



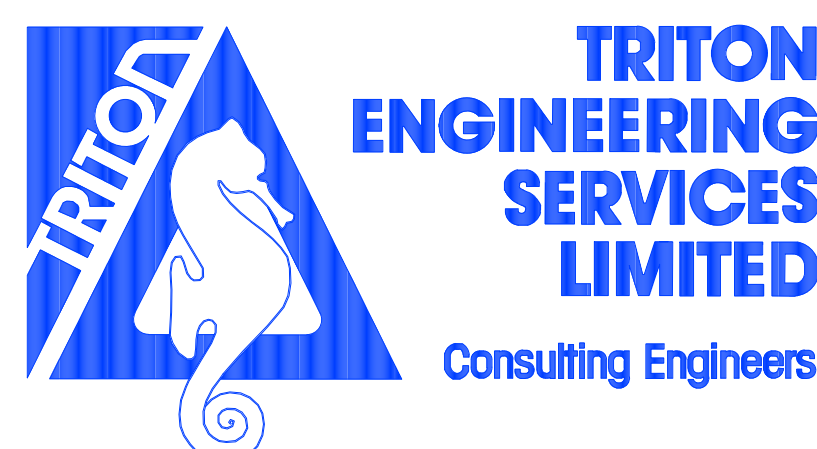
# THE CORPORATION OF THE TOWNSHIP OF CENTRE WELLINGTON

CLASS ENVIRONMENTAL  
ASSESSMENT

## TRUNK STORM SEWER EVALUATION

VICTORIA CRESCENT  
ELORA

PUBLIC INFORMATION CENTRE



## OPPORTUNITY STATEMENT

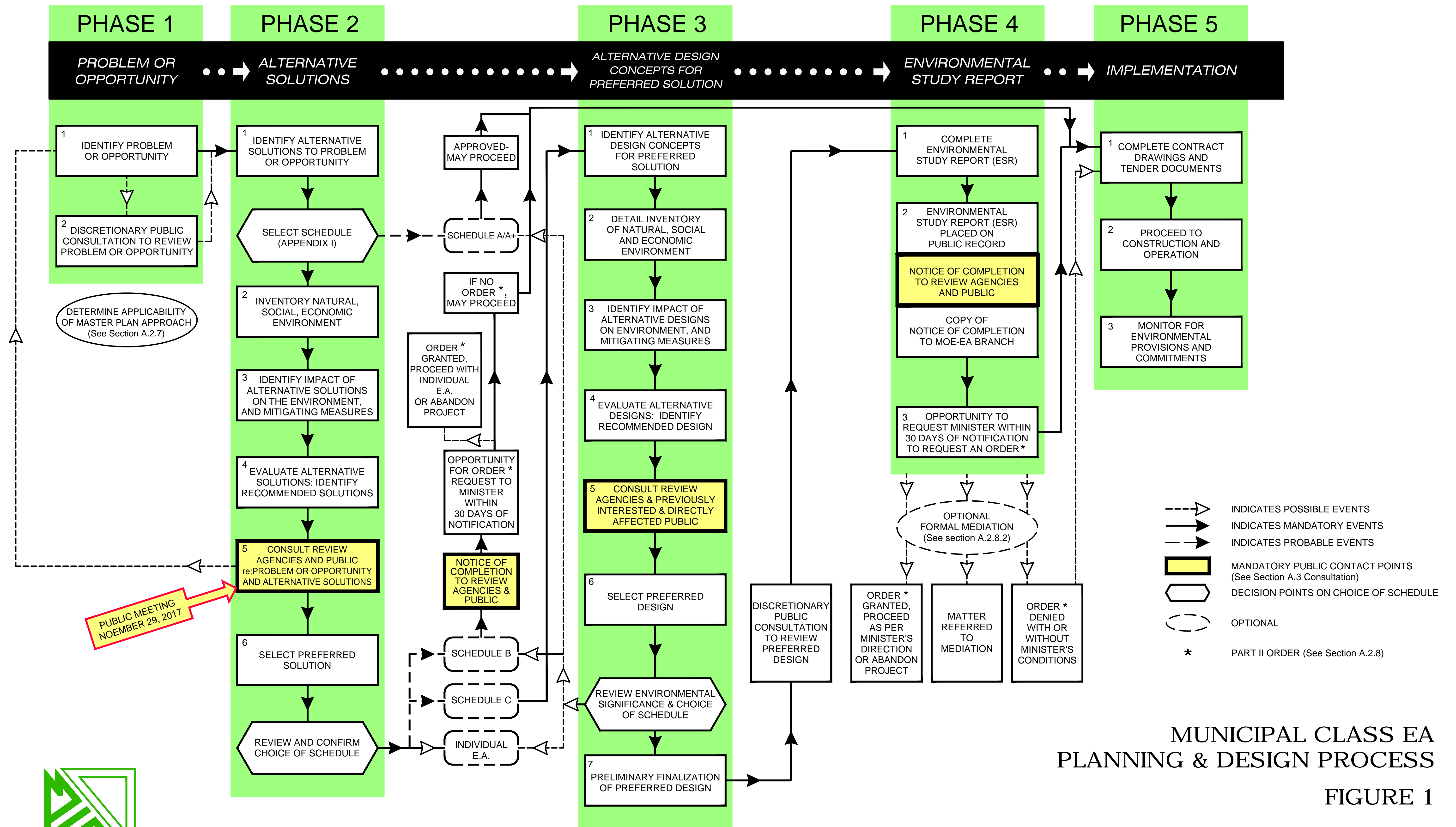
THE TOWNSHIP OF CENTRE WELLINGTON (TOWNSHIP) IS CONDUCTING A CLASS ENVIRONMENTAL ASSESSMENT (EA) TO ADDRESS THE SEVERE DETERIORATION OF STORMWATER INFRASTRUCTURE WITHIN THE FORMER VILLAGE OF ELORA. STORMWATER RUNOFF FROM THE STUDY AREA DISCHARGES TO THE IRVINE CREEK IN THE VICINITY OF VICTORIA CRESCENT IN ELORA.

THE STORM SEWER HAS INSUFFICIENT COVER AND THE OVERALL CONDITION OF THE AGING SEWER IS EXTREMELY POOR.

THIS CLASS EA STUDY WILL CONSIDER OPTIONS AND IDENTIFY THE PREFERRED ALTERNATIVE TO ADDRESS THE DETERIORATION OF THE STRUCTURE.

# MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

**NOTE:** This flow chart is to be read in conjunction with Part A of the Municipal Class EA



MUNICIPAL CLASS EA PLANNING & DESIGN PROCESS

FIGURE 1



# ALTERNATIVES

- ALTERNATIVE 1 - Do Nothing
- ALTERNATIVE 2 - Replace Storm Sewer in Same Location
- ALTERNATIVE 3 - New Storm Outlet on New Alignment Along Southerly Limit of Property of No. 200 Victoria Crescent, Connecting to Existing Outlet Structure from No. 190 Victoria Crescent. Existing Trunk Sewer to be Decomissioned and Abandoned in Place.
- ALTERNATIVE 4A - New Storm Outlet on New Alignment Along Victoria Crescent and Through Victoria Park, including the Installation of a New Outlet Structure through the Bank of the Irvine River. Existing Trunk Sewer and Outlet to be Decomissioned and Abandoned in Place.
- ALTERNATIVE 4B - New Storm Outlet on New Alignment Routed Along Smith Street and Henderson Street and Through Victoria Park, including the Installation of a New Outlet Structure through the Bank of the Irvine River. Existing Trunk Sewer and Outlet to be Decomissioned and Abandoned in Place.



TOWNSHIP OF CENTRE  
WELLINGTON

TRUNK STORM SEWER  
EVALUATION  
VICTORIA CRESCENT  
(ELORA)



LEGEND:

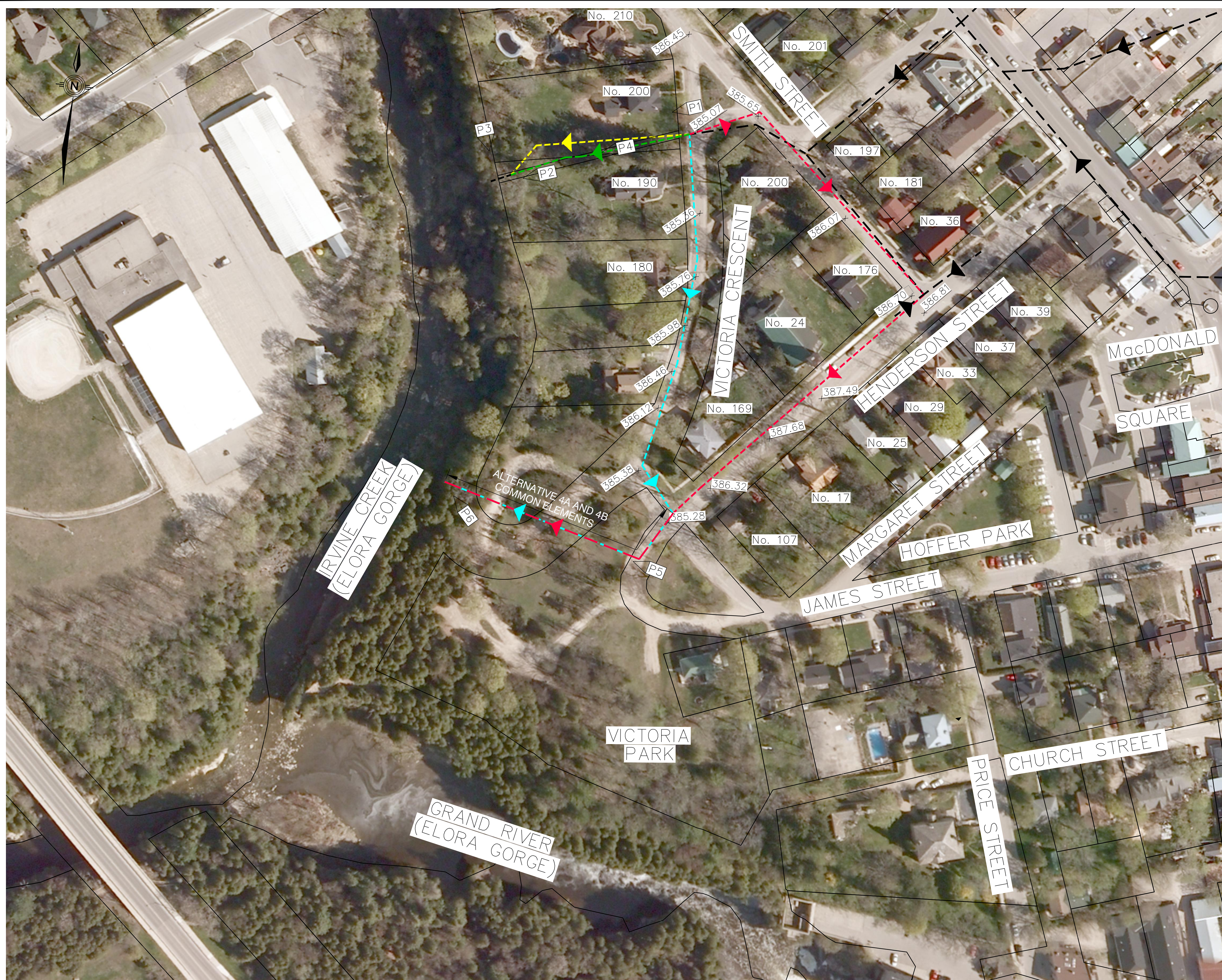
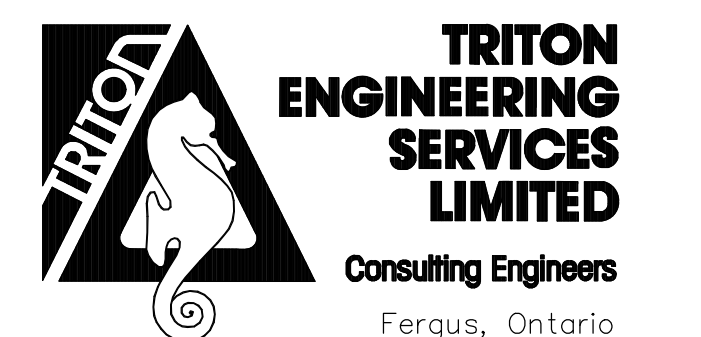
- APPROXIMATE PROPERTY LIMITS
- EXISTING STORM SEWER DIRECTION OF FLOW
- ALTERNATIVE 2 TRUNK SEWER ALIGNMENT (REPLACE IN EXISTING LOCATION)
- ALTERNATIVE 3 TRUNK SEWER ALIGNMENT
- ALTERNATIVE 4A TRUNK SEWER ALIGNMENT
- ALTERNATIVE 4B TRUNK SEWER ALIGNMENT
- PHOTO LOCATION
- EXIST. GROUND SURFACE ELEVATION (TESL SURVEY, 2017)

ALTERNATIVES 2, 3, 4A & 4B  
STORM SEWER  
ALIGNMENTS

AUGUST 2017

1:750

M6186  
SK-01







P1 August 2017. Existing conditions at 190 and 200 Victoria Crescent. Looking west.



P2 June 2014. Existing trunk storm outlet to Irvine Creek. Looking west.



P3 June 2014. Existing foot bridge on Irvine Promenade Trail, over existing trunk storm outlet structure. Looking south.



P4 June 2006. Long horizontal cracks in existing trunk storm sewer.



P5 August 2017. Existing Conditions of proposed trunk storm sewer alignment through Victoria Park. Looking northwest.



P6 August 2017. Existing conditions of Irvine Promenade Trail at edge of Elora Gorge in Victoria Park at proposed location for new outlet structure (Alternatives 4A and 4B). Looking northwest.



# ANALYSIS/EVALUATION OF ALTERNATIVES

<b>ALTERNATIVE 1</b>						
CRITERIA	Criteria Significance <sup>(1)</sup>	Normalized Weighting of Criteria	"Do Nothing"	Performance Marking <sup>(3)</sup>	Impacts <sup>(4)</sup>	
<b>CULTURAL ENVIRONMENT</b>						
Archaeology	• Impacts to archaeological resources and cultural heritage landscapes	3	1.00	• Archaeological assessment not immediately required.	0	0.00
<b>Total Impacts on Cultural Environment <sup>(4)</sup></b>					<b>0.00</b>	
<b>Ranking of Alternative Within Cultural Environment <sup>(6)</sup></b>					<b>1</b>	
<b>SOCIAL ENVIRONMENT</b>						
<b>• No immediate construction activity expected.</b>						
Land Use	• Impacts on private property	4	0.44	• No immediate impacts to natural features. • Eventual failure of the existing structure could lead to erosion, flooding, and property damage. • Currently no easement for the storm sewer across private property (house No. 190 and No. 200 Victoria Crescent).	-2	-0.89
	• Temporary construction impacts (access, noise, dust, etc.)	3	0.33	• No immediate impacts.	0	0.00
	• Impacts on land use and traffic	2	0.22	• No traffic impacts.	0	0.00
<b>Total Impacts on Social Environment <sup>(4)</sup></b>					<b>-0.89</b>	
<b>Ranking of Alternative Within Social Environment <sup>(6)</sup></b>					<b>1</b>	
<b>NATURAL ENVIRONMENT</b>						
Trees and Vegetation	• Impacts to trees and vegetation	4	0.29	• Potential impact to trees and vegetation in the event of structural failure of the existing storm sewer.	-1	-0.29
Wildlife	• Impacts to wildlife and species at risk	4	0.29	• Potential impact to terrestrial habitat in the event of structural failure of the existing storm sewer.	-1	-0.29
Hydrology	• Impacts to storm water management	3	0.21	• The ability for this portion of the storm sewer to convey peak flows under existing and future growth conditions is limited given its current condition. Storm flow in excess of existing Trunk Sewer capacity will continue to flow overland between house No. 190 and No. 200 Victoria Crescent. • The elevation and grade of the existing Trunk Sewer will limit future design improvements to the upstream storm sewer network.	-2	-0.43
	• Impacts to water quality	3	0.21	• No opportunity to add water quality controls.	-1	-0.21
<b>Total Impacts on Natural Environment <sup>(4)</sup></b>					<b>-1.21</b>	
<b>Ranking of Alternative Within Natural Environment <sup>(6)</sup></b>					<b>4</b>	
<b>TECHNICAL ENVIRONMENT</b>						
Design/Function	• Ability to address opportunity statement	4	0.17	• Does not address the opportunity statement.	-2	-0.33
	• Design considerations	3	0.13	• No immediate impacts.	0	0.00
	• Ability to meet current municipal design standards	3	0.13	• Existing structure does not meet current municipal design standards for storm sewers.	0	0.00
	• Staging, grading constraints, utility conflicts, traffic management	3	0.13	• No immediate impacts.	0	0.00
	• Initial anticipated studies	4	0.17	• No immediate impacts.	0	0.00
	• Initial anticipated approvals	4	0.17	• No immediate impacts.	0	0.00
	• Maintenance/access considerations	3	0.13	• This portion of the storm sewer is located on private property, which imposes access issues for maintenance.	-2	-0.25
<b>Total Impacts on Technical Environment <sup>(4)</sup></b>					<b>-0.58</b>	
<b>Ranking of Alternative Within Technical Environment <sup>(6)</sup></b>					<b>4</b>	
<b>ECONOMICAL ENVIRONMENT</b>						
Costs	• Capital costs	3	0.50	• Capital works not immediately required; however, the Trunk Sewer will eventually require replacement, therefore, capital costs are only deferred. It is expected that deferred cost will be approximately \$190,000.	-1	-0.50
	• Operation and maintenance costs	3	0.50	• Highest expected operation and maintenance costs due to current condition of the Trunk Sewer.	-2	-1.00
<b>Total Impacts on Economical Environment <sup>(4)</sup></b>					<b>-1.50</b>	
<b>Ranking of Alternative within Economical Environment <sup>(6)</sup></b>					<b>4</b>	
<b>Total Impact on All Environments <sup>(5)</sup></b>					<b>-4.19</b>	
<b>Preliminary Ranking of Alternative, Total of All Anticipated Impacts Considered <sup>(6)</sup></b>					<b>3</b>	



# ANALYSIS/EVALUATION OF ALTERNATIVES

<b>ALTERNATIVE 2</b>						
CRITERIA	Criteria Significance <sup>(4)</sup>	Normalized Weighting of Criteria	Replace Storm Sewer in Same Location	Performance Marking <sup>(3)</sup>	Impacts <sup>(4)</sup>	
<b>CULTURAL ENVIRONMENT</b>						
Archaeology	• Impacts to archaeological resources and cultural heritage landscapes	3	1.00	• A Stage 1 archaeological assessment has been completed. Prior to any construction, a Stage 2 archaeological assessment is required.	0	0.00
<b>Total Impacts on Cultural Environment <sup>(4)</sup></b>					<b>0.00</b>	
<b>Ranking of Alternative Within Cultural Environment <sup>(6)</sup></b>					<b>1</b>	
<b>SOCIAL ENVIRONMENT</b>						
• Duration of construction activities estimated to be 6 weeks.						
Land Use	• Impacts on private property	4	0.44	• Aesthetics of private property temporarily impacted due to removal of mature trees and vegetation. Although the vegetation will be restored, it may take some time for disturbed natural areas to re-establish and these areas may appear less naturalized during and for some time following construction activities. • An easement for the new storm sewer alignment is required across private property (house No. 190 and No. 200 Victoria Crescent).	-2	-0.89
	• Temporary construction impacts (access, noise, dust, etc.)	3	0.33	• Disruptions to private property residents (especially house No. 190 and No. 200 Victoria Crescent) during construction phase.	-1	-0.33
	• Impacts on land use and traffic	2	0.22	• Minimal disruption to Victoria Crescent traffic expected during construction phase. • Temporary (relatively short duration) disruption to access to a portion of private properties (house No. 200 Victoria Crescent) during construction.	-1	-0.22
<b>Total Impacts on Social Environment <sup>(4)</sup></b>					<b>-1.44</b>	
<b>Ranking of Alternative within Social Environment <sup>(6)</sup></b>					<b>3</b>	
<b>NATURAL ENVIRONMENT</b>						
Trees and Vegetation	• Impacts to trees and vegetation	4	0.29	• Moderate impact to trees and vegetation on private property (No. 190 and No. 200 Victoria Crescent). • Based on the results of a Tree Assessment completed by Aboud in September 2017, it is anticipated that implementation of Alternative 2 would result in the removal of 25 trees out of a total of 52 existing trees along the property line between house No. 190 and No. 200 (47 of the trees are on private property and 5 are on municipal property). Removal of 18 trees are a direct result of disturbance from construction activities and 7 trees (all on private property) are recommended for removal due to poor/very poor/dead condition of the tree. • Of the 52 existing trees, 10 are classified as having a dominant crown, 12 are co-dominant, 14 are intermediate, and 16 are suppressed/overtopped. Of the 7 trees (all on private property) that are recommended for removal due to poor/very poor/dead condition, 1 has a co-dominant crown class, 1 has an intermediate crown class, and 5 have suppressed crown classes. Of the 18 trees that would require removal due to construction, 8 are classified as having a dominant crown, 5 as having an intermediate crown, and 5 as having a suppressed crown. • **NOTE: Tree crown classes are as follows: Trees having a dominant crown typically have a trunk diameter that is the largest in the stand and the crown is generally well developed and dominates the canopy of the stand. Trees with codominant crowns help form the main canopy and typically have trunk diameters in the upper range within the stand. Trees with an intermediate crown extend into the lower part of the main canopy, typically intercepting direct sunlight by a limited area on the top of the crown and have varying trunk diameters, typically in the lower range of the stand. Trees having a suppressed/overtopped crown sit well below the main canopy, are small and sparse, not exposed to direct sunlight, and generally have trunk diameters that are the smallest in the stand.	-2	-0.57
Wildlife	• Impacts to wildlife and species at risk	4	0.29	• Potential for low/moderate impact to wildlife and wildlife habitat due to the anticipated number and type of trees requiring removal.	-1	-0.29
Hydrology	• Impacts to storm water management	3	0.21	• The Trunk Sewer will be adequately sized to convey peak flows from the 5 year storm for the revised Victoria Crescent drainage area under existing and future growth conditions. Storm water in excess of the 5 year storm will continue to flow overland between house No. 190 and No. 200 Victoria Crescent. • The elevation and grade of the Trunk Sewer is constrained by the elevation of the existing outlet, therefore limiting future design improvements to the upstream storm sewer network.	1	0.21
	• Impacts to water quality	3	0.21	• Opportunity to add water quality controls to the storm water management system, improving water quality discharging into Irvine Creek from the Trunk Sewer.	2	0.43
<b>Total Impacts on Natural Environment <sup>(4)</sup></b>					<b>-0.21</b>	
<b>Ranking of Alternative Within Natural Environment <sup>(6)</sup></b>					<b>2</b>	
<b>TECHNICAL ENVIRONMENT</b>						
Design/Function	• Ability to address opportunity statement	4	0.17	• Addresses opportunity statement.	2	0.33
	• Design considerations	3	0.13	• Limited impacts.	1	0.13
	• Ability to meet current municipal design standards	3	0.13	• Upgrade the new Trunk Sewer to conform to current municipal design standards.	1	0.13
	• Staging, grading constraints, utility conflicts, traffic management	3	0.13	• Potential conflict with utilities.	0	0.00
	• Initial anticipated studies	4	0.17	• Stage 2 archaeological assessment • Scoped Environmental Impact Study and Report which includes, but may not be limited to the following: characterization of vegetation communities and botanical inventory, breeding bird survey, investigation for wildlife habitat and wildlife presence (includes Species at Risk), impact assessment on natural heritage features, recommendations for compensation and mitigation.	0	0.00
	• Initial anticipated approvals	4	0.17	• Legal easement on No. 190 and 200 Victoria Crescent • Grand River Conservation Authority (GRCA) for work within a Regulated Area • Ministry of the Environment and Climate Change (MOECC) Environmental Compliance Approval (ECA)	0	0.00
	• Maintenance/access considerations	3	0.13	• This portion of the storm trunk sewer is located on private property (difficult access for maintenance). • An easement for the new storm sewer alignment is required across private property (house No. 190 and No. 200 Victoria Crescent).	-2	-0.25
<b>Total Impacts on Technical Environment <sup>(4)</sup></b>					<b>0.33</b>	
<b>Ranking of Alternative Within Technical Environment <sup>(6)</sup></b>					<b>2</b>	
<b>ECONOMICAL ENVIRONMENT</b>						
Costs	• Capital costs	3	0.50	• Costs to restore disturbed areas is increased due to moderate impact to existing mature trees/vegetation. • A new outlet structure is not required; the existing outlet to Irvine Creek can be incorporated into the design of the new trunk sewer. • Limited potential for project cost escalation (i.e. unexpected subsurface conditions). • Estimated \$150,000	0	0.00
	• Operation and maintenance costs	3	0.50	• New Trunk Sewer will have an expected useful service life in excess of 75 years and require minimal maintenance for the foreseeable future. • Increased costs associated with monitoring establishment of vegetation following site restoration.	1	0.50
<b>Total Impacts on Economical Environment <sup>(4)</sup></b>					<b>0.50</b>	
<b>Ranking of Alternative within Economical Environment <sup>(6)</sup></b>					<b>2</b>	
<b>Total Impact on All Environments <sup>(5)</sup></b>					<b>-0.83</b>	
<b>Preliminary Ranking of Alternative, Total of All Anticipated Impacts Considered <sup>(6)</sup></b>					<b>2</b>	



# ANALYSIS/EVALUATION OF ALTERNATIVES

## PRELIMINARY PREFERRED ALTERNATIVE

				<b>ALTERNATIVE 3</b>		
CRITERIA	Criteria Significance <sup>(1)</sup>	Normalized Weighting of Criteria	New Storm Sewer on New Alignment Along Southerly Limit of House No. 200 Victoria Crescent, Connected to Existing Outlet Structure	Performance Marking <sup>(3)</sup>	Impacts <sup>(4)</sup>	
<b>CULTURAL ENVIRONMENT</b>						
Archaeology	• Impacts to archaeological resources and cultural heritage landscapes	3	1.00	• A Stage 1 archaeological assessment has been completed. Prior to any construction, a Stage 2 archaeological assessment is required.	0	0.00
Total Impacts on Cultural Environment <sup>(4)</sup>					0.00	
Ranking of Alternative Within Cultural Environment <sup>(6)</sup>					1	
<b>SOCIAL ENVIRONMENT</b>						
• Duration of construction activities expected to be 6 weeks.						
Land Use	• Impacts on private property	4	0.44	• Temporary impact to aesthetics of private property (No. 200 Victoria Crescent) until disturbed vegetation is fully restored to existing or better conditions. • The majority of mature trees will be untouched. • New alignment requires easement on private property (house No. 190 and No. 200 Victoria Crescent). • Existing Trunk Sewer will require decommissioning.	-1	-0.44
	• Temporary construction impacts (access, noise, dust, etc.)	3	0.33	• Disruption to private property residents (house No. 190 and No. 200 Victoria Crescent) during construction phase.	-1	-0.33
	• Impacts on land use and traffic	2	0.22	• Minimal disruption to Victoria Crescent traffic. • Temporary (relatively short duration) disruption to access to a portion of private properties (house No. 200 Victoria Crescent) during construction.	-1	-0.22
Total Impacts on Social Environment <sup>(4)</sup>					-1.00	
Ranking of Alternative within Social Environment <sup>(6)</sup>					2	
<b>NATURAL ENVIRONMENT</b>						
Trees and Vegetation	• Impacts to trees and vegetation	4	0.29	• Low impact to trees and terrestrial habitat on private properties (No. 190 and No. 200 Victoria Crescent). • Based on the results of a Tree Assessment completed by Abound in September 2017, it is anticipated that implementation of Alternative 3 would result in the removal of 15 trees out of a total of 52 existing trees along the property line between house No. 190 and No. 200 (47 of the trees are on private property and 5 are on municipal property). Removal of 8 trees are a direct result of disturbance from construction activities and 7 trees (all on private property) are recommended for removal due to poor/very poor/dead condition of the tree. • Of the 52 existing trees, 10 are classified as having a dominant crown, 12 are co-dominant, 14 are intermediate, and 16 are suppressed/overtopped. Of the 7 trees (all on private property) that are recommended for removal due to poor/very poor/dead condition, 1 has a co-dominant crown class, 1 has an intermediate crown class, and 5 have suppressed crown classes. Of the 8 trees that would require removal due to construction, 1 is classified as having a dominant crown, 1 is classified as having a co-dominant crown, 1 as having an intermediate crown, and 5 as having a suppressed/overtopped crown. • **NOTE: Tree crown classes are as follows: Trees having a dominant crown typically have a trunk diameter that is the largest in the stand and the crown is generally well developed and dominates the canopy of the stand. Trees with codominant crowns help form the main canopy and typically have trunk diameters in the upper range within the stand. Trees with an intermediate crown extend into the lower part of the main canopy, typically intercepting direct sunlight by a limited area on the top of the crown and have varying trunk diameters, typically in the lower range of the stand. Trees having a suppressed/overtopped crown sit well below the main canopy, are small and sparse, not exposed to direct sunlight, and generally have trunk diameters that are the smallest in the stand.	-1	-0.29
Wildlife	• Impacts to wildlife and species at risk	4	0.29	• Limited impact to wildlife and wildlife habitat anticipated due to the anticipated number and type of trees requiring removal.	0	0.00
Hydrology	• Impacts to storm water management	3	0.21	• The Trunk Sewer will be adequately sized to convey peak flows from the 5 year storm for the revised Victoria Crescent drainage area under existing and future growth conditions. Storm water in excess of the 5 year storm will continue to flow overland between house No. 190 and No. 200 Victoria Crescent. • The elevation and grade of the Trunk Sewer is constrained by the elevation of the existing outlet, therefore limiting future design improvements to the upstream storm sewer network.	1	0.21
	• Impacts to water quality	3	0.21	• Opportunity to add water quality controls to the storm water management system, improving water quality discharging into Irvine Creek from the Trunk Sewer.	2	0.43
Total Impacts on Natural Environment <sup>(4)</sup>					0.36	
Ranking of Alternative Within Natural Environment <sup>(6)</sup>					1	
<b>TECHNICAL ENVIRONMENT</b>						
Design/Function	• Ability to address opportunity statement	4	0.17	• Addresses opportunity statement and includes decommissioning the existing Trunk Sewer.	2	0.33
	• Design considerations	3	0.13	• Limited impacts.	1	0.13
	• Ability to meet current municipal design standards	3	0.13	• Upgrade the new Trunk Sewer to conform to current municipal design standards.	1	0.13
	• Staging, grading constraints, utility conflicts, traffic management	3	0.13	• Potential conflict with utilities.	0	0.00
	• Initial anticipated studies	4	0.17	• Stage 2 archaeological assessment • Scoped Environmental Impact Study and Report which includes, but may not be limited to the following: characterization of vegetation communities and botanical inventory, breeding bird survey, investigation for wildlife habitat and wildlife presence (includes Species at Risk), impact assessment on natural heritage features, recommendations for compensation and mitigation.	0	0.00
	• Initial anticipated approvals	4	0.17	• Legal easement on No. 190 and 200 Victoria Crescent • GRCA for work within a Regulated Area • MOECC ECA	0	0.00
	• Maintenance/access considerations	3	0.13	• This portion of the storm trunk sewer is located on private property (difficult access for maintenance). • An easement for the new storm sewer alignment is required across private property (house No. 200 Victoria Crescent).	-1	-0.13
Total Impacts on Technical Environment <sup>(4)</sup>					0.46	
Ranking of Alternative Within Technical Environment <sup>(6)</sup>					1	
<b>ECONOMICAL ENVIRONMENT</b>						
Costs	• Capital costs	3	0.50	• Cost to restore disturbed areas is minimized since there is a low impact to trees/vegetation that will require restoration. • A new outlet structure is not required; the existing outlet to Irvine Creek can be incorporated into the design of the new trunk sewer. • Limited potential for project cost escalation (i.e. unexpected subsurface conditions). • Estimated \$165,000	0	0.00
	• Operation and maintenance costs	3	0.50	• New Trunk Sewer will have an expected useful service life in excess of 75 years and require minimal maintenance for the foreseeable future.	2	1.00
Total Impacts on Economical Environment <sup>(4)</sup>					1.00	
Ranking of Alternative within Economical Environment <sup>(6)</sup>					1	
<b>TOTAL IMPACT ON ALL ENVIRONMENTS <sup>(5)</sup></b>					<b>0.82</b>	
<b>PRELIMINARY RANKING OF ALTERNATIVE, TOTAL OF ALL ANTICIPATED IMPACTS CONSIDERED <sup>(6)</sup></b>					<b>1</b>	



# ANALYSIS/EVALUATION OF ALTERNATIVES

<b>ALTERNATIVE 4A</b>						
CRITERIA	Criteria Significance <sup>(1)</sup>	Normalized Weighting of Criteria	New Storm Sewer on New Alignment Along Victoria Crescent and Through Victoria Park, Including the Installation of a New Outlet Structure Through the Bank of Irvine Creek	Performance Marking <sup>(3)</sup>	Impacts <sup>(4)</sup>	
<b>CULTURAL ENVIRONMENT</b>						
Archaeology	• Impacts to archaeological resources and cultural heritage landscapes	3	1.00	<ul style="list-style-type: none"> <li>• A Stage 1 archaeological assessment is necessary to determine the archaeological potential; however, given the archaeological sensitivity of the area, it is assumed that further archaeological assessment (Stage 2) will be required.</li> <li>• Installation of a new outlet through the side of the Elora Gorge will impact the cultural heritage landscape.</li> </ul>	-2	-2.00
<b>Total Impacts on Cultural Environment <sup>(4)</sup></b>					<b>-2.00</b>	
<b>Ranking of Alternative Within Cultural Environment <sup>(6)</sup></b>					<b>2</b>	
<b>SOCIAL ENVIRONMENT</b>						
<b>• Duration of construction activities expected to be 3.5 months and directly affect approximately 10 private properties.</b>						
Land Use	• Impacts on private property	4	0.44	<ul style="list-style-type: none"> <li>• Access to private properties interrupted temporarily during construction period.</li> <li>• Private property landscape features (sidewalks, driveways, trees) disturbed during construction. Although the vegetation will be restored, it may take some time for disturbed natural areas to re-establish and these areas may appear less naturalized during and for some time following construction activities.</li> <li>• No easement required.</li> <li>• Existing Trunk Sewer will require decommissioning.</li> </ul>	-2	-0.89
	• Temporary construction impacts (access, noise, dust, etc.)	3	0.33	• Expanded construction footprint and disruption to Victoria Crescent residents, visitors of the Irvine Promenade Trail and Victoria Park over an extended construction period.	-2	-0.67
	• Impacts on land use and traffic	2	0.22	• Temporary significant inconvenience to residents and the community due to disruption to Victoria Crescent traffic, Victoria Park, and Irvine Promenade Trail. Construction activities associated with the implementation of this alternative is significant due to physical size (footprint) of the project.	-2	-0.44
<b>Total Impacts on Social Environment <sup>(4)</sup></b>					<b>-2.00</b>	
<b>Ranking of Alternative within Social Environment <sup>(6)</sup></b>					<b>4</b>	
<b>NATURAL ENVIRONMENT</b>						
Trees and Vegetation	• Impacts to trees and vegetation	4	0.29	<ul style="list-style-type: none"> <li>• Low to Moderate impact to trees and vegetation in Victoria Park and Irvine Promenade Trail.</li> <li>• Impacts to trees/vegetation beneath new outlet are expected.</li> <li>• Based on the results of a Tree Assessment completed by Aboud in September 2017, it is anticipated that implementation of Alternative 4A would result in the removal of 24 trees out of a total of 68 existing trees located along a 10 m corridor encompassing the proposed sewer alignment through Victoria Park (all of the existing trees are located on municipal property). Removal of 19 trees through the assessed corridor are a direct result of disturbance from construction activities and 5 trees are recommended for removal due to poor/very poor/dead condition of the tree.</li> <li>• Of the 68 existing trees located along the assessed corridor in Victoria Park, 6 are classified as having a dominant crown, 10 are co-dominant, 36 are intermediate, and 16 are suppressed/overtopped. Of the 5 trees that are recommended for removal due to poor/very poor/dead condition, 1 is classified as having a co-dominant crown, 1 is classified as having an intermediate crown, and 3 have suppressed crowns. Of the 19 trees that would require removal due to construction, 2 are classified as having a dominant crown, 1 is classified as having a co-dominant crown, 11 as having an intermediate crown, and 5 as having suppressed crowns.</li> <li>• None to limited impact to trees is anticipated for the section of sewer alignment that is proposed along Victoria Crescent within the municipal road right-of-way between the existing trunk sewer location and the proposed alignment through Victoria Park.</li> <li>•**NOTE: Tree crown classes are as follows: Trees having a dominant crown typically have a trunk diameter that is the largest in the stand and the crown is generally well developed and dominates the canopy of the stand. Trees with codominant crowns help form the main canopy and typically have trunk diameters in the upper range within the stand. Trees with an intermediate crown extend into the lower part of the main canopy, typically intercepting direct sunlight by a limited area on the top of the crown and have varying trunk diameters, typically in the lower range of the stand. Trees having a suppressed/overtopped crown sit well below the main canopy, are small and sparse, not exposed to direct sunlight, and generally have trunk diameters that are the smallest in the stand.</li> </ul>	-2	-0.57
Wildlife	• Impacts to wildlife and species at risk	4	0.29	• Potential for moderate impact to wildlife and wildlife habitat due to the anticipated number and type of trees requiring removal.	-2	-0.57
Hydrology	• Impacts to storm water management	3	0.21	<ul style="list-style-type: none"> <li>• The Trunk Sewer will be adequately sized to convey peak flows from the 5 year storm for the revised Victoria Crescent drainage area under existing and future growth conditions. Storm water in excess of the 5 year storm will continue to flow overland between house No. 190 and No. 200 Victoria Crescent.</li> <li>• The Trunk Sewer will be installed deeper below grade, therefore allowing the opportunity to make improvements to the upstream storm sewer network.</li> </ul>	2	0.43
	• Impacts to water quality	3	0.21	• Opportunity to add water quality controls to the storm water management system, improving water quality discharging into Irvine Creek from the Trunk Sewer.	2	0.43
<b>Total Impacts on Natural Environment <sup>(4)</sup></b>					<b>-0.29</b>	
<b>Ranking of Alternative Within Natural Environment <sup>(6)</sup></b>					<b>3</b>	
<b>TECHNICAL ENVIRONMENT</b>						
Design/Function	• Ability to address opportunity statement	4	0.17	• Addresses opportunity statement and includes decommissioning the existing Trunk Sewer.	2	0.33
	• Design considerations	3	0.13	<ul style="list-style-type: none"> <li>• The overall length of Trunk Sewer will increase and as a result, the design of an extensive rock excavation will be required to achieve the appropriate grade/fall from the current upstream storm sewer junction to the new outlet at Irvine Creek.</li> <li>• Design will be constrained by the location of existing utilities.</li> <li>• Long design process due to initial anticipated studies required, stakeholder involvement, and initial anticipated approvals required.</li> </ul>	-2	-0.25
	• Ability to meet current municipal design standards	3	0.13	• Upgrade the new Trunk Sewer to conform to current municipal design standards.	1	0.13
	• Staging, grading constraints, utility conflicts, traffic management	3	0.13	<ul style="list-style-type: none"> <li>• Potential conflicts with watermain, sanitary sewer and utilities along Victoria Crescent and Victoria Park.</li> <li>• Construction activities will require phasing to minimize impacts to the public and reduce traffic management requirements.</li> </ul>	-2	-0.25
	• Initial anticipated studies	4	0.17	<ul style="list-style-type: none"> <li>• Stage 2 archaeological assessment</li> <li>• Scoped Environmental Impact Study and Report which includes, but may not be limited to the following: characterization of vegetation communities and botanical inventory, breeding bird survey, investigation for wildlife habitat and wildlife presence (includes Species at Risk), delineation of woodland dripline, evaluation and significance of the woodland, Fish Habitat Assessment and Fish Community Survey, Thermal Impact Assessment (also includes post-construction monitoring requirements), slope stability assessment and geotechnical investigation, impact assessment on natural heritage features, and recommendations for compensation and mitigation.</li> </ul>	-2	-0.33
	• Initial anticipated approvals	4	0.17	<ul style="list-style-type: none"> <li>• DFO</li> <li>• Township and County to alter lands zoned as Core Greenlands within the Official Plan</li> <li>• GRCA for work within a Regulated Area</li> <li>• MOECC ECA</li> <li>• MNRF</li> </ul>	-2	-0.33
	• Maintenance/access considerations	3	0.13	• Provides accessible outlet for maintenance.	2	0.25
<b>Total Impacts on Technical Environment <sup>(4)</sup></b>					<b>-0.46</b>	
<b>Ranking of Alternative Within Technical Environment <sup>(6)</sup></b>					<b>3</b>	
<b>ECONOMICAL ENVIRONMENT</b>						
Costs	• Capital costs	3	0.50	<ul style="list-style-type: none"> <li>• Considerable rock excavation is expected.</li> <li>• Physical infrastructure required is increased.</li> <li>• Several technical studies and permits/approvals are anticipated.</li> <li>• Although the vegetation will be restored, it may take some time for disturbed natural areas to re-establish and these areas may appear less naturalized during and for some time following construction activities. A new outlet to Irvine Creek is required.</li> <li>• Large construction footprint that will require restoration to match or exceed existing conditions.</li> <li>• Moderate potential for project cost escalation (i.e. unexpected subsurface conditions, equipment requirements, etc.).</li> <li>• Estimated \$715,000</li> </ul>	-2	-1.00
	• Operation and maintenance costs	3	0.50	<ul style="list-style-type: none"> <li>• New Trunk Sewer will have an expected useful service life in excess of 75 years and require minimal maintenance for the foreseeable future.</li> <li>• Increased costs associated with monitoring establishment of vegetation following site restoration.</li> </ul>	1	0.50
<b>Total Impacts on Economical Environment <sup>(4)</sup></b>					<b>-0.50</b>	
<b>Ranking of Alternative within Economical Environment <sup>(6)</sup></b>					<b>3</b>	
<b>Total Impact on All Environments <sup>(5)</sup></b>					<b>-5.24</b>	
<b>Preliminary Ranking of Alternative, Total of All Anticipated Impacts Considered <sup>(6)</sup></b>					<b>4</b>	



# ANALYSIS/EVALUATION OF ALTERNATIVES

<b>ALTERNATIVE 4B</b>						
CRITERIA	Criteria Significance <sup>(1)</sup>	Normalized Weighting of Criteria	New Storm Outlet on New Alignment Routed Along Smith St. and Henderson St. and Through Victoria Park, Including the Installation of a New Outlet Structure Through the Bank of Irvine Creek	Performance Marking <sup>(3)</sup>	Impacts <sup>(4)</sup>	
<b>CULTURAL ENVIRONMENT</b>						
Archaeology	Impacts to archaeological resources and cultural heritage landscapes	3	1.00	<ul style="list-style-type: none"> <li>A Stage 1 archaeological assessment is necessary to determine the archaeological potential; however, given the archaeological sensitivity of the area, it is assumed that further archaeological assessment (Stage 2) will be required.</li> <li>Installation of a new outlet through the side of the Elora Gorge will impact the cultural heritage landscape.</li> </ul>	-2	-2.00
<b>Total Impacts on Cultural Environment <sup>(4)</sup></b>					<b>-2.00</b>	
<b>Ranking of Alternative Within Cultural Environment <sup>(6)</sup></b>					<b>2</b>	
<b>SOCIAL ENVIRONMENT</b>						
<b>• Duration of construction activities expected to be 4 months and directly affect approximately 23 private properties.</b>						
Land Use	Impacts on private property	4	0.44	<ul style="list-style-type: none"> <li>Access to private properties interrupted temporarily during construction period.</li> <li>Private property landscape features (sidewalks, driveways, trees) disturbed during construction. Although the vegetation will be restored, it may take some time for disturbed natural areas to re-establish and these areas may appear less naturalized during and for some time following construction activities.</li> <li>No easement required.</li> <li>Existing Trunk Sewer will require decommissioning.</li> </ul>	-2	-0.89
	Temporary construction impacts (access, noise, dust, etc.)	3	0.33	Expanded construction footprint and disruption to Victoria Crescent, Smith St., and Henderson St. residents and visitors of the Irvine Promenade Trail and Victoria Park over an extended construction period.	-2	-0.67
	Impacts on land use and traffic	2	0.22	Temporary significant inconvenience to residents and the community due to disruption to Victoria Crescent, Smith St. and Henderson St. traffic, Victoria Park, and Irvine Promenade Trail. The expected duration of construction activities associated with implementation of this alternative is the longest of all of the alternatives being considered due to the physical footprint of the project.	-2	-0.44
<b>Total Impacts on Social Environment <sup>(4)</sup></b>					<b>-2.00</b>	
<b>Ranking of Alternative within Social Environment <sup>(6)</sup></b>					<b>4</b>	
<b>NATURAL ENVIRONMENT</b>						
Trees and Vegetation	Impacts to trees and vegetation	4	0.29	<ul style="list-style-type: none"> <li>Low to Moderate impact to trees and vegetation in Victoria Park and Irvine Promenade Trail.</li> <li>Impacts to trees/vegetation beneath new outlet are expected.</li> <li>Based on the results of a Tree Assessment completed by Aboud in September 2017, it is anticipated that implementation of Alternative 4A would result in the removal of 24 trees out of a total of 68 existing trees located along a 10 m corridor encompassing the proposed sewer alignment through Victoria Park (all of the existing trees are located on municipal property). Removal of 19 trees through the assessed corridor are a direct result of disturbance from construction activities and 5 trees are recommended for removal due to poor/very poor/dead condition of the tree.</li> <li>Of the 68 existing trees located along the assessed corridor in Victoria Park, 6 are classified as having a dominant crown, 10 are co-dominant, 36 are intermediate, and 16 are suppressed/overtopped. Of the 5 trees that are recommended for removal due to poor/very poor/dead condition, 1 is classified as having a co-dominant crown, 1 is classified as having an intermediate crown, and 3 have suppressed crowns. Of the 19 trees that would require removal due to construction, 2 are classified as having a dominant crown, 1 is classified as having a co-dominant crown, 11 as having an intermediate crown, and 5 as having suppressed crowns.</li> <li>None to limited impact to trees is anticipated for the section of sewer alignment that is proposed along Victoria Crescent within the municipal road right-of-way between the existing trunk sewer location and the proposed alignment through Victoria Park.</li> <li>**NOTE: Tree crown classes are as follows: Trees having a dominant crown typically have a trunk diameter that is the largest in the stand and the crown is generally well developed and dominates the canopy of the stand. Trees with codominant crowns help form the main canopy and typically have trunk diameters in the upper range within the stand. Trees with an intermediate crown extend into the lower part of the main canopy, typically intercepting direct sunlight by a limited area on the top of the crown and have varying trunk diameters, typically in the lower range of the stand. Trees having a suppressed/overtopped crown sit well below the main canopy, are small and sparse, not exposed to direct sunlight, and generally have trunk diameters that are the smallest in the stand.</li> </ul>	-2	-0.57
Wildlife	Impacts to wildlife and species at risk	4	0.29	Potential for moderate impact to wildlife and wildlife habitat due to the anticipated number and type of trees requiring removal.	-2	-0.57
Hydrology	Impacts to storm water management	3	0.21	<ul style="list-style-type: none"> <li>The Trunk Sewer will be adequately sized to convey peak flows from the 5 year storm for the revised Victoria Crescent drainage area under existing and future growth conditions. Storm water in excess of the 5 year storm will continue to flow overland between house No. 190 and No. 200 Victoria Crescent.</li> <li>The Trunk Sewer will be installed deeper below grade, therefore allowing the opportunity to make improvements to the upstream storm sewer network.</li> </ul>	2	0.43
	Impacts to water quality	3	0.21	Opportunity to add water quality controls to the storm water management system, improving water quality discharging into Irvine Creek from the Trunk Sewer.	2	0.43
<b>Total Impacts on Natural Environment <sup>(4)</sup></b>					<b>-0.29</b>	
<b>Ranking of Alternative Within Natural Environment <sup>(6)</sup></b>					<b>3</b>	
<b>TECHNICAL ENVIRONMENT</b>						
Design/Function	Ability to address opportunity statement	4	0.17	Addresses opportunity statement and includes decommissioning the existing Trunk Sewer.	2	0.33
	Design considerations	3	0.13	<ul style="list-style-type: none"> <li>The overall length of Trunk Sewer will increase and as a result, the design of an extensive rock excavation will be required to achieve the appropriate grade/fall from the current upstream storm sewer junction to the new outlet at Irvine Creek.</li> <li>Design will be constrained by the location of existing utilities.</li> <li>Long design process due to initial anticipated studies required, stakeholder involvement, and initial anticipated approvals required.</li> </ul>	-2	-0.25
	Ability to meet current municipal design standards	3	0.13	Upgrade the new Trunk Sewer to conform to current municipal design standards.	1	0.13
	Staging, grading constraints, utility conflicts, traffic management	3	0.13	<ul style="list-style-type: none"> <li>Anticipated conflicts with watermain, sanitary sewer and utilities along Victoria Crescent, Smith St, and Henderson St.</li> <li>Construction activities will require phasing to minimize impacts to the public and reduce traffic management requirements.</li> </ul>	-2	-0.25
	Initial anticipated studies	4	0.17	<ul style="list-style-type: none"> <li>Stage 2 archaeological assessment</li> <li>Scoped Environmental Impact Study and Report which includes, but may not be limited to the following: characterization of vegetation communities and botanical inventory, breeding bird survey, investigation for wildlife habitat and wildlife presence (includes Species at Risk), delineation of woodland dripline, evaluation and significance of the woodland, Fish Habitat Assessment and Fish Community Survey, Thermal Impact Assessment (also includes post-construction monitoring requirements), slope stability assessment and geotechnical investigation, impact assessment on natural heritage features, and recommendations for compensation and mitigation</li> </ul>	-2	-0.33
	Initial anticipated approvals	4	0.17	<ul style="list-style-type: none"> <li>DFO</li> <li>Township and County to alter lands zoned as Core Greenlands within the Official Plan</li> <li>GRCA for work within a Regulated Area</li> <li>MOECC ECA</li> <li>MNRF</li> </ul>	-2	-0.33
Maintenance/access considerations	3	0.13	Provides accessible outlet for maintenance.	2	0.25	
<b>Total Impacts on Technical Environment <sup>(4)</sup></b>					<b>-0.46</b>	
<b>Ranking of Alternative Within Technical Environment <sup>(6)</sup></b>					<b>3</b>	
<b>ECONOMICAL ENVIRONMENT</b>						
Costs	Capital costs	3	0.50	<ul style="list-style-type: none"> <li>Considerable rock excavation is expected.</li> <li>Physical infrastructure required is significantly increased.</li> <li>Several technical studies and permits/approvals are anticipated.</li> <li>A new outlet to Irvine Creek is required.</li> <li>Largest construction footprint that will require restoration to match or exceed existing conditions.</li> <li>Additional effort required to remove existing storm sewers on Smith St. and Henderson St.</li> <li>Moderate/high potential for project cost escalation (i.e. unexpected subsurface conditions, equipment requirements, etc.).</li> <li>Estimated \$975,000</li> </ul>	-2	-1.00
	Operation and maintenance costs	3	0.50	<ul style="list-style-type: none"> <li>New Trunk Sewer will have an expected useful service life in excess of 75 years and require minimal maintenance for the foreseeable future.</li> <li>Increased costs associated with monitoring establishment of vegetation following site restoration.</li> </ul>	1	0.50
<b>Total Impacts on Economical Environment <sup>(4)</sup></b>					<b>-0.50</b>	
<b>Ranking of Alternative within Economical Environment <sup>(6)</sup></b>					<b>3</b>	
<b>Total Impact on All Environments <sup>(5)</sup></b>					<b>-5.24</b>	
<b>Preliminary Ranking of Alternative, Total of All Anticipated Impacts Considered <sup>(6)</sup></b>					<b>4</b>	

## ANALYSIS/EVALUATION OF ALTERNATIVES

### EVALUATION NOTES

**(1) Significance Weighting of Environmental Criterion (based on best representation of stakeholders' viewpoints)**

- 1 = Low Importance
- 2 = Important
- 3 = High Importance
- 4 = Utmost Important

**(2) Normalized Weighting of Criteria = Criteria Significance / Sum of all Criteria Significance within Environmental Category**

**(3) Performance Rating,\* based on the expected impacts of an alternative to a specific criterion**

- 2 = Significant net benefits are expected
- 1 = Net positive impacts (benefits outweigh the negative impacts)
- 0 = Neutral; none or very limited changes to existing conditions are expected
- 1 = Net negative impacts (negative impacts outweigh the benefits)
- 2 = Significant net negative impacts are expected

**\*Factors considered in the assignment of a performance rating:**

- magnitude of impact (low/moderate/high)
- geographic extent of impact (site specific, local, regional)
- duration of impact (temporary, long-term, permanent)
- frequency of impact (rare, irregular, regular, continuous)
- reversibility of impact (reversible or irreversible)
- ecological/socioeconomic context (undisturbed, developed)
- confidence in prediction of impact (low, moderate, high)
- likelihood of impact (low, medium, high probability)
- other projects/activities/actions that may contribute to the cumulative environmental impacts

**(4) Impact = Normalized Criteria Weighting x Performance Marking**

**(5) Total Impact on all Environments = Sum of all impacts on all environmental categories**

**(6) Preliminary Ranking of alternatives based on the following numerical scale and colour scheme:**

- 1 = Most Preferred (1st Choice)
- 2 = 2nd Choice
- 3 = 3rd Choice
- 4 = Least Preferred (Last Choice)

# MITIGATION MEASURES

The project design will ensure the following measures are taken to mitigate identified impacts:

## Natural Environment

- Complete technical studies and evaluations to the satisfaction of regulatory agencies and public consultation to support detailed design
- Complete subsurface investigation prior to excavation and/or rock cutting
- Prepare a tree and vegetation conservation and restoration planting plan to match or exceed existing conditions
- Implement sediment and erosion control measures
- Follow all regulatory requirements to protect the environment
- Plan construction work during non-sensitive periods (i.e. breeding seasons) for wildlife
- Prepare contingency plan for clean-up during construction
- Obtain applicable permit approvals, as required

## Social Environment

- Stage construction to cause least disturbance to adjacent uses
- Employ noise, vibration and dust control measures
- Advance notification to public agencies and adjacent owners of construction scheduling and temporary access routes
- Carry out Stage 2 archaeological assessment
- Preserve existing amenities as much as possible



# NEXT STEPS

## Alternative Design and Selection

- Respond to comments/suggestions from review agencies and the public
- Select preferred solution
- Post notice of completion to review agencies and the public for 30 calendar day review period
- File project on public record

## Implementation

- Complete contract drawings and tender documents
- Perform construction and operation measures
- Monitor for environmental provisions and commitments