel bed elevation would be raised to address the grade drop immediately downstream of the CN rail crossing. Vortex rock weirs would be installed along the channel bed as grade control measures with pools in between the weirs to establish a more natural channel morphology.

4.2 Description of the Environment Potentially Affected

The environment potentially affected by the alternative solutions is described according to the following components as defined in the *Environmental Assessment Act* (*EA Act*) based on a review of existing available information sources and field investigations:

– Natural Environment
– Built Environment
– Social Environment
– Economic Environment
– Cultural Environment

4.2.1 Natural Environment

4.2.1.1 Aquatic Environment

Sheridan Creek originates north of the Queen Elizabeth Way (QEW) in Mississauga and flows in a southeasterly direction, out letting to Lake Ontario through the Rattray Coastal Marsh, a provincially significant wetland and large Area of Natural and Scientific Interest (ANSI). The Creek is surrounded by an urbanized landscape, dominated by residential development in the vicinity of the Project area. As stated, the watercourse has been historically altered over much of its extent to accommodate this urban development.

Sheridan Creek is classified as having a warm water thermal regime by the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) Aquatic Resource Area (ARA) data; however, the record notes that there is the potential for cold water rehabilitation. Due to the warm water designation, an in-water construction timing window allowing works between July 15 to March 15 is anticipated, with exact dates to be confirmed during the post EA Project permitting process.

The fish community within and upstream of the Project area includes carps and minnows, common shiner (*Luxilus cornutus*), creek chub (*Semotilus atromaculatus*), and fathead minnow (*Pimephales promelas*) (NDMNRF 2020). The fish community downstream of the Project area was more diverse due to past channel restoration efforts, mitigation of barriers and connection to Rattaray Marsh. This community included alewife (*Alosa pseudoharengus*), blacknose dace (*Rhinichthys atratulus*), bluntnose minnow (*Pimephales notatus*), brown bullhead (*Ameiurus nebulosus*), common carp (*Cyprinus carpio*), common shiner, creek chub, emerald shiner (*Notropis atherinoides*), fathead minnow, gizzard shad (*Dorosoma cepedianum*), golden shiner (*Notemigonus crysoleucas*), lake chub (*Couesius plumbeus*), longnose dace (*Rhinichthys cataractae*), northern pike (*Esox lucius*), pumpkinseed (*Lepomis gibbosus*), rainbow smelt (*Osmerus mordax*), river chub (*Nocomis micropogon*), round goby (*Neogobius melanostomus*), spotfin shiner (*Cyprinella spiloptera*), spottail shiner (*Notropis hudsonius*), white sucker (*Catostomus commersonii*), and yellow perch (*Perca flavescens*) (NDMNRF 2020).

CVC also had a monitoring location downstream of the Project area with periodic sampling between 2002 and 2018. CVC records in 2018 included white sucker, longnose dace and Western blacknosedDace (CVC, 2018). Past benthic sampling within Sheridan Creek has indicated some level of degradation, and the average Index of Biological Integrity (IBI) score for Sheridan Creek of 0.87 indicated “poor health” (Aquafor Beech Ltd., 2011).

None of the listed species are provincial or federal Species at Risk (SAR) and Department of Fisheries and Oceans (DFO) online Aquatic Species At Risk mapping did not indicate any critical habitat within or adjacent to the Project area. MECP responded to an information request from GHD and indicated that Sheridan Creek had historically provided habitat to redside dace, but is not currently considered to be regulated habitat.

4.2.1.2 Terrestrial Environment

There are no regionally or provincially significant wetlands, natural heritage features, or rare vegetation communities within the Project area based on terrestrial habitat assessments completed as part of the MCEA. GHD characterized the existing ecological conditions in the Project area based on the following assessments: Species at Risk Act (SARA), Endangered Species Act (ESA), ANSI Environmental Inventory Analysis, Wildlife Inventory Analysis, and Vegetation Inventory Analysis. The assessment results are included in **Appendix C**, and a summary of the significant findings is as follows:

The Project area is designated as “Significant Natural Areas and Natural Green Spaces” and “Natural Hazard” in the City of Mississauga’ Official Plan and is in Credit Valley Conservation (CVC) regulation limits.

The following SAR were observed within the Project Area during breeding bird surveys:

– Chimney swift (protected under ESA)
– Eastern wood-pewee (populations and their habitat may be considered Significant Wildlife Habitat).

The following provincially protected SAR have a moderate probability of occurring within the Project area:

– Little brown myotis, northern myotis, and tri-coloured bat.

European reed, a highly invasive plant species, is present within the Project area.

The area is dominated by forest, with single family or high-density residential properties surrounding it.

Though the Project area does not contain any provincially significant wetlands or other provincially designated areas, the majority of the Project area is designated as a Significant Natural Area, under the City of Mississauga's 2019 Natural Areas – System (City of Mississauga, 2019).

4.2.1.3 Species at Risk

In addition to the SAR identified in the Aquatic Environment and Terrestrial Environment sections, the following SAR have been identified as potentially occurring within the Project area: Henslow's sparrow (*Ammodramus henslowii*), northern bobwhite (*Colinus virginianus*), yellow-breasted chat (*Icteria virens virens*), redside dace (*Clinostomus elongatus*; historical), and butternut (*Juglans cinerea*).

4.2.2 Built Environment

As illustrated in **Figure 1-1**, the Project area includes Sheridan Creek from the Lushes Avenue pedestrian bridge crossing to the Clarkson Road South culvert crossing. This section of Sheridan Creek includes two additional crossings: the Inverhouse Drive bridge crossing and the CN rail bridge crossing.

Within Reach 1, the watercourse flows through a narrow, sloped, forested valley bounded by private residential properties. North of the watercourse within the reach, the land use is primarily apartment complexes and parking lots. South and west of the reach, the land use is primarily residential, with multiple private properties along Lushes Avenue.

The watercourse continues to flow through a narrow, forested valley within Reach 2. The surrounding area is residential land use with a pedestrian trail situated parallel to the watercourse along its north side. Multiple residential properties exist along Bonnymede Drive to the south with a higher density of residential properties in a cul-de-sac off Inverhouse Drive.

Reach 3 has a wider forested valley relative to the other reaches. The Wawel Villa Seniors Residence and Clarkson Public School are present north of the watercourse. Land use to the south of the watercourse is residential with multiple private properties along Fletcher Valley Crescent and one property off Clarkson Road South.

The existing land uses reflect the official City of Mississauga land use designation. Greenland land use is immediately adjacent to the watercourse in a riparian buffer throughout the entirety of the project area. Within Reach 1, spanning from the Lushes Avenue pedestrian crossing to the upstream/northern limit of the concrete channel, both Residential Medium Density and Residential High Density land uses bound the Greenland to the West and East, respectively. Reach 2,

spanning from immediately upstream/east of Inverhouse Drive to the CN rail crossing, has Greenland within the watercourse area and is bound by Residential Low Density II. Reach 3 has a Greenland corridor immediately surrounding the watercourse with Residential High Density land use adjacent to the Greenland space.

4.2.3 Social Environment

As stated, the section of Sheridan Creek from the Lushes Avenue pedestrian bridge crossing to the Clarkson Road South culvert crossing is situated in a mature urban neighbourhood of the City with private residential properties backing onto the watercourse. There is a short pedestrian trail that exists on the north side of Sheridan Creek between Inverhouse Drive and the CN Rail crossing and then continues adjacent to the Wawel Villa Seniors Residence. The Clarkson Public School is also located north of the Creek but is separated by three residential properties. As a result, there are nearby sensitive receptors and people walking in close proximity to Sheridan Creek.

4.2.4 Economic Environment

There are no proposed developments adjacent to the section of Sheridan Creek from the Lushes Avenue pedestrian bridge crossing to the Clarkson Road South culvert crossing noted on the City's register for Development Applications. However, there is one application for a Condominium located at 2006, 2008, and 2110 Lushes Avenue which is located approximately 70 m from the Creek (separated by a low-rise residential property).

4.2.5 Cultural Environment

4.2.5.1 Archaeology

A Stage 1 Archaeological Assessment (AA) and a Stage 2 AA were completed as part of the Project and are on file with the City of Mississauga. The Stage 1 AA identified several areas that exhibited archeological potential; however, the Stage 2 AA confirmed that the Project limits are considered free of archaeological concern.

4.2.5.2 Cultural Heritage

The Municipal Heritage Register was consulted as part of the Stage 1 AA and there were no properties within the Project area that were Listed or Designated under the *Ontario Heritage Act*. In addition, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) requested that the Project area be screened using the MHSTCI Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes. The screening identified that the Project area has a low potential for built heritage or cultural heritage landscapes. **Appendix D** includes the completed Checklist**.**

4.3 Evaluation of the Alternative Solutions

Following the establishment of the existing environmental conditions in the Project area, the alternative solutions for each reach were comparatively evaluated leading to a recommended solution. To identify and consider the potential effects of each alternative solution on the environment in a traceable, logical, understandable, and reproducible manner, evaluation criteria were developed as a first step. The evaluation criteria were developed based on the alternative solutions being considered including their location, the existing environmental conditions associated with the locations, the type and scale of potential environmental effects anticipated from the alternatives and their relative significance, and comments received from stakeholders.

Each evaluation criterion was connected to a particular aspect of the environment (e.g., natural, social, cultural, etc.) as defined in the *Environmental Assessment Act* (*EA Act*), which is also reflected in the Municipal Class Environmental Assessment (MCEA). In addition, criteria were included for assessing the technical and financial aspects of the alternative solutions. One or more indicators were developed for each of evaluation criterion to identify how the potential environmental effects were to be measured for each criterion. **Table 4-1** lists the evaluation criteria and their respective indicators by category.

Table 4-1 Alternative Solutions Evaluation Criteria

Category	Evaluation Criteria	Indicator
Technical	Effect on Hazard to Tableland	Area of tableland unprotected and exposed to natural hazards due to valley wall contacts
Technical	Regulatory Agency Acceptance	Relative certainty of approval from CVC, DFO, MECP, and NDMNRF
Technical	Infrastructure Protection[6]	Relative level of protection provided to infrastructure
Technical	Lifespan of Works	Expected lifespan (years) before further invention (beyond general maintenance) is needed
Technical	Geomorphic Form and Function	Impact on geomorphic stability and physical components of stream function
Natural Environment	Effect on Terrestrial Habitat and Species	Area of temporary and/or permanent loss of natural heritage features and vegetation by type – including ESAs, ANSIs, wildlife corridors, and others

6 The Project assumes that the as built drawings provided for sanitary and stormwater infrastructure within the Project area are accurate and representative of the structure locations and elevations for the purposes of identifying potential effects.

Category	Evaluation Criteria	Indicator
Natural Environment	Effect on Terrestrial Habitat and Species	Terrestrial species potentially affected temporarily or permanently
Natural Environment	Effect on Aquatic Habitat and Species	Temporary or permanent loss of aquatic features or categorical loss of functions by type – including Provincially Significant Wetland, Locally Significant Wetland, watercourses, and others
Natural Environment	Effect on Aquatic Habitat and Species	Aquatic communities potentially affected temporarily or permanently
Natural Environment	Effect on Fish Passage	Condition of fish passage upstream through reach
Natural Environment	Effect on Surface Water	Temporary or long-term change in surface water quality and quantity
Social, Economic and Built Environments	Effect on Existing Land Uses	Number of residences, businesses and/or community, institutional, and recreational facilities disrupted or displaced
Social, Economic and Built Environments	Effect on Public Safety	Relative hazard to public safety
Cultural Environment	Effect on Built Heritage Resources and Cultural Heritage Landscapes	Number and type of built heritage resources and cultural heritage landscapes displaced or disrupted
Cultural Environment	Effect on Archaeological Resources	Number and type of potentially significant, known archaeological sites affected
Cultural Environment	Effect on Archaeological Resources	Area (ha) of archaeological potential (i.e., lands with potential for the presence of significant archaeological resources) affected
Financial	Capital Costs	Comparable capital costs for implementing the alternative solution
Financial	Maintenance Costs	Comparable maintenance costs for the alternative solution once implemented

Following the development of evaluation criteria and indicators, they were applied to each of the alternative solutions on an individual reach basis to identify potential environmental effects.

Next, the alternative solutions were comparatively evaluated using the Reasoned Argument or “Trade off” approach based on the results of applying the evaluation criteria and indicators. This approach identifies the relative differences in effects between the alternative solutions to determine the relative advantages (positive) and disadvantages (negative) to the environment of each alternative.

As per the Ministry of the Environment, Conservation and Parks' (MECP's) Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario, the *EA Act* does not differentiate between the importance of the different environments (that is, natural, built, social, economic, cultural), and it is expected that the effects to one environment may be greater than the effects to another7. Considering this, one alternative is rarely preferred to all others in every respect and relative advantages in one environment may be offset by relative disadvantages in another. As a result, the evaluation process consists of trade-offs in which the advantages and disadvantages to the environment are considered holistically in determining a recommended solution. In general, the alternative solution that has the best balance of advantages and disadvantages is identified as the recommended solution.

The following briefly summarizes the "*Trade-off*" approach:

– Step 1: Identify Criterion Rankings Based on Effects - First, the effects identified for each alternative by criterion were compared to one another to identify a criterion ranking by alternative (e.g., Most Preferred, More Preferred, Less Preferred or Least Preferred). If the corresponding effects of a criterion were the same for two or more alternatives, then they were ranked equally and the word "tied" was added to the criterion ranking (e.g., Tied for Most Preferred).
– Step 2: Identify Category Rankings Based on Criterion Rankings - The criterion rankings that are identified through the preceding step were considered collectively to assign an alternative ranking (e.g., Most Preferred, More Preferred, Less Preferred or Least Preferred (includes Ties)) by individual category (e.g., Technical, Natural Environment, and Financial). In the situations where a category has more than one evaluation criterion, then all the evaluation criterion rankings were considered collectively to identify an alternative ranking for the category. For example, in the case of the Technical Category, rankings assigned for all five Technical evaluation criteria will be considered collectively in determining the alternative rankings for the Technical Category.
– Step 3: Identify Overall Recommendation Based on Category Rankings - Following the identification of category rankings, an overall recommendation was assigned to the alternative with the greatest number of top placed category rankings (e.g., more "Most Preferred" and "More Preferred" rankings) among the alternatives considered, thus providing the highest number of advantages and the least number of disadvantages overall.

The application of the evaluation criteria for Reach 1, Reach 2, and Reach 3 are shown in **Table 4-2**, **Table 4-3**, and **Table 4-4**, respectively.

The following studies were completed to help inform the comparative evaluation and have been appended to the report:

– Detailed Geomorphic Assessment (**Appendix E**)
– Hydraulic Model Results (**Appendix F**)
– Geotechnical Report (**Appendix G**)
– Hazard Assessment (**Appendix H**)

7 Ministry of the Environment, Conservation and Parks, Code of Practice, Preparing and Reviewing Environmental Assessments in Ontario, January 2014, page 32.

Table 4-2 Comparative Evaluation Summary of the Alternative Solutions for Reach 1

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Technical	Effect on Hazard to Tableland	**More Preferred** Significant area of tableland unprotected but no valley wall contacts, and minimal natural hazards related to bank erosion.	**Least Preferred** Significant area of tableland unprotected and potential to initiate instability within the channel and increase erosion.	**Most Preferred** No area of tableland unprotected or exposed to natural hazards. Diversion of flow away from channel banks to reduce erosion.
Technical	Regulatory Agency Acceptance	**Most Preferred** No need for approval from regulatory agencies as there is no existing hazards or infrastructure at risk within the reach.	**Less Preferred** Reduced certainty of approval from regulatory agencies as protection is not necessary and involves a moderate level of disturbance.	**Least Preferred** Reduced certainty of approval from regulatory agencies as protection is not necessary and involves a high level of disturbance.
Technical	Infrastructure Protection	**Most Preferred (tied)** High level of protection to infrastructure as there is minimal existing risk to infrastructure.	**Least Preferred** Low level of protection to infrastructure as there is potential to initiate instability within the channel.	**Most Preferred (tied)** High level of protection to infrastructure as there is no change to minimal existing risk to infrastructure.
Technical	Lifespan of Works	**Less Preferred** Future intervention for maintenance may be required but is not anticipated.	**Least Preferred** Reduced lifespan of the works with potential to initiate instability within the channel.	**Most Preferred** Enhanced lifespan of the works which provide immediate and long-term protection needs.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Technical	Geomorphic Form and Function	**More Preferred** Reach is geomorphically stable with no significant geomorphic hazards. Natural channel bed but lack of variability within channel bed morphology.	**Most Preferred** Geomorphic stability would be improved. Development of a more natural "U" shaped channel with removal of debris and addition of boulders to the channel bed.	**Least Preferred** Physical components of stream function are lost due to loss of natural channel banks. Improved channel bed morphology with development of cascade-pool sequence.
Technical	**Technical Category Ranking**	**1st**	**3rd**	**2nd**
Natural Environment	Effect on Terrestrial Habitat and Species	**Most Preferred** No effect.	**More Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) while limiting short-term impact.	**Least Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) with moderate short-term impact.
Natural Environment	Effect on Aquatic Habitat and Species	**Least Preferred** No benefit to aquatic habitat or species in the long term.	**Most Preferred** In-stream and overhanging riparian cover opportunities are enhanced, while minimizing short-term impact.	**More Preferred** In-stream habitat is enhanced in the long-term with moderate short-term impact.
Natural Environment	Effect on Fish Passage	**Most Preferred (tied)** No effect. No existing barriers to fish passage within Reach 1.	**Most Preferred (tied)** No effect. No existing barriers to fish passage within Reach 1.	**Least Preferred** If a weir were to fail in the long term, a barrier to fish passage could be created.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Natural Environment	Effect on Surface Water	**Most Preferred** No effect.	**Less Preferred** Minor impact to flood levels.	**Least Preferred** Impact to flood levels.
Natural Environment	Effect on Species at Risk	**Most Preferred** No impacts to species at risk.	**More Preferred** Potential minor impacts to candidate species at risk habitat.	**Least Preferred** Greater impacts to candidate species at risk habitat through tree removal for Site access.
Natural Environment	**Natural Environment Category Ranking**	**1st**	**2nd**	**3rd**
Social, Economic and Built Environments	Effect on Existing Land Uses	All alternatives are tied as **Most Preferred** because no residences, businesses or community, institutional, and recreational facilities would be disrupted or displaced with any of them.	All alternatives are tied as **Most Preferred** because no residences, businesses or community, institutional, and recreational facilities would be disrupted or displaced with any of them.	All alternatives are tied as **Most Preferred** because no residences, businesses or community, institutional, and recreational facilities would be disrupted or displaced with any of them.
Social, Economic and Built Environments	Effect on Public Safety	All alternatives are tied as **Most Preferred** because there would be no impact on public safety within the reach with any of them.	All alternatives are tied as **Most Preferred** because there would be no impact on public safety within the reach with any of them.	All alternatives are tied as **Most Preferred** because there would be no impact on public safety within the reach with any of them.
Social, Economic and	**Social, Economic and Built Environments Category Ranking**	**1st (tied)**	**1st (tied)**	**1st (tied)**

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Built Environments				
Cultural Environment	Effect on Built Heritage Resources and Cultural Heritage Landscapes	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.
Cultural Environment	Effect on Archaeological Resources	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.
Cultural Environment	**Cultural Environment Category Ranking**	**1st (tied)**	**1st (tied)**	**1st (tied)**
Financial	Capital Costs	**Most Preferred** No capital costs for implementing 'Do Nothing'.	**More Preferred** Lower capital costs relative to Alternative 3 and higher capital costs compared to Alternative 1.	**Least Preferred** Higher capital costs compared to Alternatives 1 and 2.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Financial	Maintenance Costs	**Most Preferred (tied)** Minimal maintenance costs. No expected maintenance required.	**Less Preferred** Minimal maintenance costs. Potential bank repair if instability occurs	**Most Preferred (tied)** Minimal maintenance costs. No expected maintenance required.
Financial	**Financial Category Ranking**	**1st**	**2nd**	**3rd**
Overall Ranking		**1st**	**2nd**	**3rd**

Table 4-3 Comparative Evaluation Summary of the Alternative Solutions for Reach 2

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Technical	Effect on Hazard to Tableland	**Least Preferred** Significant area of tableland at-risk if banks were to fail. Continued erosion of banks makes failure likely in the future.	**Most Preferred (tied)** Protection of tableland area and channel banks to limit erosion.	**Most Preferred (tied)** Protection of tableland area and channel banks to limit erosion.
Technical	Regulatory Agency Acceptance	**Least Preferred** Likely not acceptable to regulatory agencies. Existing hazards to infrastructure and fish passage barriers remain.	**More Preferred** Likely acceptable to agencies to protect infrastructure; however, fish passage barriers remain.	**Most Preferred** Acceptable to agencies.
Technical	Infrastructure Protection	**Least Preferred** No level of infrastructure protection. No protection to existing infrastructure.	**Most Preferred (tied)** High level of infrastructure protection. Protection of infrastructure and reduced risk to infrastructure.	**Most Preferred (tied)** High level of infrastructure protection. Protection of infrastructure and reduced risk to infrastructure.
Technical	Lifespan of Works	**Least Preferred** Short lifespan of existing works. Future intervention to address failure of segments of concrete banks and bed is anticipated.	**More Preferred** Moderate lifespan of works. Provides immediate and long-term protection needs; however, intervention is anticipated in the future.	**Most Preferred** Long lifespan of works. Provides immediate and long-term protection needs with no anticipated future intervention.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Technical	Geomorphic Form and Function	**Least Preferred** No existing physical components of stream function. No channel bed morphology. Completely hardened channel.	**More Preferred** No physical components of stream function. No channel bed morphology. Baffles add minor flow variability. Completely hardened channel.	**Most Preferred** Introduces physical components of stream function. Natural channel bed with development of riffle-pool sequence. Improved sediment transport through reach.
Technical	**Technical Category Ranking**	**3rd**	**2nd**	**1st**
Natural Environment	Effect on Terrestrial Habitat and Species	**Most Preferred** No effect.	**More Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) while limiting short-term impact.	**Least Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) with moderate short-term impact
Natural Environment	Effect on Aquatic Habitat and Species	**Least Preferred** No benefit to aquatic habitat or species in the long term	**More Preferred** Baffles will create diversity in flow, improving existing aquatic habitat conditions, however concrete channel remains	**Most Preferred** Removal of concrete channel and addition of weirs and natural substrate will improve habitat diversity and provide naturalized conditions more attractive to aquatic species

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Natural Environment	Effect on Fish Passage	**Least Preferred** No effect. Barrier remains.	**More Preferred** Baffles provide potential opportunity for fish passage through concrete reach.	**Most Preferred** Baffles and rock weirs provide potential fish passage through reach, while natural substrate encourages movement/habitation within this reach.
Natural Environment	Effect on Surface Water	**Least Preferred (tied)** No effect	**Least Preferred (tied)** Minor impact to flood levels.	**Most Preferred** Minor impacts to flood levels, however flood hazards confined to stream corridor and velocities reduced.
Natural Environment	Effect on Species at Risk	**Most Preferred** No impacts to species at risk.	**More Preferred** Potential minor impacts to candidate species at risk habitat.	**Less Preferred** Greater impacts to candidate species at risk habitat through tree removal for Site access.
Natural Environment	**Natural Environment Category Ranking**	**3rd**	**2nd**	**1st**
Social, Economic and Built Environments	Effect on Existing Land Uses	All alternatives are tied as **Most Preferred** because no residences, businesses or community, institutional, and recreational facilities would be disrupted or	All alternatives are tied as **Most Preferred** because no residences, businesses or community, institutional, and recreational facilities would be disrupted or	All alternatives are tied as **Most Preferred** because no residences, businesses or community, institutional, and recreational facilities would be disrupted or

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
		displaced with any of them.	displaced with any of them.	displaced with any of them.
Social, Economic and Built Environments	Effect on Public Safety	**Least Preferred** Potential hazard to public safety if the protection were to fail.	**Most Preferred (tied)** The reach is already fenced off on both sides. No hazards to public safety.	**Most Preferred (tied)** The reach is already fenced off on both sides. No hazards to public safety.
Social, Economic and Built Environments	**Social, Economic and Built Environments Category Ranking**	**2nd**	**1st (tied)**	**1st (tied)**
Cultural Environment	Effect on Built Heritage Resources and Cultural Heritage Landscapes	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.
Cultural Environment	Effect on Archaeological Resources	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.
Cultural Environment	**Cultural Environment Category Ranking**	**1st (tied)**	**1st (tied)**	**1st (tied)**

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works
Financial	Capital Costs	**Most Preferred** No capital costs.	**More Preferred** Lower capital costs relative to Alternative 3 and higher capital costs compared to Alternative 1.	**Least Preferred** Higher capital costs compared to Alternatives 1 and 2.
Financial	Maintenance Costs	**Least Preferred** High level of maintenance costs. More frequent inspections to monitor condition of stormwater outfalls and emergency repairs.	**Most Preferred** Minimal maintenance requirements.	**More Preferred** Potential rock or planting replenishment.
Financial	**Financial Category Ranking**	**3rd**	**1st**	**2nd**
Overall Ranking		**3rd**	**2nd**	**1st**

Table 4-4 Comparative Evaluation Summary of the Alternative Solutions for Reach 3

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Technical	Effect on Hazard to Tableland	**Least Preferred** Significant area of tableland unprotected, natural hazards due to valley wall contacts, and continued erosion of banks.	**Less Preferred** Moderate area of tableland unprotected. Local repairs to bank protection to reduce bank and tableland erosion.	**More Preferred** Majority of tableland protected; bank protection along hazard areas of reach to reduce bank erosion.	**Most Preferred** All of tableland within the reach is protected. Realignment of watercourse to remove natural hazards due to existing valley wall contacts.
Technical	Regulatory Agency Acceptance	**Least Preferred** Not acceptance to agencies. Existing hazards to infrastructure and fish passage barriers remain.	**Most Preferred** Likely acceptable to agencies. Channel bed elevation will increase flood levels, but fish passage barrier is removed.	**More Preferred** Likely acceptable to agencies. Channel bed elevation will increase flood levels, but fish passage barrier is removed along with erosion hazards.	**Less Preferred** Less acceptable to agencies. Channel bed elevation will increase flood levels, but fish passage barrier is removed, extensive armouring and realignment.
Technical	Infrastructure Protection	**Least Preferred** Minimal protection provided to infrastructure.	**More Preferred** Moderate level of protection of infrastructure and reduced risk to infrastructure.	**Most Preferred (tied)** High level of protection of infrastructure and reduced risk to infrastructure.	**Most Preferred (tied)** High level of protection of infrastructure and reduced risk to infrastructure.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Technical	Lifespan of Works	**Least Preferred** Short lifespan of works. Future intervention to address bank erosion concerns and infrastructure damage is anticipated.	**More Preferred** Moderate lifespan of works. Provides immediate and long-term protection needs; however, intervention is anticipated in the future.	**Most Preferred (tied)** Long lifespan of works. Provides immediate and long-term protection	**Most Preferred (tied)** Long lifespan of works. Provides immediate and long-term protection
Technical	Geomorphic Form and Function	**Least Preferred** Poor geomorphic stability. Debris and failing bank protection limit existing stream function.	**Less Preferred** Improved local geomorphic stability. Removal of debris. Reduce bank undercutting and remove scour pool.	**Most Preferred** Improved reach scale geomorphic stability. Removal of debris, and development of cascade-pool sequences with some natural banks for sediment supply.	**More Preferred** Improved reach scale geomorphic stability. Impacts to physical components of stream function with loss of natural channel banks. Removal of debris, and the development of cascade-pool sequences.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Technical	**Technical Category Ranking**	**4th**	**3rd**	**1st**	**2nd**
Natural Environment	Effect on Terrestrial Habitat and Species	**Most Preferred** No effect.	**More Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) with small short-term impact.	**Less Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) with moderate short-term impact.	**Least Preferred** Benefit to terrestrial species and habitat in the long-term (post-restoration) with moderate to large short-term impact.
Natural Environment	Effect on Aquatic Habitat and Species	**Least Preferred** No benefit to aquatic habitat or species in the long term.	**Less Preferred** Some erosion to be stabilized, however degraded channel conditions not addressed.	**Most Preferred** More extensive improvements to aquatic habitat, some 'natural' banks, however bank stabilizations involve hard engineering measures (i.e., armour stone wall).	**More Preferred** More extensive improvements to aquatic habitat, however bank stabilizations through entirety of reach involve hard engineering measures (i.e., armour stone wall).
Natural Environment	Effect on Fish Passage	**Least Preferred** No effect. Barrier at CN Rail remains.	**Most Preferred (tied)** Barrier at CN Rail mitigated.	**Most Preferred (tied)** Barrier at CN Rail mitigated.	**Most Preferred (tied)** Barrier at CN Rail mitigated.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Natural Environment	Effect on Surface Water	**More Preferred** No effect.	**Least Preferred** Channel bed elevation increase will increase flood levels.	**Less Preferred (tied)** Increased connectivity to floodplain; however, channel bed elevation increase will increase flood levels.	**Less Preferred (tied)** Increased connectivity to floodplain; however, channel bed elevation increase will increase flood levels.
Natural Environment	Effect on Species at Risk	**Most Preferred** No impacts to species at risk.	**More Preferred** Potential minor impacts to candidate species at risk habitat through tree removal for Site access.	**Less Preferred** Potential moderate impacts to candidate species at risk habitat through tree removal for Site Access.	**Least Preferred** Potential major impacts to candidate species at risk habitat through increased tree removal due to Site access and channel realignment.
Natural Environment	**Natural Environment Category Ranking**	**3rd**	**1st**	**2nd**	**4th**

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Social, Economic and Built Environments	Effect on Existing Land Uses	**Less Preferred** Impact on multiple residential properties. Continued erosion of banks results in loss of tableland within private property.	**More Preferred (tied)** Addresses private property erosion concerns to multiple residential properties.	**More Preferred (tied)** Addresses private property erosion concerns to multiple residential properties.	**Most Preferred** Realignment of channel away from residential houses reduces impact to residential land use and addresses private property erosion concerns.
Social, Economic and Built Environments	Effect on Public Safety	**Least Preferred** High hazard level to public safety. Remaining public safety concerns along downstream valley wall contacts on private properties.	**Less Preferred** High hazard level to public safety. Remaining public safety concerns along portions of the reach downstream that flow through private properties.	**More Preferred** Reduced hazard level to public safety. Bank protection will reduce erosion into residential properties and reduce public safety concerns.	**Most Preferred** Reduced hazard level to public safety. Bank protection will reduce erosion into residential properties and realignment of channel away from residential houses reduces existing public safety concerns.
Social, Economic and Built Environments	**Social, Economic and Built Environments Category Ranking**	**4th**	**3rd**	**2nd**	**1st**

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Cultural Environment	Effect on Built Heritage Resources and Cultural Heritage Landscapes	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.	All alternatives are tied as **Most Preferred** because no built heritage resources and cultural heritage landscapes would be displaced or disrupted with any of them.
Cultural Environment	Effect on Archaeological Resources	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.	All alternatives are tied as **Most Preferred** because no areas of archaeological potential are affected for any of the alternatives.

Category	Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2 – Site Based Works	Alternative 3 – Reach Scale Works	Alternative 4 – Channel Realignment
Cultural Environment	**Cultural Environment Category Ranking**	**1st (tied)**	**1st (tied)**	**1st (tied)**	**1st (tied)**
Financial	Capital Costs	**Most Preferred** No capital costs.	**More Preferred** Lower capital costs relative to Alternatives 3 and 4 and higher capital costs compared to Alternative 1.	**Less Preferred** Lower capital costs relative to Alternative 4 and higher capital costs compared to Alternatives 1 and 2.	**Least Preferred** Higher capital costs compared to the other alternatives.
Financial	Maintenance Costs	**Least Preferred** High maintenance costs for emergency repairs.	**Most Preferred** Potential rock or planting replenishment.	**More Preferred (tied)** Potential larger-scale rock or planting replenishment.	**More Preferred (tied)** Potential larger-scale rock or planting replenishment.
Financial	**Financial Category Ranking**	**3rd**	**1st**	**2nd**	**4th**
Overall Ranking		**4th**	**2nd**	**1st**	**3rd**

4.3.1 Recommended Solutions

For Reach 1, Alternative 1 – Do Nothing is the recommended solution because it is ranked as “most preferred” (1st or 1st (tied)) in all the categories. Alternative 1 is recommended because of the following advantages:

– No existing risk to infrastructure, hazards to tableland, or barriers to fish passage that need to be mitigated
– No capital costs and minimal maintenance costs

For Reach 2, Alternative 3 – Reach Scale Works is the recommended solution because it is ranked as “most preferred” (1st or 1st (tied)) or “more preferred (2nd (tied)) in most of the categories. Alternative 3 is recommended because of the following advantages:

– Reduced channel bank and bed erosion with protection of infrastructure within the reach
– Significant improvement of aquatic habitat conditions and geomorphic form and function of the reach through naturalization of the channel
– Impacts to flood levels confined to the channel corridor
– Reduction in channel velocity
– No impact on existing land uses
– Minimal maintenance costs

For Reach 3, Alternative 3 – Reach Scale Works is the recommended solution because it is ranked as “most preferred” (1st or 1st (tied)) or “more preferred (2nd (tied)) in most of the categories. Alternative 3 is recommended because of the following advantages:

– Reduced channel bank and bed erosion with protection of infrastructure within the reach
– Significant improvement of aquatic habitat conditions, fish passage conditions, and geomorphic form and function of the reach
– Reduced impact to residential land use and protection against private property erosion concerns
– Minimal maintenance costs

4.3.2 Confirmation of the Preferred Solution

The recommended solution for each of the reaches as detailed in **Table 4-5** below was confirmed as the preferred solutions for the Project based on comments received during the mandatory point of contact of the MCEA. The consultation process involved an online Public Information Centre (PIC), further detailed in **Section 7**. The notice of the PIC was issued to review agencies, Indigenous communities, and the public and published on the City’s website.

Comments were received from the CVC and adjacent property owners who visited the online PIC. None of the comments received objected to any of the recommended solutions. The comments did offer suggestions and made requests for additional assessments. In response, GHD completed the additional assessments to address CVC’s comments.

Table 4-5 Preferred Solutions for each Reach

Reach	Preferred Solution
Reach 1	**Do Nothing**
Reach 2	**Reach Scale Work** - involving the removal of the concrete channel and the grade drop immediately upstream of the CN rail crossing. The channel would be reconstructed within the same planform as the concrete channel with an increased bankfull channel width. The banks would be constructed using armourstone walls, potentially with vegetated buttress along the top as a bio-engineering measure to improve the naturalization of the channel. Vortex rock weirs would be installed along the channel bed as grade control measures with pools in between the weirs to establish a more natural channel morphology.
Reach 3	**Reach Scale Work** - involving the removal of the existing gabion structures through the reach and replacing them with armour stone and/or vegetated buttress bank protection measures. The channel would be hardened in the existing planform. The channel bed elevation would be raised to address the grade drop immediately downstream of the CN rail crossing. Vortex rock weirs would be installed along the channel bed as grade control measures with pools in between the weirs to establish a more natural channel morphology.

5. Description and Implementation of the Preferred Solution

5.1 Detailed Description of the Preferred Solution

As mentioned, the preferred solutions were confirmed as 'Do Nothing' (Reach 1) and 'Reach Scale Works' (Reaches 2 and 3) for the Project through the MCEA. A detailed description of the 'Reach Scale Works' solution is provided specific to each of the two reaches in the following sub-sections.

5.1.1 Reach 2 Preferred Solution

The preferred solution for Reach 2 would involve the removal of the concrete channel and the grade drop immediately upstream of the Canadian National Railway (CN Rail) crossing, representing the downstream extent of Reach 2 (**Appendix I**). The bankfull channel width would be increased for the new reconstructed channel along Reach 2 within the same planform as the existing concrete channel. The banks would be constructed using armourstone walls spanning both banks, encompassing the entire re-constructed channel within the reach.

Vegetated buttresses would also be used along the top of both re-constructed armourstone banks as a bio-engineering measure to improve the naturalization of the channel. Restoration plantings for the vegetated buttresses would be determined in detail design, which follows the MCEA. Vortex

rock weirs would be installed along the channel bed, approximately every 20 meters, as grade control measures with pools spaced in between the weir structures to establish a more diverse channel morphology. The cascade-pool sequence would be designed to be passable by fish. **Appendix I** provides further details.

5.1.2 Reach 3 Preferred Solution

The preferred solution for Reach 3 would involve the removal of existing failing gabion structures through the reach. This would involve removing the failing gabion structures at the upstream storm outfall channel as well as the failing gabion structures throughout the reach. Structures would remain in place where they can be stabilized through protection of the failed toe gabions. Structures that cannot be saved or repaired would be replaced with armourstone walls and vegetated buttress bank protection measures where necessary throughout the reach, except for the mid-reach area where no channel works are anticipated.

The channel would be hardened in the existing planform where required to protect property or infrastructure. The channel bed elevation would be raised at the rail crossing to address the grade drop immediately downstream of the rail crossing. Vortex rock weirs would be installed along the channel bed, approximately every 20 meters, as grade control measures with pools between the rock wiers to establish a diverse channel morphology that is passable by fish. All existing storm outlets would be repaired and/or retrofitted in place, as required. Baffles are proposed for the concrete channel under the rail crossing to improve fish passage. **Appendix I** provides further details.

5.1.3 Proposed Construction Sequencing

Construction sequencing of the proposed works associated with Reaches 2 and 3 will depend on available access routes. Potential access routes are shown in **Appendix I**. Reach 2 upstream of Inverhouse Drive can be accessed on City property off Lushes Avenue from the west side of the pedestrian bridge crossing. Reach 2 upstream of Inverhouse Drive can also be accessed from the north side of the Inverhouse Drive bridge crossing.

Three potential options have been presented for Reach 2 downstream of Inverhouse Drive and Reach 3. These include under the CN Rail crossing, entering from the north side; the parking lot on the west side of Wawel Villa Seniors home; as well as access from Clarkson Road. The City will engage with local landowners to determine a viable access route for construction purposes.

Locations for staging areas are very limited. A potential staging area is shown in **Appendix I**. This potential staging and stockpiling area are directly west of the north side of the Inverhouse Drive bridge crossing, near the residential building. The City will engage with local landowners to determine a viable staging area for construction purposes.

It is estimated that construction would last for approximately 4 to 6 months once viable access routes and staging area(s) have been confirmed by the City.

5.2 Cost Estimate

Table 5-1 presents a Rough Order of Magnitude cost estimate for the Preferred Solution (Reaches 2 and 3) based on the conceptual design carried out as part of the MCEA. The cost estimate will be reviewed and updated at detail design. **Appendix J** provides a further cost breakdown for constructing the proposed works associated with Reaches 2 and 3.

Table 5-1 Cost Estimate

Item	Rough Order of Magnitude Cost Estimate
Construction (**Appendix K**)	$ 4,185,000.00
Construction Inspection/Contract Administration	$ 140,000.00
Post Construction Monitoring	$ 30,000.00
Total	**$ 4,355,000.00**

5.3 Confirmation of Environmental Effects and Proposed Monitoring for the Preferred Solution

As part of confirming the Preferred Solution, consultation with review agencies (e.g., Ministry of Environment, Conservation, and Parks (MECP) and CVC)) was completed as several assessments were completed in response to review agency requests. Through these assessments, several additional environmental aspects including air quality, source water protection and climate change were addressed as part of the Project.

5.3.1 Air Quality

No long-term air quality impacts are anticipated from implementing the preferred solution based on the nature of the Project: addressing erosion impacts within a watercourse: bank and valley wall destruction; slumping of gabion banks; and elevated storm sewer outfalls. As a result, only temporary, localized effects on air quality could arise during construction activities associated with the movements and operation of construction vehicles.

Best management practices (BMPs) will be implemented to limit temporary air quality impacts on area sensitive receptors over the four-to-six-month construction duration. The following BMPs will be implemented at the onset of construction:

– Undertake regular maintenance of equipment used on site to minimize exhaust.
– Use effective dust suppression techniques such as on-site watering, as necessary.
– Reduce speed limits on unpaved areas for mobile equipment.
– Optimize material transfer operations including reducing distance for material transfers, where possible.

5.3.2 Noise and Vibration

There is a potential for a temporary increase in noise and vibration to nearby sensitive receptors over the four-to-six-month construction duration. Similar to air quality, BMPs for noise reduction will be implemented to limit noise and vibration impacts including the following:

– Limiting idling of vehicles.
– Use of construction equipment that meets the requirements of the MECP Construction Equipment Publication (NPC-115).
– Complete works during appropriate hours (e.g., no early morning or evening works).

5.3.3 Source Water Protection

The MECP requested that the CVC be contacted directly regarding source water protection. It was noted by CVC that the Project area transects the following vulnerable areas identified under the *Clean Water Act, 2006*:

– **Intake Protection Zone -2 (IPZ 2)** - The IPZ-2 zone represents the area, both on land and in water, where a spill of a contaminant might reach the intake before the plant operator can respond. In the Credit Valley Source Protection Authority, the minimum response time, as specified in the *Technical Rules*, is 2 hours, which has been used for all intakes.
– **Highly Vulnerable Aquifers (HVA)** - HVA can be easily changed or affected by contamination from both human activities and human process because of its intrinsic susceptibility (as a function of the thickness and permeability of overlaying layers), or by preferential pathways to the aquifer.
– **Significant Groundwater Recharge Area (SGRA)** - is an area that supplies a community or private residence with drinking water and is characterized by porous soils, which allow water to seep easily into the ground and flow to an aquifer.

Under the *Clean Water Act, 2006*, a “prescribed threat” is defined as “an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water and includes an activity or condition that is prescribed by source protection regulation as a drinking water threat”.

The province has identified 22 activities that, if they are present in vulnerable areas, now or in the future, could pose a threat (listed in Section 1.1 of O. Reg. 287/07). GHD completed an assessment of the 22 activities and only one was applicable during construction activities (the handling and storage of fuel).

During the construction period, there is a short-term threat posed by the handling and storage of fuel associated with the use of construction equipment. The risk is generally related to fuel, or other automotive liquid spills. This would be considered a possible threat for any on-site machine fueling and/or maintenance. BMPs for all fuel handling and storage will be required along with a spill contingency plan prior to initiating construction to minimize the risks of the potential threat.

5.3.4 Climate Change

To protect against future impacts of climate change, climate change is now being considered early in infrastructure planning and design to create more sustainable and resilient infrastructure. Sustainable and resilient infrastructure will allow for the flexibility needed to account for the uncertainty associated with climate change.

To this end, MECP developed a guide entitled *Consideration of Climate Change in Environmental Assessments in Ontario*[8] (the Guide) to aid proponents in considering climate change as part of environmental assessments for infrastructure and facilities. The Guide outlines the Ministry's expectations for considering climate change throughout the environmental assessment process and includes the following considerations:

– Effects of a project on climate change
– Effects of climate change on a project
– How the project will minimize identified negative effects on climate change

As a result, the Guide was reviewed as part of addressing climate change for the Project. This review is documented in the following sections.

5.3.4.1 Effects of the Project on Climate Change

Potential effects of the Project on climate change include limited greenhouse gas (GHG) emissions associated with construction activities. GHG emissions will be generated by the equipment and machinery required for construction, the distance travelled by construction workers to get to and from the Project area and the sourcing of materials.

To minimize or offset the potential effects of the Project on climate change, in particular to reduce the GHG emissions associated with the construction, mitigation measures will be implemented. The MECP Guide defines mitigation as "The use of measures or actions to avoid or reduce greenhouse gas emissions, to avoid or reduce effects on carbon sinks, or to protect, enhance, or create carbon sinks" (MECP 2016, Page 40). Mitigation measures include actions such as utilizing different technologies and construction materials.

Mitigation measures to reduce the Project's effect on the environment will be determined by the City of Mississauga and implemented at the onset of construction. Possible Best Management Practices (BMP)/mitigation measures for consideration include the following:

– Implement and enforce an anti-idling policy for all vehicles and machinery on site during the construction stage.
– Ensure all vehicles/machinery and equipment are in good repair, equipped with emission controls, as applicable, and operated within regulatory requirements.
– Use materials that have a lower carbon footprint and a long lifespan.

8 Ontario Government. 2016. Considering climate change in the environmental assessment process. [online] Available at: <https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process> [Accessed 19 May 2022].

– Plant additional vegetation to create a carbon sink where possible.

5.3.4.2 Effects of Climate Change on the Project

The increasing frequency of storm events (e.g., rainfall, snowfall, extreme wind) has the potential to cause disruption/delays to construction and increased soil erosion and runoff during construction. As a result, the construction stage of the Project may be adversely affected by changes in weather patterns. The likelihood of these impacts is generally considered to be low because the construction periods are relatively short duration events (four-to-six months for this Project); and therefore, it is possible to minimize potential climate change effects related to rainfall, storms, temperature, and moisture by managing the overall construction schedule so that it does not occur during periods beyond the typical/normal range for these parameters.

Notwithstanding this, the potential effects of climate change on both the construction phase and lifetime of the Project are considered to be "medium" or "nil" across a number of parameters as summarized in **Table 5-2**. "medium" indicates that the effect may cause a minor impact. "Nil" indicates that no effect is anticipated due to the potential change.

Table 5-2 Estimated Sensitivity of the Project to Potential Climate Change Effects[9]

Climate Parameters	Estimated Sensitivity	Estimated Sensitivity
	Construction	Project Lifetime
Mean Temperature	**NIL –** Erosion control works are successfully conducted in areas with significantly higher/lower mean temperature.	**NIL-** An increase in mean temperature is unlikely to cause an increase in damage to the erosion control works
Frequency and/or Severity of Extreme Temperature	**NIL-** More frequent and/or severity of extreme temperature is not anticipated to effect the construction of the erosion control works	**NIL -** More extreme heat is unlikely to damage the erosion control works throughout their lifetime.
Total Annual Rainfall	**Low** – Erosion control works can be successfully conducted in areas with significantly higher/lower total annual rainfall volumes. A water management plan will be required to avoid significant impacts of large flow events during construction.	**Low -** Significantly higher/lower total annual rainfall volumes have to potential to cause washouts and damage to the erosion control works. Works will be designed to be stable for large low frequency events with an additional factor of safety to account for future increase in severity of flow events.
Total Annual Snowfall	**NIL –** Erosion control works are successfully conducted in areas with	**NIL –** Erosion control works function in areas with

9 Table modified from: "Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners" (Federal-Provincial-territorial Committee on Climate Change, November 2003).

Climate Parameters	Estimated Sensitivity Construction	Estimated Sensitivity Project Lifetime
	significantly higher/lower total annual snowfall amount.	significantly higher/lower total annual snowfall amounts.
Frequency and/ or Severity of Precipitation and Weather Extremes	**Low-** More frequent and severe storms have the potential to cause construction delays. As well, there is the potential for more extreme rain events to cause increased erosion and sedimentation through runoff into Sheridan creek if proper mitigation measures are not employed.	**Low-** More frequent and severe storms and extreme temperature have the potential to cause washouts and damage to the erosion control works (including hardscape and vegetative materials) and stormwater management infrastructure. Works will be designed to be stable for large low frequency events with an additional factor of safety to account for future increase in severity of flow events.
Soil Moisture & Groundwater	**NIL -** Soil moisture and groundwater relate to potential weather changes. Erosion control works are successfully conducted in areas with significantly different weather conditions.	**NIL -** Soil moisture and groundwater relate to potential weather changes. Erosion control measures successfully function in areas with significantly different weather conditions.
Evaporation Rate	**NIL -** Evaporation rate relates to potential weather changes. Erosion control works are successfully conducted in areas with significantly different weather conditions.	**NIL -** Evaporation rate relates to potential weather changes. Erosion control measures successfully function in areas with significantly different weather conditions.
Wind Velocity	**NIL –** Wind Velocity is related to potential weather changes. Erosion control works are successfully conducted in areas with significantly different weather conditions.	**NIL -** Wind Velocity is related to potential weather changes. Erosion control works function in areas with significantly different weather conditions.

Also, the effects of climate change have the potential to cause increased maintenance of the proposed works constructed within Reaches 2 and 3. Considering this, adaptation is focused on addressing effects of climate change on the Project. The Guide defines adaptation as “The process of adjustment in the built and natural environments in response to actual or expected climate change and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects” (MECP 2016, Page 38).

Although it was determined that climate change will have no appreciable adverse effects on the Project, the identification of possible adaptation measures was undertaken to increase both the Project's and the local ecosystem's resilience to climate change.

Adaptation measures are aimed at strengthening and increasing the resilience of the proposed works. Such measures could include the following:

– Works will be designed to be stable for large low frequency events with an additional factor of safety to account for future increase in severity of flow events.
– Design embankments with additional stabilization, through planting vegetation
– Choose vegetation to stabilize embankments that is known to withstand erosion and climatic stressors such as extreme heat, drought tolerance, and flood resistance

5.3.5 Proposed Impact Management Measures and Environmental Monitoring

The potential effects, proposed impact management measures, and resultant net effects associated with the Reach Scale Works were identified based on the conceptual design level of detail and noted specific studies/assessments carried out. **Table 5.3** summarizes the potential effects, proposed impact management measures, and resultant net effects, which have been presented in the same order as the environment is described in **Section 4.2** (beginning with the Natural Environment and ending with the Social Environment).

Along with confirming the net effects, **Table 5.3** also specifies the pre-construction, construction and/or post-construction environmental monitoring programs associated with the proposed impact management measures where appropriate. Monitoring programs were determined based on the confirmed net effects anticipated. The purpose of the programs is to monitor the net effects associated with the construction of the Reach Scale Works, as necessary, and implement further impact management measures, monitoring, and contingency plans, where possible, so that:

- Predicted net negative effects are not more than expected
- Unanticipated negative effects are addressed
- Predicted benefits are realized

As mentioned, the net effects will be re-confirmed as part of detail design along with the proposed impact management measures and monitoring programs. The re-confirmed impact management measures and monitoring programs associated with the Reach Scale Works will be implemented unless they are determined to be no longer applicable or required.

Table 5-3 Summary of the Net Effects and Proposed Monitoring Programs for the Reach Scale Works in Reaches 2 and 3

Category	Potential Effects	Impact Management Measures	Net Effects	Proposed Monitoring Program
Natural Environment	Deleterious substances (including sediment) entering the water during construction and/or immediately following construction	Develop a comprehensive Erosion and Sediment Control (ESC) Plan as part of the detail design Implement ESC Plan measures prior to construction activities taking place to ensure deleterious substances are prevented from entering Sheridan Creek, such as requirements for refuelling locations, storage, and emergency spill response protocols. Complete site stabilization as construction progresses; final site restoration involving native seeding, plantings and biodegradable erosion control blankets where applicable.	It is anticipated that the potential for deleterious substances to enter the watercourse can be controlled and avoided with appropriate mitigation measures.	ESC monitoring during construction should include regular site inspections of works and mitigation measures, as well as site inspections immediately before and after significant rainfall events (>12mm rain within 24-hour period).
Natural Environment	Temporary loss of fish habitat during construction / death of fish during construction	In-water work areas to be isolated via cofferdams with flows pumped/diverted around the site to allow construction works to occur in the dry. Under a valid Licence to Collect Fish, a qualified biologist to conduct a fish rescue prior to dewatering of any isolated in-water work areas with captured fish released upstream or downstream of the site. Any pump intakes used for water management are to be screened to prevent the entrainment or impingement of fish. An in-water construction timing restriction for warmwater habitat will be followed (no works between March 16 and July 14, or as otherwise stated by regulatory agencies). Mitigation of existing barriers to fish passage as part of the Project will open access to previously blocked upstream habitat to downstream fish communities.	Fish relocation and pump intake screening during construction is anticipated to avoid any fish mortality. Existing fish habitat is in very poor condition, with Reach 2 anticipated to not support any fish and downstream fish populations fragmented from those found upstream of the site. The proposed works will improve existing conditions and create new aquatic habitat, as well as open access to previously blocked habitat via the mitigation of existing barriers to fish passage.	Construction contract requirements to be enforced by a Contract Administrator. Post-construction fisheries monitoring to confirm use of rehabilitated habitat by fish.
Natural Environment	Temporary riparian vegetation impacts during construction	A tree inventory and protection plan to be completed prior to construction, with appropriate tree protection measures adhered to during construction. Tree compensation based on vegetation impacted to be completed as part of the site restoration process. Native seeding of disturbed areas and incorporation of native shrubs into bank stabilization design will also be included to return site to a naturalized state post-construction. All vegetation removals	Site restoration and tree compensation measures are anticipated to replace any temporarily disturbed terrestrial vegetation.	Contract requirements for monitoring vegetation survival post-construction and replanting within warranty period of deceased individuals. Monitoring of tree protection measures incorporated into the regular ESC monitoring requirements noted above.

Category	Potential Effects	Impact Management Measures	Net Effects	Proposed Monitoring Program
		within CVC's Regulated Area (Natural Heritage System) will be compensated for and will follow CVC's Ecosystem Offsetting Guidelines. This will be calculated during the detailed design. Construction activities should adhere to the *Clean Equipment Protocol for Industry* (Halloran et. al. 2016) to mitigate the potential spread of invasive species.		
Natural Environment	Permanent loss of riparian vegetation due to slight widening of the watercourse channel	Surrounding riparian habitat will have additional plantings as part of site restoration works. Removal of existing hard bank stabilization measures and replacement with measures that incorporate shrub plantings, where appropriate. Tree compensation ratios to be followed as required by City of Mississauga Forestry.	The aquatic and terrestrial segments of the Site are currently in a highly impacted state. The proposed works are anticipated to result in an overall positive improvement of the natural environment.	Contract requirements for monitoring vegetation survival post-construction and replanting within warranty period of deceased individuals.
Natural Environment	Temporary impact to terrestrial species and/or Species at Risk habitat (birds, bats)	Limit work areas in natural vegetation to the extent possible Avoid tree clearing during bat roosting periods (April 1 to October 31) Avoid vegetation clearing during breeding bird nesting periods (April 1 to August 31)	Net impacts, specifically to bat species, must be confirmed against a detailed design.	The need for additional targeted surveys or applications under the *Endangered Species Act* must be confirmed at the detail design stage. This monitoring and associated approvals, if applicable, would be required prior to construction. Species-specific post-construction monitoring requirements may be dictated in permit approvals.
Built Environment	Damage to existing trail system during construction staging and access	Designated staging and access routes during construction. Site restoration requirements to include repair of trails, roadways, sidewalks, as applicable	Built aspects of the site are anticipated to be restored to existing or better condition following construction.	No specific monitoring program is proposed at this time.
Social Environment	Temporary disruption and/or inconvenience during construction to resident use/enjoyment of adjacent properties	The construction activities will be scheduled to limit disruption to adjacent properties. Adjacent homes and businesses will be notified on the construction scheduling prior to commencement.	The temporary disruption will be mitigated through appropriate scheduling and notifying adjacent dwellings in advance.	No specific monitoring program is proposed at this time.
Social Environment	A temporary and localized effects on air quality in the immediate vicinity from emissions (i.e., fugitive dust and combustion products) associated with the movement and operation of construction equipment and vehicles, which may cause a nuisance or disturbance to residents	Determine specific BMPs/mitigation measures as part of detail design and implement at the onset of construction. Possible BMPs/measures for consideration could include the following: – Undertake regular maintenance of equipment used on site to minimize exhaust – Limit equipment idling to the minimum necessary to perform the specific work. – Use effective dust suppression techniques such as on-site watering, as necessary	The temporary and localized effects on air quality in the immediate vicinity would be reduced.	No specific monitoring program is proposed at this time.

Category	Potential Effects	Impact Management Measures	Net Effects	Proposed Monitoring Program
		– Reduce speed limits on unpaved areas for mobile equipment – Optimize material transfer operations including reducing distance for material transfers, if possible		
Social Environment	A temporary increase in noise and vibration to nearby residences associated with the movement and operation of construction equipment and vehicles, which may cause a nuisance or disturbance to residents.	Determine specific BMPs/mitigation measures as part of detail design and implement at the onset of construction. Possible BMPs/measures for consideration could include the following: – Limiting idling of construction vehicles – Use construction equipment that meets the requirements of the MECP Construction Equipment Publication (NPC-115) – Complete works during appropriate hours (e.g., no early morning or evening works)	Temporary increase in noise levels during construction would be minimized by implementing the impact management measures.	No specific monitoring program is proposed at this time.

5.4 Commitments

A number of commitments were made regarding the proposed impact management measures, monitoring requirements, and in response to consultation activities carried out during the Project. **Table 5-4** summarizes the commitments made for the Project under the following headings:

- Commitment description
- Commitment timing (when the commitment will be implemented)

The commitments are further grouped into either one of the following three categories:

- General (not specific to a particular environmental category or the result of consultation)
- Environment (Natural, Built, Social, etc.)
- Consultation

The City (as the ultimate owner) are committed to ensuring that the Project is constructed and maintained in accordance with the MCEA planning and design process followed and conclusions reached.

Table 5-4 Class EA Commitments and Compliance Monitoring

Category	Id No.	Commitment Description	Commitment Timing
General	1	The detail design will consider the location of sanitary sewers and rodent control	Detail Design
Natural Environment	2	Net impacts, specifically to bat species, must be confirmed against a detailed design.	Pre-construction,
Natural Environment	3	To limit the potential threat to source water protection caused by spills a Spill Contingency Plan will be prepared	Pre-Construction
Natural Environment	4	Erosion and Sediment Control monitoring will be completed regularly and immediately before and after significant rain events	Construction
Natural Environment	5	Site restoration and tree compensation measures will be implemented to replace any temporarily disturbed terrestrial vegetation. All vegetation removals within CVC's Regulated Area (Natural Heritage System) will be compensated for and will follow CVC's Ecosystem Offsetting Guidelines.	Post-construction
Natural Environment	6	Monitoring vegetation survival post-construction and replanting within warranty period of deceased individuals.	Post-construction

Category	Id No.	Commitment Description	Commitment Timing
Natural Environment	7	Post-construction fisheries monitoring will be completed to confirm use of rehabilitated habitat by fish within Reach 2	Post-construction
Technical	8	Post-construction monitoring of stability of the works to be determined through the permitting process	Post-construction
Social Environment	9	To limit noise impacts to adjacent residents the following measures will be implemented: – Limiting idling of vehicles – Use of construction equipment that meets the requirements of the MECP Construction Equipment Publication (NPC-115) – Complete works during appropriate hours (e.g., no early morning or evening works)	Construction
Social Environment	10	To limit air quality impacts to adjacent residents the following measures will be implemented: – Undertake regular maintenance of equipment used on site to minimize exhaust – Use effective dust suppression techniques such as on-site watering, as necessary – Reduce speed limits on unpaved areas for mobile equipment – Optimize material transfer operations including reducing distance for material transfers, where possible	Construction
Cultural Environment	11	If archaeological sites are discovered during construction of the Project, then appropriate action will be taken, including a cessation of construction work on the affected site, consultation with Indigenous communities and adherence to MHSTCI guidelines.	Construction
Cultural Environment	12	If human remains are encountered, all activities will cease immediately and the local police as well as the Registrar, Burials of the Ministry of Government and Consumer Services will be contacted. In situations where human remains are associated with archaeological resources, MHSTCI should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.	Construction

Category	Id No.	Commitment Description	Commitment Timing
Consultation	13	The draft PFR will be provided to MECP and CVC, for review and comments prior to finalizing it for the mandatory 30 calendar day comment period.	Pre-construction
	14	Indigenous communities will be followed up with after the Notice of Completion is issued to ensure they receive the notice and are aware of the opportunity to provide comments	Pre-construction
	15	If archaeological sites are discovered during construction of the Project, then appropriate action will be taken, including a cessation of construction work on the affected site, consultation with Indigenous communities and adherence to MHSTCIguidelines.	Construction

5.5 Permitting and Approvals

In addition to requiring *EA Act* approval, there are a number of municipal, regional and other provincial approvals anticipated to be required in order to implement the design for each reach. The following post-EA permits and approvals are required:

Table 5-5 Anticipated Post EA Permits and Approvals

Approval Authority	Anticipated Permit and Approval required	Legislation or By-Law Reference
Municipal and Regional Approvals		
City of Mississauga Forestry	A Tree Injury and Removal Permit is anticipated	By-Law #474-05
Provincial Approvals		
Ministry of Environment, Conservation and Parks	Potential impacts to terrestrial provincial Species at Risk (SAR), specifically little brown myotis, northern myotis or tricolored bat, should be reviewed when design details are available to confirm if a permit or approval is applicable.	Endangered Species Act, 2007

Approval Authority	Anticipated Permit and Approval required	Legislation or By-Law Reference
Credit Valley Conservation Authority	Regulation of development, interfering with wetlands and alterations to shorelines and watercourses	Ontario Regulation 160/06 under the Conservation Authorities Act
Ministry of Northern Development, Mines, Natural Resources and Forestry	A Licence to Collect Fish will be required during the construction process	Fish and Wildlife Conservation Act, 1997
Federal Approvals		
Department of Fisheries and Oceans, Canada	Obtain a Letter of Advice through the Request for Review process; an Authorization is not anticipated.	Fisheries Act

6. Implementation of the Proposed Improvements

As previously stated, the Sheridan Creek Erosion Control Study (Lushes Avenue to Clarkson Road South) is classified as a Schedule 'B' project, the City, as the Proponent, is required to prepare a Project File Report documenting the first two phases of the Municipal Class Environmental Assessment MCEA process, and conclusions reached, in addition to making it available for a 30 calendar day comment period.

6.1 Notice of Completion

As part of the process of making the Project File Report available for review, the City issued a formal Notice of Completion for the Sheridan Creek Erosion Control Study Class EA through the following activities:

- Issuing a letter with the Notice via email and/or direct mailing to review agencies, Indigenous communities, and interested public members
- Issue a letter with the Notice to registered stakeholder and adjacent property owners via email and direct mail
- Publishing the Notice in the Mississauga News
- Posted the Notice on the City's website: Sheridan Creek Erosion Control – Lushes Avenue to Clarkson Road South – City of Mississauga

30-Day Comment Period

The City established the 30-calendar day comment period starting on January 25, 2023 and ending on February 23, 2023 whereby any interested person could inspect the Project File Report and provide comments. The comments, including any issues or concerns, would be sent first to GHD, on behalf of the City, for potential resolution.

If there were any outstanding concerns that the Project may adversely impact constitutionally protected Aboriginal and treaty rights, which cannot be resolved in discussion with the City, then a person or party could request that the Minister make an order for the Project to comply with Part 16 of the *EA Act*. This is referred to as a Part 16 Order, which addresses Individual Environmental Assessments.

In addition, the Minster may issue an order on his or her own initiative. In this situation, the Director of the Environmental Approvals Branch, MECP (Director), would issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent.

Once the requested information has been received, the Minister would have 30 days within which to make a decision or impose conditions on the Project. This means the proponent cannot proceed

with the Project until at least 30 days after the end of the comment period provided for in the Notice of Completion.

6.2 Class EA Phase 5

A proponent can proceed to Phase 5 of the MCEA process and implement the preferred solution in accordance with the following criteria:

– If no Part 16 Order requests are received during the 30-calendar day comment period or those that are received are satisfactorily resolved.
– The Minister does not issue an order or impose conditions on the Project.
– Specifically, Phase 5 of the MCEA process for this Project entails three steps:
    - Complete detail design and associated pre-construction environmental provisions and commitments as specified in the Project File Report, including acquiring all necessary post-EA permits and approvals
    - Proceed to construct the Reach Scale Works in Sheridan Creek, monitoring to ensure fulfilment of construction-related environmental provisions and commitments as specified in the Project File Report
    - Undertake monitoring to ensure fulfilment of infrastructure operations-related environmental provisions and commitments as specified in the Project File Report

Anticipated Construction Timeline

Construction is currently planned to commence in the fall of 2023. It is anticipated that the duration of construction will be between four and six months, pending weather conditions. Since construction is planned to begin in the fall, potential construction impacts will be abated during key breeding and spawning periods for local wildlife and fish to prevent disturbance to the local fauna.

7. Overview of Consultation

Consultation with review agencies, Indigenous communities, and the public was carried out throughout the Sheridan Creek Erosion Control Class Environmental Assessment (Class EA) (Project). Consultation undertaken as part of the Project was carried out in accordance with the Municipal Class Environmental Assessment (MCEA). Specifically, consultation was carried out early in and throughout the Project satisfying the following:

– The need for a minimum of two mandatory points of contact as specified in the MCEA for Schedule B activities (**Section 7.1**)
– The need to contact all main stakeholders identified in the MCEA: review agencies including municipalities, Indigenous communities, and the public (**Section 7.2**)
– The need to provide a variety of methods for involving the public as stated in the MCEA (**Section 7.3**)

– The need to integrate input received into the Project and decision-making process as outlined in the MCEA (**Section 7.4**)

Each of the preceding requirements are further elaborated upon in the following subsections.

7.1 Points of Contact When Consultation Occurred

Although only two mandatory points of contact are required for Schedule B activities, four were included as part of the Project as follows:

– Commencement of the Project
– Confirmation of the Preferred Solution
– Review of the draft Project File Report by the Ministry of Environment, Conservation and Parks (MECP) and Credit Valley Conservation (CVC)
– Filing of the Project File Report

As a result, input was sought and obtained from the involved participants at the key decision-making points in the MCEA before moving forward with those decisions in the Project.

7.2 Interested Participants and How Input Was Obtained

As part of initiating the Project, potentially interested participants were grouped together into review agencies, Indigenous communities (First Nations and Métis organizations), and the public for consultation purposes (**Appendix K**). A comprehensive contact list comprised of these three participant groups was then established based on the following:

– The MCEA
– Other projects recently completed or ongoing within the vicinity of the Project
– The consultation experience of GHD and the City of Mississauga

Each participant group and how they were consulted is described in further detail in the following subsections.

7.2.1 Review Agencies

Review agencies included federal agencies, provincial ministries and agencies, local agencies, and utilities. In total, 14 review agencies and utilities were consulted as part of the Project (**Table 7-1**).

Review agency input on the Project was obtained through virtual meetings and email correspondence.

Table 7-1 Review Agencies

Review Agency
Federal Agencies
Transport Canada
Navigable Waters Protection Program, Transport Canada Marine Office
Ministry of Aboriginal Affairs
Fisheries and Oceans Canada
Provincial Agencies
Ministry of the Environment, Conservation and Parks
Ministry of Northern Development Mines, Natural Resources and Forestry
Ministry of Heritage, Sport, Tourism and Culture Industries
Municipal and Local Agencies
Region of Peel
Toronto Indigenous Services Canada
Credit Valley Conservation
Utilities
Alectra Inc.
Enbridge Gas Distribution Inc.
Hydro One Networks Inc.
Bell Canada
Rogers Communications

7.2.2 Indigenous Communities

The Indigenous communities who were invited to participate in the Project are presented in **Table 7-2**. The list is based on recent projects undertaken by GHD and the City and the Ministry of Environment, Conservation, and Parks (MECP's) direction provided at the start of the Project. The list of participating Indigenous communities was updated, as appropriate, throughout the Project to ensure that all who wished to be involved were provided the opportunity to do so and those requesting to disengage from the Project were no longer contacted.

Indigenous communities were consulted through a separate, but parallel process to the review agencies and the public throughout the Project. This process followed the responsibilities delegated to proponents by the MECP as communicated in their February 18, 2020 correspondence. Input from Indigenous communities on the Project was obtained through written and email correspondence.

Table 7-2 Indigenous Communities

Indigenous Communities
Mississaugas of the Credit First Nation
Six Nations of the Grand River
Huron-Wendat Nation
Haudenosaunee Development Institute
Credit River Metis Council

7.2.3 The Public

Like review agencies and Indigenous communities, the public, including adjacent property owners, were also invited to participate in the Project. Any member of the Public who showed an interest in the Project by submitting written or email correspondence and/or provided their information as part of the Online Public Information Centre (PIC) were sent Project notifications. Input from public participants on the Project was obtained through email.

7.3 Consultation Activities Carried Out

The consultation activities carried out during the Project were tailored to each participant group with the intent to inform, efficiently obtain input, and address concerns/issues as much as possible. The following subsections summarize the consultation activities undertaken with each participant group beginning with review agencies and ending with the public.

7.3.1 Review Agencies

The consultation activities carried out during the Project with review agencies was completed via email correspondence and virtual meetings. For instance, Project related notices were issued to review agencies as follows:

– Notice of Commencement on October 15, 2020 (**Appendix L**)
– Notice of Online PIC on September 30, 2021 (**Appendix L**)
– Notice of Completion on January 25, 2023 (**Appendix L)**

For all comments received in response to the issued Notices, written correspondence was provided. In addition, where necessary, emails and virtual meetings were made with interested agencies throughout the Project to directly answer questions, obtain clarifications, and provide a two-way exchange of information. **Table 7-3** provides a summary of these meetings and **Appendix M** provides all correspondence.

Table 7-3 Agency Meetings

Review Agency	Purpose	Meeting Date / Site Visit
Credit Valley Conservation (CVC)	To discuss the site conditions, potential solutions and CVC expectations	January 13, 2021, virtual meeting
Credit Valley Conservation (CVC)	To receive guidance from CVC on selection of the preferred alternative based on balance of flood impacts and benefits to aquatic habitat.	January 31, 2022, virtual meeting
Credit Valley Conservation (CVC)	To share updates concerning the floodplain modelling for Sheridan Creek, hydraulic assessment, and next steps.	February 24, 2022, virtual meeting
Credit Valley Conservation (CVC)	To discuss the updated existing conditions flood model.	August 23, 2022, virtual meeting

7.3.2 Indigenous Communities

Like review agencies, Indigenous communities were consulted on the Project via written and email correspondence. For instance, Project related notices were issued, by email and registered mail to the Indigenous communities listed in **Table 7-2** as follows:

– Notice of Commencement on October 15, 2020 and mailed out on October 21, 2020 (**Appendix L**)
– Notice of Virtual PIC on September 30, 2021 (**Appendix L**)
– Notice of PFR on January 23, 2023 (**Appendix L**)

All comments received from Indigenous Communities in response to the issued Notices were responded to in the same way as they were received (i.e., letters were responded to with formal written correspondence, emails were responded to through an email). A copy of the Indigenous community consultation tracking is presented in **Appendix N**.

The Indigenous Communities were provided the Stage 1 Archaeological Assessments (AA) for review and comment. They were also invited to participate in the Stage 2 AA field investigations; however, none were able to make it. The Stage 2 AA was provided to the Indigenous Communities for review and comment.

7.3.3 The Public

A variety of consultation activities were carried out during the Project with the public. These activities included the following:

– Notifications
– PIC
– Email correspondence

In conjunction with issuing Project related notices directly to review agencies and Indigenous communities, the following notifications were issued directly to all public participants included in the Project's contact database and posted on the City's website:

– Notice of Commencement on October 15, 2020 (**Appendix L**)
– Notice of Virtual PIC on September 30, 2021(**Appendix L**)
– Notice of PFR on January 25, 2023 (**Appendix L**)

In addition, the first two notices were published in the Mississauga News.

Virtual Public Information Centre

One PIC was held as part of the Project for the public so that they could provide input at the key decision-making point in Phase 2 of the MCEA. The PIC was hosted online for public health and safety purposes related to COVID-19. The virtual PIC was hosted on the City's website from September 30, 2021 to October 28, 2021 for a 30-day public comment period. A presentation was presented on the City's website to walk stakeholder through the Online PIC, a copy of the presentation was also uploaded to the website to allow stakeholder to view the information at their own pace and a comment form was also uploaded so that feedback could be provided. A copy of the presentation is available in (**Appendix O**)

Email correspondence was undertaken with the public to respond to submitted comments, answer questions, and provide information. In total, 6 emails were received from public participants during the comment period prior to issuing the Notice of Completion and filing the PFR for comment.

7.4 Consideration of Comments Received and Issues Raised

Although comments were received from all three participant groups, the majority were received from review agencies followed by the public with the fewest comments from Indigenous communities. Many of the comments from the public were in response to the virtual PIC. The comments received and how they were considered as part of the Project are summarized in the following subsections via a series of tables by participant group in accordance with the MECP's Code of Practice for Preparing and Reviewing Environmental Assessments in Ontario (January 2014):

– **Table 7-4** summarizes the comments received from review agencies through meetings, and correspondence (written and electronic), and how they were considered (organized by individual review agency according to Project notification milestone)
– **Table 7-5** summarizes the comments received from Indigenous communities through correspondence (written and electronic) and how they were considered (organized by individual Indigenous community according to Project notification milestone)
– **Table 7-6** summarizes the comments received from the public through correspondence (written and electronic) by issue and how they were considered (organized according to Project notification milestone)

Appendix M includes the comments received and responses for review agencies and the public, which were recorded in the Project's communications record database. **Appendix N** includes the Project's Indigenous communities record of consultation.

7.4.1 Review Agencies

Six of the 14 review agencies notified of the Project responded (**Table 7-4**). Those who responded included the Credit Valley Conservation (CVC), MECP, Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), Region of Peel, Transport Canada and Hydro One.

Table 7-4 Summary of Review Agencies' Comments and How They Were Considered in the Project

Review Agency	Summary of Comments Reviewed	Consideration of Comments Received
Credit Valley Conservation (CVC)	**Re: Notice of Commencement** CVC noted there were still some site considerations with regards to potential permits, erosion control measures, protection of significant wildlife habitat and migratory bird nesting, the use of soft bank stabilization techniques, and the development of a fish passage from lower Sheridan Creek from Lake Ontario up to Clarkson Go Station. **Re: Virtual Public Information Centre** It was noted by CVC that a hydraulic assessment and erosion assessment would be required for the Project. CVC also noted that the impacts of the preferred alternatives to the geomorphic form and function of the creek should be further analyzed. In addition to this, CVC expressed a preference for a softer approach to bed and bank treatment where geomorphologically suitable.	**Re: Notice of Commencement** A permit application will be prepared if required during the appropriate stage of the study. GHD notes the purpose of the work is to identify measures to rehabilitate the stream reach and reduce/prevent erosion. A hydraulic analysis will be completed as part of the Study, which will include follow up contact with CVC staff. Aquatic habitat enhancements appropriate to this reach will be an integral design consideration for the Study. **Re: Virtual Public Information Centre** GHD have completed a hydraulic analysis, erosion assessment and geomorphic hazard assessment to address CVC's concerns. A copy of the draft PFR with all the technical reports will be submitted to the CVC once complete. CVC were consulted with during the hydraulic analysis.
Ministry of Environment, Conservation and Parks (MECP)	**Re: Notice of Commencement** MECP noted that Indigenous communities must be consulted and MECP must received a draft copy of the PFR.	**Re: Notice of Commencement** All Indigenous communities identified by MECP will be consulted and a draft copy of the PFR will be submitted to MECP.

Review Agency	Summary of Comments Reviewed	Consideration of Comments Received
	MECP noted that policies applicable to affected conservation areas must be applied to the Study; in addition, to applying all relevant source protection water. MECP also noted that climate conditions, air quality, dust and noise, contaminated soil, and stormwater management plan must be documented in the final RFP. Additionally, MECP noted that mitigation measures, construction and post-construction should be referenced, along with the consultation requirements of the Class EA, and list of applicable permits and approvals in the PFR.	The Study location is outside designated conservation areas, and the local source protection authority will be consulted concerning source water protection policies applicable to this Study. Climate conditions air quality, dust and noise, contaminated soil in the PFR; however, no stormwater management plan will be produced. The PFR will document the mitigation measures, construction and post-construction, Class EA consultation requirements and the applicable permits and approvals.
Ministry of Housing, Sport, Tourism and Cultural Industries (MHSTCI)	**Re: Notice of Commencement** MHSTCI noted that technical cultural heritage studies and their recommendations (i.e., Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes, Heritage Impact Assessments, and Archaeological Assessments), including consultations with Indigenous communities concerning knowledge of cultural heritage resources in the final report.	**Re: Notice of Commencement** All technical cultural studies and recommendations (i.e., Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes and a Stage 1 Archaeological Assessments completed by ASI) will be included in the final PFR; in addition to, consulting Indigenous communities to learn of their knowledge of cultural heritage resources.
Region of Peel	**Re: Notice of Commencement** Region of Peel noted that the Project should make note of major sanitary sewers located in the Study Area (i.e., Lushes Avenue, Inverhouse Drive, Clarkson Road South, Lakeshore Road West); in addition to, the need for rodent control measures.	**Re: Notice of Commencement** The location of sanitary sewers and rodent control measures will be noted in the final design.

Review Agency	Summary of Comments Reviewed	Consideration of Comments Received
Transport Canada	**Re: Notice of Commencement** Transport Canada noted that the Project should self-assess the likelihood their Project will have significant adverse environmental effects.	**Re: Notice of Commencement** A self-assessment has been completed and the Project does not interfere with any federal properties or waterways, nor does it require any authorization under *the Impact Assessment Act, Canadian Navigable Waters Act, Railway Safety Act, Transportation of Dangerous Goods Act, and the Aeronautics Act*. The Project Contact List was amended to remove Transport Canada as a Stakeholder.
Hydro One	**Re: Notice of Commencement** Hydro One noted there are no existing Hydro One transmission assets in the subject area, and direct construction away from the transmission corridor if lot grading and/or drainage proximity changes.	**Re: Notice of Commencement** Hydro One will be contacted if the proposed undertaking changes or Study Area expands.

7.4.2 Indigenous Communities

Two of the Indigenous communities notified of the Project submitted a response (**Table 7-5**). The Indigenous communities who responded were the Mississaugas of the Credit First Nation and Huron-Wendat Nation. The Mississaugas of the Credit First Nation, Huron-Wendat Nation, and Six Nations of the Grand River all reviewed the Stage 2 Archaeological Assessment Report and each responded via emails stating that they had no comments or concerns. As mentioned, **Appendix N i**ncludes the Indigenous community comments received and responses.

Table 7-5 Summary of Indigenous Communities Comments and How They Were Considered in the Project

Indigenous Communities	Summary of Comments Reviewed	Consideration of Comments Received
Mississaugas of the Credit First Nation	**Re: Notice of Commencement** The Mississaugas of the Credit First Nation requested that the Stage 1 Archaeological Assessment (AA) Report be provided for review and noted that they would be interested in participating in the Stage 2 AA field investigations.	**Re: Notice of Commencement** A copy of the Stage 1 AA was provided to the Mississaugas of the Credit First Nation as well as an invitation to participate in the Stage 2 AA field investigations.

Indigenous Communities	Summary of Comments Reviewed	Consideration of Comments Received
Huron-Wendat Nation	**Re: Notice of Commencement** The Huron-Wendat Nation requested a copy of the Stage 1 AA Report for their review and to participate in the Stage AA field investigations.	**Re: Notice of Commencement** A copy of the Stage 1 AA was provided to the Huron-Wendat Nation as well as an invitation to participate in the Stage 2 AA field investigations.
Nation Huronne-Wendat	**Re: Stage 2 AA** No comments or concerns were noted.	**Re: Stage 2 AA** Comment noted.
Six Nations of the Grand River	**Re: Stage 2 AA** No comments or concerns were noted.	**Re: Stage 2 AA** Comment noted.
Mississaugas of the Credit First Nation	**Re: Stage 2 AA** No comments or concerns were noted.	**Re: Stage 2 AA** Comment noted.

7.4.3 The Public

Only a few public members notified of the Project, either directly or indirectly, provided comments. In total, five individual comments on the Project were received from the public. **Table 7-6** summarizes the public's comments by issue and how they were considered as part of the Project.

Table 7-6 Summary of the Issues Raised by the Public and How They Were Considered in the Project

Summary of Issues Raised	Consideration of Issues Raised
Receiving Direct Project Notifications	The stakeholder contact list was updated and notices were issued accordingly.
Loss of natural heritage / tree cover / animal habitat	Maintenance of the existing trees along the creek will be considered across all Project Alternatives. Disturbance to trees will be limited and occur outside bat roosting (April-October), vegetation restoration will be applied, and wherever possible, tree protection /fences were installed. A considerable number of small trees will be removed to implement the Preferred Alternative. However, this Alternative will improve both aquatic and terrestrial habitat in consultation with the CVC, non-native vegetation will be replaced with native species.
Project Status	A response was issued to the stakeholder informing them of the additional studies requested by CVC. A commitment to issue the Notice of Completion to the stakeholder was made.

7.4.4 Review of the Draft Project File Report

The Draft Project File Report (PFR) was provided to MECP and CVC for their review and comments before finalizing the PFR and making it available for the 30-calendar day comment period. This was done as a good practice in accordance with the MCEA and in response to requests received during the Project. **Table 7-7** summarizes the comments received and how they were considered as part of finalizing the draft PFR and **Appendix M** includes the actual correspondence.

Table 7-7 Summary of the Review Agency's Comments on the Draft Project File Report and Their Consideration

Review Agency	Summary of Comments Received on the Draft Project File Report	Consideration of Comments Received in Preparing the Final Project File Report
Ministry of the Environment, Conservation and Parks	Satisfied with the PFR. No technical comments or concerns, but the PFR should clarify if any reply was received from Indigenous communities in response to the Stage 2 AA Report being provided to them (e.g., acknowledging receipt, no comments, etc.).	The requested clarification was included in Section 7.4.2 of the final PFR.
Credit Valley Conservation (CVC)	Will the Project impact upstream flood elevations or slope stability/increase slope hazards.	No. Further confirmatory review take place at detailed design following Environmental Assessment (EA) approval.
CVC	Justification/confirmation of anticipated height increases in storm events based on HEC-RAS modeling	The anticipated water surface elevation changes for design storm events will be mitigated during detail design as part of more accurate modeling and design refinement.
CVC	Update the Hydraulic Assessment (Appendix F of the PFR) and include additional requested information.	The Hydraulic Assessment was updated with requested information included (see Appendix F of the PFR).

Review Agency	Summary of Comments Received on the Draft Project File Report	Consideration of Comments Received in Preparing the Final Project File Report
CVC	Clarify how erosion potential in Reach 2 will be reduced/limited	Vortex rock weirs will slow the flow and direct low and moderate flows to the center of the channel. Banks will be armoured with armourstone that will also act as retaining walls for slope stability.
CVC	Consider incorporating the recommended changes for Reach 3	The recommended changes will be used as much as possible and will be closely assessed as part of detail design.
CVC	Provide a commitment in the PFR associated with vegetation removals/offsetting	Requested commitment included.
CVC	Provide additional information at the detail design stage	Requested information will be provided.
CVC	Confirm technical inputs, data, methodology, etc. for the HEC-RAS model and update accordingly.	The technical inputs, data, methodology, etc. were updated for the HEC-RAS model

8. Summary

The City of Mississauga (City) initiated a project to address the erosion impacts to Sheridan Creek from Lushes Avenue to Clarkson Road South. Sheridan Creek originates in the industrial lands north of the Queen Elizabeth Way and flows southeast through the study area and ultimately discharges into Rattray Marsh and Lake Ontario further southeast. Through the City's ongoing erosion monitoring program, it was identified that this section of Sheridan Creek needed rehabilitation. Excessive erosion has led to the following impacts: bank and valley wall destruction; slumping of gabion banks; and elevated storm sewer outfalls.

The Project has been carried out in accordance with the planning and design process for a Schedule 'B' project as outlined in the Municipal Engineers Association "Municipal Class Environmental Assessment", (October 2000, as amended in 2015). Through the Municipal Class Environmental Assessment (MCEA) process, alternative solutions were developed and evaluated.

The Project Area was divided and examined within three distinct reaches, which were based on changes in channel planform and active geomorphological processes. Reach 1 spans from the

Lushes Avenue pedestrian bridge to just upstream of the Inverhouse Drive crossing, at the upstream limit of the concrete channel. Reach 2 spans from just upstream of the Inverhouse Drive crossing, at the upstream limit of the concrete channel to the Canadian National Railway (CN rail) crossing. Reach 3 extends from the CN rail crossing to the Clarkson Road South crossing.

Three alternative solutions were identified for Reaches 1 and 2 and a fourth alternative was included for reach 3. The Alternatives included: Alternative Solution No. 1: Do Nothing.

Alternative Solution No. 2: Site Based Works, Alternative Solution No. 3: Reach Scale Works and Alternative Solution No. 4 (only considered for Reach 3): Channel Realignment.

Consultation was undertaken to notify key stakeholders of the proposed project and to solicit input concerning the Identified Problem, Alternative Solutions and Preferred Solution. The two main consultation activities that were completed included the issuing of the Notice of Study Commencement followed by an Online Public Information Centre (PIC) with review agencies, Indigenous communities, and the public.

Through the evaluation process and consultation with key stakeholders, the Preferred Solution for Reach 1 was Alternative 1 - the ‘Do Nothing’ Approach, because of its limited risk to existing infrastructure, built resources, and to fish passage. For Reach 2, Alternative 3 – Reach Scale Works was the Preferred Solution because of its minimal impact on bank and bed erosion, improvement to aquatic habitat, and limited impact on existing built and archaeological resources. For Reach 3, Alternative 3 – Reach Scale Works was the Preferred Solution because of its significant improvement to aquatic habitat, fish passage, and to the reduction in impact of soil erosion on surrounding private property.

Next steps for this Project will be the commencement of construction activities, which is currently planned to commence in the fall of 2023. It is anticipated that the duration of construction will be 6 months, pending weather conditions. Construction would begin in the fall, therefore, construction impacts will be abated during key breeding and spawning periods for local wildlife and fish to prevent disturbance to the local fauna.