7. POTENTIAL EFFECTS, EFFECTS ASSESSMENT AND MITIGATION MEASURES FOR PREFERRED ALTERNATIVES

7.1 Approach to Step 4: Detailed Assessment of the Preferred Alternatives

The provincial EA process under which the SWP must seek approval requires a proponent to identify and detail the Preferred Alternative which minimizes negative effects to the environment and best meets the identified need for the project. The environment is defined broadly to include the natural, social, economic and cultural components and the identified need refers to the problem to be solved or the opportunity addressed. For the SWP, TRCA is seeking to address the problems and opportunities as discussed in **Chapter 2**.

For all EAs, it is recognized that minor changes to project design and/or construction methods are likely to occur during Detailed Design between EA approval and construction.

The effects assessment presented in **Section 7.3** is based on the SWP as presented in **Chapter 6**.

The positive benefits of the SWP in creating a functional ecological system and providing public access to a section of the Scarborough Waterfront that is currently inaccessible are anticipated to greatly exceed any potential negative effects during construction. The operational phase of the SWP includes a measurable improvement in ecological functioning over existing conditions, and lends itself to the use of environmental performance criteria which will measure the improvements in ecological function (detailed in **Chapter 8**).

7.2 Assessment Criteria and Indicators

Using the criteria developed for the comparative evaluation detailed in Chapter 5 as a basis, a set of indicators and their associated measures were defined to structure and, where possible, quantify the effects of the SWP on the environment during construction and operation.

7.2.1 Identifying Net Effects

For each indicator, the effects to existing conditions (**Chapter 3**) due to SWP works and activities (**Chapter 6**) were predicted. In some cases, no effects were predicted due to the application of mitigation or avoidance measures. Where net effects were predicted

(i.e., effects remaining after mitigation is applied), they were classified as positive, negative, or negligible.

Positive effects (e.g., improved habitat) are generally associated with operation, and were quantified where possible.

Effects that were either negative or negligible tended to be associated with construction activities. Negligible effects are generally short-term, localized, do not occur frequently, and can be minimized to a large extent through mitigation. These are often typical of construction projects. Examples include air and noise emissions from construction equipment and construction traffic.

Negative effects are those that mitigation could not minimize to the extent that it became negligible, thus, the effect was considered a net negative effect of the SWP.

7.3 Effects Assessment by Objective

The effects of the SWP on the existing environment, as well as proposed mitigation and resulting net effects are described in **Sections 7.3.1** through **7.3.5**. The discussions are organized by SWP objective; for each Objective, effects are first presented in two tables (construction, operation), and are followed by a summary description of the overall success of the SWP in meeting the objective.

Table 7-1 provides the criteria and indicators by objective and project phase.

7.3.1 Objective 1: Project and enhance terrestrial and aquatic natural features and linkages

7.3.1.1 Construction Effects

Criterion: Ability to minimize effects associated with construction works, construction access and laydown areas

Indicator: Alteration and loss of aquatic habitat

SWP construction activities, particularly land creation, will result in alteration and loss of the portion of existing aquatic habitat. This indicator was quantitatively assessed by estimating the footprint of the land creation and habitat modification associated with the Preferred Alternative using the Preferred Alternative concept drawings and typical cross-sections in ArcGIS. Both permanent loss of habitat (portions of the proposed structures that are above the high water mark) and habitat alteration (underwater portions of the proposed structures which are associated with a change in depth, vegetation and/or substrate type) were considered. Note that the footprint of habitat altered also includes areas positioned behind the headlands where waves are attenuated thus providing additional shelter and cover opportunities for fish.

Table 7-1 Effects assessment criteria and indicators relevant to phase.

Criteria	Indicators	Effects Relevant To	
		Construction	Establishment
OBJECTIVE 1: Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages			
Ability to minimize effects associated with construction works, construction access and laydown areas	Alteration and loss of aquatic habitat	√	
	Disruptions to fish and fish habitat	√	
	Nuisance effects on wildlife	√	
	Removal and disturbance of terrestrial habitat (include ANSI and ESA)	√	
Ability to provide functional nearshore open coast aquatic habitat	Ability to increase shoreline morphology by increasing shoreline irregularity		√
	Ability to increase shoreline substrate diversity		√
	Ability to provide habitat for various life stages		√
Ability to improve and manage functional terrestrial habitat	Area of terrestrial habitat removed from unsustainable inappropriate use		√
	Area of habitat created		√
OBJECTIVE 2: Manage Public Safety and Property Risk			
Ability to minimize public safety risk and property loss as a result of slope erosion/failure	Potential public safety risk to users of the water's edge as a result of natural slope crest migration		√
	Potential public safety risk to users of the top of bluff as a result of natural slope crest migration		√
	Change in potential for loss of public property and/or infrastructure due to natural slope crest migration		√
Ability to minimize public safety risk as a result of wave uprush	Potential public safety risk to users of the water's edge as a result of wave uprush		√
Resilience of shoreline protection works to potential climate change impacts	Potential for shoreline works to accommodate natural changes resulting from climate change		√
Ability to improve Emergency Services access to the waterfront	Potential for improved emergency services access along the shoreline		√
Ability to protect source water protection areas	Potential for impact to water quality at F.J. Horgan intake pipe		√
Potential to manage safety risk for pedestrians and cyclists gaining access to the shoreline	Safety associated with potential conflict between pedestrian/cyclists and vehicles		√

Criteria	Indicators	Effects Relevant To	
		Construction	Establishment
OBJECTIVE 3: Provide an Enjoyable Waterfront Experience			
Improve public access to the waterfront	Potential to provide continuous formal public access along the waterfront		√
	Potential to provide a primary multi-use trail		√
	Potential to meet AODA grade standard for access to and along the shoreline.		√
	Potential to improve existing access to the shoreline		√
	Potential to provide new access to the shoreline		√
	Potential to provide direct public access to water		√
Ability to maintain public access to and along the waterfront during construction	Changes to access to and along the shoreline as a result of construction activities	√	
Potential for change to use and enjoyment of park areas, existing trails and beaches during construction	Potential for dust, vehicle emission and noise from construction activities including traffic to affect use and enjoyment	√	
	Potential for changes in ability use park areas during construction due to construction traffic, changes to access and unavailability of areas due to construction	√	
Changes to the use of existing beaches/shoreline	Potential for change to character and use of existing sand beaches/shoreline	√	√
	Potential for impact to water quality at Bluffer's Park Blue Flag Beach	√	√
Changes to the use of the waterfront for recreation	Potential for change in use of existing park areas	√	√
	Potential to maintain navigation along the shore	√	√
	Potential to provide new opportunities for views/viewscapes to Lake Ontario and to the Bluffs		√
	Potential to improve navigation at entrance to boat basin		√

Criteria	Indicators	Effects Relevant To	
		Construction	Establishment
OBJECTIVE 4: Consistency and Coordination with Other Initiatives			
Integration with City and other agency plans and initiatives	Consistency with the goals of the Fish Community Objectives for Lake Ontario		√
	City of Toronto Official Plan and TRCA Living City Policies		√
	Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens		√
	Consistency with objectives of the Wet Weather Flow Master Management Plan		√
Impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential impact to known or potential archaeological sites	√	
	Potential for impact to known built heritage sites, and cultural heritage landscapes	√	
	Potential for impact on traditional land uses and valued cultural features	√	
Potential for effects to residents in the local community	Potential for disturbance effects to residents from construction related traffic	√	
	Potential impacts to arterial road traffic	√	
	Potential disturbance effects to residents from construction activity	√	
	Potential disturbance effects to waterfront users and parking from construction activity	√	
	Potential disturbance effects from waterfront users and parking during operation		√
Integration with existing land uses	Compatibility with existing land use (open space, institutional and industrial)		√
OBJECTIVE 5: Achieve Value for Cost			
Estimated capital cost	Estimated cost to construct	√	
	Amount of waterlot and private property acquisition required	√	
Maintenance costs associated with the new shoreline and erosion protection structures	Average maintenance costs of the shoreline and erosion works being proposed		√

The Project will result in the loss of up to 20 ha and alteration of up to 16 ha of open coast habitat. However, existing habitat is generally considered to be poor, as it lacks substrate diversity and shoreline morphology to provide functional habitat for a variety of

fish species and life stages. The SWP will result in a shoreline which is approximately 1,700 m longer, more irregular, and more diverse, thus increasing the quality of the local aquatic habitat by providing resident and migratory fish species with enhanced cover, shelter and foraging opportunities. Retrofitting the existing revetment shoreline along South Marine Drive and Guild Park and Gardens will result in valuable gains in habitat quality. Notably, the Project presents a unique opportunity to create spawning habitat for one of the most valuable native salmonids, Lake Trout, by constructing a Lake Trout spawning shoal off of the proposed Bluffer's Park headland extension.

In the Detailed Design stage, fish habitat alteration and loss will be quantified in more detail using DFO's ***Habitat/Ecosystem Assessment Tool (HEAT)***, and a comprehensive compensation plan will be developed in collaboration with appropriate agencies.

With the improvements to existing habitat quality and additional aquatic habitat enhancements, the net effect associated with fish habitat alteration and loss is expected to be negligible and the establishment of higher quality habitat will have a positive effect within the Project Study Area.

Indicator: Disruptions to fish and fish habitat

SWP construction activities, particularly in-water works, have the potential to disrupt fish and fish habitat in adjacent areas through increases in water ***turbidity***, increases in noise and vibration, release of deleterious substances, and entrapment of fish within the land creation area, resulting in a negative effect. This indicator was assessed by reviewing the means by which disruptions to fish and fish habitat may occur and the application of mitigation measures which will significantly reduce or eliminate the impacts.

The environmental management practices and mitigative measures that will be employed during construction are outlined in the MOECC's Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario (2011) and TRCA's Lakefill Quality Control Program. Other guidelines to be used include DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat (2016). A comprehensive list of mitigation measures is provided in **Appendix H**.

For each phase of fill operations, a containment berm will be constructed prior to placing any fill, which will eliminate sedimentation issues from fill placement operations. Once fill has been placed, there is potential for soils to be eroded by wind or water, resulting in offsite sedimentation issues. This will be mitigated by stabilizing soils using standard soil stabilization techniques, such as establishing vegetation cover upon completion of a construction cell. To prevent fish entrapment within the containment berm, fish rescue

operations will be conducted prior to cell infilling. Potential disruptions to fish as a result of land creation activities are expected to be short-term in duration.

Restricted activity timing windows are applied to protect fish from impacts of works or undertakings in and around water during spawning migrations and other critical life stages (Fisheries and Oceans Canada, 2013). In Ontario, the MNRF has the responsibility for setting timing window guidelines. The timing windows are determined on a case by case basis according to the species of fish in the water body, whether those fish spawn in the spring or fall, and whether the water body is located in the Northwest, Northeast or Southern Region of Ontario.

The SWP is located in the Southern Region of Ontario. While over 100 fish species inhabit the Lake Ontario basin, only a subset of those (**Appendix D**) utilizes the Project Study Area. Habitat conditions in the areas where land creation is proposed are most suitable for species that broadcast their eggs over sand and coarser substrates, and do not require aquatic vegetation. Moreover, spawning period start, end and the overall length vary with environmental conditions such as temperature. Therefore, spawning periods in a given year may differ from the default timing windows set for the Southern Region of Ontario.

During the Detailed Design Project phase, an evidence-based approach will be applied to determine the restricted activity timing windows in consultation with MNRF. Scheduled fisheries monitoring using appropriate methods (e.g., electrofishing) and water temperature monitoring will be conducted near the end and/or beginning of the timing windows to determine if fish that may utilize the Project Study Area for spawning in a given season are present in the active construction areas. This scientific information will then be used to determine in collaboration with MNRF site specific construction start and end dates for work areas of the SWP. Absence of fish that may utilize the Project Study Area for spawning in a given season indicates that the risk to fish and fish habitat associated with in-water land creation activities is minimal. If fish species associated with a given restriction window are present, in-water works will cease.

Further, potential impacts to fish and fish habitat will also be considered in developing water quality impact prevention and mitigation measures such as a turbidity monitoring program, to be developed at Detailed Design.

Overall, the negative effects associated with disruptions to fish and fish habitat as a result of construction activities will be short in duration, and mitigated with appropriate ***best management practices***, resulting in negligible net effects.

Indicator: Nuisance effects on wildlife

This indicator estimates the temporary displacement of wildlife as a result of construction activities such as the increase in noise and vibration from construction equipment and the displacement from areas of the shoreline under construction. The indicator was assessed based on previous project experience in similar environments with similar effects. It is noted that while construction will move across the shoreline, there are some areas where construction will persist throughout the entire construction period, in particular the Guild Construction Access Route and the area at the base of the Guild Construction Access Route. This area currently experiences maintenance traffic and many of the species are tolerant of existing traffic, are mobile, and their habitat exists across the shoreline, and are anticipated to move.

Potential impacts include reduced numbers of nesting and breeding birds; reduced foraging and loafing opportunities for migrating and resident waterfowl, waterbirds and shorebirds; reduced amphibian breeding; and the displacement of reptiles and urban mammals from areas of the shoreline that are under active construction. Wildlife is expected to relocate to other natural areas.

Mitigation measures include phasing construction across the Project Study Area into discrete areas so that wildlife that prefer the shoreline habitats will have the opportunity to move further along the shoreline where construction is not occurring to avoid construction activities. Mitigation measures will include a variety of best management practices to minimize effects where possible, see **Appendix H**. In order to minimize impacts on breeding amphibians, no construction will occur during evening hours when amphibians are calling. Construction vehicles will not access the backshore of the Bluffer's Park Beach (a likely breeding location) between the third week of May and October due to recreational use, which will also allow most of the amphibian breeding season to occur without construction interference.

Mitigation measures for wildlife at East Point Park include scheduling activities related to the construction of the tableland trail outside of the late April - late May time period to avoid impacts to migrating birds. Prior to construction commencement the active construction area will be surveyed for breeding birds and a species-appropriate buffer will be applied to any surveyed nests to avoid impact. With the implementation of mitigation measures, nuisance effects on wildlife are expected to be minimal, and temporary.

Bank swallows are generally tolerant of human activities; construction activity in areas where bank swallow nesting occurs (primarily Cudia Bluffs) will be underway in May when swallows return so they become habituated to this disturbance. Additionally, phasing of construction activities along the shoreline will result in discrete areas of

disturbance, so that not all bank swallow nesting locations in the Project Study Area will be disrupted at the same time, allowing for swallows to move to other locations. It is noted that bank swallow nest occupation significantly varies on an annual basis for a variety of reasons. Therefore, lack of bank swallow nesting within a discrete colony location may not be related to construction activities.

Overall, the nuisance effects on wildlife as a result of construction activities will be short in duration and mitigated with appropriate best management practices, resulting in negligible net effect.

Indicator: Removal and disturbance of terrestrial habitat

This indicator quantifies the approximate area of habitat that will be removed as a result of the Project. The amount of vegetation removal was estimated using field and GIS mapping of ELC communities overlain on the SWP concept.

Some areas of existing natural habitat will be disturbed to facilitate construction, and approximately 2.97 ha of existing habitat will be permanently removed for the trail (**Table 7-2**).

Much of the habitat to be removed is located in ANSIs, and a portion is also within ESAs. However, the habitats are typical of urban areas, and are being impacted by unmanaged informal trails and invasive species, and are generally considered fair to poor habitat quality. Areas that will be impacted by construction access routes and staging activities will be restored to pre-construction conditions, and where appropriate, invasive species may be controlled to improve the quality of habitat. Impacted habitat features such as cavity trees will be replaced with artificial or constructed features such as nest boxes that mimic the original features. Following Project completion and habitat establishment, no long term effects are anticipated.

Four vegetation communities will be impacted by the proposed path along Brimley Road. Two forest communities, Dry-Fresh Sugar Maple-Oak Deciduous Forest (FOD5-3) and Fresh-Moist Manitoba Maple Lowland Deciduous Forest (FOD7-a) representing 0.19 ha will be removed. Approximately 0.09 ha of Sumac Deciduous Thicket (CUT1-1) will be removed. Approximately 0.1 ha of Exotic Forb Meadow (CUM1-c) will be removed.

A total of 11 vegetation communities will be impacted as a result of the Project at East Point Park. Three forest communities, Silver Maple-Conifer Mixed Plantation (CUP2-E), White Cedar Coniferous Plantation (CUP3-G) and Fresh-Moist Popular Deciduous Forest (FOD8-1), representing 0.12 ha will be removed. Five successional communities, Sumac Deciduous Thicket (CUT1-1), Exotic Deciduous Thicket (CUT1-c), Red Osier Dogwood Deciduous Thicket (CUT1-E), Willow Deciduous Thicket (CUT1-G) and Native

Deciduous Successional Woodland (CUW1-A3), totalling 0.34 ha will be removed. One meadow community, Native Forb Meadow (CUM1-A) totalling 0.26 ha will be removed. Two wetland communities, Common Reed Mineral Meadow Marsh (MAM2-a) and Red Osier Dogwood Thicket Swamp (SWT2-5) representing 0.008 ha will be removed.

One existing provincially rare vegetation community, Sea Rocket Open Sand Beach (BBO1-1) will be impacted by construction activities, with approximately 1.8 ha anticipated to be affected. Mitigation measures include plant salvage, where appropriate. Past salvage experience, where the sea rocket was removed and then replanted following construction, has proven successful for this species.

Approximately 0.05 ha of bluff communities is anticipated to be lost through bluff trimming to facilitate construction of the corkscrew tableland connection. This is composed of the Exotic Treed Bluff (BLTc-1) vegetation community, dominated by non-native species such as black locust and Manitoba maple, and the actively eroding Mineral Open Bluff (BLO1) community, which is not vegetated and restricted to the upper portion of the bluffs only.

An existing artificially-created wetland feature (~0.008 ha) at the base of the Guild construction access route is expected to be relocated and expanded as a result of the construction of the Guild public gathering space. The wetland area will be expanded to include two wetland features, one on either side of the Guild public gathering space, for an approximate area of 0.2 ha.

No butternut trees (species at risk) have been identified within the footprint of the construction access roads or trail, therefore no effects are anticipated. As part of the Detailed Design phase a detailed survey will be conducted to confirm the absence of butternut.

Table 7-2 Existing vegetation communities to be removed.

SWP Area Feature	Area of Habitat to be Permanently Removed (ha)
Forest Communities	0.31
Successional Communities	0.43
Meadow Communities	0.36
Beach/Dune Communities	1.8
Wetland Communities	0.016
Bluff Communities	0.05

The area of privately owned tableland east of Grey Abbey Ravine has not been assessed. Therefore, impacts to vegetation communities in this location cannot be quantified, and were assessed qualitatively. Orthophotograph interpretation suggests this area consists of open habitat that is periodically mowed, likely resulting in a cultural meadow vegetation community. As this area is privately owned, the effects will be assessed at Detailed Design once access to the property has been achieved.

Approximately 2.97 ha of existing terrestrial natural habitat will be removed and approximately 17.6 ha of new naturalized habitat will be created by the Project, resulting in a net positive effect. Habitat restoration and enhancement are expected to mitigate terrestrial habitat impacts and no long term impacts are anticipated. Impacts related to the disturbance or removal of vegetation are not expected to reduce ecosystem function within the existing ANSIs and ESAs, and together with informal trail decommissioning, along with the development of an East Point Park Management Plan and a SWP Operations Plan, will result in benefits to ANSIs and ESAs.

Summary: Ability to minimize effects associated with construction works, construction access and laydown areas

Construction effects associated with fish and fish habitat disruptions are expected to be negligible following the implementation of mitigation measures. Although land creation is expected to result in the loss of approximately 20 ha and alteration of 16 ha of aquatic habitat, the establishment of high quality habitat within the Project Study Area and development of a comprehensive compensation program as part of Detailed Design will result in overall benefits.

Construction effects associated with wildlife and terrestrial habitat disruptions are expected to be negligible following the implementation of mitigation measures. The removal and disturbance of terrestrial habitat will result in the loss of approximately 2.97 ha of existing natural cover however, mitigation measures including habitat enhancement and new land creation address the loss of this habitat resulting in 17.6 ha of new naturalized habitat. The amount of new habitat created will exceed the amount of existing habitat that will be impacted by the Project. Therefore, SWP meets the Project Objective 1, where aquatic and terrestrial natural heritage is protected and enhanced.

Table 7-3 Detailed Effects Assessment: Objective 1 Construction.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Ability to minimize effects associated with construction works, construction access and laydown areas	Alteration and loss of aquatic habitat	SWP construction activities, particularly land creation, will result in alteration and loss of the portion of existing aquatic habitat in the Project Study Area: • Up to 20 ha of nearshore habitat will be lost • Up to 16 ha of nearshore habitat will be altered	The negative impacts will be mitigated via incorporating a diversity of shoreline substrate types and increased shoreline irregularity into the Preferred Alternative Detailed Design, employing a variety of aquatic habitat enhancement techniques, including retrofitting existing revetment shoreline structures, and development and implementation of compensation program.	Negligible • Project results in overall benefits to aquatic habitat
	Disruptions to fish and fish habitat	• Disruption to spawning fish and spawning habitat • Increase in water turbidity • Increase in noise and vibration • Release of deleterious substances • Fish entrapment in the land creation areas	Examples of mitigation measures to minimize negative effects associated with fish and fish habitat disruptions include: • Use of project-specific restricted activity timing windows for in-water works to be set in consultation with MNRF • Construct containment berm prior to placing any fill, which will minimize • Remove any fish potentially trapped in a cell prior to commencement of filling • Sediment and erosion controls • Ensure equipment is free of leaks and fluids containing deleterious substances	Negligible • Appropriate mitigation measures will ensure that the negative impacts to fish and fish habitat are prevented /minimized

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
	Nuisance effects on wildlife	• Temporary wildlife displacement as a result of noise and vibration • Temporarily reduced foraging and loafing opportunities for migrating and resident waterfowl, waterbirds, shorebirds and migratory birds • Temporarily reduced amphibian breeding habitat and breeding activity due to noise • Temporary displacement of reptiles, from shoreline. • Temporary displacement of urban tolerant mammals from shoreline	Adhere to BMPs as outlined in **Appendix H** to minimize disturbance, noise and dust. In addition: • Avoid construction activities at East Point Park during the spring migration and breeding bird period (late April to late May) • Where bank swallow colonies are located within 50 m of active construction ensure works are underway prior to bank swallows return in spring (~May) so they become habituated to the disturbance	Negligible • Nuisance effects to wildlife during construction are temporary and wildlife is generally tolerant of activities

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
	Removal and disturbance of terrestrial habitat	• Some areas of natural cover will be temporarily removed to facilitate construction access and staging • Approximately 2.97 ha of existing habitat located within ANSIs and ESAs will be removed for the trail • Approximately 0.19 ha of forest, 0.09 ha of successional, and 0.1 ha of meadow vegetation communities will be removed for the proposed path along Brimley Road • Approximately 0.12 ha of forest, 0.34 ha of successional, 0.26 ha of meadow, and 0.008 ha of wetland vegetation communities will be removed for the trail through East Point Park • Approximately 1.8 ha of one rare community (sea rocket open sand beach) will be removed for the trail • Approximately 0.05 ha of bluff vegetation, composed of non-native species and	• Salvage plants, including sea rocket, for replanting, where appropriate • Where appropriate, vegetation communities will be restored • Any habitat features (i.e., cavity trees) that will be impacted will be replaced with an artificial or constructed habitat (i.e., bird nesting boxes) • Relocation and expansion of artificially created wetland at base of Guild Construction Access Route	Positive • While some areas of existing habitat will be removed, approximately 17.6 ha of new naturalized habitat will be created resulting in a net increase in terrestrial habitat • Sea rocket is expected to re-establish resulting in no net loss • Habitat restoration is expected to mitigate terrestrial wildlife/bird habitat impacts and no long term impacts are anticipated • Net increase in size of wetland area which will be recreated properly

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
		Mineral Open Bluff Face (restricted to upper portions of the bluffs only) is anticipated to be removed • Approximately 0.008 ha of an existing artificially-created wetland is to also be removed for construction of the Guild public gathering space • Butternut removals may be required (pending Detailed Design)		

7.3.1.2 Operation Effects

Criterion: Ability to provide functional nearshore open coast aquatic habitat

Indicator: Ability to increase shoreline morphology by increasing shoreline irregularity

SWP presents a valuable opportunity to enhance the shoreline morphology within the Project Study Area via increasing shoreline irregularity. A more complex shoreline profile provides for more nearshore habitat by increasing fish foraging opportunities, cover and shelter. This indicator was assessed quantitatively by comparing the post-construction and pre-construction shoreline lengths. The more irregular (longer) the shoreline is, the greater its ecological value. To calculate the percent change, pre-construction shoreline lengths were measured using geo-referenced aerial imagery and compared to the post construction shoreline lengths which were measured in ArcGIS using the Preferred Alternative concept drawings.

The post-construction shoreline is approximately 15% longer and undulating and resulting in a more irregular than the current shoreline. The Preferred Alternative increases shoreline irregularity and the ability to provide nearshore habitat. Net effects from the SWP on shoreline irregularity and nearshore habitat are positive, and, as a result, no mitigation measures are required. Most gains in profile complexity are made along the shoreline between Bluffer's Park and Meadowcliffe, along Grey Abbey Park shoreline, and between Grey Abbey Ravine and East Point Park.

Shoreline morphology enhancement through increasing shoreline irregularity as well as diversification of the shoreline vertical profile through the implementation of habitat enhancement techniques represent a net positive effect on the ability of the Preferred Alternative to provide functional nearshore habitat. No mitigation measures were identified.

Indicator: Ability to increase shoreline substrate diversity

The change in shoreline substrate diversity refers to the difference between each type of the pre-construction and post-construction shoreline (cobble, sand, and armourstone/boulder). This indicator was assessed quantitatively by measuring the lengths of each pre-construction shoreline type using geo-referenced aerial imagery, and comparing them to the post-construction lengths of each shoreline type measured in ArcGIS using the Project concept drawings.

There are three main shoreline substrate types within the Project Study Area: sand, cobble and armourstone (boulder). Coarse substrates such as cobble and boulders constitute the major building blocks of habitat physical structure as they provide fish with cover and shelter, and enhance foraging opportunities. Though sand is preferred by certain species, sand shorelines lack the substrate diversity to be able to provide adequate cover, shelter and foraging opportunities for multiple species that constitute the majority of the local fish community.

The current shoreline consists of approximately 4,700 m of sand, 1,350 m of cobble and 4,950 m of armourstone (boulder). The post-construction shoreline will consists of approximately 4,000 m of sand, 1,900 m of cobble and 6,750 m of armourstone (boulder). The Preferred Alternative reduces the length of sand shoreline by 15%. Length of cobble shoreline is increased by 40%, and length of armourstone (boulder) shoreline is increased by 35%. Overall, the shoreline substrate type composition of the Preferred Alternative is more diverse, with an increase in the cobble and boulder proportions, relative to sand.

Cobble and armourstone (boulder) shorelines present valuable opportunities to increase substrate diversity in the nearshore areas adjacent to the proposed structures. This is achieved via implementing appropriate open coast habitat enhancement techniques such as shoreline shoals, underwater shoals and surcharged headlands. Moreover, habitat enhancements to the existing structures, particularly revetments, provide further benefits associated with diversifying shoreline and nearshore substrate.

Armourstone (large boulders) serves an anchoring function, providing for overall shoreline stability and preventing cobble migration. At the same time, interstitial spaces between individual stones provide valuable shelter and cover for smaller fish, particularly when it comes to headlands surcharged with large, irregular shaped

boulders and cobble. Cobble and rubble serve as spawning substrates for species that require these (e.g., Lake Trout).

Sand, though reduced in terms of length of shoreline, is still prevalent in the nearshore, where shallow depths (particularly east of Grey Abbey Park) are still available to those species that depend on it (e.g., Emerald Shiner).

Overall, diverse substrates provide higher quality cover, shelter and foraging opportunities, thereby increasing the capacity of the local shoreline to serve as nursery, spawning and migratory habitat. Thus, increased shoreline substrate diversity represents a net positive effect, and no mitigation measures are required.

Indicator: Ability to provide aquatic habitat for various life stages

The nearshore zone of Lake Ontario within the Project Study Area provides habitat for various fish life stages: spawning habitat, nursery and juvenile habitat, and adult habitat. This criterion was assessed by examining the various habitat requirements of the species found utilizing the Project Study Area nearshore habitat.

Habitat requirements vary by fish life stage and species. Adequate spawning habitat is necessary for successful reproduction (egg deposition and survival). Suitable nursery habitat is required for young fish survival and attainment of reproductive maturity. Important adult habitat is necessary to sustain adult populations to ensure successive reproduction and species persistence in the ecosystem.

Suitable habitat availability and habitat quality play an important role in how successful each fish life stage is. Availability of specific substrate is crucial in determining whether a given species is able to utilize an area for spawning, as different species are adapted to use different substrate types to deposit their eggs. The species anticipated to utilize aquatic habitat within the Project Study Area for spawning include those that broadcast their eggs over substrate and do not require aquatic vegetation or presence of woody debris. Such species include forage fish species such as alewife, rainbow smelt and emerald shiner, and native salmonids including lake trout and round whitefish.

Non-native Alewife have been reported to spawn over a variety of substrates from boulder to sand and even silt and clay, in the 0-5 m depth range. Native Emerald Shiner and rainbow smelt prefer rubble, gravel and sand, in the 0 to over 5 m depths (Lane et al., 1996). Lake Trout favor bedrock, boulder, cobble and rubble, and, though they have been observed to spawn in 0 to over 5 m depths, 5-8 m range is the most suitable (**Appendix D**). Round Whitefish require rubble and gravel, and have been reported to spawn in 0 to over 5 m depth range.

Though the land creation activities would reduce availability of sand in the primarily 0 to 3 m depth range, sand substrate in the depths utilized by Alewife, Emerald Shiner and Rainbow Smelt would still be widely available. At the same time, the Project would increase availability of cobble, boulder and rubble in depths used by lake trout (5-8 m, Bluffer's Park headland extension) and potentially Round Whitefish.

Young and adults of species such as Smallmouth Bass, Northern Pike, American Eel, Yellow Perch and White Sucker utilize the Project Study Area nearshore habitat. Nursery and juvenile habitat has to provide sufficient cover, shelter and foraging opportunities to reduce competition for habitat and resources, and ensure young fish survival. Similarly, cover, shelter and foraging opportunities availability are equally important for adult survival. Cover, shelter and foraging opportunities would be enhanced via diversifying substrate and constructing a more irregular shoreline in the nearshore zone. It is anticipated that a variety species and life stages will be able to utilize those portions of the Project Study Area that currently lack a diversity of substrates and shoreline profile complexity.

Overall, the Project results in an enhanced ability of the local nearshore habitat to serve as habitat for a variety of native species and life stages, and no mitigation measures are required.

Summary: Ability to provide functional nearshore open coast aquatic habitat

Shoreline morphology enhancement, increased shoreline substrate diversity and the enhanced ability of the local nearshore habitat to serve as habitat for various life stages provide an overall positive benefit to providing functional nearshore open coast aquatic habitat.

Criterion: Ability to improve and manage functional terrestrial habitat

Indicator: Area of terrestrial habitat removed from unsustainable inappropriate use

This indicator measures the area of informal trails that will be decommissioned. The indicator was assessed and mapped through field surveys and orthophoto interpretation. Final distances were measured using ArcGIS. Typically, telltale signs of human trails include width of approximately 30 cm, trampled vegetation, broken branches, dead-ends, footprints, encounters with people, and/or litter.

The SWP will decommission approximately 8 km of informal trails at East Point Park, and removing these areas from the negative effects associated with unmanaged use, such as habitat fragmentation, vegetation trampling, degradation of rare and sensitive bluff vegetation communities, soil compaction, increased vulnerability for invasive

species colonization, and increased wildlife predation (i.e., urban raccoons depredating ground/low nesting bird nests) and parasitism (i.e., brown-headed cowbird parasitism).

Intensification and densification of residential urban areas will increase pressure on natural areas. Given the forecasted 32.4% population increase in Toronto over the next 25 years (Ontario Ministry of Finance, 2016) and the upward trend of public use of greenspaces (Park People, 2016), managed access of natural areas, particularly ANSIs and ESAs, will be critical to helping ensure their ecological integrity persists. Techniques to manage use, including the decommissioning and management of informal trails will be detailed in the East Point Park Management Plan and could include tree and shrub planting, installation of habitat piles (i.e., woody debris and aggregates), signage and bylaw enforcement.

The addition of a well-designed formalized trail system along the bluffs and at East Point Park, with formal access points will provide a clear route for people to enjoy the waterfront, thereby reducing unmanaged use and mitigating associated impacts. This will help to achieve better conservation of natural areas, including rare and sensitive bluff vegetation communities. Management of unsustainable inappropriate use will result in a net positive effect, and no mitigation measures are identified.

Indicator: Area of habitat created

This indicator measures the area of forest, meadow, successional, beach/dune and wetland communities created. This indicator was assessed quantitatively by measuring the approximate new habitat area created in ArcGIS.

The SWP will produce an increase in natural habitat cover within the Project Study Area, improving the shoreline as a critical stepping-stone habitat for birds, mammals, fish and other wildlife.

Restoration and enhancement areas include new lands, as well as a section of the north slope of the hill east of Beechgrove Drive. This 0.5 ha area will be restored to achieve a forest community, which will also improve habitat connectivity from East Point Park to Highland Creek. Native plant species will be planted to improve the overall diversity, and increase breeding, foraging and overwintering opportunities for wildlife. Appropriate restoration techniques and plant care will ensure successful establishment, and monitoring will identify areas that may require additional infill planting over time. Potential negative effects related to invasive plant species colonizing the created habitat will be managed to the extent possible using adaptive management and best management practices, such as identifying target invasive species for removal. Invasive species management will be developed as part of an Operations and Maintenance Plan, to be prepared in collaboration with the City of Toronto at Detailed Design.

The overall quantity of forest, meadow, successional, beach/dune and wetland communities created increases due to the SWP, therefore, net effects are anticipated to be positive.

Habitat features, such as bird nest boxes and woody habitat piles, will be installed where appropriate to maximize the functionality of the new habitat for wildlife which will result in improved breeding, migratory, and overwintering opportunities. Habitat features will be closely examined during the Detailed Design phase to enhance the overall functionality of habitat within the Project Area.

Summary: Ability to improve and manage functional terrestrial habitat

Management of unsustainable inappropriate use will result in a net positive effect to the terrestrial ecosystem. In addition the SWP will result in an increase in the quantity of terrestrial habitat in the Project Study Area, and improve the integrity of habitat in East Point Park.

Table 7-4 Detailed Effects Assessment: Objective 1 Operation.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Ability to provide functional nearshore open coast aquatic habitat	Enhance shoreline morphology by increasing shoreline irregularity	• Shoreline irregularity is increased by 15% • Enhancements provide for an increase in nearshore open coast habitat	None	Positive • Enhanced shoreline morphology provides for increased ability of the Preferred Alternative to provide functional nearshore open coast aquatic habitat
	Increase shoreline substrate diversity	• Reduction of sand shoreline by approximately 15%, the length of cobble shoreline is increased by 40% and armourstone (boulder) shoreline by 35%	None	Positive • Increased shoreline substrate diversity represents a net positive effect associated with the ability of the Preferred Alternative to provide functional nearshore open coast habitat
	Ability to provide habitat for various life stages	• Sand substrate in the depths utilized by alewife, emerald shiner and rainbow smelt would still be widely available • Increase availability of cobble, boulder and rubble in depths used by Take Trout (5-8 m, Bluffer's Park	None	Positive • Overall, the Project results in an enhanced ability of the local nearshore habitat to serve as habitat for various life stages

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
		headland extension) and potentially Round Whitefish • Nursery, juvenile and adult habitat would be enhanced via diversifying substrate and constructing a more irregular shoreline • A variety species and life stages will be able to utilize portions of the Project Study Area that currently lack a diversity of substrates and shoreline profile complexity		
Ability to improve and manage functional terrestrial habitat	Area of terrestrial habitat removed from unsustainable inappropriate use	• Decreased impacts associated with informal trails (i.e., habitat fragmentation, vegetation trampling, soil compaction, invasive species, predation, parasitism, etc.)	None	Positive • Overall the Project will decommission the number of informal trails and lead to improved habitat quality
	Area of habitat created	• The overall quantity of forest, meadow, successional, beach/dune and wetland communities increase • Potential to increase the functionality of the habitat for wildlife resulting in improved breeding, migratory and overwintering opportunities • Native plant species will be planted to improve diversity and maximize opportunities for breeding, foraging and overwintering habitat.	• Development of an Operations and Maintenance Plan collaboratively with the City of Toronto to address inappropriate use and promote community stewardship	Positive • Total natural cover and the number of essential wildlife habitat features increase which provide positive influences on the functionality of the habitat

7.3.1.3 Summary of Objectives

SWP Objective 1 is to protect and enhance terrestrial and aquatic natural features and linkages within the Project Study Area.

SWP Project Study Area habitat will undergo changes along the Lake Ontario shoreline, table lands and construction access routes and laydown areas both during and following construction. The summary of net gains and losses with respect to Objective 1 of the Project is presented in **Table 7-5**, while the overall effects related to Objective 1 are listed in **Table 7-6**.

Table 7-5 Net gains and losses with respect to the Naturalization Objective.

SWP Area Feature	Losses	Gains	Net Effect
Aquatic Habitat along the Lake Ontario shoreline	• Loss of 20 ha • Alteration of 16 ha • Sand shoreline reduced by 15%	• 15% increase in shoreline irregularity • 40% increase in cobble beach • 35% increase in armourstone (boulder) • Functional habitat for all life stages	Positive
Forest communities	0.31 ha	0.50 ha	Positive
Successional communities	0.43 ha	5.40 ha	Positive
Meadow communities	0.36 ha	3.60 ha	Positive
Beach/dune communities	1.8 ha	7.70 ha	Positive
Wetland communities	0.016 ha	0.40 ha	Positive
Bluff Communities	0.05 ha	0.00 ha	Negative

Table 7-6 Overall effects related to Objective 1.

Criteria	Indicator	Overall Effects
Ability to minimize effects associated with construction works, construction access and laydown areas	Alteration and loss of aquatic habitat	Negligible
	Disruptions to fish and fish habitat	Negligible
	Nuisance effects on wildlife	Negligible
	Removal and disturbance of terrestrial habitat	Positive
Ability to provide functional nearshore open coast fish habitat	Ability to increase shoreline morphology by increasing shoreline irregularity	Positive
	Ability to Increase shoreline substrate diversity	Positive
	Ability to provide habitat for various life stages	Positive
Ability to improve and manage functional terrestrial habitat	Area of terrestrial habitat removed from unsustainable inappropriate use	Positive
	Area of habitat created	Positive
Summary: Overall, the Preferred Alternative for the SWP provides an improvement to the ecological conditions within the Project Study Area. The loss or alteration of poorer quality habitat is offset by the creation of higher quality aquatic and terrestrial habitat. Thus, the Preferred Alternative meets the Objective to protect and enhance terrestrial and aquatic features and linkages.		

7.3.2 Objective 2: Manage Public Safety and Property Risk

7.3.2.1 Construction Effects

There are no construction effects associated with the objective of managing public safety and property risk.

7.3.2.2 Operation Effects

Criterion: Ability to minimize public safety risk and property loss as a result of slope erosion/failure

Indicator: Potential public safety risk to users of the water's edge as a result of natural slope crest migration

The Scarborough Bluffs are an eroding feature which can be a hazard for anyone at the bottom of the bluffs caught in a landslide or slump associated with on-going natural slope crest migration. The existing conditions in the SWP Study area are that many areas at the base of the bluffs are within the risk line for hazards associated with natural slope crest migration (e.g., landslides) and that people are accessing these areas

despite the lack of safe trails and despite the risks. Park users want access to the water's edge and one of the objectives of the SWP is to provide that access while mitigating the risk.

Implementation of the SWP will provide a formal trail along the water's edge outside of the risk line permitting users access to the water up to the eastern edge of the Grey Abbey Ravine. Beyond these points access will continue to be informal and at the risk of the user.

Therefore, there is a positive impact in the reduction of public safety risk to users of the water's edge.

Indicator: Potential public safety risk to users of the top of bluff as a result of natural slope crest migration

The Scarborough Bluffs are an eroding feature which can be a hazard for anyone caught in a landslide or slump associated with on-going natural slope crest migration at the top of the bluffs. The existing conditions in the SWP Study area are that many areas at the top of the bluffs are within the risk line for hazards associated with natural slope crest migration and that people are accessing these areas despite the lack of safe trails and despite the risks. Park users want access to the top edge of the bluffs to enjoy views to the lake and one of the objectives of the SWP is to provide that access while mitigating the risk.

Implementation of the SWP will provide a formal trail along the top of the bluffs outside of the risk line permitting users access along the top of the bluffs from the eastern edge of the Grey Abbey Ravine to Beechgrove Drive.

Therefore, there is a positive impact in the reduction of public safety risk to users along the top of the bluffs from the east side of Grey Abbey Ravine through East Point Park.

Indicator: Change in potential for loss of public property and/or infrastructure due to natural slope crest migration

The Scarborough Bluffs are an eroding feature which can cause the potential loss of public property and/or infrastructure due to on-going natural slope crest migration. The existing conditions in the SWP Study area are that many areas of the bluffs undergoing natural slope crest migration have associated public property and/or infrastructure at the top of the bluffs at risk from the erosion within the planning period for the SWP (approximately 60 years). One of the objectives of the SWP is to mitigate the risks to public property and/or infrastructure.

Implementation of the SWP will mitigate existing risks to public property and infrastructure including parks, trails, and roads (and associated infrastructure), from

Bluffer's Park to the eastern edge of Grey Abbey Ravine. Public property and infrastructure east of this point will still be at risk; however, no structure or infrastructure is at risk within the planning period of the SWP.

Therefore, there is a positive impact in the reduction of public property and infrastructure at risk from natural slope crest migration.

Summary: Ability to minimize public safety risk and property loss as a result of slope erosion/failure

Implementation of the SWP will result in a net positive impact with respect to minimizing public safety risk and property loss as a result of slope erosion/failure. This will be achieved through the provision of a formal trail along the water's edge outside of the risk line up to the eastern edge of Grey Abbey Ravine, and along the top of the bluffs outside of the risk line from the eastern edge of Grey Abbey Ravine to Beechgrove Drive. Additionally, implementation of the SWP will mitigate risks to public property and infrastructure, including parks, trails and roads (and associated infrastructure) between Bluffer's Park and the eastern edge of Grey Abbey Ravine.

Criterion: Ability to minimize public safety risk as a result of wave uprush

Indicator: Potential public safety risk to users of the water's edge as a result of wave uprush

The open coast shore of Lake Ontario can be hazardous for anyone on the water's edge during a storm or high wave conditions. Under existing conditions, sections of the waterfront are at risk as a result of wave uprush. The shoreline protection works implemented as part of the SWP have been designed to provide safe overtopping levels.

Summary: Ability to minimize public safety risk as a result of wave uprush

Implementation of the SWP will have a net positive impact by reducing public safety risk as a result of wave uprush.

Criterion: Resilience of shoreline protection works to potential climate change impacts

Indicator: Potential for shoreline works to accommodate natural changes resulting from climate change

The MOECC requires proponents to assess the contribution of a project to climate change and the projects resiliency to the effects of climate change. The SWP has no potential to contribute to climate change as it does not have emissions of greenhouse gases associated with it. The SWP does have the potential to be affected by climate

change as a result of changes to storm frequency and severity and potential changes to water levels. As discussed in **Section 3.1.8.1**, Lake Ontario water levels are regulated by the International Joint Commission so there is less water level variation associated with Lake Ontario than the other Great Lakes. Coastal design undertaken for the project has examined worst case scenarios which included potential changes as a result of climate change.

Summary: Resilience of shoreline protection works to potential climate change impacts

The SWP has been designed to create resilience of shoreline protection works to potential climate change impacts, creating no impact.

Criterion: Ability to improve emergency services access to the waterfront

Indicator: Potential for improved emergency services access along the shoreline

At present, emergency services access along the shoreline is limited by the lack of roads or wide trails in the vicinity of the shore or top of bluffs. Consequently, there are areas of the bluffs which are not easy to access by emergency services. Implementation of the SWP will improve access for emergency services along the shore from Bluffer's Park to Beechgrove Drive.

Although access along the corkscrew ramp east of Grey Abbey Ravine may not be possible by emergency services vehicles, emergency services will be able to travel along the shoreline to east of Grey Abbey Ravine, and along the tablelands from Beechgrove Road to east of Grey Abbey Ravine.

Summary: Ability to improve emergency services access to the waterfront

Implementation of the SWP results in an improvement for emergency services access along the shoreline

Criterion: Ability to protect source water protection areas

Indicator: Potential for impact to water quality at F.J. Horgan intake pipe

F. J. Horgan water treatment plant draws water from Lake Ontario for use as drinking water in residences. As such, it is important to ensure that the quality of water being drawn into the facility is not impacted by the project. Water quality modelling using the regional water quality model for the Greater Toronto Area was undertaken to determine if the shoreline protection works proposed for the SWP would impact water quality. The results of the modelling indicated that the Project will have no effect on the quality of the water at the intake. Water quality modelling report is available in **Appendix I**.

Summary: Ability to protect source water protection areas

Implementation of the SWP will have no effect on the quality of water at the F. J. Horgan water treatment plant intake.

Criterion: Potential to manage safety risk for pedestrians and cyclists gaining access to the shoreline

Indicator: Safety associated with potential conflict between pedestrians/cyclists and vehicles

Under existing conditions there are conflicts between pedestrians, cyclists and vehicles trying to access Bluffer's Park using Brimley Road. Many of these conflicts arise because of the narrow width of the roadway and the lack of dedicated pedestrian and cycling paths. The SWP will implement changes to Brimley Road to add a path for pedestrians going up and down Brimley Road. The trail will also be available to cyclists walking their bikes up or down the trail. Road markings will be used to separate cyclists riding up or down the road from vehicular traffic. The TRCA and the City of Toronto recognize that while these changes will improve the situation there are likely other changes that will need to be made to ease the traffic, congestion and resultant conflict in the Brimley Road area.

Summary: Potential to manage safety risk for pedestrians and cyclists gaining access to the shoreline

Implementation of the SWP will have a positive impact on the potential for conflict between pedestrians, cyclists and vehicles.

Table 7-7 Detailed Effects Assessment: Objective 2 Operation.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Ability to minimize public safety risk and property loss as a result of slope erosion/failure	Potential public safety risk to users of the water's edge as a result of natural slope crest migration	Implementation of the SWP will provide a formal trail along the water's edge outside of the risk line permitting users access to the water up to the eastern edge of the Grey Abbey Ravine. Beyond these points access will continue to be informal and at the risk of the user.	None	Positive • Positive impact in the reduction of public safety risk to users of the water's edge

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
	Potential public safety risk to users of the top of bluff as a result of natural slope crest migration	SWP will provide a formal trail along the top of the bluffs outside of the risk line permitting users access along the top of the bluffs from the eastern edge of the Grey Abbey Ravine to Beechgrove Drive	None	Positive • Positive impact in the reduction of public safety risk to users along the top of the bluffs through East Point Park
	Change in potential for loss of public property and/or infrastructure due to natural slope crest migration	SWP will mitigate existing risks to public property and infrastructure including parks, trails, and roads from Bluffer's Park to the eastern edge of Grey Abbey Ravine. Public property and infrastructure to the east will still be at risk.	None	Positive • Positive impact in the reduction of public property and infrastructure at risk from natural slope crest migration
Ability to minimize public safety risk as a result of wave uprush	Potential public safety risk to users of the water's edge as a result of wave uprush	The shoreline protection works implemented as part of the SWP have been designed to remove trail users from the risk of wave uprush	None	Positive • The SWP has a positive impact by reducing public safety risk as a result of wave uprush
Resilience of shoreline protection works to potential climate change impacts	Potential for shoreline works to accommodate natural changes resulting from climate change	Coastal design undertaken for the project has examined worst case scenarios which reflect potential changes as a result of climate change	None	No impact • The SWP has been designed to create resilience of shoreline protection works to potential climate change impacts creating no impact
Ability to Improve Emergency Services access to the waterfront.	Potential for improved emergency services access along the shoreline	Implementation of SWP results in an improvement for emergency services access along the shoreline	None	Positive • Positive change to emergency services access along the shoreline

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Ability to protect source water protection areas	Potential for impact to water quality at F.J. Horgan intake pipe	No effect to water quality at intake	None	No effect
Potential to manage safety risk for pedestrians and cyclists gaining access to the shoreline	Safety associated with potential conflict between pedestrian/cyclists and vehicles	SWP will implement changes to Brimley Road to add a path for pedestrians going up and down Brimley Road. The path will also be available to cyclists walking their bikes up or down the trail. Road markings will be used to separate cyclists riding up or down the road from vehicular traffic.	The TRCA and the City of Toronto recognize that while these changes will improve the situation there are likely other changes that will need to be made to ease the traffic, congestion and resultant conflict in the Brimley Road area	Positive • The implementation of SWP will have a positive impact on the potential for conflict between pedestrians, cyclists and vehicles

7.3.2.3 Summary of Objective 2

The Objective to Manage Public Safety and Public Property Risk seeks to manage risks associate with natural slope crest migration at both the toe and top of slopes, public safety risk from wave uprush, resiliency to climate change, improve access for emergency services, protect water quality and manage safety risks for pedestrians and cyclists accessing the shoreline. The criteria and indicators assessed for this objective are only applicable in the operation phase. For all criteria and indicators the implementation of SWP results in a positive change therefore, meeting this objective (**Table 7-8**).

Table 7-8 Overall effects related to Objective 2.

Criteria	Indicator	Overall Effects
Ability to minimize public safety risk and property loss as a result of slope erosion/failure	Potential public safety risk to users of the water's edge as a result of natural slope crest migration	Positive
	Potential public safety risk to users of the top of bluff as a result of natural slope crest migration	Positive
	Change in potential for loss of public property and/or infrastructure due to natural slope crest migration	Positive
Ability to minimize public safety risk as a result of wave uprush	Potential public safety risk to users of the water's edge as a result of wave uprush	Positive
Resilience of shoreline protection works to potential climate change impacts	Potential for shoreline works to accommodate natural changes resulting from climate change	No impact

Criteria	Indicator	Overall Effects
Ability to Improve Emergency Services access to the waterfront.	Potential for improved emergency services access along the shoreline	Positive
Ability to protect source water protection areas	Potential for impact to water quality at F.J. Horgan intake pipe	Positive
Potential to manage safety risk for pedestrians and cyclists gaining access to the shoreline	Safety associated with potential conflict between pedestrian/cyclists and vehicles	Positive
Summary: Overall implementation of the SWP will result in a positive change to managing public safety risk and public property risk related to slope erosion/failure, wave uprush, resilience to climate change, access for emergency services, protection of water quality and management of safety risks for pedestrians and cyclists accessing the shoreline. Overall the Preferred Alternative for the SWP meets the Manage Public Safety and Public Property Risk Objective.		

7.3.3 Objective 3: Provide an Enjoyable Waterfront Experience

7.3.3.1 Construction Effects

Criterion: Ability to maintain public access to and along the waterfront during construction

Indicator: Changes to access to and along the shoreline as a result of construction activities

Access to and along the shoreline will be limited by construction activities intermittently. Areas under construction will be fenced off from user access. For example; sections of trails within Bluffer's Park may be closed to pedestrians and cyclists for limited periods of time to permit construction to occur. This would be done to protect public safety. Closures and limitations to access will be minimized and where possible will not occur on weekends. Construction activities along Brimley Road will be done prior to May 15 or after October (Thanksgiving) on weekdays to minimize disruption to users. When construction is occurring at the base of Doris McCarthy Trail, access to the shore will be fenced off. The Guild construction access route will be used for construction vehicle access and thus will be closed on weekdays but open on weekends to permit public access. Once construction is complete, final enhancements to the Guild construction access route to create trail amenities will be completed prior to May 24 or after October on weekdays in order to minimize disruption to users.

Summary: Ability to maintain public access to and along the waterfront during construction

The effects to access will occur throughout the construction period but will be intermittent resulting in a negligible effect to users.

Criterion: Potential for change to use and enjoyment of park areas, existing trails and beaches during construction

Indicator: Potential for dust, vehicle emission and noise from construction activities including traffic to affect use and enjoyment

This indicator identifies potential negative effects related to the generation of dust, vehicle emissions and noise to users of existing parks and open spaces within the Project Area in proximity to construction activities. This indicator was assessed based on professional experience with similar waterfront projects on Lake Ontario.

Construction of the SWP will result in typical atmospheric emissions including dust generation from the transport and placement of fill, combustion emissions from construction equipment and other nuisance effects associated with construction noise. These effects are short-term (during active construction) and infrequent (during certain times of the day), and are limited to the areas under construction. Users of adjacent parks and open spaces in proximity to the SWP will experience some nuisance effects related to dust, vehicle emissions and noise but they will be localized, temporary and of short duration.

Best management practices for dust suppression such as watering of the access road during dry periods and speed limits on the access road will be employed. Vehicles and other construction equipment will be well maintained to minimize emissions and vehicles will be equipped with mufflers to minimize noise from equipment. All construction activities will adhere to the City of Toronto's Noise By-Law. As a result, overall net effects are expected to be negligible.

Indicator: Potential for changes in ability use park areas during construction due to construction traffic, changes to access and unavailability of areas due to construction

Construction activity has the potential to create conflicts and/or restrictions for the public and local park users. This indicator was assessed to identify potential negative impacts to users of Bluffer's Park, East Point Park and other adjacent parks and open spaces related to traffic congestion or changes to access resulting from construction. This indicator was assessed by modeling traffic conditions along construction routes such as Brimley Road and Guildwood Parkway based on current conditions combined with anticipated construction traffic associated with the SWP.

The traffic analysis conducted for the SWP indicates that future traffic conditions are already operating at lower a Level of Service. The additional construction traffic associated with the SWP will not change these conditions. The selected truck routes will be able to accommodate the proposed truck volumes with no appreciable increase in traffic volume during peak periods (**Appendix J**).

During the 12 years of construction, visitors to Bluffer's Park and East Point Park will have restricted access to some areas, particularly the eastern portion of Bluffer's Beach. In addition, there is a potential for impairment to the "sense of nature" visitors may feel when the park is not under/adjacent to construction. However, users will retain use of the majority of both parks and construction hours will be limited to weekdays so that the park is construction free during evenings and weekends. Therefore, overall net effects are expected to be negligible.

Criterion: Changes to the use of existing beaches/ shoreline

Indicator: Potential for change to character and use of existing sand beaches/shoreline

Construction of the SWP will change how existing beaches and shoreline areas are used. This indicator was assessed to identify both positive and negatives effects to the use of existing beaches/shorelines during the construction period. This indicator was assessed based on professional experience with similar waterfront projects on Lake Ontario and considering input received from the users of these areas.

During construction parts of Bluffer's Park Beach will be temporarily closed to public use. These effects are short-term (during active construction) and are limited to the areas under construction. Users of the beach will experience some nuisance effects related to dust, vehicle emissions and noise but they will be localized, temporary and of short duration.

Access to the eastern headland will be restricted during construction, limiting surfing and other uses in this area.

Beaches which are accessed informally by the public, including sandy shoreline areas currently in private ownership, will also be affected by construction particularly those areas east of the Guild Construction access route. The currently privately owned sandy shoreline at the base of the Bluffs east of the Guild access route and west of Grey Abbey Ravine will be inaccessible during construction. As noted above, areas under construction will be fenced to limit public access. Where possible, access will be provided on weekends and evenings to minimize effects on users. The overall net effect to use of existing sand beaches during construction is negligible.

Indicator: Potential for impact to water quality at Bluffer's Park Blue Flag Beach along the shoreline

As discussed in **Section 7.3.1.1**, all fill will meet MOECC guidelines and will be placed behind containment berms, which will minimize sedimentation. Turbidity monitoring will be undertaken while construction is occurring. Construction will generally occur outside

of the times the Bluffer's Park Blue Flag Beach will be used for swimming, therefore, impacts to the Bluffer's Park Blue Flag Beach are anticipated to be minimal.

Best management practices as detailed in **Appendix H** will be used to minimize to further minimize the potential effects to water quality at Bluffer's Park Blue Flag Beach. Overall, net effects during construction are negligible.

Summary: Changes to the use of existing beaches/ shoreline

Construction of the SWP will have a negligible effect with respect to changes to the use of the existing beaches/shoreline. Areas of Bluffer's Park Beach will be closed temporarily during construction; however, these effects will be short-term and limited to areas under construction. There is the potential for water quality at Bluffer's Park Beach to be affected by construction, but best management practices will be used to minimize the potential effects.

Criterion: Changes to the use of the waterfront for recreation

Indicator: Potential for change in use of existing park areas

Construction of the SWP will change how existing park areas are used. This indicator was assessed to identify both positive and negatives effects to the use of park areas during the construction period. This indicator was assessed based on professional experience with similar waterfront projects on Lake Ontario and considering input received from the users of these areas.

Within Bluffer's Park the arm of the eastern headland will likely be closed throughout the duration of construction so that the area can be used to stage and stockpile construction material. Any other closures will be short-term, temporary and limited to areas under construction or adjacent to areas under construction. Within East Point Park informal trails will be closed permanently and decommissioned to restore ecosystem integrity. The main trail within East Point will be improved and there will be temporary closures and detours to manage access during construction. Any closures will be short-term. As noted above, users of the parks will experience some nuisance effects related to dust, vehicle emissions and noise but they will be localized, temporary and of short duration. Overall, the net effects to the change in use of existing park areas is negligible

Indicator: Potential to maintain navigation along the shore

Construction of the SWP could change navigation along the shoreline for recreational boating. This indicator was assessed to identify both positive and negatives effects to navigation during the construction period. This indicator was assessed based on professional experience with similar waterfront projects on Lake Ontario and considering input received from the users of these areas.

Construction activities are likely to restrict navigation for recreational boaters around the eastern headland of Bluffer's Park while construction is underway. These restrictions will be short term and are not anticipated to negatively affect the use of Bluffer's Park by recreational boaters. The construction of headlands and other shoreline works along the remainder of the shoreline will affect navigation only within those areas under construction. There will not be additional limitations placed on navigational boating in the nearshore area. Overall, net effects to navigation during construction are negligible.

Summary: Changes to the use of the waterfront for recreation

Construction of the SWP will have a negligible effect on changes to the use of the waterfront for recreation. Within Bluffer's Park, the arm of the eastern headland will likely be closed for the duration of construction in the West Segment so that the area can be used to stage and stockpile construction material. However, any other closures will be short-term, temporary and limited to areas under construction, or adjacent to areas under construction. Within East Point Park, informal trails will be closed permanently and decommissioned to restore ecosystem integrity. Temporary closures will be required to manage access through the park during construction, but the main trail within East Point Park will be improved overall. There is the potential that construction activities may restrict navigation for recreational boaters around the eastern headland of Bluffer's Park; however, these restrictions will be short-term and are not anticipated to negatively affect the use of Buffer's Park by recreational boaters.

Table 7-9 Detailed Effects Assessment: Objective 3 Construction.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Ability to maintain public access to and along the waterfront during construction.	Changes to access to and along the shoreline as a result of construction activities	Temporary restrictions to access generally on weekdays. Guild access route will be used for construction vehicles on weekdays.	Timing of restrictions to periods of lower use. Opening of access points where and when possible on weeknights and weekends.	Negligible • Negligible effects to access for most users
Potential for change to use and enjoyment of park areas, existing trails and beaches during construction	Potential for dust, vehicle emission and noise from construction activities including traffic to affect use and enjoyment	Effects to users from nuisance effects will be temporary and intermittent to locations under construction.	Use of best management practices for dust, emissions and noise associated with construction activities and vehicles.	Negligible • Negligible effects to use and enjoyment of park areas, existing trails and beaches during construction

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
	Potential for changes in ability use park areas during construction due to construction traffic, changes to access and unavailability of areas due to construction	Future traffic conditions in the Project Study Area will not be negatively impacted by construction of the SWP; the selected truck routes will be able to accommodate the proposed truck volumes with no appreciable increase in traffic volume during peak periods.	None	Negligible • Negligible effect on ability to use park areas during construction due to traffic
Changes to the use of existing beaches/shoreline	Potential for change to character and use of existing sand beaches/shoreline	Areas of Bluffer's beach will be closed temporarily during construction. Sandy shorelines in other areas will also be temporarily closed while they are under construction.	Areas of beaches closed will be limited to only those areas under construction to minimize effects to users	Negligible • Negligible effect on character and use of existing sand beaches
	Potential for impact to water quality at Bluffer's Park Blue Flag Beach	Water quality may be affected by construction from placement of fill creating turbidity.	Best management practices will be used to reduce turbidity. Construction around Bluffer's beach will likely occur outside of the summer months.	Negligible • Negligible effect on water quality at Bluffer's Beach
Changes to the use of the waterfront for recreation	Potential for change in use of existing park areas	Within Bluffer's Park the arm of the eastern headland will likely be closed throughout the duration of construction so that the area can be used to stage and stockpile construction material. Any other closures will be short-term, temporary and limited to areas under construction	None	Negligible

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
		or adjacent to areas under construction. Within East Point Park informal trails will be closed permanently and decommissioned to restore ecosystem integrity. The main trail within East Point will be improved and there will be temporary closures and detours to manage access during construction.		
	Potential to maintain navigation along the shore	Minor effects around Bluffer's eastern headland during construction	Appropriate warnings and signage	None

7.3.3.2 Operation Effects

Criterion: Improve public access to and along the waterfront

Indicator: Potential to provide continuous formal public access along the waterfront.

Currently there is no continuous formal public access along the waterfront. For this indicator, a qualitative assessment of the degree to which continuous formal access can be provided was evaluated.

Implementation of the Preferred Alternative will provide continuous formal access along the waterfront from Bluffer's Park in the West to just east of Grey Abbey Ravine along the water's edge and from Grey Abbey Ravine through East Point Park to Beechgrove along the top of the bluffs.

This continuous formal access will be outside of the risk line and the shore/bluff edge of private properties along the shore will be purchased such that public access will be permitted along the entire length of shore to the west and east of Grey Abbey Ravine.

Indicator: Potential to provide a primary multi-use trail

Currently the Waterfront Trail is forced to bypass much of the actual waterfront within the SWP Project Study Area. For this indicator, a qualitative assessment of the connection that will be provided by the new route for the Waterfront Trail following construction was evaluated.

The lands created for the SWP will allow for a primary to high-capacity multi-use connection of the Waterfront Trail that traverses across the Project Study Area and provides water's edge linkage between Bluffer's Park and for the east side of Grey Abbey Ravine and a top of the bluffs connection from the ravine to Beechgrove Drive, which will connect the Waterfront Trail back to the water's edge further to the east. This new trail connection will create a positive effect by allowing for a waterfront connection across the SWP Study Area. In addition, this provides for the relocation of the existing off road connection of the Waterfront Trail which may be constrained by the Metrolinx Lakeshore East Rail Corridor expansion.

Indicator: Potential to meet AODA grade standard for access to and along the shoreline the proposed trails

Currently access to the shoreline does not meet the AODA grade standard and access along the shoreline only meets the standard within Bluffer's Park. Implementation of the SWP will result in access along the shoreline which meets the AODA grade standard throughout the length of the proposed multi-use trail. Given the steepness and vegetation communities of concern associated with the bluffs face AODA grade standard was much more difficult to achieve for access to the shoreline. Modifications to Brimley Road will not improve the grades to meet AODA requirements. Access along the existing Doris McCarthy Trail and the Guild access cannot be flattened to meet AODA grade requirements without considerable negative effects to the surrounding vegetation communities of concern (see **Section 6.2.4**). Therefore, for both access points, the location of resting areas will be considered as part of Detailed Design to improve accessibility. The proposed access at the east side of Grey Abbey Ravine will be a corkscrew ramp and bridge which will meet AODA grade requirements. Finally, the Beechgrove Drive access cannot be flattened to meet AODA grade requirements without causing significant impacts to the adjacent eroding bluff face and vegetation communities of concern.

Therefore, although AODA grade requirements will not be met in all areas, AODA accessibility with regards to grade will be improved over the existing conditions.

Indicator: Potential to improve existing access to the shoreline

Improvements to access to the shoreline were identified early in project planning as a key issue to be resolved. The ability to improve existing access to the shoreline was evaluated qualitatively based on professional judgment.

Existing formal access to the waterfront is provided at Brimley Road and Doris McCarthy Trail. Informal access is provided at the Guild construction access route, Beechgrove Drive extension, and at several user-made informal trails along the bluff face, particularly within East Point Park. One of the main Objectives of this Project is to

formalize access where feasible and decommission informal access points that are causing damage to the ecosystem. Access along Brimley Road will be improved through the development of a path that is continuous from Barkdene Hills to Bluffer's Park as discussed in **Section 6.2.4.1**. The Guild construction access route will become a formal trail providing pedestrian and cycling access to the shoreline. Informal trails particularly within East Point Park will be decommissioned and the creation of new informal trails will be deterred through the use of education, signage, and planting of native plants that's discourage access (e.g., wild rose).

The SWP will result in improvements to existing access to the shoreline.

Indicator: Potential to provide new access to the shoreline

This indicator was assessed by qualitatively reviewing the Preferred Alternative against existing conditions to assess whether or not new access has been provided. As discussed in **Section 6.2.4**, it is difficult to provide access to the shoreline given the slope of the bluffs, the eroding face and the vegetation communities of concern generally associated with the bluff face. One new access point will be provided between the top of the bluffs and the toe of the bluffs as part of the waterfront trail. A corkscrew ramp and bridge will be constructed on the east side of the Grey Abbey Ravine in order to minimize impacts to vegetation communities of concern and the area of eroding bluff face. The trail connection will be provided across private industrial land and the treatment plant providing access can be negotiated. This trail will connect to a trail along the top of the bluffs and it will include a trail link to the parking lot at East Point Park to allow access. Therefore, only one new access point to the shoreline has been deemed to be possible.

Indicator: Potential to provide direct public access to water

Ease of regular access to the water's edge will enhance public enjoyment of the waterfront, and facilitate a variety of uses. The accessible water's edge was evaluated both qualitatively and quantitatively. Quantitatively, pre- and post-construction formally accessible shoreline lengths were measured from geo-referenced aerial imagery using ArcGIS. Currently, only 900 m of shoreline provides formal public access to the water, limited to Bluffer's Park Beach. Approximately, 1,770 m is constrained by private ownership or critical infrastructure (through the East Segment), with a further 1,890 m of informal access provided within the risk line along East Point Park to the mouth of the Highland Creek.

Cobble beaches throughout the Toronto waterfront are well-used by the public to gain access to and into the water. Cobble beaches will be sized to allow for most users to allow for access for most users.

Following implementation the SWP, the shoreline distance which will provide formal access to the water will increase to approximately 3,200 m broken down as: 1,900 m of cobble and 1,300 m of sandy beach. These areas will be publicly accessible along formal trails which are AODA grade accessible and removed from the risk of slope failure (e.g., landslides). Approximately 2,560 m of existing informally accessible sand shoreline within the East Segment will continue to be available.

While the SWP will result in a net loss in publicly inaccessible sandy/gravel shoreline, the SWP will provide a substantial increase in overall publicly accessible shoreline (predominantly cobble) and a more easily accessed water's edge. In addition, the shoreline east of Grey Abbey Ravine will remain accessible on an informal basis. The net increase in direct access to the water will result in a positive effect.

Summary: Improve public access to and along the waterfront

The SWP will improve all aspects of public access to and along the waterfront from existing conditions. This includes the provision of continuous access along the shore at the toe and top of the bluffs from Bluffer's Park to Beechgrove Drive.

Criterion: Changes to the use of existing beaches/shoreline

Indicator: Potential for change to character and use of existing sand beaches /shoreline

Land creation activities have the potential to change the character and use of beaches and sandy shorelines throughout the Project Area for beach, sandy shoreline, and water-based activities. Changes to the shoreline could affect the recreational experience of current beach users and water sports (e.g., surfers and paddle boarders). Potential effects are assessed using professional judgment. It should be noted that this indicator assesses the use of beaches, sandy shorelines, and other shoreline areas.

The beach at Bluffer's Park will be expanded by approximately 400 m in width and 60 m in depth which will enhance the recreational experience and the capacity of beach for users of the sand beach. The ultimate design of the SWP has the potential to affect the use of nearshore areas around the headland for water sports, particularly surfing. Shoreline orientation and the presence of new landforms will influence how surfers use the area. Potential effects to these users are assessed using professional judgment.

The surfing community has provided input that their use of the beach on the eastern headland of Bluffer's Park is likely to be affected, known as the 'Lighthouse' surf break. A wave model was undertaken to simulate the differences in wave height in this location from pre-construction conditions. Results of the wave model suggest that there may be an impact to wave conditions under southwest waves; however, no change under Easterly waves. As such, under southwest waves, surfing conditions may change. The

Project Team will continue to work with the surfing community at Detailed Design to minimize impacts to surfing. Surfers will continue to have access to other sand and cobble beaches at Bluffer's Park.

Some members of the public have indicated a preference for maintaining the existing character of the sandy shorelines particularly to the east of Morna Avenue. The SWP would replace approximately 1,250 m of existing sandy shorelines with a headland and cobble beach system, of which 490 m has been previously modified. It is noted that use of these existing sandy shorelines is informal and at the risk of the users, as there is no formal trail to or along the shoreline. In addition, some of the sandy shorelines are privately owned. Consequently, current use often results in damage to vegetation communities of concern as access is gained through the use of informal and often inappropriate trails. The SWP minimizes the replacement of the existing sandy shorelines to only those areas requiring toe protection to protect public infrastructure at risk within the planning timelines of the Project. Current use of the sandy shorelines for walking, water sports and other activities will not change as all of these activities can continue on the cobble beaches associated with the headland beach system. Access along the existing sandy shorelines to the east will continue to be informal, with no additional access between the top and toe of the bluffs until the Beechgrove Drive extension for approximately 1.7 km to the east. Therefore, the implementation of the SWP will have a negligible effect on recreational activities on the existing beaches and sandy shorelines.

Indicator: Potential for impact to water quality at Bluffer's Park Blue Flag Beach

The implementation of the SWP has limited potential to affect local circulation patterns and thus the water quality at Bluffer's Park Blue Flag Beach. Potential effects were assessed using a lake water quality model.

Circulation modeling indicates that following construction, there is likely to be little change in water quality. Therefore, the implementation of the SWP will have no effect on the water quality at Bluffer's Park beach.

Summary: Changes to use of existing beaches/shoreline

Implementation of the SWP will have negligible impact to the use of existing beaches/shoreline. Bluffer's beach will be expanded which will be welcomed by users who enjoy using the beach for lounging, water sports, and swimming. Water quality at Bluffer's Beach will not change as a result of this project. Where existing sandy shorelines are being replaced with headland beach systems existing activities, such as walking and water sports, can continue. Surfing conditions for the Lighthouse surf break may change, and the Project Team will continue to engage the surfers at Detailed Design to try and minimize the impacts to surfing.

Criterion: Changes to the use of the waterfront for recreation

Indicator: Potential for change in use of existing park areas

Operation of the SWP will change how existing park areas are used. This indicator was assessed to identify both positive and negatives effects to the use of park areas. This indicator was assessed based on professional experience with similar waterfront projects on Lake Ontario and considering input received from the users of these areas.

Both Bluffer's Park and East Point Park are currently destination parks with limited opportunities to connect to other parks along the waterfront. The implementation of SWP will provide a connection between these existing park spaces such that users can use existing park facilities as an embarkation point or as a stopover point for a longer trip. The implementation of SWP will not change, alter or remove any existing park uses and will simply enhance the park experience. All changes to the use of existing park areas are therefore positive.

Indicator: Potential to maintain navigation along the shore

The nearshore of Lake Ontario is currently used for recreational boating of a variety of crafts including paddle boats, sailboats and recreational motor boats. Continuation of these activities is an important feature of providing an enjoyable waterfront experience. This indicator was qualitatively assessed based on expected changes along the waterfront from establishment of the SWP.

The implementation of the shoreline works and aquatic habitat enhancements proposed for the SWP will alter some shoreline areas but will not change the ability of paddleboats, sailboats and recreational motor boats to navigate along the shore. Users of small craft will need to adapt to the new shoreline configuration and presence of new landforms. To mitigate these effects, navigation maps will be updated based on new shoreline configurations so that users are aware of any new potential hazards. Navigation will be maintained along the shore therefore, there are no net effects to users anticipated.

Indicator: Potential to provide new opportunities for views/viewscapes to Lake Ontario and to the Bluffs

The provision of views along the shoreline and from the shoreline and adjacent areas are an important feature in enhancing public enjoyment of the waterfront. This indicator was qualitatively assessed based on expected changes along the waterfront from establishment of the SWP.

No prominent lookout areas towards Lake Ontario will be affected. Views from the lake toward the shoreline are currently highly valued but are currently only accessible to

those in boats or those risking walking along the shore within the risk line. There will be a number of new opportunities for improved views of the bluffs from headland areas and along the formal trail along the water's edge. As a result of toe protection works the bluffs with start to stabilize and vegetate which will alter their appearance however, similar changes have occurred at Bluffer's Park and have not diminished the quality of the views of the bluffs experienced by users. These new opportunities will create a positive net effect of the SWP.

Indicator: Potential to improve navigation at entrance to boat basin

There has been an on-going issue with the accumulation of sediment in the entrance to Bluffer's Park Marina. This is occurring because the existing beach at Bluffer's is full and sediment is by-passing the beach and being deposited at the entrance to the boat basin.

The SWP has the potential to mitigate this issue by reducing the transport of sediment into the Bluffer's Park embayment. The widened and expanded Bluffer's beach and the proposed headlands to protect it will trap most of the sand and sediment currently entering the embayment reducing the future need for dredging and improving navigation at the entrance to the boat basin. This results in a positive impact to navigation at the entrance to the boat basin as a result of implementation of the SWP.

Summary: Changes to use of waterfront for recreation

The SWP results in positive changes to the use of the waterfront for recreation. The implementation of SWP will not change, alter or remove any existing park uses and will simply enhance the park experience. Navigation along the shore will be maintained while navigation at the entrance to the boat basin will be improved as the need to dredge will be reduced. Finally, there will be a number of new opportunities for improved views of the bluffs from headland areas and along the formal trail along the water's edge. As a result of toe protection works the bluffs with start to stabilize and vegetate which will alter their appearance however, similar changes have occurred at Bluffer's Park and have not diminished the quality of the views of the bluffs experienced by users.

Table 7-10 Detailed Effects Assessment: Objective 3 Operation.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Improve Public Access to the Waterfront	Potential to provide continuous formal public access along the waterfront	Continuous formal access will be outside of the risk line and the shore/bluff edge of private properties along the shore will be purchased such that public access will be permitted along the entire length of shore to the west and east of Grey Abbey Ravine	None	Positive • Positive as continuous formal access is provided where it currently does not exist
	Potential to provide a primary multi-use trail	Provides a multi-use connection of the Waterfront Trail that provides water's edge linkage between Bluffer's Park and for the east side of Grey Abbey Ravine and a top of the bluffs connection from the ravine to Beechgrove Drive. This provides for the relocation of the existing off road connection of the Waterfront Trail which may be constrained by the Metrolinx Lakeshore East Rail Corridor expansion.	None	Positive • Positive as a primary multi-use trail is provided
	Potential to meet AODA grade standard for access to and along the shoreline	Access along the shoreline will meet AODA grade standards. Due to the steepness of the bluffs AODA grade standard can only be met through the provision of landings on access trails to the shoreline.	Provision of landings on access trails to the shoreline to meet AODA	Positive • Positive change as trail along the shoreline will meet AODA grade requirements and trails to the shore will have landings to facilitate access for those users who may have mobility issues
	Potential to improve existing access to the shoreline	Access along Brimley Road will be improved through the development of a trail that is continuous from Barkdene Hills to Bluffer's Park. Both Doris McCarthy Trail and the Guild Access Route will become formal trails providing pedestrian	None	Positive • The SWP will result in improvements to existing access to the shoreline

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
		access to the shoreline trail. The Guild Access Route will also provide access for cyclists. Informal trails particularly within East Point Park will be decommissioned and the creation of new informal trails will be deterred through the use of education, signage, and planting of noxious native plants.		
	Potential to provide new access to the shoreline	One new access point will be provided between the top of the bluffs and the toe of the bluffs: a corkscrew ramp and bridge will be constructed on the east side of the Grey Abbey Ravine. The trail connection will be provided across private industrial land and the treatment plant providing access can be negotiated. This trail will connect to a trail along the top of the bluffs and it will include a trail link to the parking lot at East Point Park to allow access.	None	Positive • Positive change over existing conditions as formal trail is provided where one currently does not exist and where impact from informal trails is considerable
	Potential to provide direct public access to water	While the SWP will result in a net loss in sandy/gravel beach, the SWP will provide a substantial increase in overall beach (predominantly cobble) and a much more accessible water's edge including improved opportunities cycling, walking, bird watching and nature appreciation. In addition, the East Point Park beach east of Grey Abbey Ravine will remain accessible on an informal basis.	None	Positive • The net increase in accessible beach will result in a positive effect
Changes to the use of existing beaches/ shoreline	Potential for change to character and use of existing sand beaches/shoreline	The beach at Bluffer's Park will be expanded by approximately 400 m in width and 80 m in depth which will enhance the recreational experience	None	Negligible • Implementation of the SWP will have a negligible effect on

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
		and the capacity of beach for users. The ultimate design of the SWP has the potential to affect the use of existing beaches and nearshore areas by surfers. Shoreline orientation and the presence of new landforms will influence how surfers use the area. Current use of the sandy shorelines for walking, water sports and other activities will not change as all of these activities can continue on the headland beach system. Access along the existing sandy shorelines to the east will continue to be informal and at the risk of the users.		• recreational activities on the existing beaches and sandy shorelines
	Potential for impact to water quality at Bluffer's Park Blue Flag Beach	No impact to water quality at Bluffer's Park Blue Flag beach as a result of the SWP	None	None
Changes to the use of the waterfront for recreation	Potential for change in use of existing park areas	Implementation of SWP will provide a connection between these existing park spaces such that users can use existing park facilities as an embarkation point or as a stopover point for a longer trip. The implementation of SWP will not change, alter or remove any existing park uses and will simply enhance the park experience.	None	Positive • All changes to the use of existing park areas are positive
	Potential to maintain navigation along the shore	The implementation of the shoreline works and aquatic habitat enhancements will alter some shoreline areas but will not change the ability of paddleboats, sailboats and recreational motor boats to navigate along the shore	Users of small craft will need to adapt to the new shoreline configuration and presence of new landforms. To mitigate these effects, navigation maps will be updated based on new	No effect • Navigation will be maintained along the shore therefore, there are no net effects to users anticipated

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
			shoreline configurations so that users are aware of any new potential hazards.	
	Potential to provide new opportunities for views/viewscapes to Lake Ontario and to the Bluffs	No prominent lookout areas towards Lake Ontario will be affected. There will be a number of new opportunities for improved views of the bluffs from headland areas and along the formal trail along the water's edge. As a result of toe protection works the bluffs with start to stabilize and vegetate which will alter their appearance however, similar changes have occurred at Bluffer's Park and have not diminished the quality of the views of the bluffs experienced by users.	None	Positive • These new opportunities will create a positive net effect of the SWP
	Potential to improve navigation at entrance to boat basin	The widened and expanded Bluffer's beach and the proposed headlands to protect it will trap most of the sand and sediment currently entering the embayment reducing the future need for dredging and improving navigation at the entrance to the boat basin.	None	Positive • Positive impact to navigation at entrance to boat basin

7.3.3.3 Summary of Objective 3

The purpose of this objective was to ensure that any changes to the waterfront resulted in an enjoyable waterfront experience. A large number of criteria and indicators were assessed for this objective for both construction and operation.

The construction period for the project is approximately 12 years; however, the actual construction activities are unlikely to be in any one location for the entire 12 years so the location of effects will change as construction activities occur in different places. Most nuisance effects from construction for recreational users will be short term and localized.

Once operational, the SWP will provide a better waterfront recreation experience than exists today with more of the shoreline being accessible to more people (**Table 7-11**).

Table 7-11 Overall effects related to Objective 3.

Criteria	Indicator	Overall Effects
Improve public access to the waterfront	Potential to provide continuous formal public access along the waterfront	Positive
	Potential to provide a primary multi-use trail	Positive
	Potential to meet AODA grade standard for access to and along the shoreline	Positive
	Potential to improve existing access to the shoreline	Positive
	Potential to provide new access to the shoreline	Positive
	Potential to provide direct public access to water	Positive
Ability to maintain public access to and along the waterfront during construction	Changes to access to and along the shoreline as a result of construction activities	Positive
Potential for change to use and enjoyment of park areas, existing trails and beaches during construction	Potential for dust, vehicle emission and noise from construction activities including traffic to affect use and enjoyment	Negligible
	Potential for changes in ability use park areas during construction due to construction traffic, changes to access and unavailability of areas due to construction	Negligible
Changes to the use of existing sand beaches/shoreline	Potential for change to character and use of existing beaches/shoreline	Positive
	Potential for impact to water quality at Bluffer's Park Blue Flag Beach	No effect
Changes to the use of the waterfront for recreation	Potential for change in use of existing park areas	Positive
	Potential to maintain navigation along the shore	Positive
	Potential to provide new opportunities for views/viewscapes to Lake Ontario and to the Bluffs	Positive
	Potential to improve navigation at entrance to boat basin	Positive
Summary: Overall, SWP results in a positive change to the waterfront experience for recreational users. Recreational users will experience some construction nuisance effects that may detract from their experience at times but these are anticipated to be localized and short term effects. Once operational the SWP will create a positive recreational experience when compared with existing conditions.		

7.3.4 Objective 4: Consistency and Coordination with Other Initiatives

7.3.4.1 Construction Effects

Criterion: Impact on archaeological resources, built heritage resources, and cultural heritage landscapes

Indicator: Potential impact to known or potential archaeological sites

A marine archaeological assessment completed in 2012 on the in-water portion of the SWP Project Area indicated that there are a number of marine-based archaeological

resources within the SWP Project Study Area. The assessment located five targets that were considered to exhibit cultural heritage value or interest. Only three of these targets will be affected by the SWP. These are:

- S56 - The Alexandria was built in 1866 as a barge towing steam sidewheeler and rebuilt in 1883. She became stranded in 1915, and all were rescued thanks to local efforts. “This site has both provincial (as a vessel that operated along the key transportation corridor of the province for over three decades) and local (as seen by the stranding and rescue events of 1915) significance”.
- S76 – remains of unidentified shipwreck (possibly barge). It is apparent that the entire ship is not present in this location, and that what has been deposited in this location was for the purposes of erosion control. Much of the wreckage is underwater and buried under rocks, and any additional information regarding its identity, type of vessel or age is unavailable without further archaeological work. This has local interest in so much as it was used as a measure of erosion control - an early methodology that was employed along the shorelines in many locations in Ontario once a ship had reached “derelict” status.
- S78 – The remains of two barge hulls were placed in the 1960s as part of an erosion control measure. There were apparently three original barges originally located here, but the remains of only two are apparent today. The third may be wrecked partially onshore (debris with metal sheet piling on rocks) or could have drifted westwards. Barges are often overlooked in the recording of marine history, and yet they were the work vessels of the day. They are important locally and provincially in terms of their contributions to marine history, but also locally as to their use after they became “derelict” vessels and repurposed as erosion control barriers.

Specific criteria were used to evaluate significance based on type of impact to the resource, the level of effort for next archaeological steps, and the cultural and historic value of the marine archaeological resources.

S56 (Alexandria) was considered to have a high level of heritage value both provincially and locally. S76 exhibited a moderate level of significance on a local level; and lastly, S78 exhibited a moderate level of significance on a local and provincial level.

Mitigation options were explored and the TRCA favoured the avoidance and buffering option (10-20 m depending on the resource). This mitigation option is suitable for S78 which is wholly submerged. For S76 and S56, however, avoidance with buffering and additional recording of the resource by a licensed archaeologist is the preferred option. Both of these resources are exposed to the air, wind, waves and ice which can collectively and individually cause damage to the resource.

To summarize, the Project has opted to avoid all three areas, but a "Do Nothing" approach even with buffering is only suitable for S78, the two barges, as they are wholly submerged. The other two resources are exposed to elements that can cause damage to the resource. Recommendations for these two marine resources are to avoid with buffering, but also to conduct minimal archaeological recording of the two resources. Minimal archaeological recording would entail physically recording the top 1-2 m of the vessels, as these are the most likely to be "torn away" or otherwise destroyed by the elements. The 20 m buffer around the Alexandria (S56) is sufficient to capture the associated debris field.

TRCA archaeologists also conducted a Stage 1 Archaeological Assessment (**Appendix E**) in 2012 for the Project Study Area to provide information about the Project Study Area's geography, history, previous archaeological fieldwork and current land conditions in order to evaluate the potential for it to contain cultural heritage resources that might be impacted by the Project.

The Stage 1 report indicated that there is potential for land-based archaeological resources to be found within the Project Study Area along the tablelands. As such, Stage 2 assessments will be undertaken during the Detailed Design phase where physical works are planned along the tablelands (i.e., trail construction down Brimley Road and from Grey Abbey Ravine to East Point Park), prior to any ground disturbing activities where past soil disturbance has not previously been documented. Should land-based resources be detected during the Stage 2 assessment, avoidance of the resource(s) will be practiced, as per TRCA's mandate.

Indicator: Potential for impact to known built heritage sites, and cultural heritage landscapes

There are no built heritage resources within the SWP Project Area that will be affected by construction. Therefore, no effects are anticipated.

Indicator: Potential for impact on traditional land uses and valued cultural features

The SWP must respect and wherever possible enhance traditional uses of lands by First Nations and Métis. Currently the SWP Project Area is not used for traditional purposes. As such, there will be no effects to traditional uses associated with the construction period.

Summary: Impact on archaeological resources, built heritage resources, and cultural heritage landscapes

Construction of the SWP is anticipated to have a negligible impact on archaeological resources as the existing marine archaeological resources will be buffered and avoided

to minimize impacts. Appropriate archaeological recording of the two resources exposed to the elements will also be undertaken. Stage 2 assessments will be undertaken during the Detailed Design phase where physical works are planned, prior to any ground disturbing activities where past soil disturbance has not been previously documented. In the event a land-based archaeological resource is found, avoidance of the resource will be practiced.

As no built heritage resources have been located within the Project Area, and the Project Area is not used for traditional purposes, construction of the SWP will have no effect on built heritage resources or cultural heritage landscapes.

Criterion: Potential for effects to residents in the local community

Indicator: Potential for disturbance effects to residents from construction related traffic

A Traffic Impact Assessment (TIA) was undertaken to determine future traffic conditions during construction including impact to arterial road traffic as detailed in the next indicator. Construction traffic can disturb residents living along construction access routes with noise, dust and limitations on access to private property. The typical volume of trucks per day on any of the construction access routes is 60-80 with a worst case of 220 trucks per day on Brimley Road and 200 trucks per day accessing the Guild construction route through Guildwood Village.

Construction traffic on Brimley road will have minimal effects on local residents as private properties generally back onto Brimley Road rather than face it. This means that traffic is removed from affecting access to and from private properties. Many of these properties are well vegetated and are separated from the road. These physical realities will mitigate noise and dust effects from construction traffic. It is anticipated that some residents may hear the trucks rolling up and down Brimley Road and in particular they are likely to hear the trucks braking. These effects will be temporary and happen in fall, winter, and spring, and should not impede anyone's use of their property. Best practice mitigative measures such as truck back-up beepers with lower volume, conforming to local noise by-laws/ordinances, conformance with assigned construction routes, minimized use of air brakes, and minimized truck idling will be used to lessen the effects of construction traffic noise.

Construction traffic through Guildwood Village will cause disturbance to local residents from noise and some congestion as detailed below. Guildwood residents have raised concerns about additional traffic through their neighbourhood and have raised issues about a number of other projects with the potential to add more traffic congestion. The cumulative effects of traffic from the SWP and other projects are assessed in **Section 7.3.4.3**. It is anticipated that Guildwood residents will be disturbed by the construction traffic moving through the neighbourhood. In order to address issues and concerns

throughout construction TRCA will have a dedicated community liaison officer who will respond to all community concerns and issues and seek resolution where possible. TRCA will also implement best practices for construction traffic through neighbourhoods including tire washing, and maintenance and inspection of vehicles. The construction traffic for SWP will result in a negative effect to Guildwood residents likely to be disturbed by traffic noise and congestion.

Indicator: Potential impacts to arterial road traffic

A Traffic Impact Assessment (TIA) was undertaken to identify current traffic patterns and to predict future traffic patterns accounting for construction traffic via Brimley Road and through Guildwood Village. The typical volume of trucks per day on any of the construction access routes is 60-80 with a worst case of 220 trucks per day on Brimley Road and 200 trucks per day accessing the Guild construction route through Guildwood Village. The TIA is provided in **Appendix J**.

Brimley Road is the primary access for the West Segment (see **Figure 6-14** in **Chapter 6**). It is a two lane, north-south collector roadway with a posted speed limit of 50 km/h. This route is proposed to provide access for both inbound and outbound truck traffic from October to April for the construction of the West Segment components.

For the purposes of the TIA it was assumed that inbound trucks would utilize 20% right hand turns from Kingston Road, 50% left hand turns from Kingston Road, and 30% of trucks going straight south through the intersection of Brimley Road and Kingston Road. This same directional distribution is to be used for outbound traffic as well (50% right hand turns, 20% left hand turns and 30% straight). Using these assumptions, the TIA determined that the addition of construction traffic would not affect the queues at the intersection of Brimley Road and Kingston Road and the intersection would operate at an acceptable Level of Service.

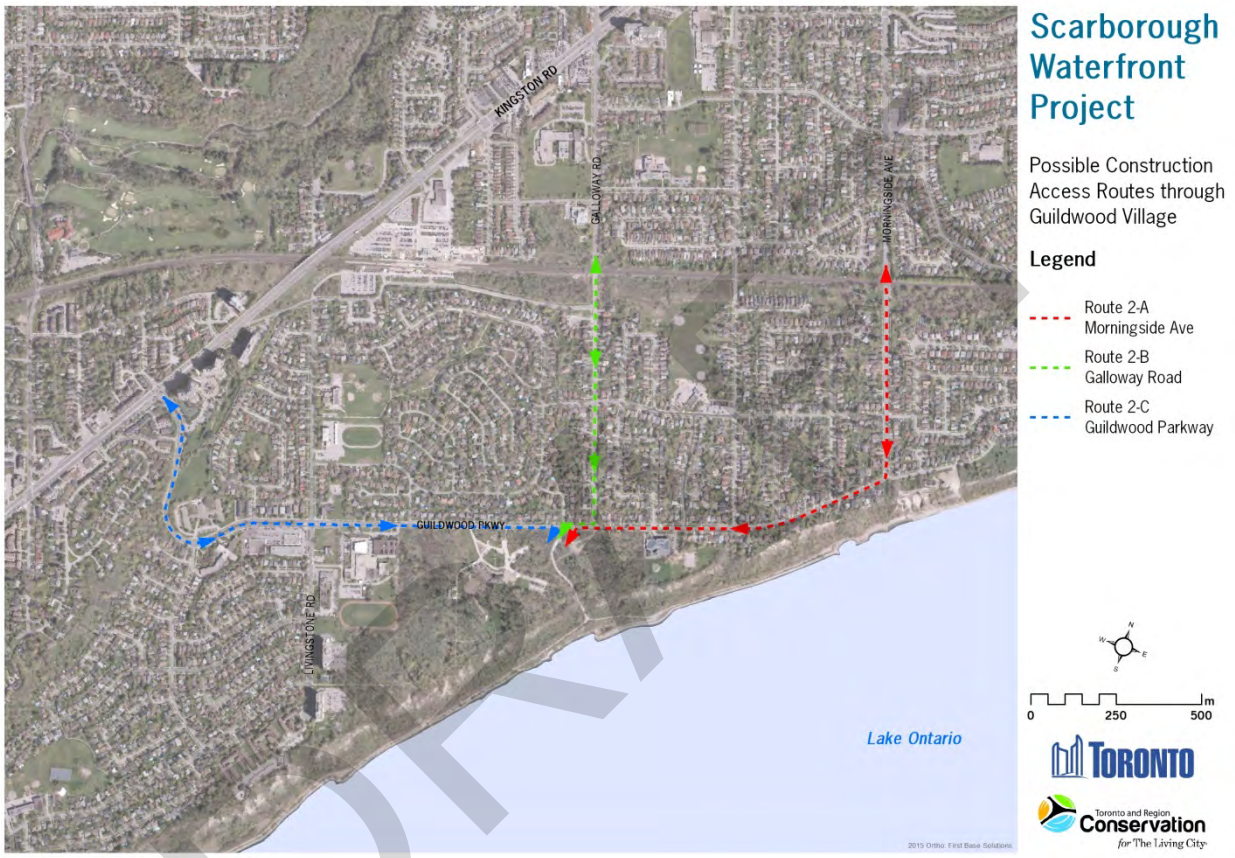
The Guild construction access route was created by TRCA in the 1980's for the purpose of constructing and maintaining remedial shoreline protection below Guild Park and Gardens, Guildwood Parkway, South Marine Drive, Sylvan, and most recently Meadowcliffe.

There are several possible routes through Guildwood Village that can be taken to the Guild construction access route. The routes assessed by the TIA are shown in **Figure 7-1** and outlined below.

The TIA analyzed each of the above routes for both inbound and outbound traffic. The analysis considered impacts on Level of Service, transit, pedestrian activity, cyclist activity, road type, residential frontage, as well as considering all road restrictions. For inbound routes, it was determined that Galloway Road and Guildwood Parkway are

already experiencing capacity and delay problems for left turns from Kingston Road. The addition of construction traffic to these areas would further increase queuing and significantly impact the intersections. As this limitation does not apply to the intersection at Morningside Avenue and Kingston Road, it was chosen as the preferred route for 100% of inbound construction traffic.

Figure 7-1 Possible construction access routes through Guildwood Village



As Morningside Avenue is the only inbound access, it was not considered as an outbound access in order to reduce truck volume traffic on Morningside Avenue. Galloway Road was chosen as the preferred outbound route over Guildwood Parkway due to the fact that Galloway Road:

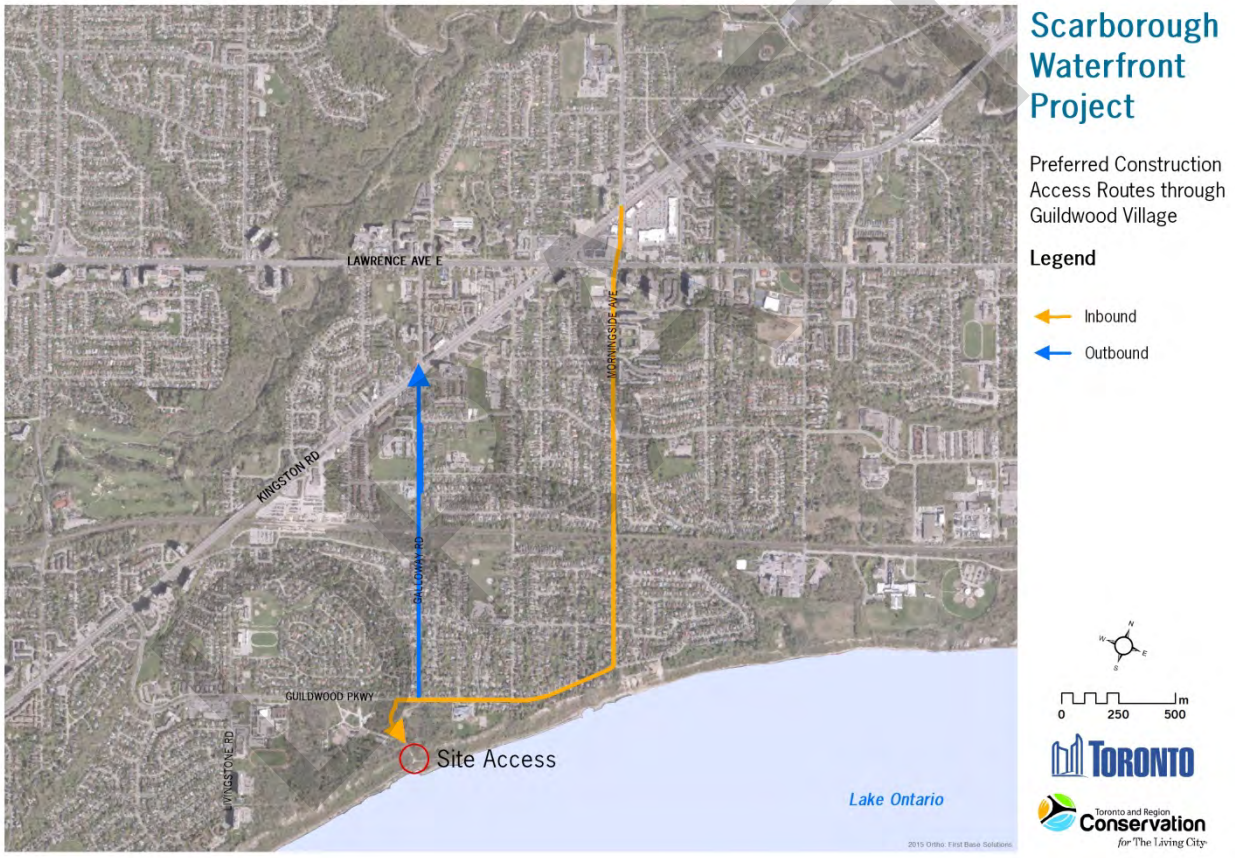
- has no TTC service;
- has fewer sidewalks (less anticipated pedestrian traffic); and
- is a wide two-lane road.

This preferred construction access route is shown in **Figure 7-2**. The TIA determined that the addition of inbound construction traffic via Morningside Avenue would not affect the queues at the intersection of Morningside Avenue and Kingston Road, nor would the addition of outbound construction traffic via Galloway Road affect the queues at the

intersection of Galloway Road and Kingston Road. The TIA also determined that this preferred construction access route would allow both intersections to operate at an acceptable Level of Service.

Truck traffic mitigation measures and best management practices will be employed and are provided in **Appendix H**. Examples of best practice mitigation measures to be implemented include maintenance and daily inspection of vehicles, minimized truck idling, conformance with local noise by-laws/ordinances, conformance with assigned construction routes, minimized use of air brakes, and maintenance of safe driving speeds.

Figure 7-2 Preferred construction access route through Guildwood Village



Indicator: Potential disturbance effects to residents from construction activity

Local residents backing onto the areas that will be under construction may be disturbed by construction activities. In particular, residents may hear the movement of construction equipment such as bulldozers, trucks and front end loaders and the sound of material being dumped to create the new land base. Construction activities will adhere to the City of Toronto Noise By-Law with respect to the hours of construction

and all equipment will be kept in proper operating condition to minimize effects. Residents may see some dust from construction activities particularly earth movement. Given the location of residences on the top of bluff away from construction it is not anticipated that any residents will be affected by dust. All construction activities will use best management practices to minimize the disturbance effects of construction on local residents. Disturbance effects related to construction are anticipated to be minor and temporary.

Summary: Potential for effects to residents in the local community

Overall, construction of the SWP will result in a negative effect to Guildwood residents likely to be disturbed by traffic noise and congestion. However, best management practices, such as well-maintained vehicles, adherence to construction traffic routes and minimal use of air brakes, will lessen the effects of construction traffic noise. Additionally, a dedicated community liaison officer will be available to respond to all community concerns and issues, seeking resolution where possible. Disturbance effects related to construction activity are anticipated to be minor and temporary, through adherence to best management practices and the City of Toronto's Noise By-Law. There are no effects anticipated to arterial road traffic.

Table 7-12 Detailed Effects Assessment: Objective 4 Construction.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential impact to known or potential archaeological sites	TRCA has opted to avoid all three marine resources and buffer them appropriately to minimize impacts. However, avoidance with buffering is only suitable for the two barges, as they are wholly submerged. The other two resources are exposed to elements that can cause damage to the resource, therefore, in addition to avoidance with buffering, minimal archaeological recording of the two resources will be conducted. The potential to encounter land-based archaeological resources along the tablelands was identified in the Stage 1 assessment.	Stage 2 assessments will be undertaken during Detailed Design where physical works are planned, prior to any ground disturbing activities where past soil disturbance has not previously been documented. In the event a land-based archaeological resource is found, avoidance of the resource will be practiced.	Negligible • Potential effects are considered negligible

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
	Potential for impact to known built heritage sites, and cultural heritage landscapes	None	None	None
	Potential for impact on traditional land uses and valued cultural features	None	None	None
Potential for effects to residents in the local community	Potential for disturbance effects to residents from construction related traffic	Construction traffic on Brimley road will have minimal effects on local residents as private properties generally back onto Brimley Road therefore traffic is removed from affecting access to and from private properties. It is anticipated that some residents may hear the trucks rolling up and down Brimley Road and in particular they are likely to hear the trucks braking. These effects will be temporary and intermittent and should not impede anyone's use of their property. Construction traffic through Guildwood Village will cause disturbance to local residents from noise and some congestion. Guildwood residents have raised concerns	Best practice mitigative measures such as well-maintained vehicles, adherence to construction traffic routes and minimal use of air brakes will lessen the effects of construction traffic noise. In order to address issues and concerns throughout construction TRCA will have a dedicated community liaison officer who will respond to all community concerns and issues and seek resolution where possible.	Negative • The construction traffic for SWP will result in a negative effect to Guildwood residents likely to be disturbed by traffic noise and congestion
	Potential impacts to arterial road traffic	The TIA determined that the addition of construction traffic would not affect the queues at the major intersections along the proposed truck route (Brimley Road and Kingston Road, Morningside Avenue and Kingston Road, and Galloway Road and Kingston Road), and the intersections would	None	None

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
		operate at an acceptable Level of Service.		
	Potential disturbance effects to residents from construction activity	Residents may hear the movement of construction equipment such as bulldozers, trucks and front end loaders and the sound of material being dumped to create landfill.	Construction activities will adhere to the City of Toronto Noise By-Law with respect to the hours of construction and all equipment will be kept in proper operating condition to minimize effects. All construction activities will use best management practices to minimize the disturbance effects of construction on local residents.	Negligible • Disturbance effects related to construction are anticipated to be minor and temporary

7.3.4.2 Operation Effects

Criterion: Integration with City and other agency plans and initiatives

Indicator: Consistency with the Fish Community Objectives for Lake Ontario

The Fish Community Objectives for Lake Ontario (Stewart et al., 2013) are to be used as a guide by the MNRF and New York State Department of Environmental Conservation to carry out their mandates to manage the fish and fisheries of Lake Ontario. On a local scale, the SWP will advance these goals and objectives once implemented. A qualitative assessment of the ability of the Preferred Alternative to support Nearshore Zone Goals and Offshore Pelagic Zone Goals of the Fish Community Objectives for Lake Ontario was assessed.

The Fish Community Objectives for Lake Ontario identifies the following goals for the Nearshore and Offshore Pelagic Zones, as shown in **Table 7-13**:

Table 7-13 Fish Community Objectives for Lake Ontario Goals for the Nearshore and Offshore Pelagic Zones.

Nearshore Zone Goal	Protect, restore and sustain the diversity of the nearshore fish community, with an emphasis on self-sustaining native fish such as Walleye, Yellow Perch, Lake Sturgeon, Smallmouth Bass, Largemouth Bass, sunfish, Northern Pike, Muskellunge, Round Whitefish, and American Eel.
Offshore Pelagic Zone Goal	Maintain the offshore pelagic fish community that is characterized by a diversity of trout and salmon species including Chinook Salmon, Coho Salmon, Rainbow Trout, Brown Trout, and Atlantic Salmon, in balance with prey fish populations and lower trophic levels.

The SWP results in aquatic habitat improvements that will provide local gains in habitat quality to the nearshore habitats.

With respect to the Fish Community Objectives for Lake Ontario, SWP will:

- Support these Objectives through the creation of new, longer and more diverse open coast complete with structural habitat features along the new structures and the existing revetments. Together, these measures will improve the potential foraging, spawning and nursery habitat for the native fish utilizing the open coast habitat within the Project Area.
- Support these Objectives by enhancing habitat quality for the prey-fish community via improving shoreline morphology and substrate diversity to create more foraging, cover and shelter opportunities.
- Support cool and cold water pelagic fish species, such as Lake Trout, through the creation of habitat features and support cool and cold water fish communities through the creation of backwater refuge areas behind headlands and additional augmentation of the shoreline with surcharged areas.

Overall, SWP results in aquatic habitat improvements that will provide local gains to the nearshore open coast habitat that are expected to help meet the nearshore and offshore goals of the Fish Community Objectives for Lake Ontario. As a result, the SWP is expected to have a positive effect on coordination with the Fish Community Objectives for Lake Ontario.

Indicator: City of Toronto Official Plan and TRCA Living City Policies

The Preferred Alternative was reviewed to ensure consistency with the policies of the City of Toronto Official Plan and the TRCA's The Living City Policies. The relevant policies are outlined in **Chapter 2**. This indicator was assessed by review the Official

Plan and The Living City Policies and doing a qualitative assessment of the Preferred Alternative's consistency with both sets of policies.

These policy documents support the provision of a continuous, accessible trail along the waterfront, connecting green spaces which is removed from hazard risks such as landslides. By providing this trail, the SWP provides an improvement to the existing conditions which is consistent with the policy direction contained in the Official Plan and The Living City Policies.

Indicator: Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens

The Management Plan for Guild Park and Gardens identifies a number of new and enhanced recreational opportunities and linkages to the open space system. The Preferred Alternative was reviewed to ensure consistency with the intent to create linkages between these amenities and the shoreline within the SWP Project Study Area and thus support the goals and implementation of the management plan. Once the SWP is established, improved trail connections along the waterfront and to the waterfront will support the Management Plan.

Indicator: Consistency with objectives of the Wet Weather Flow Master Management Plan

The Preferred Alternative is reviewed to ensure consistency with the City of Toronto Wet Weather Flow Master Management Plan (WWFMMP). The goal of the WWFMMP is to reduce and ultimately eliminate the adverse impacts of wet weather flow, which is runoff generated when it rains or snows, to protect our environment improve the ecosystem health of the watersheds. The Plan was developed with the recognition that wet weather flow will be managed on a watershed basis accompanied by a hierarchy of solutions starting with "at source", followed by "conveyance," and concluding with "end-of-pipe."

The SWP provides the opportunity to provide "end-of-pipe" management of stormwater through the improvement of stormwater outfall locations with wet features which will contribute to the primary treatment of stormwater before it enters Lake Ontario. The size and thus function of these wet features is limited by the land base available at the base of the bluffs and the volume of water. Wet features will be constructed in the following locations:

- Base of Doris McCarthy Trail
- Base of Grey Abbey Ravine

By providing these wet features, the SWP provides an improvement to the existing conditions which is consistent with the direction contained in the Wet Weather Flow Management Plan.

Summary: Integration with City and other agency plans and initiatives

Implementation of the SWP will have a net positive effect with respect to integration with City and other agency planning initiatives. The Project will provide local gains with regard to achieving goals established in the Fish Community Objectives for Lake Ontario through regional and local improvements to the nearshore open coast fish communities. The SWP is also consistent with the long-term planning in the City of Toronto Official Plan and TRCA Living City Policies with respect to the waterfront and waterfront Trails. As well, the Project is consistent with the goals of the Management Plan for Guild Park and Gardens, and will support the achievement of objectives of the WWFMP by contributing to end of pipe treatment at stormwater outfalls.

Criterion: Potential for effects to residents in the local community

Indicator: Potential disturbance effects from waterfront users and parking

As noted in **Chapter 2** and **Chapter 3** of this EA, it is anticipated that as the City of Toronto's population grows, densifies and changes there will be increased demand for recreational use and spaces and consequently, increased use of the Scarborough Waterfront. One of the drivers of SWP was to ensure appropriate trails and spaces are in place to manage the anticipated future uses. Local residents raised concerns during the EA planning with respect to how current level of use and this increased use is and could affect the use and enjoyment of their private properties. It is noted that most of the existing concerns pertain to areas around Bluffer's Park and the trail heads for Doris McCarthy and Guild construction access route. In general, the concerns and potential effects relate to parking on residential streets, litter, and trespass.

With respect to Bluffer's Park, the City of Toronto is undertaking a number of pilot projects to better manage parking and the line-ups that can occur to get into the park on busy days. These projects include better security, turning cars around north at Barkdene Hills when parking lots are full, and parking gates. In addition, discussions with adjacent schools and other facilities are on-going to secure shared use of parking lots. It is hoped that these pilot projects will alleviate some of the existing effects from inappropriate parking, litter, and trespass near Bluffer's. Changes to the shoreline as a result of the SWP are not anticipated to make the situation worse as it is already at capacity. The provision of the trail connection further to the east may improve the situation as users will be able to park at other locations and walk or bike to Bluffer's Park as a destination.

With respect to Doris McCarthy Trail, there will be no parking or improvements of the trail or at the trailhead which will continue to limit use. No changes to the area are contemplated at this time

With respect to the Guild access route, parking will be available at the existing gravel lot. This may alleviate some of the pressures at Bluffer's Park as users become aware that this access is also available.

Throughout the Project Study Area the Waterfront Trail will move from on-street locations to the waterfront taking cyclists off of the roads and out of local communities.

Summary: Potential for effects to residents in the local community

It is expected that the disturbance effects from waterfront users and parking on residents in the local community will likely remain the same, with no improvements as a result of the SWP.

Criterion: Integration with existing land uses

Indicator: Compatibility with existing land use (open space, institutional and industrial)

The SWP Project area is currently a patchwork of residential, open space, industrial and institutional land uses as described in **Section 3.3.1**. The SWP builds on the existing open space network in accordance with the City of Toronto Official Plan and TRCA's The Living City Policies. The park space and trail connection created by the SWP is compatible with existing land use.

Summary: Integration with existing land uses

The SWP is consistent with existing land uses.

Table 7-14 Detailed Effects Assessment: Objective 4 Operation.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Integration with City and other agency plans and initiatives	Consistency with the goals of the Fish Community Objectives for Lake Ontario	The SWP will provide local gains with regard to achieving goals established in the Fish Community Objectives for Lake Ontario	None	Positive • Improvements are anticipated both regionally and locally to the nearshore open coast fish communities

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
	City of Toronto Official Plan and TRCA Living City Policies	The SWP is consistent with the City of Toronto Official Plan and TRCA Living City Policies with respect to the waterfront and waterfront trails	None	Positive • The SWP is consistent with long term planning in the City of Toronto Official Plan and TRCA Living City Policies
	Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens	The SWP is consistent with the goals of the management plan and as such will support the achievement of the goals and objectives of the Management Plan for Guild Park and Gardens	None	Positive • The SWP will result in positive linkages with the Guild Park and Gardens site
	Consistency with objectives of the Wet Weather Flow Master Management Plan	The SWP supports the achievement of the objectives of Wet Weather Flow Master Management Plan by contributing to end of pipe treatment at stormwater outfalls	None	Positive • The SWP will support achievement of objectives of Wet Weather Flow Management Master Plan
Potential for effects to residents in the local community	Potential disturbance effects from waterfront users and parking	The SWP is not anticipated to make disturbance effects worse at Bluffer's Park as it is already at capacity. The provision of the trail connection further to the east may improve the situation as users will be able to park at other locations and walk or bike to Bluffer's Park as a destination. With respect to Doris McCarthy Trail, there will be no parking or improvements of the trail or at the trailhead which will continue to limit use. With respect to the Guild access route, parking will be available at the existing gravel lot. This may alleviate some of the pressures at Bluffer's park as users become aware that this access is also available. Throughout the Project Study Area the Waterfront Trail will move from on-street locations to the water's edge taking cyclists off of the roads and out of local communities.	None	Situation will likely remain the same with no improvement as a result of SWP

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Integration with existing land uses	Compatibility with existing land use (open space, institutional and industrial)	The SWP is consistent with existing land uses	None	No effect

7.3.4.3 Summary of Objective 4

This Objective measures consistency and coordination with other initiatives. The Preferred Alternative was evaluated for alignment of plans policies and existing uses. The SWP is consistent with the relevant planning and policy documents and in many cases supports the achievement of the stated goals and objectives.

It is anticipated that construction activities and construction traffic may affect some local residents particularly in the Guildwood neighbourhood. This neighbourhood has experienced these effects in the past and is sensitive to them. In addition, there are a number of other construction projects on-going planned and proposed that will affect local residents. These other projects are detailed in **Table 7-15**.

Table 7-15 On-going and proposed construction projects with the potential to impact the Guildwood Community.

Project	Proponent	Status	Location	Potential Cumulative Effects
Lakeshore East Rail Corridor Expansion	Metrolinx	Approved and under Detailed Design.	Along rail corridor and cross streets throughout Project Study Area	• Construction traffic • Noise • Dust • Corridor operation – one train every 7 minutes • Closure of at grade rail crossings
Eglinton LRT Kennedy to Morningside	TTC/ Metrolinx		Kennedy to Morningside	• Diversion of traffic during construction from Kingston Road to Guildwood Parkway by means of Morningside, Poplar and Galloway
Morningside Grade Separation	Metrolinx	Approved	Morningside rail corridor crossing	• Crossing open to traffic during construction
Galloway Grade Separation	Metrolinx	Approved	Galloway rail corridor crossing	• Galloway road will be closed for approximately 3 years during construction
Guild Inn Estates	Dynamic Hospitality	Approved and set to open spring 2017	Former Guild Inn site	• Anticipated to have minimal impact on traffic but that will be dependent on timing and popularity of events at the new event space and use of surrounding park land

Condo developments along Kingston Road	Various	Various	Various	• Construction traffic • Noise • Dust
Ongoing operations at Highland Creek WWTP – two week summer biosolids removal	City of Toronto	On-going	Copperfield Road	• Traffic

The effects associated with many of the projects identified relate to construction nuisances and construction traffic. Provincial and Municipal regulations, guidelines and by-laws recognize that construction is part of the growth and revitalization of urban areas and as such there are best management practices to mitigate the effects to acceptable levels. However, there are no standards in place for noise or traffic congestion related to construction.

It is recognized that the Guildwood community will be experiencing a cumulative effect from disturbances associated with construction of multiple projects over an extended period of time. Given the nature of cumulative effects it is necessary to put in place mitigative measures that address the effects from all sources. To this end, TRCA will work with Metrolinx, the City of Toronto, and the TTC to put in place a plan to coordinate construction traffic through the neighbourhood to minimize on-going effects. This will include a dedicated community liaison officer to deal with community comments and issues, changing construction access routes as construction increases and decreases in the neighbourhood, and liaison with school boards and the TTC to ensure those uses are not making the situation worse. The Traffic Impact Assessment will be completed at Detailed Design and will incorporate all updated information available about the other Projects occurring through the area.

Table 7-16 Overall effects related to Objective 4.

Criteria	Indicator	Overall Effects
Integration with City and other agency plans and initiatives	Consistency with the goals of the Fish Community Objectives for Lake Ontario	Positive
	City of Toronto Official Plan and TRCA Living City Policies	Positive
	Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens	Positive
	Consistency with objectives of the Wet Weather Flow Master Management Plan	Positive
Impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential impact to known or potential archaeological sites	Negligible effect
	Potential for impact to known built heritage sites, and cultural heritage landscapes	No effect
	Potential for impact on traditional land uses and valued cultural features	No effect

Potential for effects to residents in the local community	Potential for disturbance effects to residents from construction related traffic	Negative
	Potential impacts to arterial road traffic	Negligible
	Potential disturbance effects to residents from construction activity	Negligible
	Potential disturbance effects to waterfront users and parking from construction activity	Negligible
	Potential disturbance effects from waterfront users and parking during operation	Negligible
Integration with existing land uses	Compatibility with existing land use (open space, institutional and industrial)	No effect
Summary: Overall the SWP supports and integrates well with City and other agency plans and initiatives. There are three marine archaeology sites for which effects will be avoided or mitigated. The SWP will result in negative effects to the local Guildwood neighbourhood from construction traffic particularly when the traffic from other projects in the Guildwood neighbourhood is considered. Mitigative measures have been proposed to manage these effects. These negative effects are relatively short-term and are outweighed by the positive long-term benefits of the SWP locally and regionally. Therefore, the SWP meets the objective of integrating with City and other agency plans and initiatives.		

7.3.5 Objective 5: Achieve Value for Cost

7.3.5.1 Construction Effects

Criterion: Estimated capital cost

Indicator: Estimated cost to construct

A capital construction cost estimate was prepared to determine the achievement of value for cost for the SWP. Capital construction costs were developed by TRCA based on current, relevant, construction rates, knowledge of the local market conditions and a database of cost information for similar large scale waterfront projects from across Southern Ontario. The costs outlined in this section are based on material quantity estimates, assumptions, and relevant project experience with similar waterfront projects.

Total capital investment is estimated to be $170 million, over a 12-year implementation period, including post-implementation reporting and monitoring. Given the conceptual level of detail considered in the EA, and annual inflation over the course of the Project, the estimated capital investment includes a healthy contingency of 50%. The total capital investment will continue to be refined during Detailed Design, as concepts are further detailed.

Indicator: Amount of waterlot and private property acquisition required

Implementation of the SWP will require the acquisition of both waterlots and the riparian or shoreline zone of private properties. The shoreline zone would include the shoreline, bluff face and receding crest of the bluff to the stable slope line. This is an area property owners would have limited use of due to the inherent hazards. The SWP would result in

the acquisition of 28 ha of waterlots and 14 ha of private property. Property acquisition would be undertaken in Detailed Design.

Summary: Estimated capital cost

Total capital investment for the Project is estimated to be $170 million over a 12-year implementation and post-implementation period. It is expected that implementation of the SWP will result in the acquisition of 28 ha of waterlots and 14 ha of private property.

Table 7-17 Detailed Effects Assessment: Objective 5 Construction.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Estimated capital cost	Estimated cost to construct	$170 million	None	$170 million investment over a 12-year implementation and post-implementation period
	Amount of waterlot and private property acquisition required	28 ha of waterlots; 14 ha of private property	Market based compensation	28 ha of waterlots; 14 ha of private property

7.3.5.2 Operation Effects

Criterion: Maintenance costs associated with the new shoreline and erosion protection structures

Indicator: Average maintenance costs of the shoreline and erosion works being proposed.

Maintenance costs for the SWP will be borne jointly by the City of Toronto and TRCA. The City will be responsible for the maintenance and operation costs of the park areas, while TRCA will be responsible for the maintenance costs associated with shoreline and erosion protection works. These costs include operational staff time, equipment, vehicles, materials required for maintenance and modest annual capital improvements and replacements.

The annual costs for maintenance and operation of the SWP is expected to fluctuate slightly on a year to year basis based on changing needs as the area matures or as particular issues arise and are addressed. The operating costs will also rise with inflation. It is important to note that the SWP will not be revenue generating and will not return any funds towards operational costs. The SWP is to remain a free amenity for

public benefit with operations and maintenance costs that must be borne by public funds.

The estimated maintenance costs of the shore protections works are in the order of $2,500 per linear meter of shoreline protection works. The works are carried out as required. Generally, structures may begin requiring maintenance after approximately 25 years and is carried out for the design life of the structures. With ongoing periodic maintenance the design life of shore protection works can be extended nearly for the foreseeable future. Not all shoreline requires maintenance at the noted at 25 year increment. Our experience suggests that less than 25% of shore length requires maintenance.

Summary: Maintenance costs associated with the new shoreline and erosion protection structures

The estimated maintenance costs of the shore protections works are in the order of $2,500 per linear meter of shoreline protection works, as required. These costs are not anticipated to be required until the structures have been in place approximately 25 years.

Table 7-18 Detailed Effects Assessment: Objective 5 Operation.

Criteria	Indicators	Effects	Mitigation Measures	Net Effects
Maintenance costs associated with the new shoreline and erosion protection structures	Average costs of the shoreline and erosion works being proposed	$2,500 per linear metre of new shoreline protection works, as required. These costs are not anticipated to be required until the structures have been in place approximately 25 years		$2,500 per linear metre of new shoreline protection works, as required. These costs are not anticipated to be required until the structures have been in place approximately 25 years

7.3.5.3 Summary of Objectives

Table 7-19 Overall effects related to Objective 5.

Criteria	Indicator	Overall Effects
Estimated capital cost	Estimated cost to construct	$170 million investment over a 12-year implementation and post-implementation period.
	Amount of waterlot and private property acquisition required	28 ha of waterlots; 14 ha of private property
Maintenance costs associated with the new shoreline and erosion protection structures	Average maintenance costs of the proposed shoreline and erosion works	$2,500 per linear metre of new shoreline protection works, as required. These costs are not anticipated to be required until the structures have been in place approximately 25 years.
Summary: Based on support from the City of Toronto, the SWP achieves value for cost by managing hazard risks to users and public infrastructure and providing a public amenity.		