

## **7.0 DETAILED ASSESSMENT OF THE PREFERRED ALTERNATIVE**

### **7.1 APPROACH TO STEP 4 DETAILED ASSESSMENT OF THE PREFERRED ALTERNATIVE**

The provincial EA processes under which the LWC Project 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 LWC Project, we are seeking to address the problem: an ecologically degraded and disconnected area of waterfront; and the opportunity: creating aquatic and terrestrial habitats and providing for public access to and along the waterfront as discussed in Chapter 2.

For all EAs, it is recognized that changes to project design and/or construction methods are likely to occur during detailed design between EA approval and construction. To address these changes, EAs have provisions for the proponent to assess whether or not the desired change makes the negative project effects worse. In general, any change to the project should mitigate project effects rather than make them worse. Therefore, if a proponent wished to manage flexibility they would define the project in a way that determined the worst acceptable level of impact at the EA stage or, in other words, assess a worst-case scenario. The impact assessment for this EA defines the *worst-case scenarios* for negative project effects, since these effects will not worsen should the project design or construction methods change, and can thus be easily dealt within the existing EA process.

The effects assessment presented in Section 7.3 is based on the LWC Project utilizing 2.0 million m<sup>3</sup> of clean fill to capture the “worst-case scenario” for any effects. A smaller potential footprint size of the Preferred Alternative, utilizing a lower limit of 1.5 million m<sup>3</sup> of clean fill, could also be established depending on the availability of fill material and budget considerations. The smaller footprint would maintain the same general shoreline configuration and habitat features as presented in Chapter 6. To maintain flexibility during detailed design while ensuring the “worst-case scenario” for any effects is captured in the EA, a sensitivity analysis is presented in Section 7.4 to determine if effects could increase on a smaller footprint.

The positive benefits of the LWC Project in creating a functional ecological system and providing public access to a section of the Mississauga Waterfront that is currently inaccessible are anticipated to greatly exceed any potential negative effects during construction. The establishment/post-establishment phase of the LWC Project includes a measurable improvement in ecological functioning over existing conditions, and lends itself to the use of minimum design requirements (i.e., elements of the design that are described in Chapter 6 and must be achieved at the end of construction).

The framework for this detailed assessment recognizes that the negative effects associated with the LWC Project are associated with construction, and thus lend themselves to bounding (*worst-case*) scenarios. If, following the completion of the detailed assessment, the design was to change within these worst-case bounds, the effects would likely be less, as demonstrated through the sensitivity analysis for a smaller footprint presented in Section 7.4, thus no re-evaluation would be required.

## **7.2 ASSESSMENT CRITERIA AND INDICATORS**

Using the criteria developed during Steps 1 to 3 as a basis, a set of indicators and their associated measures were defined for construction and establishment to structure and, where possible, quantify the effects of the construction and establishment of the LWC Project on the environment.

### **7.2.1 Identifying Net Effects**

For each indicator, the effects to existing conditions (Chapter 3) due to LWC Project 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 establishment/post-establishment, and were quantified where possible. As described above, these are generally considered to be minimum design requirements that the LWC Project must achieve in detailed design and construction.

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 of these include air and noise emissions from construction equipment and temporary rerouting of recreational trails.

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

## **7.3 EFFECTS ASSESSMENT BY OBJECTIVE**

The effects of the LWC Project 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 LWC Project objective; for each objective, effects are first presented in two tables (construction, establishment/post-establishment), and are followed by a summary description of the overall success of the LWC Project in meeting the objective.

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While criteria for each objective could be relevant to both construction and establishment/post-establishment, it was determined that indicators, and criteria with no indicators, are relevant to only one phase. Table 7.1 provides the criteria and indicators by objective as well as to which phase the indicator is relevant. Table 7.1 also provides rational for each indicator.

**Table 7.1 Effects Assessment Criteria and Indicators Relevant to Phase**

Criteria	Indicator	Relevant to	
		Construction	Establishment/ Post- Establishment
<b>Naturalization</b>			
Ability of alternative to be self-compensating with respect to fish habitat	Area of aquatic habitat lost or altered (ha)	✓	
	HAAT model estimates of area requiring compensation (ha)	✓	
	Potential disruption to fish habitat as a result of land creation activities (siltation, fish removal, etc.)	✓	
Habitat removal or disruption during construction of site access road and laydown area	Terrestrial habitat and vegetation removed or disrupted.	✓	
	Number of Species at Risk removed/disrupted	✓	
	Aquatic habitat removed or disrupted	✓	
Change in shoreline character	Change in diversity of shoreline types created		✓
	Quantitative assessment of shoreline irregularity and the ability to provide nearshore habitat		✓
Ability to create functional habitat blocks	Area of habitat created of wetland, forest, and, meadow.		✓
	Assessment of improvements to aquatic habitat created and ecological benefits achieved through the changes to Serson and Applewood Creeks		✓
	Qualitative assessment of habitat created including benefits created by LWC with respect to filling in missing and/or impaired portions of aquatic and terrestrial ecosystems in this part of the Mississauga waterfront		✓
	Qualitative assessment of connectivity between habitats for the movement for wildlife (e.g. mammals, herptofauna, invertebrates, fish, birds, etc.)		✓
Effects of hydraulics and hydrology / sedimentation on sustainability of wetland communities	Qualitative assessment of ability to manage a full range of flows without adverse impact on wetland communities (high erosional stress, sediment deposits)		✓
	Influence of lake level fluctuation on channel and wetland connectivity		✓
	Potential for sedimentation to affect channel form (including river mouths) and associated vegetation		✓
	Qualitative assessments of the adaptability of the wetland function to climate change.		✓
	Qualitative assessment to determine the ability of river channels and shoreline works to accommodate changes in flow and lake levels due to climate change		✓

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**Table 7.1 Effects Assessment Criteria and Indicators Relevant to Phase (Cont'd)**

Criteria	Indicator	Relevant to	
		Construction	Establishment/ Post- Establishment
<b>Access</b>			
Potential for change in access to and use of waterfront trail during construction	Duration and length of trail closed to use	✓	
	Potential for signalization of trail crossing with construction vehicles	✓	
Potential for change to use and enjoyment of park areas including waterfront trail during construction	Potential for dust and vehicle emissions and noise to affect Waterfront Trail use and enjoyment	✓	
	Potential for changes in ability to access and use park during construction due to traffic congestion and or changes to access	✓	
Potential for displacement of <i>built heritage resources</i> due to construction of access road, laydown area and land creation area	Cultural heritage value of built heritage resources and cultural heritage landscapes within land creation area	✓	
Potential effects from construction of access road, laydown area and land creation area on marine- and land-based archaeological resources	Significance of archaeological resources within footprint of land creation and associated park area	✓	
Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by First Nations and Métis	Extent of traditional uses of lands within LWC Project Study Area	✓	✓
Potential for lookout areas	Number of opportunities for views and character of views from the LWC Project to Lake Ontario, OPG's Lakeview site to Lake Ontario and back to the cities of Mississauga and Toronto and from the Lake Ontario onshore		✓
Potential for changes to use of waterfront for recreation	Potential for changes to water quality at Marie Curtis Beach West with respect to swimming		✓
	Potential for changes to existing recreational activities on the sand beach at Marie Curtis Park west		✓
	Potential for changes to use for windsurfers and/or kiteboarders		✓
Potential for public access to water's edge	Percentage of accessible water's edge		✓
	Potential to create tiered trail system providing seasonal access (Waterfront Trail)		✓
	Potential to create multi-use trail connection across area of land creation		✓

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**Table 7.1 Effects Assessment Criteria and Indicators Relevant to Phase (Cont'd)**

Criteria	Indicator	Relevant to	
		Construction	Establishment/ Post- Establishment
<b>Compatibility</b>			
Potential for construction traffic to affect traffic volumes on arterial roads and access and egress from arterial roads	Additional vehicle traffic on arterial roads resulting from construction	✓	
Potential for construction traffic volumes to require changes to intersections	Number of intersections requiring changes to facilitate LWC related construction traffic	✓	
Potential to affect operations at WWTF	Changes in access to outfall during construction	✓	
	Changes to access to outfall during establishment/post-establishment		✓
Potential for effects to water quality at Water Treatment Plant intakes	Potential for effects during construction	✓	
	Potential for effects during establishment/post-establishment		✓
Changes to site security for WWTF	Ability to maintain/enhance site security for the WWTF		✓
Changes to parking capacity	Potential to affect existing parking capacity at Marie Curtis Park and adjacent areas		✓
<b>Coordination</b>			
Consistency with City of Mississauga Waterfront Parks Strategy (2008)	Consistency of alternative with Waterfront Parks Strategy		✓
Consistency with the Visioning for Inspiration Lakeview	Consistency of alternative with Visioning for Inspiration Lakeview		✓
	Ability to integrate alternative with potential plans for OPG's Lakeview site		✓
Consistency with LOISS	Consistency of alternative with priorities identified by LOISS		✓
Consistency with Lake Ontario Biodiversity Strategy	Consistency of alternative with priorities identified by the Lake Ontario Biodiversity Strategy		✓
Consistency with Marie Curtis Park Revitalization Plan	Ability to integrate recreational opportunities and trails between the LWC, Arsenal Lands and Marie Curtis Park	✓	✓
MNR Lake Ontario Fish Community Objectives	Consistency with the goals of the MNR Lake Ontario Fish Community Objectives		✓
Consistency with CVC's hazard land guidelines and regulations.	Potential for flooding as a result of land creation		✓
<b>Fiscal Viability</b>			
Capital development cost	Capital Construction Cost estimate	✓	
Amount of fill material to be diverted from rural disposal sites	Volume of earth fill (soil) placed, brick rubble and concrete in cubic metres.	✓	
Economic and employment effects	Economic Output	✓	
	Gross Domestic Product	✓	
	# of direct full time jobs created	✓	
	# of indirect full time jobs created	✓	
Annual maintenance costs for naturalized area	# of induced full time jobs created	✓	
	Annual cost of maintenance of naturalized and park areas		✓

### **7.3.1 Objective 1: Naturalization**

#### **7.3.1.1 Construction Effects**

##### **Criterion: Ability of Alternative to be Self-Compensating with Respect to Fish Habitat**

*Indicator: Area of aquatic habitat lost or altered (ha)*

Land creation activities will result in a loss of or alteration to, existing aquatic habitat in Lake Ontario. A significant amount of that area will be lost or altered permanently as a result of land creation activities, which will create new terrestrial habitats such as meadows, forests and treed swamps. The indicator was quantitatively assessed by measuring the footprint of the land creation of the Preferred Alternative from geo-referenced aerial imagery and the LWC Project Grading Plan (2013) in ArcGIS.

The LWC Project will result in altering up to 39 ha of open coast aquatic habitat. However, this habitat is currently degraded and the LWC Project will result in 23 ha of meadow, forest and treed swamp habitat, 1.5 ha of beach habitat, 7.5 ha of wetland and estuarine habitat and 1.4 km of fish habitat in Serson Creek (between Lakeshore Road and Lake Ontario). An additional 0.4 km of habitat may become available for fish migration north of Lakeshore Road, subject to the City of Mississauga's installation of new culverts at Lakeshore Road that are anticipated in the near future. CVC is working with the City of Mississauga to explore culvert crossing designs to include consideration of fish migration under Lakeshore Road.

With the creation of new habitat, the net effect of the loss or alteration of the current aquatic habitat is expected to result in a negligible effect on aquatic habitat and the establishment of higher quality habitat will have positive effects within the LWC Project Study Area.

*Indicator: HAAT model estimates of area requiring compensation (ha)*

DFO uses a suite of tools such as the Habitat Alteration Assessment Tool (HAAT) to assess the change in habitat amount and function (from a fisheries perspective) from an existing condition to the proposed modified condition based on the following four variables: area, depth, substrate, and cover. The model seeks to identify whether there is a net benefit or impairment to the existing ecological function of a project area for a suite of fish species.

In the case of the LWC Project, the area and type of fish habitat (as defined by depth, cover and substrate) lost and altered was measured, based on the footprint of the Preferred Alternative. Habitat suitability indices for six fish groups (warmwater piscivores, warmwater non-piscivores, coolwater piscivore, coolwater non-piscivores, coldwater piscivores and coldwater non-piscivores) were incorporated for all three life stages of the fish (adult, spawning, young of the year) to assess the anticipated change in habitat value resulting from the Preferred Alternative as

defined by the HAAT model. The HAAT model results indicate a deficit of 5.8 ha of fish habitat that would require compensation.

Recognizing that the HAAT model is only one of the assessment tools used to determine overall ecological benefits of the LWC Project, it is important to utilize professional judgment of the technical team to recognize additional ancillary ecological benefits that have not been accounted for in the HAAT modeling exercise. Ancillary ecological benefits include: improved watershed function; the inclusion of functional habitats in the design and increased primary and secondary production. Ecological benefits to the watershed will be achieved by connecting Serson Creek to Lake Ontario allowing fish movement into the Serson Creek watershed from the lake (approximately 1,800 m of Serson Creek will now be accessible to fish). Approximately 3,200 m of riparian habitat will be created which will improve stream habitat structure and availability. Finally, a net increase in primary and secondary production is expected through inputs of plant material, insects and amphibians and an increase in coastal forage species such as emerald shiners. From an aquatic habitat perspective, these features will create habitat improvements on both local and regional scales. Overall these improvements will provide a functional linkage between open coast, watershed and wetland habitats and adjacent aquatic habitat refuges such as Colonel Sam Smith Park, and Etobicoke Creek to the east and Lakefront Promenade Park and the Credit River to the west.

The LWC Project will significantly enhance the quality of fish habitat in an area of highly degraded fish habitat. Through discussions with MNR, DFO and Conservation Authority biologists during detailed design, it is anticipated that the ancillary ecological benefits that are not captured in the HAAT model will result in neutral (no) net effects on fish habitat.

*Indicator: Potential disruption to fish habitat as a result of land creation activities (siltation, fish removal, etc.)*

Activities pertaining to the construction of the LWC Project have the potential to have a negative effect on the natural environment. Berm construction and placement of fill has the potential to disrupt fish habitat in adjacent areas through siltation, release of deleterious substances, and entrapment of fish within the land creation area, resulting in a negative effect. A review of the expected effects and proposed mitigation measures was undertaken to evaluate this indicator.

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. Potential disruption to fish as a result of land creation construction activities is expected to be short-term

in duration. In addition, a number of mitigation measures are proposed in order to mitigate effects related to siltation, the release of deleterious substances and direct effects on fish. A list of mitigation measures is provided in Appendix C.

The negative effects associated with construction of the landform are expected to be short in duration and mitigated with contractor requirements, fish salvage operations and the use of quarried stone products and construction rubble. As such, the net effects on fish and fish habitat will be negligible.

**Summary of: Ability of Alternative to be Self-Compensating with Respect to Fish Habitat**

Construction effects associated with fish habitat are expected to be negligible following the implementation of mitigation measures. Similarly, although the land creation is expected to result in the loss or alteration of 39 ha of aquatic habitat, more than 33 ha of higher quality terrestrial and wetland habitat and an additional 6 hectares of high quality aquatic habitat will be created. Therefore, the LWC Project is considered to be self-compensating with respect to fish habitat creating a positive effect.

**Criterion: Habitat removal or disruption during construction of site access road and laydown area**

*Indicator: Terrestrial habitat and vegetation removed or disrupted*

This indicator estimates the amount of vegetation required to be removed or disturbed for the construction access route. The amount of vegetation removed was estimated using GIS mapping of ELC communities overlain on the access route, and confirmed through visual surveys of the area.

Although the access route will follow the existing pathway, some vegetation (largely non-native trees) will require removal including the likely removal of portions of a 0.2 ha treed beach ridge. In addition, construction and use of the access route may result in a minor disruption to movement of medium sized wildlife species (e.g., installation of construction fencing may act as a physical barrier). Wildlife will likely find an alternate route around the construction site during active construction times.

A number of mitigation measures are proposed including removal of invasive species, salvaging native plant material and replanting of disturbed areas, where appropriate. Following decommissioning of the access route restoration of the treed beach ridge will be undertaken.

With respect to habitat effects, best management practices such as limiting vegetation removal to outside of the breeding bird period (March 15-July 31) will be implemented. In addition, effects will be limited to the 7-10 year construction period.

With these measures in place the effect of vegetation removal and terrestrial habitat disruption will be negligible during construction. Efforts to restore any disturbed areas will be such that a positive effect is created.

*Indicator: Number of Species at Risk removed/disrupted*

Number of Species at Risk removed/disrupted was examined as an indicator. Several Species at Risk species (such as butternut and bobolink) have been identified within the LWC Project Study Area. This indicator measures the effects to Species at Risk species as a result of construction of the site access route. Species at risk mapping and known occurrences were compared to the proposed route to determine the likelihood and character of potential effects.

No Species at Risk have been identified within the proposed footprint of the construction access road and laydown area, so no effects to Species at Risk are anticipated. As part of the final road design and layout a detailed vegetation survey will be conducted to confirm the absence of SAR.

*Indicator: Aquatic habitat removed or disrupted*

The construction access route has the potential to remove aquatic habitat associated with surface water features in the LWC Project Study Area. This indicator measures the amount of aquatic habitat lost or potentially impacted. GIS mapping of ELC communities was overlain on the route and was measured using ArcGIS.

The construction access route is not within the floodplain of either Applewood or Serson Creeks and the road will be a minimum of 20 m from the existing wetlands. Combined with standard sediment and erosion control measures (e.g., installation of silt control measures) to mitigate any potential effects from sediment discharge, the potential effects to aquatic habitat from the installation and use of the site access road and laydown area is expected to be negligible.

Summary of: Habitat removal or disruption during construction of site access road and laydown area

The potential effects from the site access road and laydown area for construction of the LWC Project are expected to be negligible because limited vegetation removal is required, best management practices should limit wildlife effects, no Species at Risk have been identified within the footprint of the construction access road and laydown area and construction will not take place within the floodplain of Applewood and Serson Creek nor within 20 m of other aquatic habitat. Mitigation measures will be implemented including salvaging native plant material and the use of standard sediment and erosion control tools such as silt fencing.

Following construction, the re-vegetation or use of the construction access road in a form that supports future plans for the Arsenal Lands is deemed to have an overall positive effect with no mitigation measures identified.

**Table 7.2 Objective 1: Naturalization (Construction Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Ability of alternative to be self-compensating with respect to fish habitat	Area of aquatic habitat lost or altered (ha)	<ul style="list-style-type: none"> <li>• Land creation activities as part of the LWC Project will result in the loss or alteration of 39-ha of degraded open coast habitat within the Project Study Area.</li> </ul>	<ul style="list-style-type: none"> <li>• The 39-ha of aquatic habitat lost or altered due to land creation activities will be used to create:                             <ul style="list-style-type: none"> <li>○ 23-ha of meadow, forest and treed swamp habitat, which provides a suite of other ecological functions;</li> <li>○ 1.5-ha of beach fish; and</li> <li>○ 7.5-ha of wetland and estuarine habitat.</li> </ul> </li> <li>• In addition, the realignment of Serson Creek will open up approximately 1.4 km of fish habitat, which is not currently available.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• While the loss or alteration of degraded fish habitat cannot entirely be mitigated strictly from an area perspective, the proposed changes in aquatic productivity and the opening of the Serson Creek watershed is anticipated to result in neutral impacts on fish habitat.</li> </ul>
	HAAT model estimates of area requiring compensation (ha)	<ul style="list-style-type: none"> <li>• The HAAT model indicates a deficit of 5.8 ha of fish habitat that will require compensation.</li> </ul>	<ul style="list-style-type: none"> <li>• The Project team will work with DFO biologists during detailed design to:                             <ul style="list-style-type: none"> <li>○ incorporate additional habitat features for specific fish species along:                                     <ul style="list-style-type: none"> <li>▪ the new revetment sections (rocky shoals); and</li> <li>▪ within the wetlands and estuarine habitats.</li> </ul> </li> </ul> </li> <li>• Wetland access gates will also contribute to further enhancements in wetland quality for fish habitat purposes.</li> </ul>	<p><b>None</b></p> <ul style="list-style-type: none"> <li>• Ancillary ecological benefits that are not captured in the HAAT model will result in no net effects on fish habitat</li> </ul>
	Potential disruption to fish habitat as a result of land creation activities (siltation, fish removal, etc.)	<ul style="list-style-type: none"> <li>• Fish habitat in the LWC Project Study Area may experience negative effects from construction activities including:                             <ul style="list-style-type: none"> <li>○ Water quality impairment due to siltation during placement of the stone;</li> <li>○ Release of deleterious substances from construction equipment and construction site runoff;</li> <li>○ Erosion of surface soils by wind and water following completion of a containment cell; and</li> <li>○ Entrapment of fish within the land creation area.</li> </ul> </li> <li>• No Species at Risk has been identified within the land creation activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of best management practices such as:                             <ul style="list-style-type: none"> <li>○ To minimize siltation:                                     <ul style="list-style-type: none"> <li>▪ construction of shoreline protection will follow the MOE Fill Quality Guidelines for Lakefilling in Ontario (March, 2003);</li> <li>▪ using quarried stone products and construction rubble the increase in turbidity is expected to be low; and</li> <li>▪ Placement will be limited to times when wave conditions allow safe construction operations and minimize potential for disruption of fill placement.</li> </ul> </li> <li>○ To minimize the risk of the release of any deleterious substance:                                     <ul style="list-style-type: none"> <li>▪ Any stockpiled materials shall be stored and stabilized away from the water;</li> <li>▪ Any part of a vehicle and/or equipment entering the water shall be free of fluid leaks and externally cleaned/degreased to prevent any deleterious substances from entering the water; and</li> <li>▪ All disturbed areas will be stabilized and re-vegetated immediately following the work.</li> </ul> </li> <li>○ To reduce harm to the existing fishery:                                     <ul style="list-style-type: none"> <li>▪ Open water construction operations will be undertaken between July 1 and March 31;</li> <li>▪ fish salvage will be done to mitigate effects related to fish entrapment within the land creation area.</li> </ul> </li> </ul> </li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Use of best management practices will ensure net effects to fish habitat are negligible.</li> </ul>

**Table 7.2 Objective 1: Naturalization (Construction Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Habitat removal or disruption during construction of site access road and laydown area	Terrestrial habitat and vegetation removed or disrupted.	<ul style="list-style-type: none"> <li>• The proposed route primarily follows an existing pathway, resulting in limited vegetation removal consisting of a couple of large mature trees and a stand of Staghorn Sumac.</li> <li>• Likely removal of portions of a 0.2 ha treed beach ridge that represents a rare natural heritage feature;</li> <li>• Potential to disrupt migratory wildlife species (e.g., birds and mammals) within the forest along the expanded trail.</li> </ul>	<ul style="list-style-type: none"> <li>• Although the remnant treed beach ridge is highly impaired, detailed design will evaluate options for restoration.</li> <li>• Native plant material will be salvaged and replanted elsewhere locally to preserve local plant genetics.</li> <li>• Disturbed areas will be replanted or brought to a rough grading condition in support of future plans for the Arsenal Lands.</li> <li>• Best management practices such as those related to <i>Migratory Birds Convention Act</i> will include:                             <ul style="list-style-type: none"> <li>○ vegetation removal will occur outside of breeding bird period (typically April 21-July 31); and</li> <li>○ a nest survey will be conducted by a qualified avian biologist prior to commencing work.</li> </ul> </li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Negative effects during construction related to removal and disruption of vegetation and terrestrial habitat and disruption of wildlife are temporary and will be mitigated either during or following construction.</li> <li>•</li> </ul>
	Number of Species at Risk removed/disrupted.	<ul style="list-style-type: none"> <li>• Species at Risk have not been identified within the footprint of the construction access road; therefore, no effects to Species at Risk are predicted.</li> </ul>	<ul style="list-style-type: none"> <li>• As part of the final road design and layout a detailed vegetation survey will be conducted to confirm the absence of SAR.</li> </ul>	<p><b>None</b></p> <ul style="list-style-type: none"> <li>• Species at Risk have not been identified within the footprint of the access road.</li> </ul>
	Aquatic habitat removed or disrupted.	<ul style="list-style-type: none"> <li>• The construction access route is not within the regulated floodplain for either Applewood Creek or Serson Creek.</li> <li>• Potential for discharge of sediment from the road into a constructed wetland on the Arsenal Lands property.</li> </ul>	<ul style="list-style-type: none"> <li>• The access road will have a minimum setback of 20 m from the existing wetland.</li> <li>• Standard sediment and erosion control measures for site drainage will be utilized including:                             <ul style="list-style-type: none"> <li>○ installation of silt fences, blankets and berms; and</li> <li>○ stabilization of exposed and newly constructed surfaces.</li> </ul> </li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Potential effects to the wetland on the Arsenal Lands property will be mitigated through the use of best management practices.</li> </ul>

### **7.3.1.2 Establishment/Post-Establishment Effects**

#### **Criterion: Change in Shoreline Character**

##### *Indicator: Change in Diversity of Shoreline Types*

The change in diversity of shoreline types refers to the difference, in metres, between the pre-construction and post-construction shoreline lengths by type (cobble beach, sand beach, and revetment). The increase in diversity at the Project Study Area will be an important step at improving the overall shoreline composition within the Regional Study Area. The pre-construction shoreline lengths by type were measured from geo-referenced aerial imagery using Arc GIS. Post construction shoreline lengths by type were measured from the LWC Project Grading Plan (2013).

The current 1,765 m of shoreline represents 2 different shoreline types: revetment (including a mix of armourstone, construction rubble and riprap); and sand beach (some of which is not publically accessible). Following construction, 2,880 m of shoreline will be composed of 6 different shoreline types (revetment, rocky island, cobble beach, gravel/cobble beach, sand/gravel beach and sand beach). The increase in shoreline diversity within the LWC Project Study Area will be an important first step at improving the overall shoreline composition within the LWC Regional Study Area. Benefits include: beaches provide increased access between terrestrial and aquatic habitats; the longer the shoreline the greater the distance available for wildlife to move between land and water and the greater function of the shoreline; lee island shorelines are more diverse and productive; and revetments lack structural diversity and do not provide productive beach habitat. The new shoreline could feature aquatic habitat features such as rocky point shoals. These features could provide additional complexity to the shoreline, on a local scale, by providing further shoreline irregularity, variations in substrate size and added vertical complexity which is beneficial to aquatic organisms. These additional features will be incorporated during detailed design. This increase in both diversity and length of substrate types represents a net positive effect in high quality nearshore habitat. No mitigation measures were identified.

The beach ridge currently found on the west side of Applewood Creek is currently succeeding. This area will be further isolated from coastal processes once the LWC Project is established. The area will still experience periodic flooding from Applewood Creek; however, the change in exposure may influence vegetation succession over time.

Currently, the east side of Applewood Creek is dominated by invasive species and these conditions could be improved upon establishment.

*Indicator: Quantitative assessment of shoreline irregularity and the ability to provide nearshore habitat*

The shoreline irregularity factor describes the irregularity of a shoreline and the potential for the creation of additional nearshore habitat. The shoreline irregularity factor is a ratio which compares the post-construction and pre-construction shoreline lengths. A ratio greater than 1.0 indicates that the LWC Project provides more nearshore habitat than the existing conditions. The greater this ratio, the more irregular the shoreline and the greater the ecological value of the transition from water and land.

To calculate the ratio, pre-construction shoreline lengths were measured from geo-referenced aerial imagery and post construction shoreline lengths were measured in ArcGIS.

The post-construction shoreline is 1.6 times more irregular/longer than the current shoreline. The preferred design increases shoreline irregularity and the ability to provide nearshore habitat and will be similar to features that would occur naturally along the north shore of Lake Ontario, while still providing the necessary stable shorelines. Net effects from the LWC Project on shoreline irregularity and nearshore habitat are positive and, as a result, no mitigation measures are required.

#### Summary of Change in Shoreline Character

The increase in shoreline diversity and irregularity will result in improved nearshore habitat in the LWC Project Study Area.

#### **Criterion: Ability to create functional habitat blocks**

*Indicator: Area of habitat created (ha) of wetland, forest, and, meadow*

This indicator measures the area of habitat in the Preferred Alternative to ensure general compliance with recommended minimum habitat size guidelines: 3.5-ha to 9-ha of wetland; 4-ha of forest; and 10-ha of meadow. The sizes of the habitats were measured using Arc GIS. These values were compared to the minimum habitat guidelines set out earlier in the process (see Chapter 6).

The LWC Project will create approximately 33 ha of new terrestrial and wetland habitat and exceeds the minimum recommended habitat size guidelines including 3.5-ha to 9-ha of wetland, 5 ha of forest and 14.5 ha of meadow; as such, this indicator results in a net positive effect following construction. No mitigation measures are required.

*Indicator: Assessment of improvements to aquatic habitat created and ecological benefits achieved through the changes to Serson and Applewood Creeks*

This indicator measures: (a) the length of new stream habitat created in metres; (b) the ability of the watershed to connect to the lake; and (c) connection(s) created to the wetland features. The pre-construction shoreline lengths were measured from geo-referenced aerial imagery and post construction shoreline lengths were measured in ArcGIS.

The establishment of the new river channels and coastal wetlands for Serson and Applewood Creeks will create a new watershed connection to Lake Ontario (in the case for Serson Creek), and will reestablish coastal wetland habitats at the mouths of both creeks. The LWC Project will create and provide access to additional high quality fish habitat including coastal wetland habitat, resulting in a net positive effect. No mitigation measures are required.

*Indicator: Qualitative assessment of habitat created including benefits created by LWC with respect to providing missing and/or impaired portions of aquatic and terrestrial ecosystems in this part of the Mississauga waterfront*

This indicator qualitatively evaluates the ability of the Preferred Alternative to provide an increase in ecologically functional areas within this part of the Mississauga waterfront. The qualitative assessment was undertaken by terrestrial and aquatic ecologists, who reviewed the refined Preferred Alternative with respect to the local aquatic and terrestrial ecosystems along the Mississauga waterfront. The refinements were further reviewed in the context of LOISS and the City of Mississauga's Landscape Scale Analysis: Natural and Semi-natural Habitats and Opportunities for Enhancement Final Technical Report (CVC 2012).

The LWC Project will produce an increase in natural habitat cover within the LWC Regional and Project Study Areas, providing critical stepping-stone habitat for birds, mammals, fish and other wildlife to other isolated greenspaces along the Lake Ontario shoreline and further upstream within the watersheds. Consolidated and connected forest, meadow and wetland habitat patches are arranged linearly in proximity of the shoreline, which provides optimal ecological function for migratory stop-over habitats, buffers to adjacent urban areas, and longshore corridors from Etobicoke Creek westwards. Potential negative effects related to invasive species colonizing the created habitat will be mitigated using adaptive management and best management practices such as identifying target invasive species for removal and the use of access gates at the inlets of Applewood and Serson Creeks to control against undesirable species. Despite the potential for some invasive species to occupy the naturalized area even with the application of best management practices, net effects are expected to be positive.

*Indicator: Qualitative assessment of connectivity between habitats for the movement of wildlife (e.g. mammals, herptofauna, invertebrates, fish, birds, etc.)*

Wildlife may require access to a variety of habitat types to fulfill various aspects of their lifecycle and/or behaviours such as foraging, feeding and reproduction. The ease of access throughout the habitat may encourage or discourage movement between the various habitat types. This indicator assesses the functionality of the habitat. The functional habitat blocks were reviewed by terrestrial and aquatic ecologists with respect to their ability to provide functional habitat blocks and connectivity between habitats.

The LWC Project will result in improved connectivity within and outside the LWC Project Study Area. The newly created habitat will provide the potential for migratory birds, bats and insects to move through the LWC Project Study Area as vegetation matures. New connections between the creeks, Lake Ontario, the newly created wetlands and the Serson Creek watershed will be significantly improved over current conditions.

The LWC Project will result in an overall improved connectivity; across the shoreline; to existing terrestrial communities; between the water/land interfaces and between the newly created vegetation communities.

Summary of: Ability to create functional habitat blocks

The creation of additional wetland, forest and meadow habitat will result in the provision of critical habitat for aquatic and terrestrial biota including the creation of stepping stone habitat for migratory species. The use of mitigation measures is expected to minimize/eliminate any negative effects non-native and/or invasive species may have on the newly created habitat. Overall, the LWC Project is expected to result in positive effects by creating functional aquatic and terrestrial habitat blocks.

**Criterion: Effects of hydraulics and hydrology/sedimentation on sustainability of wetland communities**

*Indicator: Qualitative assessment of ability to manage a full range of flows without adverse impact on wetland communities (high erosional stress, sediment deposits)*

Variable flow conditions have an effect on wetland communities. This indicator measures the potential effect of variable flow conditions on the wetland communities. This indicator was assessed by professional judgment comparing existing conditions against changes that would occur by developing the Preferred Alternative.

Both Serson and Applewood Creeks have been designed to contain flows up to the 5 year event. The main channel cross section will convey the 2 year flow while levees will contain the 5 year flow. Flows beyond this capacity will spill into the wetland features. Hydraulic conditions within the creeks are likely to be low velocity with little energy to erode the boundaries; therefore, erosional stress on the wetland boundaries is not anticipated to be an issue. Sedimentation in the design channel is likely to naturally occur, but it is expected that the channels will be able to manage sediment over time by flushing it out during higher, less-frequent flows (2-year and higher). The design will maintain flow between Applewood and Serson Creeks and Lake Ontario. As such, there is negligible effect anticipated from flows on the wetland communities.

*Indicator: Influence of lake level fluctuation on channel and wetland connectivity*

Low lake levels caused by daily, seasonal and long-term lake level fluctuation may result in limited connectivity between the channel and wetlands. This indicator measures the ability of the low flow channel to maintain connectivity with the feeder outlets during low lake conditions.

The designs for Applewood and Serson Creek incorporate the anticipated high lake level and the monthly low lake level to produce a profile that will ensure connectivity to Lake Ontario under both conditions. Levels at the outlets successfully convey the 5-year flood for each creek at a lake level of 75.4 masl. The design should ensure that the creeks do not become ‘perched’ during flow conditions based on current available data, and they are designed to meet the low lake level of 73.75 masl. The design maintains connectivity at the downstream end and does not account for any potential disconnects upstream. Under low lake levels the backwater effect will be reduced in the channel and the drop in water level may lead to higher velocities flushing out accumulated sediments. Low lake levels are not anticipated to effect connectivity with the wetlands.

Based on the design, Lake Ontario water level is expected to have minimal effect on channel and wetland connectivity. The wetlands will be built with significant bathymetric variation to respond to changing lake levels. Areas that may be deep open water in the wetland may become emergent habitat on low lake level years and conversely, submergence/emergent vegetation areas may become open water habitat during very high lake level years. As such, no mitigation measures are proposed and net effects are expected to be negligible.

*Indicator: Potential for sedimentation to affect channel form (including river mouths) and associated vegetation*

The potential risk for sedimentation in the creeks is relatively low. In Serson Creek, there is low sediment supply which consists of mainly fine sediments (very fine sand to small cobble) which will be easily transported through the system. For Applewood Creek, sediment load and size is slightly larger (pebble to small boulder; however, transport of sediment mainly consists of

redistribution within the channel. Applewood has several large bar features and it is assumed that the new designed section will similarly re-work sediments as bars and riffles but will likely not move large volumes of sediment in the downstream direction. While the movement of the sediment within the channel may result in some accumulation, it is likely this will be temporary and sediment transport processes within the channel are expected to balance naturally.

Given that neither Applewood Creek nor Serson Creek are expected to result in anything more than temporary sedimentation, no mitigation measures are proposed and the overall expected effect is negligible.

*Indicator: Qualitative assessments of the adaptability of the wetland function to climate change*

Climate change has the potential to increase the size and frequency of large flood events, influence winter ice cover conditions and potentially influence long-term average lake levels in Lake Ontario. This indicator measures the ability of the Preferred Alternative to accommodate these changes. Potential effects were assessed from a qualitative perspective.

Larger and more frequent storms could result in increased discharge to the wetlands and any potential drop in the level of Lake Ontario could result in disconnection from the lake. In either situation, the water control gates located at the inlets of the wetlands will allow for the management of water levels.

Most climate change models suggest future increases in the average temperature in Ontario. An increase in temperature is likely to reduce the frequency and extent of ice formation in wetlands. Where ice does form in the wetlands, there is a risk of “ice plucking<sup>16</sup>” of wetland vegetation and soils if large rain storms cause a rapid increase in stream and wetland water levels. High flows resulting from winter storms under mild weather conditions will likely flow on top of the wetland ice, rather than lift it from below. As such, the risk for ice plucking of wetland soils and vegetation in the design will be low. In the event that the ice plucking does occur, the installed water level control gates would enable CVC staff to lower water levels during the following spring, summer and fall to encourage new vegetation growth to re-establish in the wetlands.

Based on the ability to actively manage water entering and exiting the wetlands and the expectation that the wetland vegetation is expected to adapt and thrive based on the frequency and duration of inundation and reductions in ice cover, the overall effects on the wetlands from climate change is expected to be negligible.

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<sup>16</sup> Ice plucking refers to a natural process where ice attaches to vegetation and soils within a wetland and rising water level raise the ice causing vegetation and/or soils to detach from the bed.

*Indicator: Qualitative assessment to determine the ability of river channels and shoreline works to accommodate changes in flow and lake levels due to climate change*

Effects from climate change could impact the river channels and shoreline works because of the potential to increase the size and frequency of large storm events as well as prolonged periods of low precipitation, both of which will potentially influence the average level of Lake Ontario. This indicator qualitatively assesses how well the Preferred Alternative can accommodate these changes.

Climate change has the potential to result in increased flooding upstream of Lake Ontario in both Applewood and Serson Creeks as well as potentially increase scour. However, a potential drop in the level of Lake Ontario may improve water conveyance down Applewood and Serson Creeks. Overall, the annual variability associated with the potential effects of climate change are expected to result in the system finding a balance and the net result is expected to be negligible.

Summary of: Effects of hydraulics and hydrology / sedimentation on sustainability of wetland communities

Both Serson and Applewood Creeks are designed to contain the 2 year and 5 year flow; any flow beyond this capacity will spill into the wetland features. Wetlands will function most optimally with a variability of flow and water control gates at the inlets will allow for management of water levels with the influence of natural variability including low water levels in Lake Ontario. Sedimentation is not expected to be an issue in either creek, and therefore to either wetland feature, although Applewood Creek is noted to have a higher sediment load.

Effects due to changes in storm frequency and severity as well as lake level will either be managed through the use of the water control gates are expected to be minimal because of the expected adaptation ability within the system.

Overall, net effects of hydrology and sedimentation on wetland communities are expected to be negligible.

**Table 7.3 Objective 1: Naturalization (Establishment/Post-Establishment Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects																		
Change in shoreline character	Change in diversity of shoreline types.	<ul style="list-style-type: none"> <li>• The increase in shoreline diversity within the LWC Project Study Area will be an important first step at improving the overall shoreline composition within the LWC Regional Study Area.</li> <li>• Within the LWC Project Study Area, shoreline will increase from 1,765 m to 2,880 m which can be broken down by shoreline type as follows: <table border="1" style="margin-left: 40px; border-collapse: collapse; width: 150px;"> <thead> <tr> <th style="text-align: left;">Shoreline Type</th> <th style="text-align: center;">Existing (m)</th> <th style="text-align: center;">LWC (m)</th> </tr> </thead> <tbody> <tr> <td>Revetment</td> <td style="text-align: center;">1,325</td> <td style="text-align: center;">1,285</td> </tr> <tr> <td>Private beach</td> <td style="text-align: center;">205</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Public beach</td> <td style="text-align: center;">235</td> <td style="text-align: center;">1,110</td> </tr> <tr> <td>Lee rocky island shoreline</td> <td style="text-align: center;">0</td> <td style="text-align: center;">485</td> </tr> <tr> <td><b>Total Shoreline</b></td> <td style="text-align: center;"><b>1,765</b></td> <td style="text-align: center;"><b>2,880</b></td> </tr> </tbody> </table> </li> <li>○ The current shoreline behind the proposed LWC Project footprint includes 235 m of publically accessible sand beach that will be replaced with 1,110 m of new beach including: <ul style="list-style-type: none"> <li>▪ 795 m of cobble beach ranging in size from 10 to 20 cm (median size of 15 cm);</li> <li>▪ 265 m of gravel/cobble beach ranging in size from 1 to 10 cm (median size of 5 cm);</li> <li>▪ 50 m of sandy/gravel beach ranging in size from 1 to 5 cm (with sand predominance in the summer and the smaller gravel-pebbles in the winter);</li> </ul> </li> <li>○ the majority of the western most sand beach behind the land creation area (235 m of which is publically accessible) will remain in place as a sandy beach ridge area behind the land creation.</li> <li>• The provision of shallow sand and gravel substrates provide high quality habitat for nearshore cyprinids for spawning and feeding.</li> <li>• The cobble beach provides excellent staging and nursery areas.</li> <li>• The addition of surcharged points and shoals provide additional nearshore habitat.</li> <li>• Net decrease in revetment shoreline to be replaced by mostly cobble beach, providing a net benefit to aquatic habitat.</li> </ul>	Shoreline Type	Existing (m)	LWC (m)	Revetment	1,325	1,285	Private beach	205	0	Public beach	235	1,110	Lee rocky island shoreline	0	485	<b>Total Shoreline</b>	<b>1,765</b>	<b>2,880</b>	None.	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Increase in diversity and length of substrate types, which provides an increase in high quality nearshore habitat.</li> </ul>
	Shoreline Type	Existing (m)	LWC (m)																			
Revetment	1,325	1,285																				
Private beach	205	0																				
Public beach	235	1,110																				
Lee rocky island shoreline	0	485																				
<b>Total Shoreline</b>	<b>1,765</b>	<b>2,880</b>																				
Quantitative assessment of shoreline irregularity and the ability to provide nearshore habitat.	<ul style="list-style-type: none"> <li>• The increase in shoreline irregularity at the local level will be an important first step at improving the overall shoreline within the LWC Regional Study Area.</li> <li>• The new shoreline will provide a shoreline that is 1.6 times longer than the former shoreline over the same area.</li> <li>• The new shoreline simulates natural shoreline irregularity with features such as headlands and islands, which will provide a sheltering effect for fish and wildlife.</li> </ul>	None.	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Shoreline irregularity will increase and nearshore habitat with features that are similar to those that would occur naturally along the north shore of Lake Ontario will be provided.</li> </ul>																			
Ability to create functional habitat blocks	Area of habitat created (ha) of wetland, forest, and, meadow.	<ul style="list-style-type: none"> <li>• The LWC Project will create approximately 33-ha of terrestrial and wetland habitat, including: <ul style="list-style-type: none"> <li>○ 14.5-ha of meadow;</li> <li>○ 1.5-ha of beach;</li> <li>○ 5-ha of forest;</li> <li>○ 7.5-ha of wetland;</li> <li>○ 3.5-ha of treed swamp; and</li> <li>○ 1-ha associated with rocky island habitat.</li> </ul> </li> <li>• LWC Project exceeds minimum recommended habitat size objectives.</li> </ul>	None.	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• The LWC Project will result in the creation of approximately 33-ha of new terrestrial and wetland habitat and will exceed minimum habitat size objectives.</li> </ul>																		

**Table 7.3 Objective 1: Naturalization (Establishment/Post-Establishment Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Ability to create functional habitat blocks (Cont'd)	Assessment of improvements to aquatic habitat created and ecological benefits achieved through the changes to Serson and Applewood Creeks.	<ul style="list-style-type: none"> <li>• The LWC Project will:                             <ul style="list-style-type: none"> <li>○ provide critical habitat for a range of life cycle stages, including reproduction; and</li> <li>○ improve the ability for certain species to migrate along the shoreline by providing stream and wetland refuge areas during severe events along the open coast of Lake Ontario.</li> </ul> </li> <li>• The LWC Project will connect Serson Creek with Lake Ontario up to Lakeshore Road. Combined with enhancements of the Lakeshore Road crossing undertaken by the City of Mississauga within the Regional Study Area, the new Serson Creek realignment will effectively connect the entire Serson Creek watershed to Lake Ontario.</li> <li>• New river channels and coastal wetlands for Serson and Applewood Creeks will:                             <ul style="list-style-type: none"> <li>○ create approximately 240 m and 330 m of critical highly productive fish estuary habitat within the land creation area for Applewood Creek and Serson Creek, respectively;</li> <li>○ open up approximately 690 m of new stormwater channel for Serson Creek;</li> <li>○ create a new watershed connection to Lake Ontario for Serson Creek, providing continual connectivity for fish; and</li> <li>○ re-establish highly productive fish coastal wetland habitats at the mouths of both creeks that will provide continual connectivity to the wetlands for riverine and pelagic fish.</li> </ul> </li> <li>• Potential for fish to become trapped in Serson and Applewood Creek during construction.</li> <li>• Potential disruption of fish migration in the lower portions of Applewood Creek (between Lake Ontario and Lakeshore Road).</li> <li>• Realignment of Serson Creek north of the WWTF will:                             <ul style="list-style-type: none"> <li>○ require the removal of juvenile trees within the existing stormwater channel; this removal is necessary to ensure flow conveyance maintenance; and</li> <li>○ require the infilling of the existing baseflow channel downstream from the stormwater channel entrance. The existing baseflow channel downstream from the sediment plug will remain in place, to allow floodwaters that overtop the channel to continue to be discharged through the culvert under the WWTF, providing additional flood conveyance under large events. Locally generated surface flows will also continue to flow through the culvert.</li> </ul> </li> <li>• No fish have been surveyed in the existing Serson Creek channel north of the WWTF. As such, the realignment will allow fish access to the Serson Creek watershed.</li> <li>• To improve habitat within the stormwater channel (which will become the primary river channel for Serson Creek), no modifications to the underlying soils of the bed and banks will occur.</li> <li>• Aquatic habitat features such as rocky steps will be incorporated within the channel as well as riparian vegetation plantings along the top of valley in areas where it will not increase flood risk, affect flow conveyance or promote bank erosion.</li> </ul>	<ul style="list-style-type: none"> <li>• Fish salvage will occur following the establishment of the confinement cells during the initial filling stages.</li> <li>• Opportunities to add habitat features will be explored further during detailed design.</li> <li>• For the realignment works of Serson Creek:                             <ul style="list-style-type: none"> <li>○ the channel will be isolated and a fish salvage conducted to ensure no fish remain in the construction area of the channel;</li> <li>○ the banks of the stormwater channel will not be excavated;</li> <li>○ incorporation of rocky steps and installation of riparian vegetation plantings as aquatic habitat features; and</li> <li>○ existing soils will not be disturbed within the stormwater channel.</li> </ul> </li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Creation of highly productive aquatic habitat not previously available.</li> <li>• Connections to the Serson Creek watershed and wetlands will provide an additional linkage that will transform this degraded site into a regionally productive site by linking Lake Ontario to the wetlands and watersheds.</li> </ul>

**Table 7.3 Objective 1: Naturalization (Establishment/Post-Establishment Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Ability to create functional habitat blocks (Cont'd)	Qualitative assessment of habitat created including benefits created by LWC with respect to filling in missing and/or impaired portions of aquatic and terrestrial ecosystems in this part of the Mississauga waterfront.	<ul style="list-style-type: none"> <li>• The LWC Project results in:                             <ul style="list-style-type: none"> <li>○ the creation of approximately 33-ha of new terrestrial and aquatic habitat features. The newly created habitat will provide areas of isolated wildlife refuge where plants and wildlife remain undisturbed and nature is encouraged;</li> <li>○ a diversity of shoreline habitats that are moderately sheltered will be created;</li> <li>○ a treed swamp providing critical habitat linkages for certain species of amphibians, reptiles and birds between the Serson Creek wetland complex and the Applewood Creek wetland complex; and</li> <li>○ important habitat for local bird and wildlife species, in conjunction with habitats provided in Marie Curtis Park and the Arsenal Lands due to the proximity and arrangement of the forest, meadow and wetland complexes.</li> </ul> </li> <li>• Potential negative effects relate to the establishment of nuisance and invasive species, such as Canada Geese, Common Carp and <i>Phragmites</i> in the wetlands; and Dog Straggling Vine and Garlic Mustard in meadows and forests. These species have the potential to negatively affect the ecological function and quality of the habitat patches created by outcompeting and displacing desirable native species.</li> </ul>	<ul style="list-style-type: none"> <li>• Best management practices during construction will be used to minimize invasive species developing on the site including:                             <ul style="list-style-type: none"> <li>○ Avoiding transport of non-native and invasive species into sensitive vegetation communities; and</li> <li>○ Cleaning all equipment working in identified invasive species locations.</li> </ul> </li> <li>• Incorporation of access gates at the inlets between the estuarine channels and coastal wetlands will control against undesirable species such as Common Carp.</li> <li>• Maximizing natural vegetation cover within the wetland and along the adjacent terrestrial areas will help to reduce the numbers of Canada Geese.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Potential effects related to the establishment of invasive species will be mitigated through best management practices.</li> <li>• Created habitat patches provide an increase in ecologically functional areas within this part of the Mississauga waterfront resulting in a net positive effect.</li> </ul>
	Qualitative assessment of connectivity between habitats for the movement for wildlife (e.g. mammals, herptofauna, invertebrates, fish, birds, etc.).	<ul style="list-style-type: none"> <li>• The LWC Project will result in improved connectivity within and outside the LWC Project Study Area, and improved structure to the vegetation communities created.</li> <li>• Newly created habitat will provide the potential for wildlife to move through the LWC Project Study Area as vegetation matures.</li> <li>• Connections to creeks from lake to newly created wetlands, estuary and upper watershed will be significantly improved over current conditions. In particular, Serson Creek will be reconnected to Lake Ontario and allow fish to re-colonize and utilize the currently fishless Serson Creek.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• The LWC Project will result in overall improved connectivity; across the shoreline; to existing terrestrial communities; between the water/land interfaces and between the newly created vegetation communities.</li> </ul>
Effects of hydraulics and hydrology / sedimentation on sustainability of wetland communities	Qualitative assessment of ability to manage a full range of flows without adverse impact on wetland communities (high erosional stress, sediment deposits).	<ul style="list-style-type: none"> <li>• Modeling shows that:                             <ul style="list-style-type: none"> <li>○ velocities during the 2-year return event decrease from 6m/s near Lakeshore Road, to 1.3m/s in the design channel for Applewood Creek;</li> <li>○ Serson Creek flow velocities increase between Lakeshore Road and the channel design, which is likely a result of the slightly steeper gradient of the existing overflow channel.</li> </ul> </li> <li>• Both Serson and Applewood Creeks have been designed to contain the 2 year and 5 year flow. Flows beyond this capacity will spill into the wetland features.</li> <li>• Hydraulic conditions within the creeks are likely to be low velocity with little energy to erode the boundaries due to backwatering from Lake Ontario.</li> <li>• An extreme flow event could result in sedimentation that could block wetland connections.</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity to manage stormwater within the wetland features has been provided by:                             <ul style="list-style-type: none"> <li>○ varying wetland depth; and</li> <li>○ use of a water control structure to regulate wetland water levels.</li> </ul> </li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• The channel will manage sediment over time and flows will be conveyed through to Lake Ontario within the design channel and berms of a 5-year capacity.</li> <li>• Sedimentation due to extreme flow will be evaluated when necessary.</li> </ul>

**Table 7.3 Objective 1: Naturalization (Establishment/Post-Establishment Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
	Influence of lake level fluctuation on channel and wetland connectivity.	<ul style="list-style-type: none"> <li>• Potential for either Applewood or Serson Creek and the associated wetlands to become disconnected from the Lake under low Lake Ontario levels.</li> <li>• Potential for outlets to become “perched” under low flow conditions.</li> <li>• Under low lake levels the lake backwater effect will be reduced in the channel and the drop in water level may lead to higher velocities flushing out accumulated sediments.</li> </ul>	<ul style="list-style-type: none"> <li>• Serson and Applewood Creek designs incorporate the anticipated high lake level and the monthly low lake level to produce a profile that will ensure connectivity to Lake Ontario under both high and low Lake Ontario conditions.</li> <li>• Levels at the outlets successfully convey the 5-year flood for each creek at a lake level of 75.4 masl.</li> <li>• The channels are designed to meet the low lake level of 73.75 masl, which should ensure that the creeks do not become ‘perched’ during low flow conditions.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Design conditions should ensure connectivity and that Serson and Applewood Creek do not become parched.</li> <li>• Flushing of sediment is likely to be a positive effect of low Lake Ontario levels.</li> </ul>
	Potential for sedimentation to affect channel form (including river mouths) and associated vegetation.	<ul style="list-style-type: none"> <li>• The low supply of fine sediments (very fine sand to small cobble) found in Serson Creek will be easily transported through the system.</li> <li>• Within Applewood Creek: <ul style="list-style-type: none"> <li>○ At lower flows, fines will deposit at locations within the design channels, but shall be remobilized during high flow events; and</li> <li>○ Containment of the flows up to the 5-year event further ensure that the design channels move and store sediment regularly.</li> </ul> </li> </ul>	None	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• The relatively low sediment supply to the lake and these design considerations provide a system which can function over time to maintain the conveyance of water and sediment to Lake Ontario</li> </ul>
	Qualitative assessments of the adaptability of the wetland function to climate change.	<ul style="list-style-type: none"> <li>• Larger, more frequent storms have the potential to cause increased discharge into the wetlands.</li> <li>• Potential, but not anticipated drops in the level of Lake Ontario due to climate change could reduce lake levels below the invert levels to the inlets to the wetlands, leaving the constructed wetlands disconnected from the lake.</li> </ul>	<ul style="list-style-type: none"> <li>• Water control gates located at the inlets to the wetlands will allow for the management of water levels within the wetlands as required in the event of water levels that exceed the anticipated range of low water levels.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Vegetation in the lake-connected wetlands is expected to adapt and thrive based on the optimized frequency and duration of inundation of the lake-connected wetlands.</li> <li>• Water control structures will allow more resilience and control to maintain wetland features.</li> </ul>
	Qualitative assessment to determine the ability of river channels and shoreline works to accommodate changes in flow and lake levels due to climate change.	<ul style="list-style-type: none"> <li>• Larger, more frequent storms have the potential to cause: <ul style="list-style-type: none"> <li>○ increased flooding upstream (or in the WWTF in the case of Serson Creek), and</li> <li>○ increased scour of the constructed channels in Serson and Applewood Creeks.</li> </ul> </li> <li>• Potential, but not anticipated drops in the level of Lake Ontario due to climate change could reduce lake levels that may improve hydraulic conveyance of Serson and Applewood Creeks, especially Applewood Creek, by increasing the slope of the channel.</li> </ul>	None	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Annual variability is expected to result in a balanced system.</li> </ul>

**7.3.1.3 Summary of: Naturalization Objective**

The Naturalization objective for the LWC Project seeks to enhance the quality of the aquatic and terrestrial habitat within the LWC Project Study Area. Included in this is the creation of linkages between habitat along the waterfront and between the waterfront and existing parks and corridors.

In order to assess the effects of the LWC Project with respect to improving aquatic and terrestrial habitat, two criteria and six indicators were evaluated for construction phase effects and three criteria and eleven indicators were evaluated for establishment/post-establishment phase effects.

The aquatic and terrestrial habitat will undergo changes within the LWC Project Study Area along the Lake Ontario shoreline, along the construction access route and within Applewood and Serson Creeks both during and following construction. Table 7.4 provides an overall summary of the net gains and losses with respect to the Naturalization objective of the LWC Project.

**Table 7.4 Net Gains and Losses from the LWC Project with respect to the Naturalization Objective**

LWC Project Area Feature	LWC Project Losses	LWC Project Gains	Mitigation and Net Effect
Aquatic Habitat – Lake Ontario Shoreline	<ul style="list-style-type: none"> <li>• Land creation will result in the loss or alteration of 39 ha of open coast aquatic habitat.</li> <li>• Land creation may cause water quality impairment in Lake Ontario due to siltation, release of deleterious substances and entrapment of fish.</li> </ul>	<ul style="list-style-type: none"> <li>• Land creation will result in an increase in the irregularity and diversity of shoreline types including an overall shoreline increase from 1,765 m to 2,880 m and improvement of aquatic habitat especially for early life stages.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Construction best management practices will minimize or eliminate potential water quality issues and fish entrapment effects.</li> <li>• The LWC Project results in an overall net increase in and improvement to Lake Ontario aquatic habitat.</li> </ul>
Aquatic Habitat – Serson and Applewood Creeks	<ul style="list-style-type: none"> <li>• Land creation and Creek improvements may cause water quality impairment in Applewood Creek, Serson Creek due to siltation, release of deleterious substances and entrapment of fish.</li> </ul>	<ul style="list-style-type: none"> <li>• An increase in the amount and overall availability of aquatic habitat in both Serson and Applewood Creeks including better connections with Lake Ontario and incorporation of habitat features such as rocky steps and improved riparian vegetation.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Construction best management practices will minimize or eliminate potential water quality and fish entrapment effects.</li> <li>• The removal of vegetation will be mitigated with overall improvements to the type and variety of riparian vegetation.</li> </ul>

**Table 7.4 Net Gains and Losses from the LWC Project with respect to the Naturalization Objective (Cont'd)**

LWC Project Area Feature	LWC Project Losses	LWC Project Gains	Mitigation and Net Effect
Aquatic Habitat – Serson and Applewood Creeks	<ul style="list-style-type: none"> <li>• Riparian vegetation removal including the removal of some juvenile trees within the existing stormwater channel of Serson Creek.</li> <li>• Construction may improve opportunities for the establishment of nuisance and invasive species.</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporation of active management of vegetation and fisheries communities in wetlands to deal with fluctuations in lake levels over anticipated future conditions.</li> <li>• Creek design elements will ensure they do not become parched even in low Lake Ontario level conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Efforts will be made to control the introduction and establishment of nuisance and invasive species.</li> <li>• The LWC Project will create better habitat connections (both aquatic and terrestrial) from Serson and Applewood Creeks to Lake Ontario and upstream.</li> <li>• Design elements such as water control structures will ensure functionality of the system within an anticipated range of Lake Ontario water levels.</li> </ul>
Terrestrial Habitat	<ul style="list-style-type: none"> <li>• Wildlife disruption will occur during construction along construction access route which may also act as a barrier to movement.</li> <li>• Vegetation removal and terrestrial habitat loss is limited to vegetation along the construction access route and riparian habitat along Serson and Applewood Creeks.</li> <li>• Alteration of successional processes on the beach ridge at the mouth of Applewood Creek.</li> <li>• Construction may improve opportunities for the establishment of nuisance and invasive species.</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of 33 ha of terrestrial habitat including meadow, beach, forest, open wetland, treed swamp and rocky island that meets or exceeds all of the LWC Project minimum habitat size objectives.</li> <li>• Creation of habitat linkages between existing and created lands.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• The LWC Project will increase both the amount and diversity of terrestrial habitat within the LWC Project Study Area.</li> <li>• Construction effects along the construction access route and Serson and Applewood Creeks will be temporary and, following decommissioning, will result in improved habitat (e.g., for reptiles and amphibians).</li> <li>• The new terrestrial habitat will provide important stepping stone habitat along the Lake Ontario shoreline, especially for migrating species.</li> </ul>

Overall, the Preferred Alternative results in net gains in aquatic and terrestrial habitat and the LWC Project meets the Naturalization objective.

*Environmental Assessment*  
*Lakeview Waterfront Connection*

**Table 7.5 Overall Effects Related to Objective 1**

<i>Criteria</i>	<i>Indicator</i>	<i>Overall Effects</i>
<b>Construction</b>		
<b>Ability of alternative to be self-compensating with respect to fish habitat</b>	Area of aquatic habitat lost or altered (ha).	Negligible
	HAAT model estimates of area requiring compensation (ha).	None
	Potential disruption to fish habitat as a result of land creation activities (siltation, fish removal, etc.	Negligible
<b>Habitat removal or disruption during construction of site access road and laydown area</b>	Area of vegetation removed or disrupted (m <sup>2</sup> ).	Negligible
	Number of Species at Risk removed/disrupted.	None
	Area of aquatic habitat removed or disrupted (m <sup>2</sup> ).	Negligible
<b>Establishment/Post-Establishment</b>		
<b>Change in shoreline character</b>	Change in diversity of shoreline types (% increase or % decrease).	Positive
	Quantitative assessment of shoreline irregularity and the ability to provide nearshore habitat.	Positive
<b>Ability to create functional habitat blocks</b>	Area of habitat created (m <sup>2</sup> ) of wetland, forest, and, meadow.	Positive
	Assessment of improvements to aquatic habitat created and ecological benefits achieved through the changes to Serson and Applewood Creeks.	Positive
	Qualitative assessment of habitat created including benefits created by LWC with respect to filling in missing and/or impaired portions of aquatic and terrestrial ecosystems in this part of the Mississauga waterfront.	Positive
	Qualitative assessment of connectivity between habitats for the movement for wildlife (e.g. mammals, herptofauna, invertebrates, fish, birds, etc.).	Positive
<b>Effects of hydraulics and hydrology / sedimentation on sustainability of wetland communities</b>	Qualitative assessment of ability to manage a full range of flows without adverse impact on wetland communities (high erosional stress, sediment deposits).	Negligible
	Influence of lake level fluctuation on channel and wetland connectivity.	Negligible
	Potential for sedimentation to affect channel form (including river mouths) and associated vegetation.	Negligible
	Qualitative assessments of the adaptability of the wetland function to climate change.	Negligible
	Qualitative assessment to determine the ability of river channels and shoreline works to accommodate changes in flow and lake levels due to climate change.	Negligible
<b>Summary:</b> <b>Overall, the Preferred Alternative for the LWC Project provides a substantial improvement to natural conditions within the LWC Project Study Area. The loss or alteration of poor quality aquatic habitat is offset by the creation of high quality terrestrial and aquatic habitat, thus, the Preferred Alternative meets the Naturalization objective.</b>		

## **7.3.2 Objective 2: Access**

### **7.3.2.1 Construction Effects**

#### **Criterion: Potential for change in access to and use of Waterfront Trail during construction**

##### *Indicator: Duration and length of trail closed to use*

To avoid conflicts between construction vehicles and trail users, the Waterfront Trail will be closed and temporarily relocated to the south side of Lakeshore Road. The length of trail lost was measured in ArcGIS.

During the 7-10 years of construction, approximately 770 m of Waterfront Trail will be affected by construction. During active construction periods, this section of trail will be closed to the public. The affected portion of the Waterfront Trail will be re-opened to the public during non-construction hours and other options to provide temporary access to the shoreline will be explored during detailed design. In addition, a continuous east-west connection of the Waterfront Trail will be maintained throughout the construction period by re-routing the Waterfront Trail along the south side of Lakeshore Road or within the Arsenal Lands. Owing to the continued access through the area by implementing the proposed mitigation measures, effects are deemed to be negligible.

##### *Indicator: Potential for signalization of trail crossing with construction vehicles*

This indicator was assessed by evaluating proposed crossing points between the preferred construction access road and the Waterfront Trail.

The preferred access road will only cross the re-routed Waterfront Trail at one intersection, which already has a signal. However, the entrance to this access route will not become available until 2015 which will necessitate using an entrance point to the east for approximately the first year of construction. Currently, there is no signalization at this proposed entrance point so signage will be required to alert trail users to the presence of turning construction vehicles. Once the preferred entrance becomes available in 2015, no effects are expected due to the presence of an existing signal and entrance (Figure 7.1).

Summary of: Potential for change in access to and use of Waterfront Trail during construction during construction, a 770 m length of the Waterfront Trail will be closed to the public; however, a continuous east-west connection across the LWC Project Study Area will be maintained and the construction access road will be made available to the public during non-construction hours. Safety will be maintained owing to the existing signal at the point where the Waterfront Trail and the preferred construction access road entrance will cross. The temporary entrance that will be

used until approximately 2015 will include signage along the trail to mitigate potential conflicts between trail users and construction vehicles.

**Figure 7.1 Construction Access and Waterfront Trail Re-Routing**



**Criterion: Potential for change to use and enjoyment of park areas including Waterfront Trail during construction**

*Indicator: Potential for dust, vehicle emissions and noise to affect park and Waterfront Trail use and enjoyment*

The LWC Project footprint and construction access route is located within or adjacent to parts of Marie Curtis Park and the Waterfront Trail. This indicator identifies potential negative effects related to the generation of dust, vehicle emissions and noise to users of Marie Curtis Park and/or the Waterfront Trail in proximity to the construction site. This indicator was assessed based on professional experience with similar land creation projects on Lake Ontario.

Construction of the LWC Project will result in typical atmospheric emissions associated with a land creation project 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 within the LWC Project Study Area. Users of Marie Curtis Park and the Waterfront Trail in proximity to the LWC Project will experience some nuisance effects related to dust, vehicle emissions and noise that will be localized during construction. Some users of the park may also find the presence of construction activity to be aesthetically unappealing.

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. Where possible, opportunities to minimize noise associated with construction vehicles backing up could be implemented. All construction activities will adhere to the City of Mississauga's Noise Control By-Law 360-79. As a result, overall net effects are expected to be negligible.

*Indicator: Potential for changes in ability to access and use park during construction due to traffic congestion and or changes to access*

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 Marie Curtis Park related to traffic congestion or changes to access resulting from construction. This indicator was assessed by modeling traffic conditions along construction routes such as Lakeshore Road based on current conditions combined with anticipated construction traffic associated with the LWC Project.

The traffic analysis conducted for the LWC Project indicates that baseline traffic conditions at most intersections is congested. Traffic generated by construction of the LWC Project will result in an increase in traffic of 0.5% to 3.5% at various intersections during peak periods which will have a negligible impact on existing traffic conditions in the Project and Regional Study Areas.

During the 7-10 years of construction, visitors to Marie Curtis will have restricted access to some areas, particularly the western portion of Marie Curtis Park 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 Marie Curtis Park and the beach east of the construction area and construction hours will be limited to weekdays so that the park is construction free during evenings and weekends.

In addition, a temporary, informal walking path could be established south of the WWTF to allow the public to view construction progress pending further investigation of its feasibility during detailed design. The opportunity to create a path between the southern boundary of the WWTF and the construction area are constrained by slopes, narrow passages, potential public safety issues and security concerns at the WWTF. It is anticipated that the temporary walking path will be mown grass with exclusionary fencing. As such, this temporary path will only be available for walking during daylight hours. Furthermore, concerns about public safety (i.e. isolation, WWTF security, etc.) associated with the temporary path have been raised which will need to be addressed during detailed design. The feasibility of establishing this temporary walking path will be confirmed during detailed design.

Summary of: Potential for change to use and enjoyment of park areas including Waterfront Trail during construction

During construction, dust, noise and vehicle emissions along with construction traffic and restricted access to some areas of Marie Curtis Park will decrease the ability of the public to enjoy the park areas, in particular the Waterfront Trail and the western portion of the Marie Curtis Park beach. However, these effects will be limited to the 7-10 year construction timeframe and mitigation measures such as adherence to the City of Mississauga Noise Control By-Law 360-79 will minimize negative effects. As such, it is expected that overall net effects will be negligible.

**Criterion: Potential for displacement of built heritage resources due to construction of access road, laydown area and land creation area**

*Indicator: Cultural heritage value of built heritage resources and cultural heritage landscapes within land creation area*

There are a number of built heritage resources within the LWC Project Study Area, including the Small Arms Building; water tower; a cultural woodlot to the west side of the Small Arms Building; a cultural woodlot to the south of the large meadow; and the rifle shooting range located at 1300 Lakeshore Road on Region of Peel property, south of the Small Arms Building.

Effects on cultural heritage resources are only expected during construction, potentially to the Small Arms Building and the baffles of the rifle shooting range as a result of the proximate location of the construction access road. There is substantial physical separation between the access road and the other heritage features. Potential effects to the Small Arms Building and the baffles of the rifle shooting range can be mitigated through physical separation and buffering of construction activities such as ensuring vehicle access to the construction site is maintained to not compromise the physical separation. Since potential effects can be mitigated, effects on cultural heritage resources are considered negligible.

Summary of: Potential for displacement of built heritage resources due to construction of access road, laydown area and land creation area

Overall, the net effects during construction will be negligible on built heritage resources. Construction traffic will maintain a minimum distance of 5 m from the baffles to mitigate impacts from vibrations and the use of barriers will protect the baffles from physical contact with the truck traffic should an accident occur. Routing construction traffic away from the Small Arms Building should eliminate potential effects from vibrations.

**Criterion: Potential effects from construction of access road, laydown area and land creation area on marine and land-based archaeological resources**

*Indicator: Significance of archaeological resources within footprint of land creation and associated park area*

A Stage 1 Archaeological Assessment identified the potential for intact cultural heritage resources to be found along the south side of the Lakeshore Road alignment, as well as along the length of access route between Lakeshore Road and the Waterfront Trail. As the access route is anticipated to be several metres wider than the existing Waterfront Trail, there is the potential for effects on archaeological resources along its length. In addition, the laydown area will be located on the Arsenal Lands parking lot, east of the Small Arms Building.

A subsequent Stage 2 archaeological assessment conducted in June 2013, confirmed that the areas containing the construction access route, laydown area, temporary trail bypass along Lakeshore Road, and channel realignment works for Serson Creek, north of the WWTF were heavily disturbed and contained no cultural or archaeological resources. As such, there are no significant effects associated with land-based archaeological resources.

A marine archaeological assessment completed in 2012 on the in-water portion of the LWC Project Study Area indicated that there are no marine-based archaeological resources within the LWC Project Study Area so there are no potential effects from the LWC Project.

Although the likelihood is small, if artifacts or human remains are found, construction will cease and the Ministry of Tourism, Culture and Sport will be notified. As such, activities will ensure that any artifacts found will not be negatively affected. Given this mitigation measure, potential effects are considered negligible.

Summary of: Potential effects from construction of access road, laydown area and land creation area on marine and land-based archaeological resources

Terrestrial and marine based archaeological assessments determined that the terrestrial based LWC Project Study Area is disturbed and unlikely to contain any artifacts and that there are no marine-based archaeological resources within the footprint of the LWC Project Study Area.

**Criterion: Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by First Nations and Métis**

*Indicator: Extent of traditional uses of lands within LWC Project Study Area*

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

Summary of: Extent of traditional uses of lands within LWC Project Study Area

Since the LWC Project Study Area is not currently used by First Nations and Métis, there are no negative effects associated with construction.

**Table 7.6 Objective 2: Access (Construction Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Potential for change in access to and use of Waterfront Trail during construction	Duration and length of trail closed to use	<ul style="list-style-type: none"> <li>770-m of the Waterfront Trail through the Arsenal Lands, will be closed to the public for the duration of the project (approximately 7-10 years).</li> </ul>	<ul style="list-style-type: none"> <li>A continuous east-west connection of the Waterfront Trail will be maintained by temporarily re-routing the existing Waterfront Trail along the south side of Lakeshore Road.</li> <li>Public access along the temporary construction road will also be allowed during non-construction hours.</li> <li>Additional opportunities to provide temporary public access to the shoreline will also be explored including a temporary viewing trail.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>Although trail use is disrupted, an east-west connection will be maintained, public access will be allowed along the temporary construction road during non-construction hours and other opportunities to allow access to the shoreline will be explored.</li> </ul>
	Potential for signalization of trail crossing with construction vehicles.	<ul style="list-style-type: none"> <li>The preferred construction access route will only cross the re-routed Waterfront Trail once at a signalized intersection, so no additional signalization is anticipated once the entrance becomes available in 2015.</li> <li>For the first year of construction, an entrance point to the east of the preferred location will be used where there is currently no signalization.</li> </ul>	<ul style="list-style-type: none"> <li>Signage will be posted where the Waterfront Trail crosses the temporary access entrance to alert trail users to the presence of turning construction vehicles.</li> </ul>	<p><b>None</b></p> <ul style="list-style-type: none"> <li>Truck traffic crosses the Waterfront Trail at a signalized intersection and no additional signalization is anticipated.</li> </ul>
Potential for change to use and enjoyment of park areas including Waterfront Trail during construction	Potential for dust and vehicle emissions and noise to affect Waterfront Trail use and enjoyment.	<ul style="list-style-type: none"> <li>Construction activity will create nuisance effects related to dust, vehicle emissions and noise for park and Waterfront Trail users in areas adjacent to the active construction site.</li> <li>Effects will be localized and limited to active construction periods.</li> </ul>	<ul style="list-style-type: none"> <li>Best management practices will be employed for dust (e.g., watering of access roads during dry periods), emissions (e.g., well maintained equipment) and noise (e.g., mufflers on construction equipment).</li> <li>Adhere to City of Mississauga Noise Control By-Law 360-79.</li> <li>Opportunities to minimize noise associated with trucks reversing out of the site will be explored.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>With the use of best management practices, the net effects to park and trail users are limited to active construction times and are similar to common effects from urban construction projects.</li> </ul>
	Potential for changes in ability to access and use park during construction due to traffic congestion and or changes to access.	<ul style="list-style-type: none"> <li>Traffic conditions on the surrounding roadways will experience minimal increases in traffic volumes during construction. Traffic analysis indicates a 0.5% to 3.5% increase in traffic at various intersections during peak hours.</li> <li>Construction vehicles will not be using the public parking areas so there will be no effect on current parking conditions.</li> <li>Public access to the western extent of the Marie Curtis Park beach will be limited during construction activities to accommodate the access road and construction activities.</li> <li>Restricted public access to the construction site will result in reduced length of beach available for recreational activities.</li> <li>Active construction may also result in an impairment of the “sense of nature” feeling when using the western beach of Marie Curtis Park.</li> </ul>	<ul style="list-style-type: none"> <li>Potential conflicts with construction vehicles and activities will be mitigated through restricted public access to the construction site along the western portion of the park.</li> <li>Users will continue to retain use of the majority of Marie Curtis Park West and the beach.</li> <li>Construction hours will be limited to weekdays to provide opportunities for the “sense of nature” feeling during the evening and weekends.</li> <li>A temporary viewing trail to the south of the WWTF could be established during construction.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>Reduced access is not anticipated to affect the user’s enjoyment of the area because high use areas are not affected.</li> <li>Reduced access will be limited to the western portion of the site and construction will be limited to weekday, daytime hours.</li> <li>Effects will be temporary.</li> <li>There will be no substantial change in traffic conditions by adding LWC construction related traffic to background conditions.</li> </ul>

**Table 7.6 Objective 2: Access (Construction Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Potential for displacement of built heritage resources due to construction of access road, laydown area and land creation area	Cultural heritage value of built heritage resources and cultural heritage landscapes within land creation area.	<ul style="list-style-type: none"> <li>• No displacement of built heritage resources.</li> <li>• No effects on the following built heritage resources, which are avoided by the construction access route:                             <ul style="list-style-type: none"> <li>○ Cultural woodlot located south of the Arsenal Lands meadow;</li> <li>○ Cultural woodlot to the west of the Small Arms Building; and</li> <li>○ Water tower.</li> </ul> </li> <li>• Potential effects from the construction access route on the:                             <ul style="list-style-type: none"> <li>○ Small Arms Building; and</li> <li>○ Baffles of the rifle shooting range.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Disturbances will be mitigated through:                             <ul style="list-style-type: none"> <li>○ physical separation,</li> <li>○ buffering, and</li> <li>○ maintenance of vehicular access.</li> </ul> </li> </ul>	<p><b>None</b></p> <ul style="list-style-type: none"> <li>• Potential effects are mitigated.</li> </ul>
Potential effects from construction of access road, laydown area and land creation area on marine- and land-based archaeological resources	Significance of archaeological resources within footprint of land creation and associated park area.	<ul style="list-style-type: none"> <li>• A Stage 2 Archaeological Assessment conducted in June 2013 confirmed that the construction access route, laydown area, and temporary trail bypass along Lakeshore Road were heavily disturbed and unlikely to contain cultural or archaeological resources. There are no marine-based archaeological resources within the LWC Project Study Area.</li> </ul>	<ul style="list-style-type: none"> <li>• Should artifacts or human remains be found during construction, construction will cease and the Ministry of Tourism, Culture and Sport notified.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Although likelihood is small, if artifacts or human remains are found, mitigation measures will ensure effects are negligible.</li> </ul>
Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by First Nations and Métis	Extent of traditional uses of lands within LWC Project Study Area.	<ul style="list-style-type: none"> <li>• The lands in the LWC Project Study Area are not currently used by First Nations or Metis communities for traditional purposes or others.</li> </ul>	<ul style="list-style-type: none"> <li>• None.</li> </ul>	<p><b>None</b></p> <ul style="list-style-type: none"> <li>• There is currently no traditional land uses within the LWC Project Study Area.</li> </ul>

### **7.3.2.2 Establishment/Post-Establishment Effects**

#### **Criterion: Potential for Lookout Areas**

*Indicator: Number of opportunities for views and character of views from the LWC Project to Lake Ontario, OPG's Lakeview site to Lake Ontario and back to the cities of Mississauga and Toronto and from the Lake Ontario onshore*

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 LWC Project.

No prominent lookout areas towards Lake Ontario will be affected. Views from the lake toward the LWC Project Study Area are not currently highly valued and the establishment of naturalized habitat and promontories as part of the LWC Project will better hide the WWTF, improving views from the lake. There will be a number of new opportunities for improved views of Lake Ontario, the created wetlands and other created terrestrial and aquatic landforms including new views towards the cities of Mississauga and Toronto. In fact, the new landforms were designed to provide prominent viewsheds wherever possible. These new opportunities will create a positive net effect of the LWC Project.

#### Summary of: Potential for Lookout Areas

The creation of new opportunities for viewing improved natural and built features will result in a positive benefit to users of the LWC Project, the Waterfront Trail, boaters on Lake Ontario and Marie Curtis Park users.

#### **Criterion: Potential for changes to use of waterfront for recreation**

*Indicator: Potential for changes to water quality at Marie Curtis Park beach west with respect to swimming*

Land creation activities have limited potential to affect local circulation patterns at Marie Curtis Park beach west. Potential effects were assessed using a lake water quality model.

The water quality modeling concludes that there is no significant change in water quality at Marie Curtis Park West Beach as a result of the LWC Project. Modeling indicates that total phosphorous levels may improve slightly following construction of the islands. Based on these results, the implementation of the LWC Project will have a negligible effect on the water quality at Marie Curtis Park beach for recreational purposes.

*Indicator: Potential for changes to existing recreational activities on the sand beach at Marie Curtis Park west*

Land creation activities have the potential to change the recreational opportunities at Marie Curtis Park west's existing sand beach. Changes to the sand beach could affect the recreational experience of current beach users. Potential effects are assessed using professional judgment.

Some members of the public have indicated a preference for walking and sitting on sand beaches (compared to cobble beaches) and the proposed changes will reduce or alter the amount of publically accessible sand beach at the water's edge at Marie Curtis Park west by approximately 235 m. The LWC Project Preferred Alternative has been refined to minimize encroachment on Marie Curtis Park west beach while still meeting the LWC Project objectives. Further opportunities to minimize encroachment will be explored during detailed design. The loss of existing sand beach at the water's edge is mitigated by providing significantly more access to the water by creating over 1110 m of new cobble beach with smaller grain sizes (sand/gravel) occurring for the first 50 m west of the groyne. Therefore, the implementation of the LWC Project will have a negligible effect on existing recreational activities on the sand beach at Marie Curtis Park west.

*Indicator: Potential for changes to use for windsurfers and/or kiteboarders*

Land creation activities have the potential to affect the use of existing beaches and nearshore areas by windsurfers and/or kiteboarders. Shoreline orientation and the presence of landforms will influence how windsurfers and/or kiteboarders use the area. Potential effects to these users are assessed using professional judgment.

The orientation of the existing shoreline will change and new landforms will be present with the implementation of the LWC Project. These changes will require windsurfers and kiteboardsers to adapt to the new shoreline configuration and presence of new landforms. To mitigate effects to these users, navigation maps will be updated based on the new shoreline configuration so lake users are aware of any new potential hazards. As indicated in Chapter 3, Marie Curtis Park is recommended for experienced riders only due to the prevalent wave and wind conditions. Once windsurfers and kiteboardsers adapt to the new shoreline configuration, they should be able to continue to use Marie Curtis Park as a launching point for their activities. Since windsurfers and kiteboarders will be able to continue using the beaches, the net effect to these users is considered negligible.

Summary of: Potential for changes to use of waterfront for recreation

Lake modeling indicates that, following construction, water quality at Marie Curtis Park beach west for recreational activities is expected to be similar to existing conditions. A portion of the sand beach at Marie Curtis Park west will be altered which will change the way some recreational users experience the site.

**Criterion: Potential for public access to water's edge**

*Indicator: Percentage of accessible water's edge*

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-construction shoreline lengths were measured from geo-referenced aerial imagery using ArcGIS and post construction shoreline lengths were measured from the LWC Project Grading Plan (2013).

- Currently, the area of Marie Curtis Park west that is affected by the LWC Project has 235 m of publically accessible beach. The remaining 270 m of publically accessible sand beach extending to Etobicoke Creek at Marie Curtis Park west will remain unaffected by the LWC Project. Following implementation of the LWC Project, the length of publically accessible beach will increase to 1,110 m which includes 795 m of cobble, 265 m of gravel/cobble and 50 m of sandy/gravel that will be mostly sandy during the summer and be similar to existing conditions. In addition, the 235 m of publically accessible sand beach that is affected by the LWC Project will remain accessible behind the created land. During detailed design, opportunities to provide controlled access to wetlands and creeks will be investigated. In summary, the LWC Project will result in the following trade-off in public access to the water's edge: 235 m of publically accessible sand beach will be transformed (will remain behind the new land creation); and
- 1,110 m of new beach created consisting of:
  - 795 m of cobble beach;
  - 265 m of gravel/cobble beach; and
  - 50 m of gravel/sand beach.

While the LWC Project will result in a net loss in sandy/gravel beach, the LWC Project will provide a substantial increase in overall beach (predominantly cobble) and a much more accessible water's edge including improved opportunities for fishing, bird watching and nature appreciation. In addition, the Marie Curtis Park beach that is east of the LWC Project groyne structure (see Figure 6.1) will remain. The net increase in accessible beach will result in a positive effect.

*Indicator: Potential to create tiered trail system providing seasonal access*

Currently the Waterfront Trail is forced to bypass much of the actual waterfront within the LWC 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 LWC Project will allow for a multi-use connection of the Waterfront Trail that traverses across the Project Study Area and provides a linkage between the OPG Lakeview site and Marie Curtis Park along the waterfront. This new trail connection will create a positive effect by allowing for a waterfront connection across the LWC Project Study Area. The existing Waterfront Trail alignment will also be maintained providing multiple trail alignments through the Project Study Area upon establishment of the LWC Project.

*Indicator: Potential to create multi-use trail connection across area of land creation*

Currently the Waterfront Trail is forced to bypass much of the actual waterfront within the LWC 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 LWC Project will allow for a multi-use connection of the Waterfront Trail that traverses across the Project Study Area and provides a linkage between the OPG Lakeview site and Marie Curtis Park along the waterfront. This new trail connection will create a positive effect by allowing for a waterfront connection across the LWC Project Study Area.

Summary of: Potential for public access to water's edge

The LWC Project will result in a Waterfront Trail that allows for improved and additional waterfront access and nature appreciation. Although the LWC Project will result in a net loss of sand beach, there will be a substantial increase of overall beach and improved access to the waterfront. Given the current limited waterfront access and trail connections along the waterfront the overall effect of the LWC Project will be a positive improvement to the current Waterfront Trail and water access.

**Criterion: Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by First Nations and Métis**

*Indicator: Extent of traditional uses of lands within LWC Project Study Area*

The new natural waterfront park must respect and wherever possible enhance traditional uses of lands by First Nations and Métis. In particular, potential effects during the establishment/post-establishment phase on traditional uses of lands by First Nations and Métis relate to their ability to access and use the land for traditional purposes.

While there are no known culturally significant riparian uses within the LWC Project Study Area, there is the potential to provide opportunities for the collection of materials. In addition, the Mississaugas of the New Credit First Nation indicated that the improved access to the water once the LWC Project is established is viewed as having important cultural significance. These are considered positive effects of the LWC Project on traditional uses of lands by First Nations and Métis.

Summary of: Extent of traditional uses of lands within LWC Project Study Area

Although the LWC Project Study Area is not currently used by First Nations and Métis, the Mississaugas of the New Credit have indicated a strong spiritual connection to water. Improved access to the waterfront will be provided following construction. This is a net positive effect of the LWC Project on the traditional use of the LWC Project Study Area by First Nations and Métis.

**Table 7.7 Objective 2: Access (Establishment/Post-Establishment Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Potential for lookout areas	Number of opportunities for views and character of views from the LWC Project to Lake Ontario, OPG's Lakeview site to Lake Ontario and back to the cities of Mississauga and Toronto and from the Lake Ontario onshore	<ul style="list-style-type: none"> <li>• New views will be created with the creation of the landform, both from onshore areas to Lake Ontario and from Lake Ontario to inland, including:                             <ul style="list-style-type: none"> <li>○ views downstream Serson Creek to Lake Ontario;</li> <li>○ from on the promontory of land back to the City of Toronto skyline; and</li> <li>○ views into and out of wetland areas have been created.</li> </ul> </li> <li>• Landforms have been designed with views in mind to ensure prominent viewsheds are created wherever possible.</li> <li>• Views from the lake will be improved since the new landform will reduce prominence of the WWTF.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• Views to OPG's Lakeview site and the WWTF are not currently of high aesthetic value.</li> <li>• New lookout opportunities will have been created where there were none before.</li> </ul>
Potential for changes to use of waterfront for recreation	Potential for changes to water quality at Marie Curtis Park beach west with respect to swimming	<ul style="list-style-type: none"> <li>• The water quality modeling concludes that there is no significant change in water quality at Marie Curtis Park West Beach as a result of the LWC Project.</li> </ul>	None	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• There are no significant impacts from the LWC land creation area on water quality at the Marie Curtis Park beaches.</li> </ul>
	Potential for changes to existing recreational activities on the sand beach at Marie Curtis Park west	<ul style="list-style-type: none"> <li>• The LWC Project Preferred Alternative will affect approximately 235 m of publically accessible sand beach at Marie Curtis Park west.</li> <li>• The existing sand beach area will remain intact behind a new shoreline that includes a mix of gravel/cobble beach.</li> <li>• The public has indicated a preference for walking and sitting on sand beaches and the proposed changes will reduce the amount of sand beach at the water's edge.</li> <li>• Overall, the Preferred Alternative will provide significantly more accessible water's edge for recreation compared to current conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• The LWC Project Preferred Alternative has been refined to minimize encroachment on Marie Curtis Park west beach while still meeting the LWC Project objectives.</li> <li>• Further opportunities to minimize encroachment while still meeting the LWC Project objectives will be explored during detailed design.</li> <li>• The loss of existing sand beach at the water's edge is mitigated by providing significantly more access to the water by the LWC Project.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• Based on the provision of substantially more accessible waterfront beach, and the retention of the majority of Marie Curtis Park west's sand beach, there will not be a substantial effect on existing recreational uses.</li> </ul>
	Potential for changes to use for windsurfers and/or kiteboarders	<ul style="list-style-type: none"> <li>• The orientation of the existing shoreline will change which will require windsurfers and kiteboarders to adapt to the new shoreline configuration.</li> <li>• The new shoreline configuration may change the conditions under which these users access the lake due to new potential hazards (e.g. rocky islands).</li> </ul>	<ul style="list-style-type: none"> <li>• Navigation maps will be updated based on the new shoreline configuration so lake users are aware of any new potential hazards.</li> <li>• Signage, including maps, will be posted at Marie Curtis Park indicating the new shoreline features including islands.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>• The new shoreline configuration will change the way windsurfers and kiteboarders currently use the beach. These users will need to adapt their use patterns to adjust to the new shoreline configuration.</li> </ul>

**Table 7.7 Objective 2: Access (Establishment/Post-Establishment Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Potential for public access to water's edge	Percentage of accessible water's edge	<ul style="list-style-type: none"> <li>• The current 235 m of publically accessible sand beach will increase to 1,110 m of publically accessible beach including:                             <ul style="list-style-type: none"> <li>○ 795 m of cobble beach;</li> <li>○ 265 m of gravel/cobble beach; and</li> <li>○ 50 m of sandy/gravel beach.</li> </ul> </li> <li>• In addition, 264 m of currently accessible sand beach will remain behind the land creation area for public use.</li> <li>• Net loss of sand and sand/gravel beach.</li> <li>• The LWC Project results in improved access to the water and waterfront and improved opportunities for fishing, bird watching, and nature appreciation.</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• There is a net increase in accessible beach shoreline; however a net loss of sand and sand/gravel beach.</li> </ul>
	Potential to create tiered trail system providing seasonal access	<ul style="list-style-type: none"> <li>• Lands created by construction allow for opportunity to create a tiered trail system that will traverse all areas of the site and allow for seasonal use and access.</li> <li>• Improved opportunities for bird watching and nature appreciation.</li> <li>• Multiple trail options will be available since the existing trail will be retained in addition to the new trail(s).</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• The new trails will create improved opportunities for nature appreciation and seasonal use and access.</li> </ul>
	Potential to create multi-use trail connection across area of land creation	<ul style="list-style-type: none"> <li>• Lands created by construction allow for the establishment of a multi-use trail connection across the site, linking to the OPG Lakeview site to the west and Marie Curtis Park to the east.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>• A new multi-use trail connection will have been created where there were none before.</li> </ul>
Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by First Nations and Métis	Extent of traditional uses of lands within LWC Project Study Area	<ul style="list-style-type: none"> <li>• Potential to provide opportunities for the collection of medicinal plants and ceremonial activities.</li> <li>• Improved access to the water.</li> </ul>	None.	<p><b>Positive</b></p> <p>The LWC Project will provide future opportunities for traditional activities and improved access to the water.</p>

### **7.3.2.3 Summary of the Access Objective**

The Access objective for the LWC Project seeks to create safe and accessible public linkages along the waterfront in the LWC Project Study Area. These linkages, including the Waterfront Trail, will allow for compatible recreational, educational and cultural heritage opportunities.

In order to assess the effects of the LWC Project with respect to improving public linkages along the waterfront, five criteria and seven indicators were evaluated for construction phase effects and three criteria and seven indicators were evaluated for establishment/post-establishment phase effects.

During construction, access to the waterfront in the LWC Project Study Area will be affected by construction and the closure and re-routing of 770 m of Waterfront Trail; however, following construction, the new Waterfront Trail will offer a trail that provides both vertical relief that will enhance views and enjoyment as well as waterfront access along the entire LWC Project Study Area shoreline.

Marie Curtis Park users may experience nuisance effects from construction such as noise, dust, vehicle emissions and increased traffic. However, effects will be temporary and overall park enjoyment is expected to increase following full build-out of the LWC Project due to access improvements.

While the LWC Project will result in a net loss of sandy/gravel beach within the LWC Project Study Area, following construction, the LWC Project will offer:

- 1,110 m of publically accessible beach and the retention of 235 m of sand behind the created land;
- New views from the created landform to Lake Ontario and back towards Marie Curtis Park, Serson Creek and the cities of Mississauga and Toronto;
- A Waterfront Trail that connects through the LWC Project Study Area via the waterfront; and
- Greater access to the waterfront including for traditional use by First Nations and Métis.

There are no expected effects related to built or cultural heritage resources or marine archaeological resources related to construction or establishment/post-establishment.

Overall, the Preferred Alternative creates linkages that will allow for compatible recreational, educational and cultural heritage opportunities. As such, the Preferred Alternative meets the Access objective of the LWC Project.

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**Table 7.8 Overall Effects Related to Objective 2**

<i>Criteria</i>	<i>Indicator</i>	<i>Overall Effects</i>
<b>Construction</b>		
<b>Potential for change in access to and use of Waterfront Trail during construction</b>	Duration and length of trail closed to use	Negligible
	Potential for signalization of trail crossing with construction vehicles.	None
<b>Potential for change to use and enjoyment of park areas including Waterfront Trail during construction</b>	Potential for dust and vehicle emissions and noise to affect Waterfront Trail use and enjoyment	Negligible
	Potential for changes in ability to access and use park during construction due to traffic congestion and or changes to access	Negligible
<b>Potential for displacement of built heritage resources due to construction of access road, laydown area and land creation area</b>	Cultural heritage value of built heritage resources and cultural heritage landscapes within land creation area	None
<b>Potential effects from construction of access road, laydown area and land creation area on marine- and land-based archaeological resources</b>	Significance of archaeological resources within footprint of land creation and associated park area	Negligible
<b>Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by First Nations and Métis</b>	Extent of traditional uses of lands within LWC Project Study Area	None
<b>Establishment/Post-Establishment</b>		
<b>Potential for lookout areas</b>	Number of opportunities for views and character of views from the LWC Project to Lake Ontario, OPG's Lakeview site to Lake Ontario and back to the cities of Mississauga and Toronto and from the Lake Ontario onshore	Positive
<b>Potential for changes to use of waterfront for recreation</b>	Potential for changes to water quality at Marie Curtis Beach West with respect to swimming	Negligible
	Potential for changes to existing recreational activities on the sand beach at Marie Curtis Park west	Negligible
	Potential for changes to use for windsurfers and/or kiteboarders	Negligible
<b>Potential for public access to water's edge</b>	Percentage of accessible water's edge	Positive
	Potential to create tiered trail system providing seasonal access	Positive
	Potential to create multi-use trail connection across area of land creation	Positive
<b>Summary:</b>		
<p><b>Construction of the LWC Project will result in some disruptions to Waterfront Trail and Marie Curtis Park users due to alternations to Waterfront Trail access and construction activity. There will also be a net loss in existing sand beach at the water's edge following construction. These effects are offset by a substantial net gain in beach access and access to the water's edge plus a continuous Waterfront Trail connection through the new landform where no water access is currently available. Overall, the Preferred Alternative for the LWC Project meets the Access objective.</b></p>		

### **7.3.3 Objective 3: Compatibility**

#### **7.3.3.1 Construction Effects**

##### **Criterion: Potential for construction traffic to affect traffic volumes on arterial roads and access and egress from arterial roads**

*Indicator: Additional vehicle traffic on arterial roads resulting from construction*

Construction traffic associated with the LWC Project has the potential to create or compound congestion issues on arterial roads (including access and egress). This indicator was assessed to determine how LWC Project related construction traffic will affect current traffic conditions on arterial roads. In order to assess this indicator, traffic conditions were modeled along construction routes and key intersections within the LWC Regional Study Area based on current conditions and combined with anticipated construction traffic associated with the LWC Project.

The traffic analysis conducted for the LWC Project indicates that baseline traffic conditions at most intersections is congested. At peak times, LWC Project related construction traffic is estimated to be in the order of 72 vehicles per hour. Traffic generated by construction of the LWC Project was found to be minimal and would have a negligible impact on existing traffic conditions in the LWC Project and Regional Study Areas. No mitigation measures are proposed for this indicator.

Summary of: Potential for construction traffic to affect traffic volumes on arterial roads and access and egress from arterial roads

Negligible effects on traffic are expected during construction since the LWC Project will add only minimal traffic volumes to current levels.

##### **Criterion: Potential for construction traffic volumes to require changes to intersections**

*Indicator: Number of intersections requiring changes to facilitate LWC related construction traffic*

Increases in traffic volumes associated with LWC Project construction could require changes to intersections to address traffic issues. This indicator was assessed to identify the number of intersections that may require changes due to LWC Project construction related traffic. This indicator was assessed by modeling traffic conditions at key intersections within the LWC Regional Study Area based on current conditions combined with anticipated construction traffic associated with the LWC Project.

Traffic conditions at most intersections within the LWC Project Regional Study Area are congested. Traffic volumes associated with the LWC Project will result in a minor increase in volume at affected intersections. The preferred access point at Lakeshore and Dixie is a

controlled intersection so no physical changes to intersection is proposed. The traffic analysis indicates that current traffic conditions at several intersections could be improved through adjustments to signal timing; however, this would need to be undertaken by the City of Mississauga and the City of Toronto. If the preferred access point is unavailable due to activities related to the Hanlan Feeder Main Project in the early stages of construction, an alternate temporary access point to the east is proposed until the preferred access point becomes available. During detailed design, the LWC Project team will explore options to mitigate traffic effects at the intersection of Lakeshore Road and the temporary construction access route through the establishment of a right hand turn lane and a merge lane exiting the site. The traffic study undertaken for this EA will be made available to the City of Mississauga to allow their traffic planning team to determine if changes to signal timing within the Regional Study Area are appropriate. No further mitigation measures are proposed for this indicator.

Summary of: Potential for construction traffic volumes to require changes to intersections  
No net effects are predicted since no intersections will require physical changes.

**Criterion: Potential to affect operations at WWTF**

*Indicator: Changes in access to outfall during construction*

The outfall pipe from the WWTF extends into Lake Ontario where it discharges. There are a number of access points to allow for maintenance along the outfall pipe. This indicator was assessed to determine the effects of construction of the Preferred Alternative on access to the outfall pipe. The effects assessment was conducted by overlaying the locations of the access points on the Preferred Alternative footprint using ArcGIS tools.

Construction of the Preferred Alternative results in two of the WWTF outfall access points being affected by the land creation area. During construction there will likely be times when these outfall access points will be inaccessible, however maintenance can be conducted at any of the unaffected access points. The overall net effect of decreased access to the two access points is deemed to be negligible during construction.

Summary of: Potential to affect operations at WWTF

Negligible effects on WWTF operations are expected during construction since access to the outfall will be available at unaffected access points.

**Criterion: Potential for effects to water quality at Water Treatment Plant intakes**

*Indicator: Potential for effects during construction*

Land creation construction activities have the potential to release high sediment loads into the lake, potentially affecting water quality at the Water Treatment Plant intakes. Assessment of this

indicator was completed qualitatively based on experience with similar land creation projects and professional judgment.

In order to mitigate the potential to release high sediment loads into the lake, best management practices related to general in-water works will be followed and the “Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario” (MOE 2011) will be met. Soil placement will follow the confined filling technique which involves the creation of brick rubble and concrete confining structures prior to soil placement. The creation of the confining structures will be highly effective at mitigating sediment release to the open water, and more specifically to the water intakes associated with the treatment plant. Overall, effects during construction on water quality at the Water Treatment Plant are expected to be negligible.

Summary of: Potential for effects to water quality at Water Treatment Plant intakes

Although there is some potential for water quality effects during construction due to in-water work and turbidity, best management practices are expected to fully mitigate these potential effects.

**Table 7.9 Objective 3: Compatibility (Construction Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Potential for construction traffic to affect traffic volumes on arterial roads and access and egress from arterial roads	Additional vehicle traffic on arterial roads resulting from construction vehicle movements	<ul style="list-style-type: none"> <li>Site generated construction traffic is minor in the range of 72 vehicles per hour during peak hours which has a minor effect on current traffic conditions on arterial roads.</li> </ul>	<ul style="list-style-type: none"> <li>Recommendations in the traffic study to alter signal timing to improve traffic flow will be provided to the City of Mississauga for consideration.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>Minor increases in traffic volumes during construction will not be noticeably different than current traffic conditions.</li> </ul>
Potential for construction traffic volumes to require changes to intersections	Number of intersections requiring changes to facilitate LWC related construction traffic	<ul style="list-style-type: none"> <li>Site generated construction traffic is considered minor and will not require any changes to intersections.</li> <li>The preferred site access road entrance occurs at a currently controlled intersection (Dixie Road).</li> <li>A temporary access point to the east may be required during early stages of construction which is an uncontrolled intersection and could cause traffic disruptions on Lakeshore related to turning vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>Options for installing a right hand turn lane and merge lane at the temporary access point will be explored during detailed design.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>Effects to intersections can be mitigated by installing appropriate turn lanes.</li> </ul>
Potential to affect operations at WWTF	Changes in access to outfall during construction	<ul style="list-style-type: none"> <li>The land creation area covers two existing access points for the WWTF outfall pipe.</li> <li>During construction, access to these two points along the outfall for maintenance will be disrupted, likely making them inaccessible at times.</li> </ul>	<ul style="list-style-type: none"> <li>Construction crews will coordinate access requirements with WWTF staff to ensure maintenance needs can be met throughout the construction period.</li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>There will be some disruption to these two access points during construction, but all other access points along the outfall will be accessible.</li> </ul>
Potential for effects to water quality at Water Treatment Plant intakes	Potential for effects during construction	<ul style="list-style-type: none"> <li>Potential for effects related to high sediment loads and placement of berm and fill materials.</li> </ul>	<ul style="list-style-type: none"> <li>Best management practices and mitigation measures will include:                             <ul style="list-style-type: none"> <li>sediment and erosion control;</li> <li>creation of containment berms to isolate fill operations; and</li> <li>“Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario” (MOE 2011) will be met.</li> </ul> </li> </ul>	<p><b>Negligible</b></p> <ul style="list-style-type: none"> <li>Best management practices and testing are expected to control potential effects.</li> </ul>

### **7.3.3.2 Establishment/Post-Establishment Effects**

#### **Potential to affect operations at WWTF**

*Indicator: Changes in access to outfall during establishment/post-establishment.*

As stated previously, the WWTF outfall pipe extends into Lake Ontario. Along this pipe, a number of access points allow for maintenance. This indicator was assessed to determine the potential effects of the Preferred Alternative on access to the outfall pipe once the LWC Project is established. The effects assessment was conducted by overlaying the locations of the access points on the Preferred Alternative footprint using ArcGIS tools.

The Preferred Alternative results in two of the WWTF outfall access points being affected by the land creation area. If left un-mitigated, this would result in these two access points being inaccessible once the LWC Project is established. During construction, manhole collar extensions will be installed on each of the affected access points bringing them to the surface of the land creation area so maintenance crews at the WWTF will continue to have access during the establishment/post-establishment phase. As such, following construction, there will be no net effect on access to the outfall pipe.

Summary of: Potential to affect operations at WWTF

No effects on WWTF operations are expected following construction.

#### **Criterion: Potential for effects to water quality at Water Treatment Plant intakes**

*Indicator: Potential for effects during establishment/post-establishment*

The land creation area has the potential to change regional water circulation patterns, potentially affecting the water quality at the Water Treatment Plant intakes. Assessment of this indicator was completed both qualitatively and quantitatively by modeling lake circulation during establishment/post-establishment and professional judgment.

Regional water circulation modeling (MIKE-3 Model) was undertaken to assess the potential impact of the new land creation area on the Water Treatment Plant intakes. Results from the modeling indicate that the water quality parameters at the intake either improved or stayed the same during the establishment/post-establishment phase of the LWC Project. As such, no mitigation measures are proposed since effects on water quality are positive.

Summary of: Potential for effects to water quality at Water Treatment Plant intakes

Following construction, water circulation modeling results indicate that water quality at the Water Treatment Plant intakes will either stay the same or improve.

**Criterion: Changes to site security for WWTF**

*Indicator: Ability to maintain/enhance site security for the WWTF*

The current WWTF fence line along the shore of Lake Ontario is relatively inaccessible to the public, thus serving a security function limiting access to the WWTF. Early in the planning process for the LWC Project, increased public access resulting from land creation in this area was raised as a potential security concern at the WWTF.

A number of ecological building blocks were being considered for the naturalization component of the LWC Project, and the placement of different building blocks in front of the WWTF was considered based on their potential to discourage public access (e.g. meadow is more conducive to public access than wetland). To mitigate security concerns at the WWTF, the design team determined that placing a treed swamp and wetlands along the current WWTF fence line where it currently borders Lake Ontario would provide a sufficient deterrent to public access. Placing the treed swamp in this location would effectively maintain or enhance site security for the WWTF during the establishment/post-establishment phase. The addition of the steep side of the promontory located between the two proposed wetlands facing the WWTF provides an added deterrent relating to terrain. These design features will maintain site security at similar levels to current, creating a negligible effect.

Summary of: Changes to site security for WWTF

Despite the new land that will be created between the WWTF and Lake Ontario, design features will maintain similar security levels to the current situation. As such, the overall change to site security for the WWTF from the LWC Project is negligible.

**Criterion: Changes to parking capacity**

*Indicator: Potential to affect existing parking capacity at Marie Curtis Park and adjacent areas*

The LWC Project will result in increased user access to the area which will create additional pressure on existing parking availability. As part of the Traffic Analysis (Appendix L) conducted for the LWC Project, a parking analysis was completed to determine the effects on existing parking availability. Future parking requirements were determined based on the Institute of Transportation Engineers parking generation guidelines.

The parking analysis indicates that the LWC Project will generate an additional 66 parked vehicles on a typical Saturday afternoon. There are currently 1,000 available parking spaces in the vicinity of the LWC Project which includes capacity at Lakefront Promenade. On a typical Saturday afternoon, approximately 600 of these spaces are occupied leaving 400 spaces available to accommodate additional vehicles generated by the LWC Project.

The preferred parking lots for users of the LWC Project will be in the lots at Marie Curtis Park where there are currently 150 spaces. The current parking demand within these lots on a typical Saturday afternoon is 95 spaces. The addition of 66 vehicles associated with the LWC Project would put these lots over capacity by approximately 11 vehicles. There are an additional 15 street parking spaces available along Lakeshore Road that could accommodate the parking overflow. The City of Toronto has indicated that existing demand for parking spaces at Marie Curtis Park may be greater than this analysis suggests as a result of recent changes to the park. CVC and the Region of Peel will be working with the City of Mississauga and TRCA to plan for additional parking as part of the planning for the Arsenal Lands and Inspiration Lakeview. Parking cannot be provided on the created land area.

It is recognized that the LWC Project will further constrain existing parking capacity issues at Marie Curtis Park. There is no opportunity to create additional parking capacity as part of the LWC Project, so the LWC planning team will continue to support planning initiatives for Inspiration Lakeview and the Arsenal Lands that could include additional parking facilities and alleviate parking constraints in the Project Study Area. Although it is anticipated that parking issues can be addressed as part of adjacent planning initiatives, constraints on existing parking is considered a negative effect.

Summary of: Potential to affect existing parking capacity at Marie Curtis Park and adjacent areas  
The establishment of the LWC Project could put existing parking at or over capacity within Marie Curtis Park. Opportunities to alleviate parking constraints will be explored through adjacent planning initiatives; however, the effect on parking is considered a negative effect.

**Table 7.10 Objective 3: Compatibility (Establishment/Post-Establishment Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Potential to affect operations at WWTF	Changes in access to outfall during establishment/post-establishment.	<ul style="list-style-type: none"> <li>Fill material placed on top of two manhole covers will cover access to submerged sewer outfalls for maintenance and operations.</li> </ul>	<ul style="list-style-type: none"> <li>A manhole collar extension will be installed on the current access locations so access can occur from the land creation area. This will provide continued, long-term access to these points.</li> </ul>	<p><b>None</b></p> <ul style="list-style-type: none"> <li>Manhole covers will remain accessible during establishment phase.</li> </ul>
Potential for effects to water quality at Water Treatment Plant intakes	Potential for effects during establishment/post-establishment	<ul style="list-style-type: none"> <li>Regional water circulation modeling indicates that the land creation results in no change or moderate improvements in water quality at the intakes.</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>Net improvement to water quality is expected.</li> </ul>
Changes to site security for WWTF	Ability to maintain/enhance site security for the WWTF	<ul style="list-style-type: none"> <li>Land creation and subsequent increases in public access to areas in front of the WWTF could create security concerns at the WWTF.</li> </ul>	<ul style="list-style-type: none"> <li>The landscape design has incorporated a treed swamp along the fence line in front of the WWTF to discourage public access.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>With the proposed design features, site security at the WWTF will be similar to current conditions.</li> </ul>
Changes to parking capacity	Potential to affect existing parking capacity at Marie Curtis Park and adjacent areas	<ul style="list-style-type: none"> <li>Parking analysis indicates that the LWC Project will generate an additional 66 vehicles requiring parking on a typical Saturday afternoon.</li> <li>Parking analysis identified approximately 1000 parking spaces in the vicinity of the LWC, of which 600 are currently occupied on a typical Saturday afternoon.</li> <li>In the lots closest to the LWC Project there are 150 spaces available with a current demand of 95.</li> <li>Thus, the LWC Project could put the closest lots over capacity in the future (i.e. 95+66=161 spaces required).</li> <li>The City of Toronto has indicated that existing demand for parking spaces at Marie Curtis Park may be greater than this analysis suggests as a result of recent changes to the park.</li> </ul>	<ul style="list-style-type: none"> <li>There is no opportunity to create additional parking capacity as part of the LWC Project.</li> <li>The LWC planning team will continue to support planning initiatives for Inspiration Lakeview and Arsenal Lands that could include additional parking facilities.</li> </ul>	<p><b>Negative</b></p> <ul style="list-style-type: none"> <li>Parking capacity in the area will be constrained by additional demand generated by the LWC Project.</li> </ul>

### **7.3.3.3 Summary of the Compatibility Objective**

The Compatibility objective seeks to ensure that the LWC Project is compatible with existing infrastructure such as the WWTF, Water Treatment Plant and associated water intake and outfall structures as well as local traffic. It is critical that the LWC Project not affect the form or function of existing infrastructure.

In order to assess the effects of the LWC Project on this objective, four criteria/indicators were evaluated for construction and three criteria/indicators were evaluated for establishment/post-establishment phase effects.

Current traffic conditions at most intersections within the LWC Project Regional Study Area are congested. At peak times during construction, the LWC Project will add about 72 vehicles per hour resulting in a negligible increase compared to existing conditions. A temporary construction access point to the east of the preferred access at Dixie Road may require upgrades to mitigate potential traffic flow issues during the first year of construction.

The WWTF outfall pipe access points that will be disrupted during construction will be fully mitigated following full build of the LWC Projects resulting in no net effects to the WWTF operations. In addition, although there is some potential for water quality effects at the Water Treatment Plant intakes during construction, water quality is expected to stay the same or improve once the LWC Project is established.

Site security at the WWTF is expected to be maintained because of landscape design elements.

Overall, the Preferred Alternative for the LWC Project will meet the Compatibility objective by causing either no, negligible or positive effects on local infrastructure.

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**Table 7.11 Overall Effects Related to Objective 3**

<i>Criteria</i>	<i>Indicator</i>	<i>Overall Effects</i>
<b>Construction</b>		
<b>Potential for construction traffic to affect traffic volumes on arterial roads and access and egress from arterial roads</b>	Additional vehicle traffic on arterial roads resulting from construction vehicle movements	Negligible
<b>Potential for construction traffic volumes to require changes to intersections</b>	Number of intersections requiring changes to facilitate LWC related construction traffic	Negligible
<b>Potential to affect operations at WWTF</b>	Changes in access to outfall during construction	Negligible
<b>Potential for effects to water quality at Water Treatment Plant intakes</b>	Potential for effects during construction	Negligible
<b>Establishment/Post-Establishment</b>		
<b>Potential to affect operations at WWTF</b>	Changes in access to outfall during establishment/post-establishment.	None
<b>Potential for effects to water quality at Water Treatment Plant intakes</b>	Potential for effects during establishment/post-establishment	Positive/none
<b>Changes to site security for WWTF</b>	Ability to maintain/enhance site security for the WWTF	Negligible
<b>Changes to parking capacity</b>	Potential to affect existing parking capacity at Marie Curtis Park and adjacent areas	Negative
<b>Summary:</b> The Preferred Alternative will not result in significant traffic disruptions and will not have an adverse effect on existing infrastructure at the WWTF or Water Treatment Plant. Overall, the Preferred Alternative for the LWC Project meets the Compatibility objective.		

### **7.3.4 Objective 4: Coordination**

#### **7.3.4.1 Construction Effects**

##### **Criterion: Consistency with Marie Curtis Park Revitalization Plan**

*Indicator: Ability to integrate recreational opportunities and trails between the LWC, Arsenal Lands and Marie Curtis Park*

The Marie Curtis Park Revitalization Plan identifies a number of new and enhanced recreational opportunities. The Preferred Alternative was reviewed to ensure consistency with the intent to create linkages between these amenities and the shoreline within the LWC Project Study Area, and thus meet the goals of these Master Plans.

Future plans for the Arsenal Lands have currently been placed on hold to allow works for the LWC Project to proceed. As such, there are currently no impacts on the Arsenal Lands as a result of construction due to the LWC Project. Should the planning process reinitiate during construction, any future planning and implementation activities would take into account the LWC Project Preferred Alternative and construction scheduling. Following construction, decommissioning of the LWC Project construction access road should include rough grading to any proposed future condition within the Arsenal Lands, if timing and opportunity allows. This would result in a net positive effect on the implementation of any future Arsenal Lands plan.

Elements of the Marie Curtis Park Revitalization Plan have been implemented in 2011, 2012 and 2013. The construction access route and construction activity does not impact the works underway involving re-vegetation, construction of the dog off leash area, volleyball court, nor the decommissioning of one of the parking lots. However, the construction access route overlaps with approximately 5 m of the new Waterfront Trail upgrades at the border of the Region of Peel. The Waterfront Trail will be temporarily re-routed, maintaining the east-west connection of the trail. Following construction, the Waterfront Trail will be reconstructed and re-opened to the public.

##### **Summary of: Consistency with Marie Curtis Park Revitalization Plan**

The net effects of the LWC Project on the Marie Curtis Park Revitalization Plan are positive. Decommissioning of the access road has the potential to provide for rough grading to potential new Arsenal Lands conditions.

**Table 7.12 Objective 4: Coordination (Construction Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Consistency with Marie Curtis Park Revitalization Plan	Ability to integrate recreational opportunities and trails between the LWC Project, Arsenal Lands and Marie Curtis Park	<p>Arsenal Lands</p> <ul style="list-style-type: none"> <li>None, however upon completion of construction, decommissioning of the LWC Project construction access road should include rough grading to any new condition, if timing and opportunity allows.</li> </ul> <p>Marie Curtis Park Revitalization Plan</p> <ul style="list-style-type: none"> <li>The construction access route overlaps approximately 5 m of the Waterfront Trail upgrades that have already been implemented.</li> </ul>	<p>Marie Curtis Park Revitalization Plan</p> <ul style="list-style-type: none"> <li>All existing Waterfront Trail that will be affected by the access route will be restored during decommissioning of the access road.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>Consideration will be given to how the access road is decommissioned such that it would support future Arsenal Lands planning.</li> </ul>

#### **7.3.4.2 Establishment/Post-Establishment Effects**

##### **Criterion: Consistency with City of Mississauga Waterfront Parks Strategy (2008)**

###### *Indicator: Consistency of alternative with Waterfront Parks Strategy*

The Preferred Alternative is reviewed to ensure consistency with the key strategic goals outlined in the Waterfront Parks Strategy. The goals include:

- better integration and connectivity of Waterfront Parks;
- improved connections to Mississauga;
- the introduction of more sustainable elements into the parks; and
- promotion of a stronger relationship between the parks and the existing natural systems.

This indicator was assessed by reviewing the City of Mississauga Waterfront Parks Strategy and doing a qualitative assessment of the Preferred Alternative's consistency with the Waterfront Parks Strategy.

The Waterfront Parks Strategy recommends, in general, that a continuous trail be provided along the entirety of Mississauga's waterfront. With a significant naturalization component that aligns with the goals and improved trail connection along the waterfront, the Preferred Alternative is consistent with the intent of the Waterfront Parks Strategy. By providing a trail that does not jog north to Lakeshore Boulevard, the LWC Project provides an improvement to what was contemplated in the Waterfront Parks Strategy.

###### Summary of: Consistency with City of Mississauga Waterfront Parks Strategy (2008)

The Preferred Alternative is consistent with the goals of the Mississauga Waterfront Parks Strategy resulting in a net positive effect.

##### **Criterion: Consistency with the Visioning for Inspiration Lakeview**

###### *Indicator: Consistency of alternative with Visioning for Inspiration Lakeview*

The shoreline and Serson Creek within the LWC Project Study Area was identified as a "Green" area in the Visioning for Inspiration Lakeview. This portion of shoreline was discussed as an area to establish a new continuous waterfront south of the WWTF. This indicator was assessed by reviewing the Visioning for Inspiration Lakeview and doing a qualitative assessment of the Preferred Alternative's consistency with that vision.

The Inspiration Lakeview report calls for a “Green Water’s Edge” along the waterfront, to be created as a park south of the WWTF. The report envisions this park area to serve several important functions:

- as the green terminus of a rejuvenated Serson Creek;
- to facilitate views to the lake from the Inspiration Lakeview site;
- to provide passive recreational opportunities; and
- to provide a ‘green’ water’s edge to create new natural heritage and habitat opportunities, including improved marine habitat.

The Preferred Alternative meets all of the objectives identified in the Visioning for Inspiration Lakeview making the LWC Project consistent with that vision and an overall positive effect.

*Indicator: Ability to integrate alternative with potential plans for OPG’s Lakeview site*

The Inspiration Lakeview Vision identifies the LWC Project Study Area as a key area for establishing public linkages. The ability of the Preferred Alternative to integrate with potential plans for OPG’s Lakeview site is important in the larger Inspiration Lakeview planning process. This indicator was assessed by reviewing the plans for OPG’s Lakeview site and doing a qualitative assessment of the Preferred Alternative’s ability to integrate with those plans.

The LWC Project Preferred Alternative includes a trail connection from the west end of Marie Curtis Park to the west side of Serson Creek where it connects to OPG’s Lakeview site. Without the LWC Project, there is no opportunity to link the OPG Lakeview site with the trail through Marie Curtis Park along the waterfront. The LWC Project makes this valuable connection possible, making it a key component of the public linkage aspect of the Inspiration Lakeview plans and a net positive effect of the LWC Project.

Summary of: Consistency with the Visioning for Inspiration Lakeview

The Preferred Alternative not only meets all of the objectives of the Visioning for Inspiration Lakeview, it also establishes a key linkage between Marie Curtis Park and OPG’s Lakeview site. The Preferred Alternative is consistent with the Visioning for Inspiration Lakeview, a positive effect.

**Criterion: Consistency with LOISS**

*Indicator: Consistency of alternative with priorities identified by LOISS*

The Preferred Alternative was reviewed against LOISS background studies to ensure consistency with the priorities identified in LOISS and moves the objectives of LOISS forward. The LOISS background study was reviewed to ensure the refinements were consistent with goals, objectives and priorities set out by LOISS.

Following full implementation of the LWC Project, the Preferred Alternative will be compatible with the priorities identified in the LOISS and will support the function of the bioregional corridor. In addition, the LWC Project supports the goals for restoration of natural ecosystems along the Lake Ontario shoreline including habitat creation.

Summary of: Consistency with LOISS

The Preferred Alternative is both consistent with the LOISS and moves objectives related to natural ecosystems and terrestrial and aquatic habitat forward. As a result, the LWC Project results in a net positive effect with respect to this indicator.

**Criterion: Consistency with Lake Ontario Biodiversity Strategy**

*Indicator: Consistency of alternative with priorities identified by the Lake Ontario Biodiversity Strategy*

The Preferred Alternative was reviewed to ensure consistency with the recommendations and targets identified in the Lake Ontario Biodiversity Strategy and to ensure that it helps to meet the objectives of the Strategy.

Following construction, the LWC Project would be consistent with five targets of the Lake Ontario Biodiversity Strategy and consistent with recommendations to protect and restore the health of Lake Ontario. The loss of 166 m of existing sand beach to the wetland that will be associated with Applewood Creek and a section of sand beach in Marie Curtis Park that will become hind beach behind a new gravel beach is mitigated by a net increase in high quality coastal wetland habitats and the establishment of a cobble beach and island system resulting in a positive effect.

Summary of: Consistency with Lake Ontario Biodiversity Strategy

With respect to the Lake Ontario Biodiversity Strategy, the LWC Project will:

- be consistent with the biodiversity targets;
- be consistent with the recommendations to protect and restore the health of Lake Ontario; and
- mitigate the loss of beach habitat with an overall increase in high quality habitat that will increase the diversity of aquatic habitat available in the LWC Project Study Area.

As a result, there is a net positive effect from the LWC Project associated with coordinating with the Lake Ontario Biodiversity Strategy.

**Criterion: Consistency with Marie Curtis Park Revitalization Plan**

*Indicator: Ability to integrate recreational opportunities and trails between the LWC, Arsenal Lands and Marie Curtis Park*

The Marie Curtis Park Revitalization Plan identifies a number of new and enhanced recreational opportunities. The Preferred Alternative was reviewed to ensure consistency with the intent to create linkages between these amenities and the shoreline within the LWC Project Study Area, and thus meet the goals of the plan.

Once the LWC Project is established, improved trail connections along the waterfront will support the Marie Curtis Park Revitalization Plan.

Summary of: Consistency with Marie Curtis Park Revitalization Plan

Once established the net effects of the LWC Project on the Marie Curtis Park Revitalization Plan are positive based on improved connections of the Waterfront Trail to and along the waterfront allow for positive coordination with the Marie Curtis Park Revitalization Plan.

**Criterion: MNR Lake Ontario Fish Community Objectives**

*Indicator: Consistency with the goals of the MNR Lake Ontario Fish Community Objectives*

The MNR Fish Community Objectives for Lake Ontario (2013) were created to advance the goals and objectives of the Lake Ontario Lakewide Management Plan (LaMP). On a local scale, the Preferred Alternative may advance the goals and objectives of the LaMP and MNR’s Fish Community Objectives for Lake Ontario following full implementation of the LWC Project. 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 MNR Lake Ontario Fish Community Objectives identifies the following goals for the Nearshore and Offshore Pelagic Zones:

Nearshore Zone	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	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 LWC Project results in aquatic habitat improvements that will provide local gains to riverine, nearshore, and coastal habitats. With respect to the MNR Lake Ontario Fish Community Objectives, LWC Project will:

- Support cool and cold water riverine and nearshore pelagic fish species by providing for improved primary productivity and foraging opportunities through the provision of streambank habitat within the new creek channels.
- Support pelagic salmonids and other top predators by providing highly productive habitat for pelagic forage fish species through the creation of new cobble beaches.
- Support cool and cold water fish communities through the creation of lee side island habitat augmented with surcharged areas (i.e., point shoal and rock piles).
- Provide, overall, a foundation for a healthier and broader fisheries community through the creation of:
  - new open coast shoreline, including structural habitat features along the toe of the revetment, which provides foraging, spawning, and nursery habitat;
  - lee side island habitat which provides sheltered conditions for Lake Ontario species;
  - coastal wetland habitat which provides sheltered, warmwater conditions for foraging, feeding, and spawning; and
  - riverine habitat within the new Serson Creek and Applewood Creek channels and existing Serson Creek stormwater channel which provides refuge, foraging and spawning habitat.

Summary of: Consistency with the goals of the MNR Lake Ontario Fish Community Objectives

The LWC Project results in aquatic habitat improvements that will provide local gains to riverine, nearshore and coastal habitat that are expected to help meet the nearshore and offshore goals of the MNR Lake Ontario Fish Management Plan. As a result, the LWC Project is expected to have a positive effect on coordination with the MNR Lake Ontario Fish Management Plan.

**Criterion: Consistency with CVC's hazard land guidelines and regulations.**

*Indicator: Potential for flooding as a result of land creation*

The Preferred Alternative was reviewed against CVC's hazard land guidelines and regulations to ensure that the land creation will not increase potential for flooding and hazard. As part of land creation, the Preferred Alternative will have 200-300 m extension of Applewood and Serson Creeks from their existing outlets. The LWC would also have wetland features adjacent to the extended creeks. There may be minor changes (increase/decrease) in water surface elevations upstream of the new proposed channel, but it does not show any negative effect on flooding or flow conveyance due to the new proposed channel. There is currently accumulated debris at the

Serson Creek outlet to Lake Ontario which will be removed as part of the creek extension. The blockage removal will provide better flow conveyance at the outlet, which will eventually improve flooding conditions upstream of the new channel.

In Applewood Creek the extended channel has wetland features that will not produce a negative effect on flooding upstream of the extended channel.

Summary of: Consistency with CVC's hazard land guidelines and regulations.

Upon establishment of the LWC Project, there will be no negative impacts on flooding in either Applewood or Serson Creeks. The LWC Project will provide improvement of flow conveyance at the Serson Creek outlet and improvement of flooding upstream of the extended channel.

**Table 7.13 Objective 4: Coordination (Establishment/Post-Establishment Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Consistency with City of Mississauga Waterfront Parks Strategy (2008)	Consistency of alternative with Waterfront Parks Strategy	<ul style="list-style-type: none"> <li>The LWC Project will be consistent with a number of the goals identified in the Waterfront Parks Strategy by improving trail connections along the waterfront and providing more natural, sustainable ecological features within the park area.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>The LWC Project will result in a positive contribution to the City of Mississauga Waterfront Parks Strategy.</li> </ul>
Consistency with the Visioning for Inspiration Lakeview	Consistency of alternative with Visioning for Inspiration Lakeview	<ul style="list-style-type: none"> <li>The LWC Project will provide a vast green space in front of the WWTF and Inspiration Lakeview site that otherwise would not exist.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>The LWC Project will consistent with Visioning for Inspiration Lakeview.</li> </ul>
	Ability to integrate alternative with potential plans for OPG's Lakeview site	<ul style="list-style-type: none"> <li>The LWC Project will provide a continuous trail connection along Lake Ontario between OPG's Lakeview site and Marie Curtis Park.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>The LWC Project will result in positive linkages with \ OPG's Lakeview site.</li> </ul>
Consistency with LOISS	Consistency of alternative with priorities identified by LOISS	<ul style="list-style-type: none"> <li>The LWC project is:                             <ul style="list-style-type: none"> <li>compatible with priorities identified in LOISS;</li> <li>supports the function of this significant bioregional corridor; and,</li> <li>does not conflict with goals for restoration of natural ecosystems including habitat creation that is consistent with recommendations from LOISS.</li> </ul> </li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>Compatible with priorities identified in LOISS.</li> <li>Support the function of this significant bioregional corridor.</li> <li>Does not conflict with restoration goals.</li> </ul>
Consistency with Lake Ontario Biodiversity Strategy	Consistency of alternative with priorities identified by the Lake Ontario Biodiversity Strategy	<ul style="list-style-type: none"> <li>Consistent with five targets of the Lake Ontario Biodiversity Strategy:                             <ul style="list-style-type: none"> <li>Creation of coastal wetlands;</li> <li>Enhancing the nearshore zone;</li> <li>Establishing coastal terrestrial systems;</li> <li>Improving river, estuaries, and connecting channels; and</li> <li>The establishment of islands.</li> </ul> </li> <li>Consistent with recommendations to protect and restore the health of Lake Ontario:                             <ul style="list-style-type: none"> <li>Restore connections and natural hydrology; and</li> <li>Restore the quality of nearshore waters.</li> </ul> </li> <li>Potential negative effect on the 166-m of existing sand beach immediately south of the WWTF, and a section of sand beach at Marie Curtis Park West.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of sand beach south of the WWTF will be replaced with high quality coastal wetland habitats, and the establishment of a cobble beach and island system.</li> <li>Sand beach at Marie Curtis Park West will remain in place, but will be located behind the new cobble beach face.</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>Consistent with biodiversity targets for Lake Ontario.</li> <li>Consistent with recommendations to protect and restore the health of Lake Ontario.</li> <li>Negative effect on the sand beach south of the WWTF is mitigated through creation of additional high quality wetland habitat and cobble beach and island system.</li> <li>The sand beach at Marie Curtis Park West will not be lost.</li> </ul>
Consistency with Marie Curtis Park Revitalization Plan	Ability to integrate recreational opportunities and trails between the LWC Project, Arsenal Lands and Marie Curtis Park	<ul style="list-style-type: none"> <li>The new Waterfront Trail will provide improved trail connections along and to the waterfront, which is consistent with the plan.</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>Improved trail connections to and along the waterfront will support the Marie Curtis Park Master Plan</li> </ul>

**Table 7.13 Objective 4: Coordination (Establishment/Post-Establishment Effects) (Cont'd)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
MNR Lake Ontario Fish Community Objectives	Consistency with the MNR Lake Ontario Fish Community Objectives	<ul style="list-style-type: none"> <li>The LWC Project will provide local gains with regard to achieving goals established in MNR's Fish Community Objectives for Lake Ontario.</li> </ul>	None	<p><b>Positive</b></p> <ul style="list-style-type: none"> <li>Improvements are anticipated both regionally and locally to the riverine, nearshore and coastal marsh fish communities.</li> </ul>
Consistency with CVC's hazard land guidelines and regulations.	Potential for flooding as a result of land creation	The LWC Project will provide improvements to flow conveyance at the outlet of Serson Creek. Upstream of the extended Serson Creek, flood risk will be reduced. There will not be any negative effect on flooding in Applewood Creek upstream of the extended channel.	None	<p>Positive</p> <ul style="list-style-type: none"> <li>Improvement of flow conveyance and flooding.</li> </ul>

### **7.3.4.3 Summary of the Coordination Objective**

The Coordination objective for the LWC Project aims to integrate the LWC Project with the other planning initiatives that will affect the waterfront within the LWC Project Study Area. The Preferred Alternative for the LWC Project was evaluated for alignment of goals, objectives, and planned improvements associated with each initiative.

In order to assess the effects of the LWC Project, coordination with eight plans, strategies or guidelines were evaluated under one criteria and indicator for construction and seven criteria and eight indicators for establishment/post-establishment phase effects.

The construction access road will overlap 5 m of the Waterfront Trail that has been upgraded as part of the implementation of the Marie Curtis Park Revitalization Plan and will pass through the Arsenal Lands. However, mitigation measures such as minimizing the footprint of the access road and temporary re-routing of the Waterfront Trail are expected to minimize effects so that they are negligible and do not represent a detrimental effect on the Marie Curtis Park Revitalization Plan and future plans for the Arsenal Lands.

Following implementation of the LWC Project, it is expected to:

- be consistent with a number of City of Mississauga Waterfront Parks Strategy goals including improving trail connections and providing more natural, sustainable ecological features;
- create a green space between the WWTF and Lake Ontario that is consistent with the Visioning for Inspiration Lakeview;
- provide a continuous trail connection along the waterfront between Marie Curtis Park and OPG's Lakeview site that is consistent with the Visioning for Inspiration Lakeview;
- be compatible with the LOISS priorities including restoration of natural ecosystems and creation of terrestrial and aquatic habitat;
- be consistent with the Lake Ontario Biodiversity Strategy targets including the creation of aquatic habitat that will restore connections and quality of nearshore waters;
- provide an opportunity to meet planned conditions for the Arsenal Lands;
- provide improved Waterfront Trail connections along the waterfront consistent with Marie Curtis Park Revitalization Plan;
- provide local gains with potential regional effects towards the goals of MNR's Fish Community Objectives for Lake Ontario for the nearshore and offshore zones; and
- provide improved flood conditions in Serson Creek and no increase in flood risk in Applewood Creek.

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The net effect of the LWC Project during establishment/post-establishment with respect to coordination with other plans, strategies and guidelines is positive.

Overall, the Preferred Alternative for the LWC Project meets the Coordination objective.

**Table 7.14 Overall Effects Related to Objective 4**

<i>Criteria</i>	<i>Indicator</i>	<i>Overall Effects</i>
<b>Construction</b>		
<b>Consistency with Marie Curtis Park Revitalization Plan</b>	Ability to integrate recreational opportunities and trails between the LWC, Arsenal Lands and Marie Curtis Park	Positive
<b>Establishment/Post-Establishment</b>		
<b>Consistency with City of Mississauga Waterfront Parks Strategy (2008)</b>	Consistency of alternative with Waterfront Parks Strategy	Positive
<b>Consistency with the Visioning for Inspiration Lakeview</b>	Consistency of alternative with Visioning for Inspiration Lakeview	Positive
	Ability to integrate alternative with potential plans for OPG's Lakeview site	Positive
<b>Consistency with LOISS</b>	Consistency of alternative with priorities identified by LOISS	Positive
<b>Consistency with Lake Ontario Biodiversity Strategy</b>	Consistency of alternative with priorities identified by the Lake Ontario Biodiversity Strategy	Positive
<b>Consistency with Marie Curtis Park Revitalization Plan</b>	Ability to integrate recreational opportunities and trails between the LWC, Arsenal Lands and Marie Curtis Park	Positive
<b>MNR Lake Ontario Fish Community Objectives</b>	Consistency with the goals of the MNR Lake Ontario Fish Community Objectives	Positive
<b>Consistency with CVC's hazard land guidelines and regulations.</b>	Potential for flooding as a result of land creation	Positive
<b>Summary:</b> <b>Construction and establishment of the LWC Project will have positive effects on other plans and policies within the Project and Regional Study Areas. Overall, the Preferred Alternative for the LWC Project meets the Compatibility objective.</b>		

### **7.3.5 Objective 5: Fiscal Viability**

#### **7.3.5.1 Construction Effects**

##### **Criterion: Capital Development Costs<sup>17</sup>**

###### *Indicator: Capital Construction Cost Estimate*

A capital construction cost estimate was prepared for the Preferred Alternative to determine the fiscal viability of the LWC Project. Capital construction costs were developed based on current, relevant construction rates, knowledge of the local market conditions and a database of cost information for projects involving similar large scale soil- and waterfront-specific projects from across Southern Ontario. The costs outlined in this section are based on a number of basic assumptions and a great deal of relevant project experience with similar waterfront projects. The costing incorporates the most up-to-date tipping fees, fill disposal locations and anticipated source locations. Key assumptions to reduce construction costs are that a portion of the protection features would consist of free materials (e.g. construction rubble) and the reuse of armourstone onsite.

Based on the upper limit of 2.0 million m<sup>3</sup> of fill, total capital costs were estimated to be \$65.4 million. Currently, clean fill and construction rubble generated by Region of Peel infrastructure projects is trucked to rural areas for disposal with associated tipping fees and transportation costs. By developing the LWC Project, the Region of Peel can utilize some of this material and save on disposal and transportation costs. The Region of Peel estimates total savings of \$25.5 million through the diversion of clean fill and construction rubble to the LWC Project. This estimate assumes offsets from transportation and disposal costs on other Region of Peel projects and revenue associated with tipping fees generated from private sector projects. The net estimated capital construction cost for the LWC Project is \$39.9 million for the upper limit of 2.0 million m<sup>3</sup> of fill.

##### **Criterion: Amount of fill material to be diverted from rural disposal sites**

###### *Indicator: Volume of earth fill (soil) and construction rubble in cubic metres*

Clean fill and construction rubble generated by infrastructure projects is often trucked to rural areas where fill disposal is becoming an increasingly controversial land use due to undesired environmental effects. Diverting clean fill and construction rubble from these areas to more sustainable land uses such as the LWC Project helps to reduce strain on rural disposal sites. The LWC Project will divert an estimated 2.0 million m<sup>3</sup> of material from rural disposal sites.

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<sup>17</sup> All cost estimates are in 2013 dollars.

Summary of: Amount of fill material to be diverted from rural disposal sites

The LWC Project will divert an estimated 2.0 million m<sup>3</sup> of material from rural disposal sites.

**Criterion: Economic and Employment Effects**

The potential economic and employment effects resulting from the construction of the Preferred Alternative were estimated using the Statistics Canada Input – Output Model (“I/O Model”), using multipliers specific to the Ontario economy. The I/O model uses the Canadian Input/Output tables to track and quantify the economic activity generated by changes in consumption or production. As such, it traces the flow of goods and services amongst various sectors of the economy. The model is maintained by Statistics Canada, and presents one of the most complete and detailed accounting frameworks of the Canadian economy. As such the model has the greatest potential of all major economic models for capturing the flows of goods and services between industries and consumers at relatively detailed levels. It should be noted that, as the I/O model only measures impacts at the provincial level, within Ontario and outside Ontario, the proportion of impacts allocated to a particular region/local area of the province cannot be identified. The I/O Model is primarily used to predict how an increase or decrease in demand in one industry will impact other industries, and, therefore, the entire economy. The following indicators were measured by the I/O model:

*Indicator: Economic Output*

Economic output refers to the overall amount of economic activity created. Economic output related to construction of the LWC Project is estimated to be \$138.4 million over the construction period.

*Indicator: Gross Domestic Product*

Gross domestic product (GDP) is a measure of the value-added to the economy by productive activities taking place within the province and also in other provinces. GDP related to construction of the LWC Project is estimated to be \$70.2 million over the construction period.

*Indicator: Number of direct full time jobs created*

Direct full time jobs are those that are directly associated with the LWC Project such as construction jobs. An estimated 372 direct full time jobs will be created by the LWC Project.

*Indicator: Number of indirect full time jobs created*

Indirect full time jobs are created by activity in sectors that supply goods and services that support the construction activity. An estimated 230 indirect full time jobs will be created by the LWC Project.

*Indicator: Number of induced full time jobs created*

Induced full time jobs are measured based on the overall impact of more income accruing to the household sector (in other words, spending of wages/salaries in the broader economy by those employed by the construction project). An estimated 176 induced full time jobs will be created by the LWC Project.

Summary of: Economic and Employment Effects

An estimated total of 778 direct, indirect and induced full time jobs will be created by the construction of the LWC Project. Construction of the LWC Project will have substantial economic benefits through job creation and economic activity both within and outside of Ontario.

**Table 7.15 Objective 5: Fiscal Viability (Construction Effects)**

Criteria	Indicator(s)	Effects	Mitigation Measures	Net Effects
Capital development cost	Capital Construction Cost estimate	Gross \$65 Million	Savings through re-use of fill: \$21.4 Million Savings through re-use of rubble: 4.1 Million Total Savings: \$25.5 Million	Net Capital Cost: \$39.5 Million
Amount of fill material to be diverted from rural disposal sites	Volume of earth fill (soil) placed, brick rubble and concrete in cubic metres.	<ul style="list-style-type: none"> <li>• Up to 2.0 Million m<sup>3</sup> of diverted material;</li> <li>• Reduced impact on fill capacity at rural disposal sites.</li> </ul>	None	Positive
Economic and employment benefits	Economic Output	\$138.4 Million	None	Positive
	Gross Domestic Product	\$70.2 Million	None	Positive
	# of direct full time jobs created	372 direct full time jobs	None	Positive
	# of indirect full time jobs created	230 indirect full time jobs	None	Positive
	# of induced full time jobs created	176 induced full time jobs	None	Positive

### **7.3.5.2 Establishment/Post Establishment-Effects**

#### **Criterion: Annual maintenance costs for naturalized area**

The analysis for CVC's land care costs accounts for Operational staff time, land planning staff time, administrative charge-backs and overhead, taxation, equipment, vehicles, purchase materials for maintenance and modest annual capital improvements and replacement.

The ongoing annual operating budget for the LWC Project is expected to fluctuate slightly from year to year based on shifting needs as the area matures or as particular issues arise and are addressed. The operating costs are also required to keep pace with inflation to ensure that the land care is maintained at appropriate levels. It is also important to note that the LWC Project is not projected to be revenue generating and will not return any funds towards operational costs; The LWC Project is to remain a free-use amenity for public benefit with operations and maintenance costs that must be borne by public funds.

#### *Indicator: Annual cost of maintenance of naturalized and park areas*

With the LWC Project estimated to be approximately 33 hectares in size and an estimated \$2975/hectare operations and maintenance costs would total \$100,000 per year. Tested against TRCA's annual operating budgets for three similar lakefill parks (and adjusted for size and elements) the estimated annual budget is substantiated and confirmed as appropriate and in-line with established operations and maintenance care costs for such lands.

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**Table 7.16 Objective 5: Fiscal Viability (Establishment/Post-Establishment Effects)**

<b>Criteria</b>	<b>Indicator(s)</b>	<b>Effects</b>	<b>Mitigation Measures</b>	<b>Net Effects</b>
Annual maintenance costs for naturalized area	Annual cost of maintenance of naturalized and park areas	\$100,000 in annual expenditure for maintenance	none	\$100,000 in annual expenditure for maintenance

***Summary of Fiscal Viability Objective***

**Table 7.17 Overall Effects Related to Objective 5**

<i>Criteria</i>	<i>Indicator</i>	<i>Overall Effects</i>
<b>Construction</b>		
<b>Capital development cost</b>	Capital Construction Cost estimate	n/a
<b>Amount of fill material to be diverted from rural disposal sites</b>	Volume of earth fill (soil) placed, brick rubble and concrete in cubic metres	Positive
<b>Economic and employment benefits</b>	Economic Output (all provinces combined)	Positive
	Gross Domestic Product (all provinces combined)	Positive
	# of direct full time jobs created	Positive
	# of indirect full time jobs created	Positive
	# of induced full time jobs created	Positive
<b>Establishment/Post-Establishment</b>		
<b>Annual maintenance costs for naturalized area</b>	Annual cost of maintenance of naturalized and park areas	n/a
<b>Summary:</b> Based on support from the Region of Peel Council, the LWC Project meets the fiscal viability objective.		

#### **7.4 SENSITIVITY ANALYSIS FOR A SMALLER LWC PROJECT FOOTPRINT**

The LWC Preferred Alternative presented in Chapter 6 and the effects assessment presented in Section 7.3 are based on the LWC Project footprint utilizing a maximum of 2.0 million m<sup>3</sup> of clean fill. The effects assessment was conducted based on this maximum footprint to capture the “worst-case scenario” for any potential negative effects.

As noted in Chapter 5, a smaller version of the Preferred Alternative could be developed depending on the availability of fill material and budget considerations as the LWC Project advances to detailed design. Further analysis by the LWC Technical Team indicates that a footprint utilizing approximately 1.5 million m<sup>3</sup> of clean fill would be the smallest footprint that could be established, while maintaining the same preferred shoreline configuration and functions, minimum habitat requirements, and park accessibility from Marie Curtis Park west as presented in Chapter 6 for the larger footprint. To confirm that the 2.0 million m<sup>3</sup> footprint captures the “worst-case scenario” for any potential negative effects and that the smaller 1.5 million m<sup>3</sup> footprint does not significantly reduce positive effects, a sensitivity analysis is presented in this section to establish that the effects associated with a smaller footprint would be the same or better.

To facilitate the sensitivity analysis, the Preferred Alternative presented in Chapter 6 was reduced in size using the same coastal process principles presented in Chapter 5 to ensure stability of the design. The ecological layers were scaled down relative to the overall footprint while recognizing the desire to maintain the recommended habitat targets. Based on the reduced footprint of the Preferred Alternative, a screening of each criterion and indicator is presented in Table 7.19 to identify indicators for which the effects will change for a smaller footprint. Where it is determined that there is potential for increased negative effects or reduced positive effects associated with developing a smaller LWC Project footprint, a discussion of the changes to effects is presented in Table 7.19 to identify the significance of any changes. Figure 7.2 provides a side-by-side visual comparison of the LWC project at the 2.0 million m<sup>3</sup> and 1.5 million m<sup>3</sup>.

Figure 7.2 LWC Project Preferred Alternative at 2.0 and 1.5 Million Cubic Metres of Fill



**Table 7.18 Sensitivity Analysis**

Criteria	Indicator	Effects at a 1.5 Million m <sup>3</sup> Footprint	Effects at 1.5 Million m <sup>3</sup>	Effects at 2.0 Million m <sup>3</sup>
<b>Naturalization</b>				
Change in shoreline character	Change in diversity of shoreline types (% increase or % decrease).	A smaller footprint will change the dimensions of the various shoreline types. At a 1.5 million m <sup>3</sup> footprint, the overall length of shoreline increases from 1,700 m (current shoreline length) to 2,700 m with a similar diversity of shoreline types as described for the 2.0 million m <sup>3</sup> footprint. Although the change in shoreline diversity is less at the 1.5 million m <sup>3</sup> footprint, similar benefits compared to existing conditions are achieved.	Positive	Positive
	Quantitative assessment of shoreline irregularity and the ability to provide nearshore habitat.	A smaller footprint will change the length of new shoreline in comparison to the existing shoreline. The 2.0 million m <sup>3</sup> footprint will provide a shoreline that is 2.1 times longer than the former shoreline over the same area. The 1.5 million m <sup>3</sup> footprint will provide a shoreline that is 1.6 times longer than the former shoreline over the same area. Although the shoreline will be slightly shorter at a smaller footprint there will still be a similar increase in diversity of shoreline types and associated ecological benefits.	Positive	Positive
Ability to create functional habitat blocks	Area of habitat created (m <sup>2</sup> ) of wetland, forest, and, meadow.	A smaller footprint will necessitate a reduction in the area of habitat blocks described for the 2.0 million m <sup>3</sup> footprint. Habitat blocks have been adjusted within the 1.5 million m <sup>3</sup> footprint in the same general configuration as the 2.0 million m <sup>3</sup> footprint. Although the smaller footprint results in smaller habitat blocks, the habitat blocks still meet or exceed the recommended habitat targets within a smaller footprint.	Positive	Positive
	Assessment of improvements to aquatic habitat created and ecological benefits achieved through the changes to Serson and Applewood Creeks.	Similar habitat improvements and ecological benefits can be achieved in Applewood and Serson Creek within a smaller footprint size. Ecological benefits are positive with either footprint size.	Positive	Positive
	Qualitative assessment of habitat created including benefits created by LWC with respect to filling in missing and/or impaired portions of aquatic and terrestrial ecosystems in this part of the Mississauga waterfront.	No changes are anticipated for this criterion at a smaller footprint. Ecological benefits continue to be positive with respect to improving impaired ecological function along the Mississauga waterfront.	Positive	Positive
	Qualitative assessment of connectivity between habitats for the movement for wildlife (e.g. mammals, herptofauna, invertebrates, fish, birds, etc.).	No changes are anticipated for this criterion at a smaller footprint. A smaller footprint will continue to have improved connectivity between habitats for the movement of wildlife.	Positive	Positive
Ability of alternative to be self-compensating with respect to fish habitat	Area of aquatic habitat lost or altered (ha).	A smaller footprint will reduce the overall area of existing fish habitat lost or altered so the negligible effects described for the 2.0 million m <sup>3</sup> footprint will not increase for this indicator at the 1.5 million m <sup>3</sup> footprint.	Negligible	Negligible
	HAAT model estimates of area requiring compensation (ha).	The area requiring compensation will change based on the reduced area of land creation and reduced area of proposed habitat features. The updated HAAT model results in less compensation area estimated for the 1.5 million m <sup>3</sup> footprint. The 2.0 million m <sup>3</sup> footprint requires 5.8 ha of like compensation whereas the 1.5 million m <sup>3</sup> footprint will require 4.7 ha of like compensation. Ancillary ecological benefits that are not captured in the HAAT model will result in neutral (no) net effects on fish habitat at both the 2.0 and 1.5 million m <sup>3</sup> footprints.	None	None
	Potential disruption to fish habitat as a result of land creation activities (siltation, fish removal, etc.).	Potential negative effects identified in Section 7.3.1 for the 2.0 million m <sup>3</sup> footprint can be mitigated using best management practices resulting in negligible effects. The smaller footprint will reduce the area of fish habitat potentially affected by land creation activities which will not increase predicted effects.	Negligible	Negligible

**Table 7.18 Sensitivity Analysis (Cont'd)**

Criteria	Indicator	Effects at a 1.5 Million m <sup>3</sup> Footprint	Effects at 1.5 Million m <sup>3</sup>	Effects at 2.0 Million m <sup>3</sup>
Habitat removal or disruption during construction of site access road and laydown area	Area of terrestrial habitat and vegetation removed or disrupted (m <sup>2</sup> ).	The access route will not change based on a smaller footprint so there will be additional negative effects resulting from a smaller footprint.	Negligible	Negligible
	Number of Species at Risk removed/disrupted.	The access route will not change based on a smaller footprint so there will be additional negative effects resulting from a smaller footprint.	None	None
	Area of aquatic habitat removed or disrupted (m <sup>2</sup> ).	The access route will not change based on a smaller footprint so there will be additional negative effects resulting from a smaller footprint.	Negligible	Negligible
Effects of hydraulics and hydrology / sedimentation on sustainability of wetland communities	Qualitative assessment of ability to manage a full range of flows without adverse impact on wetland communities (high erosional stress, sediment deposits).	A smaller footprint will not affect the configuration of Serson Creek but will require changes to Applewood Creek. Changes to Applewood Creek were assessed and it was determined that the creek design within the smaller footprint results in no changes to the effects described for this indicator.	Negligible	Negligible
	Influence of lake level fluctuation on channel and wetland connectivity.	Lake level fluctuation will affect channel and wetland connectivity similarly at both the 1.5 and 2.0 million m <sup>3</sup> footprints.	Negligible	Negligible
	Potential for sedimentation to affect channel form (including river mouths) and associated vegetation.	Sedimentation will affect channel form and associated vegetation similarly at both the 1.5 and 2.0 million m <sup>3</sup> footprints.	Negligible	Negligible
	Qualitative assessments of the adaptability of the wetland function to climate change.	Wetland function will adapt to climate change similarly at both the 1.5 and 2.0 million m <sup>3</sup> footprints.	Negligible	Negligible
	Qualitative assessment to determine the ability of river channels and shoreline works to accommodate changes in flow and lake levels due to climate change.	The ability of river channels and shoreline works to accommodate changes in flow and lake levels due to climate change will be similar at both the 1.5 and 2.0 million m <sup>3</sup> footprints.	Negligible	Negligible
Access				
Potential for lookout areas	Number of opportunities for views and character of views from the LWC Project to Lake Ontario, OPG's Lakeview site to Lake Ontario and back to the cities of Mississauga and Toronto and from the Lake Ontario onshore.	A smaller footprint will still provide opportunities for views to Lake Ontario, OPG's Lakeview site and the cities of Mississauga and Toronto.	Positive	Positive
Potential for change in access to and use of waterfront trail during construction	Duration and length of trail closed to use.	Effects to the Waterfront Trail are related to the construction and operation of the construction access route which is the same regardless of the final footprint size.	Negligible	Negligible
	Potential for signalization of trail crossing with construction vehicles.		None	None
Potential for change to use and enjoyment of park areas during construction	Potential for dust and vehicle emissions and noise to affect Waterfront Trail use and enjoyment.	Changes to use and enjoyment of park areas during construction are related to the construction site access road so the effects described in Section 7.3 are the same at a smaller footprint.	Negligible	Negligible
	Potential for changes in ability to access and use park during construction due to traffic congestion and or changes to access.		Negligible	Negligible
Potential for changes to use of waterfront for recreation	Potential for changes to water quality at Marie Curtis Beach West with respect to swimming.	Similar to the larger footprint, modeling indicates the developing a smaller footprint is unlikely to affect the frequency of annual beach closure posting at Marie Curtis Park beach.	Negligible	Negligible
	Potential for changes to existing recreational activities on the sand beach at Marie Curtis Park west.	A smaller footprint will reduce the amount of existing sand beach at Marie Curtis Park west that is affected by the LWC Project, so any negative effects will be reduced.	Negligible	Negligible

**Table 7.18 Sensitivity Analysis (Cont'd)**

Criteria	Indicator	Effects at a 1.5 Million m <sup>3</sup> Footprint	Effects at 1.5 Million m <sup>3</sup>	Effects at 2.0 Million m <sup>3</sup>
	Potential for changes to use for windsurfers and/or kiteboarders	A smaller footprint will reduce the amount of existing sand beach at Marie Curtis Park west that is affected by the LWC Project and will reduce the extent of potential new navigation hazards in Lake Ontario, so any negative effects will be reduced.	Negligible	Negligible
Potential for public access to water's edge	Percentage of accessible water's edge	All of the positive effects described for this criterion will be realized within a smaller footprint.	Positive	Positive
	Potential to create tiered trail system providing seasonal access	A tiered trail system can be established within the smaller land creation area so positive effects will still be achieved at a smaller footprint.	Positive	Positive
	Potential to create multi-use trail connection across area of land creation	A multi-use trail connection can be established across the smaller land creation area so positive effects will still be achieved at a smaller footprint.	Positive	Positive
Potential for displacement of <i>built heritage resources</i> due to construction of access road, laydown area and land creation area	Cultural heritage value of built heritage resources and cultural heritage landscapes within land creation area	Effects under this criterion are related to the construction site access road so the effects described in Section 7.3 are the same at a smaller footprint.	None	None
Potential effects from construction of access road, laydown area and land creation area on marine- and land-based archaeological resources	Significance of archaeological resources within footprint of land creation and associated park area	A smaller footprint will not increase negative effects on archaeological resources since a smaller marine area will be affected by project activities and no new areas are impacted by the smaller footprint. Effects under this criterion that relate to the construction site access road are the same at a smaller footprint.	Negligible	Negligible
Potential for effect from construction of access road, laydown area and land creation area on traditional uses of lands by <i>First Nations</i> and <i>Métis</i>	Extent of traditional uses of lands within LWC Project Study Area	There are no net effects to this criterion at the 2.0 million m <sup>3</sup> fill volume, which will be the same at a smaller footprint.	None	None
<b>Compatibility</b>				
Potential to affect operations at WWTF	Changes in access to outfall during construction	A smaller footprint will not increase negative effects on existing WWTF outfalls since the smaller footprint will not affect additional access points.	Negligible	Negligible
	Changes to access to outfall during establishment/post-establishment		None	None
Changes to site security for WWTF	Ability to maintain/enhance site security for the WWTF	A smaller footprint will not increase negative effects on site security at the WWTF since the same mitigation measures can be applied regardless of the extent of the land creation area in Lake Ontario.	Negligible	Negligible
Potential for effects to water quality at Water Treatment Plant intakes	Potential for effects during construction	The smaller footprint has potential for effects related to high sediment loads during placement of berm and fill materials however these potential effects can be mitigated using proven land creation methods and potential impacts do not increase with a smaller footprint.	Negligible	Negligible
	Potential for effects during establishment/post-establishment	Regional water circulation modeling indicates that the land creation results in no change or moderate improvements in water quality at the intakes at both the 1.5 M m <sup>3</sup> and 2.0 M m <sup>3</sup> footprints.	Positive/None	Positive/None
Potential for construction traffic to affect traffic volumes on arterial roads and access and egress from arterial roads	Additional vehicle traffic on arterial roads resulting from construction	A smaller footprint will require less fill and fewer truck trips into the site to supply the fill. This will result in an overall reduction in construction related truck traffic which will not increase traffic related effects.	Negligible	Negligible
Potential for construction traffic volumes to require changes to intersections	Number of intersections requiring changes to facilitate LWC related construction traffic	A smaller footprint will require less fill and fewer truck trips into the site to supply the fill. This will result in an overall reduction in construction related truck traffic which will not increase traffic related effects.	None	None

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**Table 7.18 Sensitivity Analysis (Cont'd)**

Criteria	Indicator	Effects at a 1.5 Million m <sup>3</sup> Footprint	Effects at 1.5 Million m <sup>3</sup>	Effects at 2.0 Million m <sup>3</sup>
Coordination				
Consistency with City of Mississauga Waterfront Parks Strategy (2008)	Consistency of alternative with Waterfront Parks Strategy	A smaller footprint will remain consistent with the City of Mississauga Waterfront Parks Strategy (2008) and provide similar positive effects.	Positive	Positive
Consistency with the Visioning for Inspiration Lakeview	Consistency of alternative with Visioning for Inspiration Lakeview	A smaller footprint will remain consistent with the Visioning for Inspiration Lakeview and provide similar positive effects.	Positive	Positive
	Ability to integrate alternative with potential plans for OPG's Lakeview site		Positive	Positive
Consistency with LOISS	Consistency of alternative with priorities identified by LOISS	A smaller footprint will remain consistent with LOISS and provide similar positive effects.	Positive	Positive
Consistency with Lake Ontario Biodiversity Strategy	Consistency of alternative with priorities identified by the Lake Ontario Biodiversity Strategy	A smaller footprint will remain consistent with the Lake Ontario Biodiversity Strategy and provide similar positive effects.	Positive	Positive
Consistency with Marie Curtis Park and Arsenal Lands Master Plan	Ability to integrate recreational opportunities and trails between the LWC, Arsenal Lands and Marie Curtis Park	A smaller footprint will remain consistent with Marie Curtis Park and Arsenal Lands Master Plans and provide similar positive effects.	Positive	Positive
MNR Lake Ontario Fish Community Objectives	Consistency with the goals of the MNR Lake Ontario Fish Community Objectives	A smaller footprint will remain consistent with MNR Lake Ontario Fish Community Objectives and provide similar positive effects.	Positive	Positive
Consistency with CVC's hazard land guidelines and regulations.	Potential for flooding as a result of land creation	A smaller footprint will not result in negative impacts on flooding in either Applewood or Serson Creeks. The LWC Project will provide improvement of flow conveyance at the Serson Creek outlet and improvement of flooding upstream of the extended channel.	Positive	Positive
Fiscal Viability				
Capital development cost	Capital Construction Cost estimate	Net capital construction costs will be \$\$\$ for the 1.5 million m <sup>3</sup> footprint compared to \$\$\$ for the 2.0 million m <sup>3</sup> footprint.	n/a	n/a
Amount of fill material to be diverted from rural disposal sites	Annual cost of maintenance of naturalized and park areas	Annual maintenance requirements will be similar regardless of the footprint size.	n/a	n/a
Economic and Employment Benefits	Economic Output (all provinces combined)	The 1.5 million m <sup>3</sup> footprint will reduce overall economic output to \$115.7 million compared to \$138.4 million at the 2.0 million m <sup>3</sup> footprint. Despite a minor reduction in overall economic output, the net effect remains positive.	Positive	Positive
	Gross Domestic Product (all provinces combined)	The 1.5 million m <sup>3</sup> footprint will reduce GDP generated to \$58.7 million compared to \$70.2 million at the 2.0 million m <sup>3</sup> footprint. Despite a minor reduction in GDP generated, the net effect remains positive.	Positive	Positive
	# of direct full time jobs created	The 1.5 million m <sup>3</sup> footprint will reduce number of direct full time jobs created to 311 compared to 372 at the 2.0 million m <sup>3</sup> footprint. Despite a minor reduction in direct full time jobs created, the net effect remains positive.	Positive	Positive
	# of indirect full time jobs created	The 1.5 million m <sup>3</sup> footprint will reduce number of indirect full time jobs created to 193 compared to 230 at the 2.0 million m <sup>3</sup> footprint. Despite a minor reduction to indirect full time jobs created, the net effect remains positive.	Positive	Positive
	# of induced full time jobs created	The 1.5 million m <sup>3</sup> footprint will reduce number of induced full time jobs created to 147 compared to 176 at the 2.0 million m <sup>3</sup> footprint. Despite a minor reduction in induced full time jobs created, the net effect remains positive.	Positive	Positive