City of Guelph

Arthur Street Trunk Sewer – Speed River Crossing Schedule B Class Environmental Assessment – Project File Report

Prepared by:

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Project Number:

60272727

Date:

February, 2014

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February 12, 2014

Mr. Arun Hindupur, P. Eng.
Infrastructure Planning Engineer
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1

Dear Arun:

Project No: **60272727**

Regarding: **Arthur Street Trunk Sewer – Speed River Crossing**
Schedule B Class Environmental Assessment

We are pleased to submit our Project File Report for the Municipal Class Environmental Assessment for the Arthur Street Trunk Sewer, Speed River Crossing.

This report summarizes the Class EA process followed, identifies the alternatives considered as well as the selected preferred alternative. The preliminary design of the preferred alternative as well as details of the Public Consultation and environmental investigation is included in the appendices.

We trust this report provides the information required for this project to proceed to design and construction. Please advise if we can be of further service.

Sincerely,
AECOM Canada Ltd.

R Clement

Rick Clement, P. Eng.
Senior Municipal Engineer

RC:rc
Encl.
cc:

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1	R. Clement	May 20, 2014	Incorporate City review comments
2	R. Clement	June 18, 2014	Incorporate City review comments

AECOM Signatures

Report Prepared By: Rick Clement, P. Eng.
Senior Municipal Engineer

Report Reviewed By: Duncaun McLeod, P. Eng.
Manager – Community Infrastructure

EXECUTIVE SUMMARY

1. Introduction

1.1 Purpose

A Municipal Class Environmental Assessment (EA) was undertaken by the City of Guelph to determine the preferred alternative of upgrading the Arthur Street Trunk sewer where it crosses the Speed River. The existing Arthur Street sanitary trunk sewer is located along the east side of the Speed River and collects flows from the northeast quadrant of the City of Guelph. This EA examined the section of the trunk sewer in the area bounded by Arthur Street South, Wyndham Street South, Wellington Street East and Macdonell Street.

1.2 Background

As part of the City's sanitary sewer drainage network, a 300mm diameter gravity sewer and a 400mm siphon cross the Speed River in the area north of Neeve Street. They connect the Arthur Street trunk sanitary sewer to the Speed River trunk sanitary sewer on Wellington Street. East of the river the 300mm diameter sewer passes through a private property. The two sewers which service a drainage area of approximately 965ha in the northeast part of the City are at the end of their service life and require replacement. Due to their age and size, they lack capacity to convey projected sewage flows.

The City of Guelph has identified that projected sewage flows will increase due to intensification of development within the City, especially in the downtown core. The City's Sanitary Sewer Master Plan included modelling of the existing sewage collection system to identify improvements required to the system that were required to accommodate the proposed intensification. This study identified that the existing Arthur Trunk Sewer siphon as well as downstream sections of the Speed River Trunk sewer required improvements. In particular, the Speed River Trunk from St. Arnaud Street at Bristol Street, along Waterloo Avenue to the Waterloo and York Trunk Sewers at Silvercreek Parkway, are to be upsized. The Master Plan also identified that the sewer from the connection of the three trunk sewers at Silvercreek Parkway, under the Hanlon Expressway to the sewage treatment plant was undersized to accommodate the projected sewage flows. This section of sewer is not considered in the Arthur Trunk Sewer EA.

The City of Guelph recently completed a Class EA for the York Trunk Sewer. This EA recommended twinning the existing York Trunk Sewer. The project is currently in the design phase with construction scheduled to begin in 2014. As part of the Arthur Trunk Sewer Class EA, alternatives that included rerouting the Arthur Trunk Sewer to the new York Trunk Sewer were investigated.

2. Environmental Assessment Process

2.1 Municipal Class Environmental Assessment

This study has been conducted in accordance with the approved requirements of a Schedule "B" project as defined in the Ontario Municipal Engineers Association (MEA) "Municipal Class Environmental Assessment" document.

Schedule B projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process involving mandatory contact with directly affected public and with relevant government agencies to ensure that they are aware of the project and that their concerns are addressed. If there

are no outstanding concerns, the project may proceed to implementation. As a result, the proponent is required to proceed through a screening process (Phases 1 and 2 of the Municipal Class EA process), including consultation with those who may be affected. At the end of Phase 2, a Project File documenting the planning process followed through Phases 1 and 2 is finalized and made available for public and agency review.

Subsequent to approval of the Class EA, detail design and tender documents will be completed based on the plan described in this Project File.

3. Problem Definition

3.1 Problem Statement

Much of the City's sanitary sewer infrastructure is aging and is in need of replacement. The existing Speed River crossings pose several risks due to their age and location within the river. Additionally, the ability for this portion of the Arthur Trunk Sewer to convey peak flows under existing and future growth scenarios is limited given its current condition.

3.2 Opportunity Statement

There is the opportunity to provide a new route and alignment for the Arthur Street Trunk Sewer downstream of Macdonell Street which will address environmental impacts associated with the existing infrastructure currently located in the Speed River. The new trunk sewer will also be able to convey peak flows under existing and future growth scenarios.

4. Existing Conditions

4.1 Legislative Environment

Legislation and policies at all three levels of government, federal, provincial and municipal have been considered for this project. The following is a summary of applicable legislation.

4.1.1 Planning Act - Provincial Policy Statement

The Provincial Policy Statement (PPS), Section 2.3 (Natural Heritage), requires that development proposals for lands adjacent to natural heritage features "demonstrate that there will be no negative impact on the natural features or on the ecological functions for which the area is identified". The Natural Heritage Reference Manual for Policy 2.3 of the PPS (March 1999) defines adjacent lands with regards to different natural heritage features and provides suggested distances for adjacent lands.

4.1.2 Conservation Authorities Act

Portions of the Study Area, including the Speed River are regulated by the Grand River Conservation Authority under Ontario Regulation 150/06 (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation).

4.1.3 Fisheries Act

Any in-water works will require review by the GRCA due to potential harmful, alteration, disturbance and destruction (HADD) of fish habitat. GRCA has a Level 3 agreement to review projects on behalf of the Department of Fisheries and Oceans (DFO) and can authorize a Letter of Advice if mitigation can be used to reduce the impacts to fish habitat. If the potential impacts cannot be mitigated, a Section 35(2) HADD authorization is required, and a project review will be conducted by DFO.

4.1.4 Migratory Birds Convention Act, 1994

The federal Migratory Birds Convention Act is applied through The Regulations Respecting the Protection of Migratory Birds that states that "[…] no person shall disturb, destroy or take a nest, egg […] of a migratory bird." This law protects all birds aside from the introduced species European Starling, House Sparrow, and Rock Pigeon. Bird nests that are destroyed during the course of construction and other related activities is referred to as "incidental take" and is illegal except under the authority of a permit obtained through the CWS (Canadian Wildlife Service).

4.1.5 Ontario Endangered Species at Risk Act, 2007

The purpose of the Ontario Endangered Species at Risk Act is to identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge as well to protect species that are at risk and their habitats, to promote the recovery of species that are at risk and to promote stewardship activities to assist in the protection and recovery of species that are at risk.

4.1.6 Federal Species at Risk Act, 2002

The purpose of the Federal Species at Risk Act is to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species to encourage the management of other species to prevent them from becoming at risk. This Act creates prohibitions to protect listed threatened and endangered species and their critical habitat and recognizes that compensation may be needed to ensure fairness following the imposition of the critical habitat prohibitions.

4.2 Background Overview

In order to evaluate the existing conditions at the site background information pertaining to the natural heritage features, wildlife and species at risk (SAR) that have been documented at or within close proximity to the site was obtained from the City of Guelph Official Plan (Official Plan), the Grand River Conservation Authority (GRCA), the Ontario Ministry of Natural Resources (OMNR), the OMNR Natural Heritage Information Database (NHIC), the Department of Fisheries and Oceans (DFO), Conservation Ontario (CO) and the Atlas of the Breeding Birds of Ontario (ABBO).

4.3 Species at Risk Screening

As the province has not been surveyed comprehensively for the presence of SAR; the absence of a species within the NHIC database for a particular area when completing a 1 km search does not necessarily indicate the absence of the species within the study area. An analysis of the suitability of the habitat identified within the study area for SAR which are known to occur, or have historically occurred, within 1 km of the study area was undertaken. A total of two Endangered, seven Threatened and six Special Concern species have been identified within the general area

surrounding the study area. Through this evaluation it was determined that suitable habitat for one threatened species, Barn Swallow, may be present in the study area.

4.4 Environmental Assessment Methods

The assessment and description of the existing terrestrial and aquatic natural heritage features was completed within the study area.

Terrestrial habitat assessments included the classification of vegetation communities using the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998), the completion of a list for each ELC community documented the structure and relative abundance of vegetation present within each community.

A tree inventory and assessment of all trees with a diameter at breast height (DBH) greater than 10 cm was also completed as part of this study.

Aquatic habitat assessments included collecting specific information to assess the aquatic habitat conditions. Fish habitat assessments are completed to identify and assess water body characteristics that provide habitat for the critical life processes outlined in the *Fisheries Act*. The habitat assessments detail the characteristics and major physical attributes of the water body and general observations of the water quality.

Due to the size and scope of the project only incidental wildlife surveys were completed during the assessment of the existing conditions at the site.

In addition to the incidental wildlife observations the habitat at the site was assessed using the Significant Wildlife Habitat Technical Guide (OMNR, 2000) to determine if Significant Wildlife Habitat (SWH) was present within the study area.

4.5 Existing Terrestrial Conditions

Only one unique ecological community, a Mineral Cultural Woodland (CUW1), was identified along the east bank of the Speed River at the existing and at one of the proposed crossings as a result of the terrestrial assessment at the site.

Generally this community is characterized by:

- a sparse red elm (Ulmus rubra) canopy which covers less than 10 % of the community;
- a Manitoba maple (Acer negundo) sub canopy which covers between 25 to 60% of the community;
- a common buckthorn (Rhamnus cathartica) shrub layer which covers over 60% of the community; and
- the ground layer which covers 10 to 25% of the community and contains common buckthorn, orchard grass (Dactylis glomerata), and tall goldenrod (Solidago altissima).

The vegetation composition of this community is consistent with that of a naturalized community that has been disturbed by various factors that are commonly associated with an urbanized environment.

Of the 27 species of plants identified 14 are classified as exotic. Aggressive exotic species such as common buckthorn can become dominant within their communities and exclude native species and drastically change a natural area (White, Haber & Keddy 1993).

Small pockets of herbaceous wetland vegetation were observed fringing the Speed River however none were large enough (>2.0 ha) to be evaluated under the Ontario Wetland Evaluation System (OMNR, 2012).

4.6 Existing Aquatic Conditions

The study area is located within the Speed River watershed and within the larger Grand River watershed. The study reach is bordered by Wellington Road on the west bank and a trail system on the east bank. The Speed River is fairly uniform throughout the study reach and has been highly influenced by urbanization, through watercourse channel modifications, construction of dams, water quality influences and alterations to flow regime. There are several old factories that were built along the Speed River and encroach upon the river banks which were then reinforced to support the buildings. Each crossing option was assessed both upstream and downstream of the proposed crossing for aquatic conditions and presented in this report.

Fish community information was obtained from the Grand River Conservation Authority website and the York Trunk Sewer and Paisley-Clythe Feedermain Schedule B Class EA study report completed by Genivar in 2011.
In the province of Ontario, all fish species found within the Speed River are classified as secure, common, widespread and abundant in the province. There are no records or observations of aquatic species at risk, or special concern, and all species range between intermediate to tolerant in their tolerance to environmental conditions and perturbations. There are no aquatic SAR identified within the study area.

Given the historical and current impacts to the Speed River it still provides important ecological function and fish habitat. The Speed River throughout the study area provides suitable habitat for fish species to carry out their life processes including spawning, feeding, rearing, migration and refuge. As previously discussed, specific aquatic impacts associated with the various alternatives will be discussed in later sections.

4.7 Wildlife Habitat

As no formal wildlife surveys were completed as part of this project only a few species were observed during the site visit. This includes Black-capped Chickadee (*Poecile atricapillus*), Common Mallard (*Anas platyrhynchos*), American Goldfinch (*Carduelis tristis*), Eastern Grey Squirrel (*Sciurus carolinensis*) and Raccoon (*Procyon lotor*).

Due to the size and disturbed nature of the habitat present at the site and its proximity to human settlement there is limited potential for SWH. Waterfowl stopover and staging habitat may be present within the Speed River at the site however it may be restricted to more common species, such as Canada Goose (*Branta canadensis*) and Common Mallard, as they are typically more tolerable of human disturbance. It is also unlikely that the habitat at the site is utilized by the target number of waterfowl, aggregations of 100 or more of the listed species a day for seven days, required to classify the sight as SWH.

5. Identification of Alternative Solutions

5.1 Alternative 1: Do Nothing

This alternative is considered as the “benchmark” for which all other alternative for which all other alternatives are evaluated against. “Do Nothing” represents what would likely occur if none of the alternatives were to be implemented. With this option, there are no impacts to natural features resulting from construction activities, however, there is a potential impact to the natural environment in the event of sewer surcharging or structure failure

as the current alignment will continue through the Speed River. This alternative does not address the problem statement.

5.2 Alternative 2: Gravity River Crossing

This alternative would replace the existing gravity and siphon sewers with a single gravity crossing, just upstream of the existing gravity crossing. An easement would be required across private property on the east side of the river. Sewers on Cross Street and Arthur Street would be rerouted to the new river crossing sewer. On the west side of the river, the sewer on Wellington Street would be upgraded from the new river crossing to Gordon Street. Downstream improvements would also be required to convey the design flows on the Speed River Trunk Sewer from St. Arnaud Street along Waterloo Avenue to Silvercreek Parkway South. The existing Speed Trunk Sewer downstream of St. Arnaud St. would be abandoned as it currently goes through private properties.

5.3 Alternative 3: Siphon River Crossing

This alternative is similar to Alternative 2, except there would be a siphon crossing of the Speed River, just upstream of the Neeve Street Bridge, rather than the gravity crossing.

5.4 Alternative 4: Under the Neeve Street Bridge to the York Trunk

With this alternative, the existing gravity and siphon sewers would be replaced with a new trunk sewer along Arthur Street, down Cross Street, along Neeve Street to the river, under the Neeve Street bridge along the east river bank to the existing trail along the east side of the river, to Wyndham Street and connect to the new York Trunk Sewer in the park east of York Street.

5.5 Alternative 5: Along Existing Streets to the York Trunk

This alternative is similar to Alternative 4, except it will be routing through existing road allowances specifically along Neeve Street to Howitt Street to Wyndham Street.

6. Evaluation of Alternatives

6.1 Evaluation Criteria and Rating Methodology

Each alternative was evaluated using a qualitative rating scale on Environmental, Social and Economic impacts. Environmental factors included Terrestrial and Vegetation, Aquatic Habitat, and Watercourse Crossing impacts. Social factors included Traffic, Archeological and Heritage Impacts. Economic factors included both Capital and Operating and Maintenance costs as well as land acquisition requirements.

6.2 Evaluation Summary

The table below summarizes the evaluation of each alternative considered as part of this EA.

	Alternative 1 Do Nothing	Alternative 2 Gravity Crossing to Speed Trunk	Alternative 3 Siphon Crossing to Speed Trunk	Alternative 4 Under Bridge to York Trunk	Alternative 5 Along Existing Streets to York Trunk
Addresses Problem Statement	○ does not address problem statement	● addresses problem statement	● addresses problem statement	● addresses problem statement	● addresses problem statement
Environmental Effects					
• Impact on Trees and Vegetation	◔ pipe failure may impact vegetation	◔ trees and vegetation at watercourse crossing impacted	◔ trees and vegetation at watercourse crossing impacted	◔ trees and vegetation along existing trail impacted	◔ limited impact to street trees
• Impact on Fisheries	○ pipe failure would impact fisheries	○ some temporary impacts to fish habitat	○ some temporary impacts to fish habitat	◔ some temporary impacts to fish habitat	● limited impacts since work is on road ROW
• Watercourse Crossing	○ existing crossings	○ crossing required	○ crossing required	◑ crossing required	● no crossing required
Social and Cultural Effects					
• Traffic Impacts	● no traffic impacts	◔ disruption to Wellington Street and Waterloo Avenue traffic	◔ disruption to Wellington Street and Waterloo Avenue traffic	◑ disruption to Wyndham Street traffic	◑ disruption to Wyndham Street and local street traffic
• Archaeological Impacts	● no change to archaeologic impacts	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◑ limited impacts since work is on road right of way
• Heritage Resource Impacts	● no change to heritage impacts	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◑ limited impacts since work is on road right of way
Economic Effects					
• Estimated Capital Cost	● maintenance of existing no new capital works	○ $10.9 Million	○ $11.1 Million	◔ $6.1 Million	◔ $6.2 Million
• Operating and Maintenance Costs	○ highest expected O & M cost	◔ river crossing impacts O & M cost	○ higher O & M due to siphon river crossing maintenance	◔ bridge crossing impacts O & M cost	◔ least expected O & M cost
• Land Acquistion Requirements	○ easement across private property requried	○ easement across private property required	◔ no easement required	◔ no easement required	◔ no easement required
					Recommended Alternative

○ ◔ ◑ ◔ ●

Least Desirable ⟷ Most Desirable

Evaluation Summary

7. Preferred Solution

7.1 Description

Based on the evaluation, the preferred solution is Alternative 5 where the trunk sewer is constructed on existing road allowances and is connected to the proposed York Trunk Sewer.

The upstream end of the trunk sewer will connect the recently constructed trunk at Macdonell Street at Arthur Street to a new sewer on Arthur Street. The route will follow along under Arthur Street, under the railway tracks (method to be confirmed at detailed design), to Cross Street, down Cross Street to Neeve Street, along Neeve Street to Howitt Street, along Howitt Street, across Margaret Street to Wyndham Street and along Wyndham Street to York Road Park where it connects to the proposed new York Trunk Sewer. The existing local sanitary sewers on these streets will be replaced by the new trunk sewer or will be reconstructed above the new trunk where the depth of the new trunk is greater than 5.0m. With the construction of the new trunk, the existing sewer crossing private property will become redundant and can be removed as part of the redevelopment of the property.

Construction will be contained within the road allowance using trench boxes for the excavation to limit impacts to street trees and residences. Extensive rock excavation is expected and additional geotechnical and hydrogeological investigation will be included in the detailed design phase. Condition surveys of the existing residences and structures within the vicinity of construction will be completed prior to construction.

7.2 Modeling

The hydraulic sewer model prepared for the Sanitary Sewer Master Plan study was used to model the preferred alternative. The upstream sewer at Macdonell Street is 825mm diameter and this size was used for all downstream sections to the York Trunk Sewer. The model found that both the proposed Arthur Trunk Sewer and the York Trunk Sewer were adequately sized to convey the existing and projected sewage flows. Sizing for the proposed trunk sewer will be confirmed at detailed design.

7.3 Additional Work

Once the new Arthur Trunk Sewer is constructed it will be necessary to decommission the existing siphon and gravity sewer river crossings. It is proposed that the siphon and sewer that are to be abandoned will have the sewage pumped from them and disposed at the sewage treatment plant and then be pumped full of grout. This would eliminate the need for access to or disturbance of the river.

There is an existing 1200mm diameter storm sewer that outlets to the river in the vicinity of the existing gravity sanitary sewer crossing. Since the City does not have an easement for this sewer, it is proposed to relocate this sewer as part of the reconstruction work to the road allowance and outlet it to the river at the Neeve Street bridge. A separate application for approval for this work will be made during the detailed design phase.

7.4 Phasing and Implementation

The construction of the new trunk sewer can be phased in separate contracts or over a period of time as required to suit the City's budget for the work. For example, it may be desirable for the work on Arthur Street to be carried out coincidental with the redevelopment of the property at 5 Arthur Street.

Construction cannot commence until the proposed new York Trunk is constructed to York Road Park. Construction will commence in the park and proceed upstream. Construction on existing streets will be phased on a block by block basis to minimize disruption of the businesses and residents. Local sewers and service connections will be

installed as work proceeds. Once the complete new trunk sewer is installed, the decommissioning of the existing siphon and gravity sewer can commence.

8. Mitigation Measures

8.1 Summary of Mitigation Measures

It is recognized that construction of the proposed works may have potential negative impacts on the environment and surrounding area. To understand the net effect of construction and operation, an assessment of the impacts and the mitigation measure to mitigate or negate these potential negative impacts has been prepared and is discussed in the report.

9. Consultation

9.1 Notice of Commencement

As part of the planning process, several steps have been undertaken to inform various stakeholders including government agencies, First Nations, affected landowners and the local community/general public of the nature and scope of the project and to solicit any comments. To inform review agencies of the project and solicit comments, at the beginning of the study a notice of study commencement was sent to review agencies outlining the proposed project and inviting comments. In addition, a Notice of study commencement including an offer to be put on project mailing list was first published in the Guelph Tribune in January 2013. A copy of the Notice and agencies contacted is included in Appendix F.

9.2 Public Information Centre

A Public Information Center (PIC) was held on December 12th, 2013, between 6:30pm and 8:30pm, in the Galleria of City Hall. The Notice of PIC was delivered to local residents and was published in the Guelph Tribune in November 2013.

The PIC included display boards depicting the study purpose, process, alternatives and evaluation matrix. Staff from AECOM and the City of Guelph were present to answer any questions and assist the public with developing an understanding of the project and process.

Attendance at the PIC included a City Councillor and one other interested person. One comment sheet was completed (by a representative of the Developer of the property on the east side of the river) indicating their interest in this project proceeding and desire to be kept advised of the schedule.

10. Conclusions and Recommendations

10.1 Conclusions

Through the completion of this Class EA, it has been determined that the preferred solution to meet the objectives of the problem statement is Alternative 5. The implementation of this solution resolves the problems and maximizes the opportunities identified in Section 3.

10.2 Recommendations

Considering the above, it is recommended that:

- Following EA Approval, Alternative 5 (Along Existing Streets to the York Trunk) proceed to detailed design;
- Required approvals be obtained; and
- The mitigation measures identified in Section 8 should be implemented as part of construction.

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Appendices

1. Introduction

1.1 Purpose

A Municipal Class Environmental Assessment (EA) was undertaken by the City of Guelph to determine the preferred alternative of upgrading the Arthur Street Trunk sewer where it crosses the Speed River. The project planning took place between March 2013 and January 2014. It follows the principles outlined by the Municipal Engineers Association, Municipal Class Environmental Assessment (EA) document for a Schedule B undertaking (EA Act). This Project File documents the planning process that was carried out.

1.2 Study Area

The existing Arthur Street sanitary trunk sewer is located along the east side of the Speed River and collects flows from the northeast quadrant of the City of Guelph. This EA examined the section of the trunk sewer in the area bounded by Arthur Street South, Wyndham Street South, Wellington Street East and Macdonell Street. The study area is shown in **Figure 1-1**.

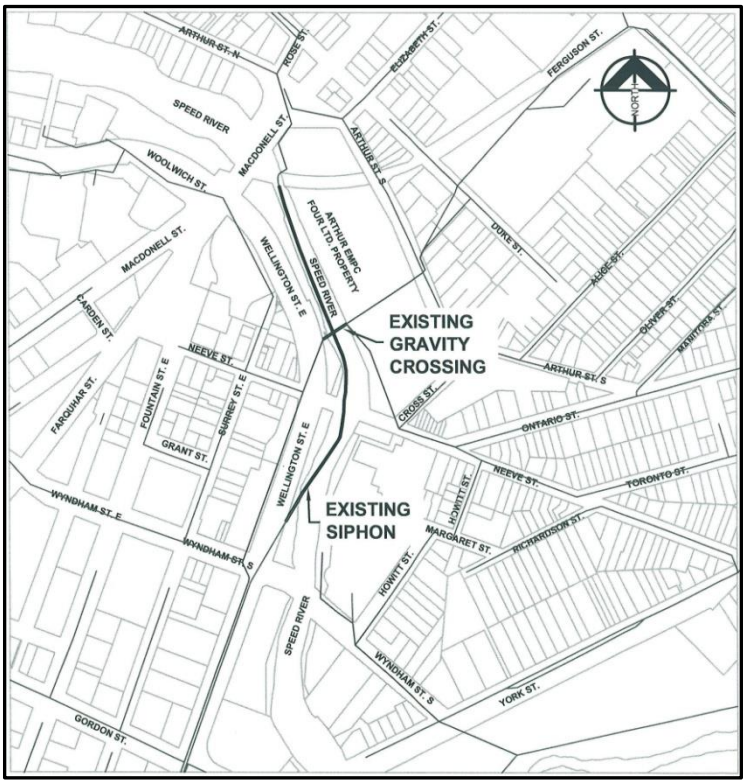


Figure 1-1 - Study Area

1.3 Background

As part of the City's sanitary sewer drainage network, a 300mm diameter gravity sewer and a 400mm siphon cross the Speed River in the area north of Neeve Street. They connect the Arthur Street trunk sanitary sewer to the Speed River trunk sanitary sewer on Wellington Street. East of the river the 300mm diameter sewer passes through a private property. The two sewers which service a drainage area of approximately 965ha in the northeast part of the City are at the end of their service life and require replacement. Due to their age and size, they lack capacity to convey projected sewage flows. The City is undertaking a Class Environmental Assessment to identify the future location of the Speed River Crossing for the Arthur Street Sanitary Sewer or an alternative to crossing the Speed River.

The Arthur Street sanitary trunk sewer runs parallel to the Speed River. It begins at Kitchener Avenue and travels along Marlborough Street to Emma Street where it continues under an easement to Arthur Street North. At the Macdonell Street Bridge, the trunk sewer becomes a 300m long siphon under the Speed River to Wyndham Street South at Wellington Street East where it connects to the Speed River Trunk sewer.

The northern portion of the Arthur Trunk Sewer is vitrified clay pipe installed in 1959. The northern section of the trunk (to the existing siphon under the river)was replaced with 825mm diameter reinforced concrete pipe in 2009. The siphon under the Speed River is made of vitrified clay and was installed in 1909. Due to the sewage flow within the siphon, it is not possible to inspect the condition of this pipe, however with its age and material of construction, it is expected that it is nearing the end of its service.

The 300mm diameter gravity sewer river crossing collects sewage from Arthur Street, south of Macdonell Street. It crosses private property that is currently planned for redevelopment. The pipe is above the river bed and it interferes with the flow in the river. In 2012, the 300mm diameter sewer on the private property was relocated temporarily while the site was undergoing remediation.

The City of Guelph has identified that projected sewage flows will increase due to intensification of development within the City, especially in the downtown core. The City's Sanitary Sewer Master Plan included modelling of the existing sewage collection system to identify improvements to the system that were required to accommodate the proposed intensification. This study identified that the existing Arthur Trunk Sewer siphon as well as downstream sections of the Speed River Trunk sewer required improvements. In particular, the Speed River Trunk from St. Arnaud Street at Bristol Street, along Waterloo Avenue to the Waterloo and York Trunk Sewers at Silvercreek Parkway, are to be upsized. The Master Plan also identified that the sewer from the connection of the three trunk sewers at Silvercreek Parkway, under the Hanlon Expressway to the sewage treatment plant was undersized to accommodate the projected sewage flows. This section of sewer is not considered in the Arthur Trunk Sewer EA.

The City of Guelph recently completed a Class EA for the York Trunk Sewer. This EA recommended twinning the existing York Trunk Sewer. The project is currently in the design phase with construction scheduled to begin in 2014. As part of the Arthur Trunk Sewer Class EA, alternatives that included rerouting the Arthur Trunk Sewer to the new York Trunk Sewer were investigated.

2. Environmental Assessment Process

2.1 Municipal Class Environmental Assessment Process

The purpose of the Ontario Environmental Assessment Act (EA Act) is to promote the protection and conservation of the environment through comprehensive planning and informed decision-making. It allows for the evaluation of environmental effects of alternatives to a project and alternative methods for carrying out a project.
The Class Environmental Assessment (Class EA) process ensures that all projects are carried out with effectiveness, efficiency and fairness. This process serves as a mechanism for understanding economic, social and environmental concerns while implementing change. The process followed for this project not only adheres to the guidelines outlined by the Municipal Engineers Association, Municipal Class Environmental Assessment process but reflects the five mandatory principles of Class EA planning under the EA Act:

- Consultation with affected parties early on, such that the planning process is a co-operative venture;
- Consideration of a reasonable range of alternatives;
- Identification and consideration of the effects of each alternative on all aspects of the environment;
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; and
- Provision of clear and complete documentation of the planning process followed, to allow “traceability” of decision-making with respect to the project.

These five principles ensure that the EA process is devoted to the prevention of problems and damage (from the project) through better planning and decision-making. It recognizes that research and evaluation of possible effects are taken into account prior to implementation of the project. The development of the project through these principles is a shift towards a more comprehensive and more participative approach to an EA.

2.2 Project Classification

The Municipal Class EA document defines four types of projects and the planning processes required for each: Schedule A, A+, B, or C.

Schedule A: Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the Class EA planning process. Schedule A projects generally include normal or emergency operational maintenance activities where the environmental effects of these activities are usually minimal

Schedule A+: The purpose of the Schedule A+ is to ensure some type of public notification for certain projects that are pre-approved under the Municipal Class EA. The proponent is required to inform the affected public of municipal infrastructure projects prior to being constructed or implemented. However, there is no ability for the public to request a Part II Order.

Part II Order refers to a request to the Minister of the Environment for a project to comply with Part II (addresses Individual Environmental Assessments (EA)) of the Environmental Assessment Act. The requirement to prepare an Individual EA involves the preparation of a Terms of Reference and EA document that are submitted to the Ministry of the Environment, other government agencies and the public for review.

Schedule B: These projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process involving mandatory contact with directly affected public and with relevant government agencies to ensure that they are aware of the project and that their concerns are addressed. If there

are no outstanding concerns, the project may proceed to implementation. As a result, the proponent is required to proceed through a screening process (Phases 1 and 2 of the Municipal Class EA process), including consultation with those who may be affected. At the end of Phase 2, a Project File documenting the planning process followed through Phases 1 and 2 is finalized and made available for public and agency review.

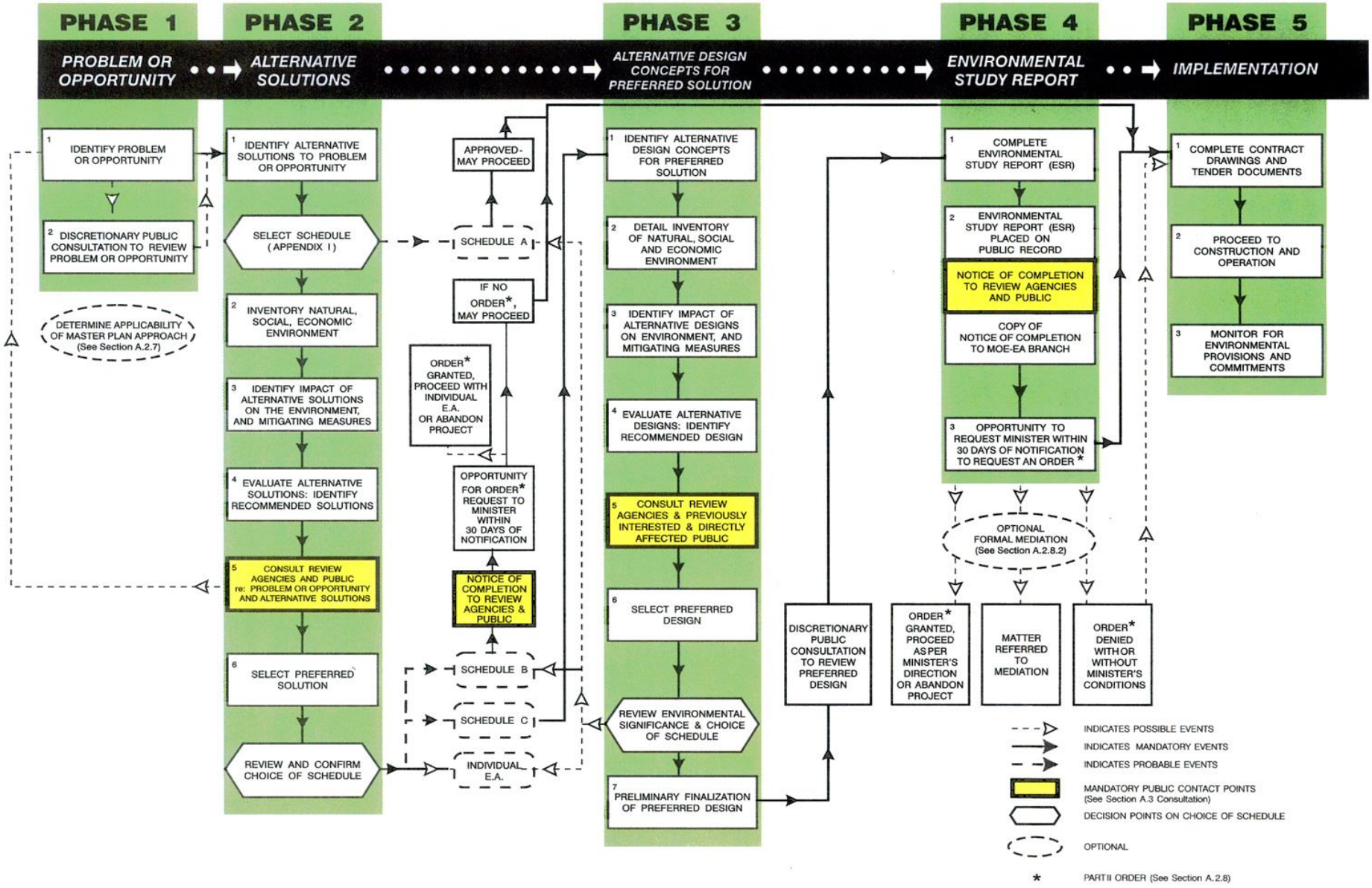
If the screening process raises a concern which cannot be resolved, a Part II Order may be requested and considered by the Minister of the Environment. Alternatively, the proponent may elect to voluntarily plan the project as a Schedule C undertaking.

Schedule C: These projects have the potential for significant environmental effects. The proponent is required to undertake the full planning and documentation procedures specified in the Municipal Class EA, including the preparation of an Environmental Study Report for review by the public and review agencies.

The selection of the appropriate project planning schedule is dependent on the anticipated level of environmental impact and, for some projects, the anticipated construction costs. Projects are categorized according to their environmental significance and their effects on the surrounding environment. Planning methodologies are described within the Municipal Class EA document and are different according to Class Type. This project is to be completed under the Municipal Class EA Schedule B planning process. The Class EA planning process shown in Figure 2-1.

Subsequent to approval of the Class EA, detail design and tender documents will be completed based on the plan described in this Project File.

Figure 2-1 - Class Environmental Process



3. Problem Definition

3.1 Problem Statement

Much of the City's sanitary sewer infrastructure is aging and is in need of replacement. The existing Speed River crossings pose several risks due to their age and location within the river. Additionally, the ability for this portion of the Arthur Trunk Sewer to convey peak flows under existing and future growth scenarios is limited given its current condition and capacity.

3.2 Opportunity Statement

There is the opportunity to provide a new route and alignment for the Arthur Street Trunk Sewer downstream of Macdonell Street which will address environmental impacts associated with the existing infrastructure currently located in the Speed River. The new trunk sewer will also be able to convey peak flows under existing and future growth scenarios.

4. Existing Conditions

4.1 Legislative Environment

Legislation and policies at all three levels of government, federal, provincial and municipal have been considered for this project. Some legislation and policies apply more directly than others with respect to natural heritage features and functions. The following is an outline of the legislation and policies relevant to natural heritage features and functions as they relate to the Arthur Trunk Sewer Speed River Crossing EA:

Table 4-1 - Relevant Legislation, Policies & Guidelines

Legislation	Policies/Regulations	Guidelines
Federal		
Fisheries Act	Policy for the Management of Fish	
Migratory Birds Act	The Regulations Respecting the Protection of Migratory Birds	
Species At Risk Act	S.C. 2002, c. 29 Species at Risk Act Policies (2009)	Addressing Species at Risk Act Considerations Under the Canadian Environmental Assessment Act for Species Under the Responsibility of the Minister responsible for Environment Canada and Parks Canada (2010) The Species at Risk Act Environmental Assessment Checklists for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada (2010) Various COSEWIC Assessment and Status Reports for listed threatened and endangered species.
Provincial		
Planning Act	Provincial Policy Statement (2005)	Natural Heritage Reference Manual (2010)
Conservation Authorities Act	Ontario Regulation 150/06	Grand River Conservation Authority Policies for the Administration of the Development, Interference, with Wetlands

		and Alterations to Shorelines and Water Courses Regulation
Endangered Species Act	Ontario Regulations 230/08 and 242/08	DRAFT Endangered Species Act (ESA) Submission standards for Activity Review and 17 (2) (c) Overall Benefit Permits (March 2011) DRAFT Categorizing and Protecting Habitat under the Endangered Species Act, 2007 (March 2011)
Municipal		
City of Guelph Official Plan	Environmental Policies	

4.1.1 Planning Act - Provincial Policy Statement

The Provincial Policy Statement (PPS), Section 2.3 (Natural Heritage), requires that development proposals for lands adjacent to natural heritage features "demonstrate that there will be no negative impact on the natural features or on the ecological functions for which the area is identified". The Natural Heritage Reference Manual for Policy 2.3 of the PPS (March 1999) defines adjacent lands with regards to different natural heritage features and provides suggested distances for adjacent lands.

4.1.2 Conservation Authorities Act

Portions of the Study Area, including the Speed River are regulated by the Grand River Conservation Authority under Ontario Regulation 150/06 (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation).

The Grand River Conservation Authority's Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (Ontario Regulation 150/06), prohibits development in or on the following areas:

a) adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to inland lakes that may be affected by flooding, erosion or dynamic beaches, and within the 15m allowance,
b) river or stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse,
c) hazardous lands;
d) wetlands; or
e) other areas where development could interfere with the hydrologic function of a wetland, including areas within 120 metres of all provincially significant wetlands and wetlands greater than or equal to 2.0 hectares in size, and areas within 30 metres of wetlands less than 2.0 hectares in size, but not including those where development has been approved pursuant to an application made under the Planning Act or other public planning or regulatory process;

As well, this Regulation prohibits alteration to:

f) Straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or change or interfere in any way with a wetland prior to receiving written consent of the Grand River Conservation Authority.

Any future construction, development and/or site alternative within the regulated areas will require the prior issuance of a permit pursuant to Ontario Regulation 150/06 from the GRCA.

4.1.3 Fisheries Act

Any in-water works will require review by the GRCA due to potential harmful, alteration, disturbance and destruction (HADD) of fish habitat. GRCA has a Level 3 agreement to review projects on behalf of the Department of Fisheries and Oceans (DFO) and can authorize a Letter of Advice if mitigation can be used to reduce the impacts to fish habitat. If the potential impacts cannot be mitigated, a Section 35(2) HADD authorization is required, and a project review will be conducted by DFO.

DFO defines direct fish habitat as the "spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes." DFO has not officially defined Indirect Habitat it is generally considered to be ecological features that do not directly support fish, but supply food, nutrients, flow, and organic material to downstream habitat that contains fish (TRCA, 2007).

4.1.4 Migratory Birds Convention Act, 1994

The federal Migratory Birds Convention Act is applied through The Regulations Respecting the Protection of Migratory Birds that states that "[…] no person shall disturb, destroy or take a nest, egg […] of a migratory bird." This law protects all birds aside from the introduced species European Starling, House Sparrow, and Rock Pigeon. Bird nests that are destroyed during the course of construction and other related activities is referred to as "incidental take" and is illegal except under the authority of a permit obtained through the CWS (Canadian Wildlife Service).

4.1.5 Ontario Endangered Species at Risk Act, 2007

The purpose of the Ontario Endangered Species at Risk Act is to identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge as well to protect species that are at risk and their habitats, to promote the recovery of species that are at risk and to promote stewardship activities to assist in the protection and recovery of species that are at risk.

The Act also includes provisions to authorize activities that would otherwise be prohibited, under specific circumstances and conditions. A person who carries out an activity that damages or destroys protected habitat without appropriate authorization under the ESA, may be prosecuted under subsection 10 (1) of the Act, or issued a stop order.

4.1.6 Federal Species at Risk Act, 2002

The purpose of the Federal Species at Risk Act is to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species to encourage the management of other species to prevent them from becoming at risk. This Act creates prohibitions to protect listed threatened and endangered species and their critical habitat and recognizes that compensation may be needed to ensure fairness following the imposition of the critical habitat prohibitions.

4.2 Background Overview

In order to evaluate the existing conditions in the study area background information pertaining to the natural heritage features, wildlife and species at risk (SAR) that have been documented at or within close proximity to the site was obtained from the City of Guelph Official Plan (Official Plan), the Grand River Conservation Authority (GRCA), the Ontario Ministry of Natural Resources (OMNR), the OMNR Natural Heritage Information Database

(NHIC), the Department of Fisheries and Oceans (DFO), Conservation Ontario (CO) and the Atlas of the Breeding Birds of Ontario (ABBO).

4.3 City of Guelph Official Plan

Information obtained from the Official Plan that pertains to the lands and natural features present within the study area revealed the following:

a) **Schedule 1 – Land Use Plan** identifies the lands along the east and west banks of the Speed River as 'Core Greenlands'.

   Under the Official Plan 'Core Greenlands' are lands that have a greater sensitivity or significance. These include provincially significant wetlands, the significant portion of the habitat of threatened and endangered species, areas of natural and scientific interest (ANSI), natural hazard lands including steep slopes, erosion hazard lands and unstable soils and the floodways of rivers, streams and creeks. These features are to be protected for their ecological values and functions and development, which under the Official Plan does not include activities that authorized under an environmental assessment process, is not permitted.

b) **Schedule 2 – Natural Heritage Features and Development Constraints** identifies the lands in the vicinity of the existing sewer river crossings as 'Floodway (Special Policy Area and Two Zone Flood Plain)' and as being within the 'Regulatory Flood Line'.

   Under the Official Plan 'Floodway' is defined as the area of the flood plain, which is delineated by the 'Regulatory Flood Line' and are the lands adjacent a watercourse which have been or may be covered by flood water, that is required for the safe passage of flood flow or the area where flood depths or velocities are considered to be such that they pose a potential threat to life or property.

   Under the Provincial Policy Statement (PPS) development within the regulatory floodplain is generally discouraged due to the potential dangers that are associated with these lands. There are however special circumstances, such as historical communities, where the prohibition of development is not practical. In these areas, which are identified as 'Two Zone Flood Plains' in the Official Plan, the PPS allows for the designation of certain lands as 'floodway' and as 'flood fringe.'

c) **Schedule 7 – Linked Open Space Concept** identifies the lands in the vicinity of the existing sewer river crossings as the 'Speed River Valley Open Space Corridor."

   Under the Official Plan environmental corridors are linear natural features that are typically associated with natural topographic, surface water and vegetation features such as wetlands, watercourses, valleylands and wooded areas. These features act as passageways and migratory routs for plants and animals. In areas where these features are associated with watercourses they also act as buffers. Where feasible the City encourages the connection of natural heritage features through the use of environmental corridors and ecological linkages.

4.4 Grand River Conservation Authority (GRCA)

Information obtained from the GRCA, provided in Appendix A, included mapping which identified the lands within the study area as 'Floodplain – Special Policy Area' and as being within the regulation limits of the GRCA

Under Ontario Regulation 150/06, GRCA has the mandate to prohibit or regulate development in river or stream valleys and hazardous lands within the Grand River Watershed. Development may be permitted within these areas

provided that the requirements identified in the GRCA Policies for the Administration of Ontario Regulation 150/06 are satisfied (GRCA, 2013).

The GRCA's website identifies the following fish species in the lower Speed River south of Guelph Lake:

- Smallmouth Bass (Micropterus dolomieu)
- Largemouth Bass (Micropterus salmoides)
- Carp (Cyprinus carpio)
- Northern Pike (Esox Lucius)
- Sunfish (Lepomis)

4.5 Ministry of Natural Resources – Guelph District

Background information pertaining to the terrestrial and aquatic natural features within the study area was requested from the OMNR on August 17th, 2012 and December 11th, 2012. Specific information that was requested included Environmentally Significant Areas (ESAs) Provincially Significant Wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), significant woodlands, the thermal regime for any watercourses within the study area, fish records, fisheries management designations and known species at risk.

As of the date of completion of this report no data has been provided.

4.6 The Atlas of the Breeding Birds of Ontario

A total of 111 species of birds, included in Appendix B, displayed some level of breeding evidence during surveys completed for the ABBO within Breeding Bird Atlas Square 17NJ62. This included a total of 5 species, include in **Table 4-2**, which are classified under the ESA as Endangered, Threatened or Special Concern.

Table 4-2 - Atlas of the Breeding Birds of Ontario Species at Risk

Common Name	Scientific Name	SARA Status	SARO Status
Chimney Swift	*Chaetura pelagica*	Threatened (Schedule 1)	Threatened
Bobolink	*Dolichonyx oryzivorus*	No Status	Threatened
Barn Swallow	*Hirundo rustica*	No Status	Threatened
Least Bittern	*Ixobrychus exilis*	Threatened (Schedule 1)	Threatened
Eastern Meadowlark	*Sturnella magna*	No Status	Threatened

SARO = Species at Risk in Ontario
SARA = Species at Risk Act

4.7 DFO Species at Risk Mapping

Mapping of the known distribution of aquatic SAR within the Grand River watershed was obtained from the Conservation Ontario website. This mapping provides the potential locations for species which are protected under the federal Species at Risk Act (SARA). A review of this mapping indicates that there are no known aquatic SAR in the Speed River within the study area.

4.8 Natural Heritage Information Centre – Biodiversity Explorer

NHIC was used to identify the historical records of SAR within or adjacent to the study area. **Table 4-3** lists the records of SAR and provincially significant species found within a 1 km search of the study area.

Table 4-3 - Natural Heritage Information Centre – Biodiversity Explorer Species at Risk

Common Name	Scientific Name	Provincial Rank*	COSEWIC Rank	SARA Status	SARO Status
Blanding's Turtle	*Emydoidea blandingii*	S3	G4	Threatened (Schedule 1)	Threatened
Tuberous Indian-plantain	*Arnoglossum plantagineum*	S3	G4G5	Special Concern (Schedule 1)	Special Concern
Northern Map Turtle	*Graptemys geographica*	S3	G5	Special Concern (Schedule 1)	Special Concern
Milksnake	*Lampropeltis triangulum*	S3	G5	Special Concern (Schedule 1)	Special Concern
Eastern Ribbonsnake	*Thamnophis sauritus*	S3	G5	Special Concern (Schedule 1)	Special Concern

*Provincial Rank, SH= Possibly Extirpated (Historical); S1= Critically Imperiled; S2 = Imperiled; S3 = Vulnerable;
COSEWIC = Committee on the Status of Endangered Wildlife in Canada
SARO = Species at Risk in Ontario
SARA = Species at Risk Act

4.9 Species at Risk and Species of Conservation Concern

The following are descriptions of the Federal and Provincial Regulations protecting Species at Risk and a description of Species of Conservation Concern.

4.9.1 Species at Risk Act (SARA)

The SARA is a national wide regulation. The goal of SARA is to monitor and protect disappearing species; provide recovery strategies for extirpated, endangered or threatened species, as well as to manage species of special concern. SARA is to be consulted when there is a need for permits and scientific/educational activities involving the handling of wildlife (Environment Canada, 2012).

- **Extirpated** - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild (SARA Registry, 2012).
- **Endangered** - a wildlife species that is facing imminent extirpation or extinction (SARA Registry, 2012).
- **Threatened** - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction (SARA Registry, 2012).
- **Special Concern** - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (SARA Registry, 2012).

4.9.2 Species at Risk in Ontario (SARO)

The Endangered Species Act (ESA) provides a protection and recovery strategy for Species at Risk in Ontario. Methods of protection include protection of SAR habitat; support for private and public organizations; recovery of

species; and strict enforcement (Ontario, 2012). The ESA regulation applies to extirpated, endangered and threatened species. Species of Special Concern are not protected under the ESA.

4.9.3 Species of Conservation Concern

The Provincial Rank (SRANK) is used by the Natural Heritage Information Centre (NHIC) as a protection tool for rare species and natural communities. The SRANK is not a legal designation. The status, rarity and urgency of conservation is evaluated by NHIC on a continual basis (NHIC, 2012). The rankings are as follows:

- S1: Critically Imperiled – Species critically imperiled due to extreme rarity.
- S2: Imperiled – Species imperiled due to restricted range, very few populations or steep declines.
- S3: Vulnerable – Species vulnerable due to a restricted range, relatively few populations and/or population decline.

4.10 Species at Risk Screening

As the province has not been surveyed comprehensively for the presence of SAR; the absence of a species within the NHIC database for a particular area when completing a 1 km search does not necessarily indicate the absence of the species within the study area. An analysis of the suitability of the habitat identified within the study area for SAR which are known to occur, or have historically occurred, within 1 km of the study area is included in Appendix C. Also included in Appendix C is a brief description of the preferred habitat and known range for each of these species.

A total of two Endangered, seven Threatened and six Special Concern species have been identified within the general area surrounding the study area. Through this evaluation it was determined that suitable habitat for one threatened species, Barn Swallow, may be present in the study area.

4.11 Environmental Assessment Methods

The assessment and description of the existing terrestrial and aquatic natural heritage features within the study area was completed by AECOM Ecologists on September 10th, 2012 and December 4th, 2012.

4.11.1 Terrestrial Habitat Assessment Methods

Terrestrial habitat assessments included the classification of vegetation communities using the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998), the completion of a list for each ELC community documented the structure and relative abundance of vegetation present within each community.

A tree inventory and assessment of all trees with a diameter at breast height (DBH) greater than 10 cm was also completed as part of this study. The height, DBH, structural condition and biological conditions of these trees were recorded and are included in Appendix D. For the purpose of this evaluation the biological and structural condition of trees present within the study area are assessed as follows:

Low (L) – a tree that displays major evidence of insects, disease, physical defects or pests.
Moderate (M) – a tree that displays minor evidence of insects, disease, physical defects or pests.
High (H) – a tree that displays no evidence of insects, disease, physical defects or pests.

Trees that displayed evidence of insects, disease, physical defects or pests that did not fit within one of the rankings described above were assigned combined rankings (i.e. Moderate Low – M(L), Moderate High – M(H)).

4.11.2 Aquatic Habitat Assessment Methods

Aquatic habitat assessments included collecting specific information to assess the aquatic habitat conditions. Fish habitat assessments are completed to identify and assess water body characteristics that provide habitat for the critical life processes outlined in the *Fisheries Act*. The habitat assessments detail the characteristics and major physical attributes of the water body and general observations of the water quality. This habitat assessment takes into consideration a variety of details including both flow characteristics and land influences, such as:

1. **Surrounding land use** – classifies potential pollution sources and adjacent landuse that may affect the water body.
2. **Riparian zone and canopy cover** – a healthy riparian zone consists of vegetation characterized by trees, shrubs, grasses and herbaceous plants. These plants help buffer the water body from runoff, provide shade and create habitat for fish and insects.
3. **Stream banks** – characteristics assessed include signs of erosion and bank scouring, undercut banks, evidence of the normal water mark and high water mark which indicate the water level fluctuation.
4. **In-stream characteristics** – details include substrate type (e.g. silt, gravel, cobble), aquatic vegetation, small and large woody debris. All of these in-stream characteristics provide habitat and cover for fish species and benthic macroinvertebrates, which are an important food source for fish.
5. **Stream morphology** – this includes the wetted width of the active channel and average wetted depth. Also a description of the stream morphology:
    a. **Runs** - typically deep, fast moving water with little to no turbulence of water.
    b. **Riffles** – shallow, fast moving water typically running over rocks. Riffles provide areas of high oxygenated waters.
    c. **Flats** – low flowing water with a smooth un-agitated surface.
    d. **Pools** – deep pockets of slow moving water that provide ideal refuge habitat for fish.
6. **General water characteristics** – water colour and clarity, presence and description of algae, and description of flow.

Information was collected for both the left and right banks which are defined by facing upstream in the watercourse. Representative photographs were taken at various locations throughout the study area and are included in Appendix E.

4.11.3 Wildlife Habitat Assessment Methods

Due to the size and scope of the project only incidental wildlife surveys were completed during the assessment of the existing conditions at the site.

In addition to the incidental wildlife observations the habitat at the site was assessed using the Significant Wildlife Habitat Technical Guide (OMNR, 2000) to determine if Significant Wildlife Habitat (SWH) was present within the study area.

4.12 Existing Terrestrial Conditions

Only one unique ecological community, a Mineral Cultural Woodland (CUW1), was identified along the east bank of the Speed River at the existing and at one of the proposed crossings as a result of the terrestrial assessment at the site.

Generally this community is characterized by:

- a sparse red elm (Ulmus rubra) canopy which covers less than 10 % of the community;
- a Manitoba maple (Acer negundo) sub canopy which covers between 25 to 60% of the community;
- a common buckthorn (Rhamnus cathartica) shrub layer which covers over 60% of the community; and
- the ground layer which covers 10 to 25% of the community and contains common buckthorn, orchard grass (Dactylis glomerata), and tall goldenrod (Solidago altissima).

The vegetation composition of this community is consistent with that of a naturalized community that has been disturbed by various factors that are commonly associated with an urbanized environment.

The mean Coefficient of Conservatism (CC) for this community is 3.54, indicating that the majority of the species can be found in a wide variety of plant communities, including disturbed sites. The coefficient of conservatism of each plant species was determined using the protocol developed by Oldham *et. al,* 2005 where each native species was assigned a rank of 0 to 10 based on its dependence to a range of site specific parameters.

The Floristic Quality Index (FQI) for this community is 12.76, indicating the condition of this community is slightly degraded. The FQI accounts for the species diversity of an area by equating the number of native species with the mean CC value. It is best suited for use in more natural areas as exotic species are typically not assigned CC values, however can still be used in disturbed environments to obtain a general idea of the condition at the site.

Of the 27 species of plants identified 14 are classified as exotic. Aggressive exotic species such as common buckthorn can become dominant within their communities and exclude native species and drastically change a natural area (White, Haber & Keddy 1993). The average weediness score for this community is -2.23 indicating that the non-native species identified sometimes cause problems, but only relatively infrequently or in localized areas. The abundance of non-native species within this areas is likely due to the location of the study area within an urban environment, adjacent a watercourse and near multiple roadways, which often enhances exotic species invasions as they act as corridors for dispersal, provide suitable habitat and have well developed seed banks for these species (Parendes and Jones, 2000).

Small pockets of herbaceous wetland vegetation were observed fringing the Speed River however none were large enough (>2.0 ha) to be evaluated under the Ontario Wetland Evaluation System (OMNR, 2012).

4.13 Existing Aquatic Conditions

The study area is located within the Speed River watershed and within the larger Grand River watershed. The study reach is bordered by Wellington Road on the west bank and a trail system on the east bank. The Speed River is fairly uniform throughout the study reach and has been highly influenced by urbanization, through watercourse channel modifications, construction of dams, water quality influences and alterations to flow regime. There are several old factories that were built along the Speed River and encroach upon the river banks which were then reinforced to support the buildings. Each crossing option was assessed both upstream and downstream of the proposed crossing for aquatic conditions and presented in later sections of this report.

4.13.1 Existing Gravity Pipe Crossing

The existing gravity sewer river crossing is located above the river bed and is supported in five locations with concrete pads. The raised pads have a 0.90 m wide opening between them to allow water through. The pipe creates a 0.50 m drop and the openings create chute like passages. Two of the openings are dammed with debris which redirects the flow to the other openings.

4.13.2 Fish Community

Fish community information was obtained from the Grand River Conservation Authority website and the York Trunk Sewer and Paisley-Clyth Feedermain Schedule B Class EA study report completed by Genivar in 2011.
The Speed River is identified as a coolwater system and mostly supports coolwater fish species including a variety of game fish which are presented below in Table 4-4. Of these species, one is non-native and introduced species (Common Carp). In the province of Ontario, all fish species found within the Speed River are classified as secure, common, widespread and abundant in the province (SRanks S5). There are no records or observations of aquatic species at risk, or special concern, and all species range between intermediate to tolerant in their tolerance to environmental conditions and perturbations. There are no aquatic SAR identified within the study area.

Table 4-4 – Speed River Fish Species

Family	Common Name	Latin Name	Thermal Regime	Spawning Season	Abundance[2]	Tolerance[3]	S-Rank[4]
Centrarchidae	Smallmouth Bass	Micropterus dolomieu	coolwater	spring	Common	intermediate	S5
	Largemouth Bass	Micropterus salmoides	Warmwater	Spring	Common	tolerant	S5
Cyprinidae	Common Carp	Cyprinus carpio	Warmwater	Spring/ Summer	Common	tolerant	SNA
Eocidae	Northern Pike	Esox lucius	Coolwater	Spring	Common	Intermediate	S5

Notes: Table created using data from The Ontario Freshwater Fish Life History Database (http://www.fishdb.ca/home.htm) accessed February 25, 2012. Last updated Feb 16. 2013

1. *Data Sources: GRCA website http://www.grandriver.ca/index/document.cfm?Sec=28&Sub1=21&sub2=0*
   York Trunk Sewer and Paisley-Clyth Feedermain Schedule B Class EA study
2. *The relative likelihood or frequency of occurrence of a species assuming suitable habitat conditions.*
3. *Tolerance – Ability of a species to adapt to environmental perturbations or anthropogenic stresses.*
   Intermediate - Species that is neither particularly sensitive nor insensitive to environmental or anthropogenic stresses.
   Tolerant - Species that is fairly insensitive or adaptive to environmental or anthropogenic stresses.
4. *SRank (Subnational Rank): Subnational conservation status ranks are assigned for Ontario by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species.*
   SNA: Not Applicable; a conservation status rank is not applicable because the species is not a suitable target for conservation activities (i.e., exotic or hybrid)..
   S5: Secure; common, widespread and abundant in the province.

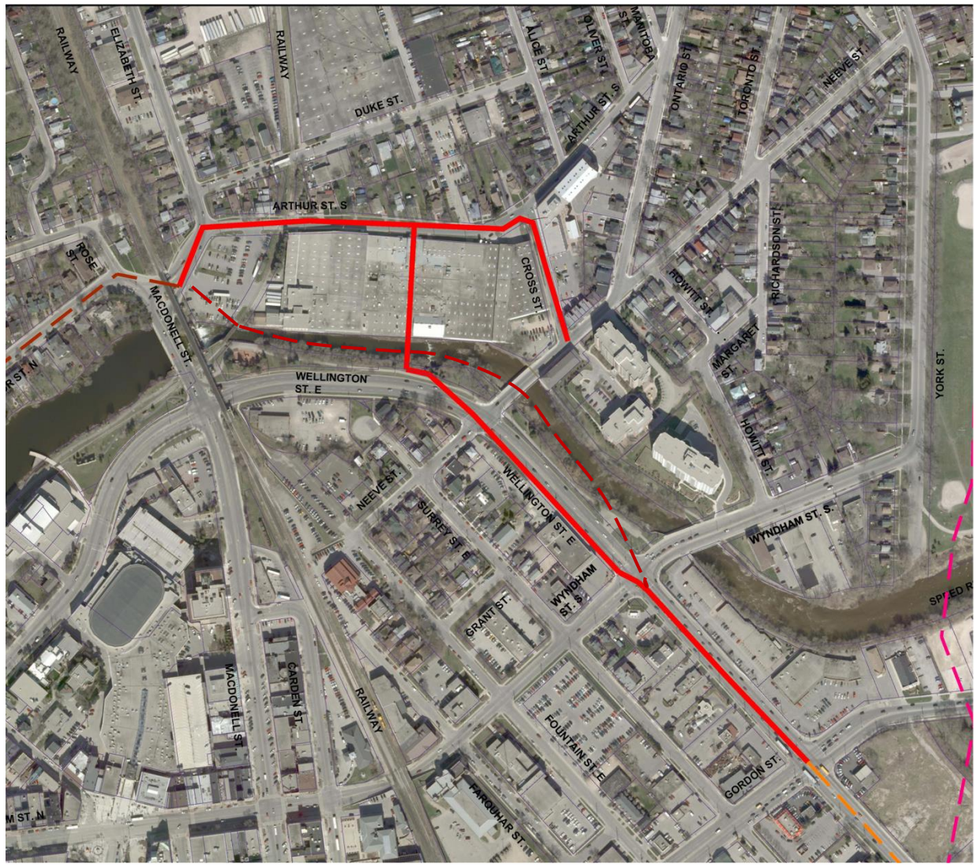
4.13.3 Summary of Aquatic Conditions

Given the historical and current impacts to the Speed River it still provides important ecological function and fish habitat. The Speed River throughout the study area provides suitable habitat for fish species to carry out their life processes including spawning, feeding, rearing, migration and refuge. As previously discussed, specific aquatic impacts associated with the various alternatives will be discussed in later sections.

4.14 Wildlife Habitat

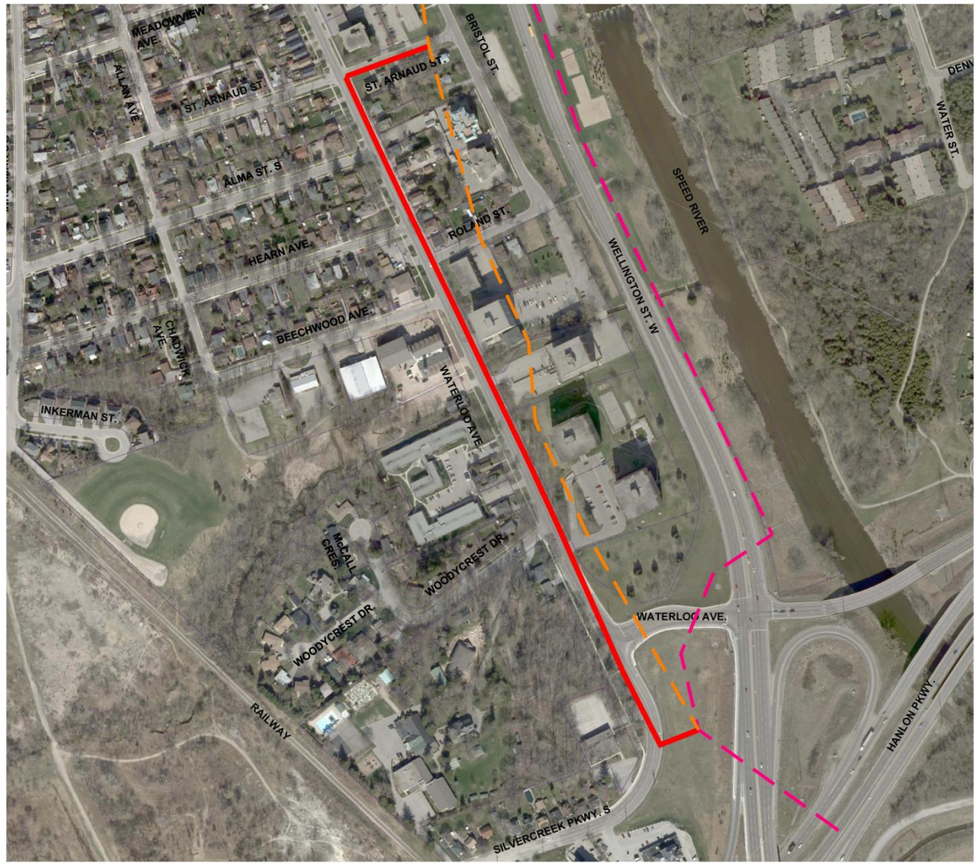
As no formal wildlife surveys were completed as part of this project only a few species were observed during the site visit. This includes Black-capped Chickadee (*Poecile atricapillus*), Common Mallard (*Anas platyrhynchos*), American Goldfinch (*Carduelis tristis*), Eastern Grey Squirrel (*Sciurus carolinensis*) and Raccoon (*Procyon lotor*).

Due to the size and disturbed nature of the habitat present at the site and its proximity to human settlement there is limited potential for SWH. Waterfowl stopover and staging habitat may be present within the Speed River at the site however it may be restricted to more common species, such as Canada Goose (*Branta canadensis*) and Common Mallard, as they are typically more tolerable of human disturbance. It is also unlikely that the habitat at the site is utilized by the target number of waterfowl, aggregations of 100 or more of the listed species a day for seven days, required to classify the sight as SWH.



LEGEND

- PROPOSED TRUNK SANITARY SEWER
- EXISTING / PROPOSED YORK TRUNK SANITARY SEWER
- EXISTING ARTHUR TRUNK SANITARY SEWER
- EXISTING SPEED TRUNK SANITARY SEWER



LEGEND

- PROPOSED TRUNK SANITARY SEWER
- EXISTING / PROPOSED YORK TRUNK SANITARY SEWER
- EXISTING ARTHUR TRUNK SANITARY SEWER
- EXISTING SPEED TRUNK SANITARY SEWER

Figure 5 2 - Alternative 3 – Siphon River Crossing

LEGEND

- PROPOSED TRUNK SANITARY SEWER
- EXISTING / PROPOSED YORK TRUNK SANITARY SEWER
- EXISTING ARTHUR TRUNK SANITARY SEWER
- EXISTING SPEED TRUNK SANITARY SEWER

Figure 5 3 - Alternative 4 – Under the Neeve Street Bridge to York Trunk

Figure 5 4 - Alternative 5- Along Existing Streets to the York Trunk

5. Identification of Alternative Solutions

5.1 Alternative 1: Do Nothing

This alternative is considered as the “benchmark” for which all other alternative for which all other alternatives are evaluated against. “Do Nothing” represents what would likely occur if none of the alternatives were to be implemented. With this option, there are no impacts to natural features resulting from construction activities, however, there is a potential impact to the natural environment in the event of sewer surcharging or structural failure as the current alignment will continue through the Speed River. This alternative does not address the problem statement.

5.2 Alternative 2: Gravity River Crossing

This alternative would replace the existing gravity and siphon sewers with a single gravity crossing, just upstream of the existing gravity crossing. An easement would be required across private property on the east side of the river. Sewers on Cross Street and Arthur Street would be rerouted to the new river crossing sewer. On the west side of the river, the sewer on Wellington Street would be upgraded from the new river crossing to Gordon Street. Downstream improvements would also be required to convey the design flows on the Speed River Trunk Sewer from St. Arnaud Street along Waterloo Avenue to Silvercreek Parkway South. The existing Speed Trunk Sewer downstream of St. Arnaud St. would be abandoned as it currently goes through private properties (see Figure 5.1 - Alternative 2 – Gravity River Crossing).

5.3 Alternative 3: Siphon River Crossing

This alternative is similar to Alternative 2, except there would be a siphon crossing of the Speed River, just upstream of the Neeve Street Bridge, rather than the gravity crossing (see Figure 5.2 - Alternative 3 – Siphon River Crossing).

5.4 Alternative 4: Under the Neeve Street Bridge to the York Trunk

With this alternative, the existing gravity and siphon sewers would be replaced with a new trunk sewer along Arthur Street, down Cross Street, along Neeve Street to the river, under the Neeve Street bridge along the east river bank to the existing trail along the east side of the river, to Wyndham Street and connect to the new York Trunk Sewer in the park east of York Street (see Figure 5.3 - Alternative 4 – Under the Neeve Street Bridge to York Trunk).

5.5 Alternative 5: Along Existing Streets to the York Trunk

This alternative is similar to Alternative 4, except going along Neeve Street to Howitt Street to Wyndham Street (see Figure 5.4 - Alternative 5- Along Existing Streets to the York Trunk).

6. Evaluation of Alternatives

6.1 Evaluation Criteria and Rating Methodology

Each alternative needs to be evaluated with a consistent methodology, the goal of which is to identify potential challenges and opportunities for each. **Table 6-1** describes the evaluation criteria. A qualitative rating scale, shown in Figure 6-1, is used to assess each alternative against the evaluation criteria.

Table 6-1 - Criteria for the Evaluation of Rehabilitation Alternatives

Criteria	Description
Environmental	
Terrestrial and Vegetation Impacts	The impact on the surrounding natural environment
Aquatic Habitat Impacts	The impact on fish habitat
Watercourse Crossing Impacts	An assessment of the impacts specifically related to the river crossing including constructability and approvability by review agencies
Social	
Traffic Impacts	The impact on pedestrian and vehicular traffic
Archaeological Impacts	The impact on archaeological features
Heritage Resource Impacts	The impact on heritage resources
Economic	
Construction Costs	Relative measure of the initial costs to install/construct the proposed works
Maintenance Costs	Relative measure of the ongoing maintenance costs following implementation
Land Acquisition Requirements	The impact to private property related to construction

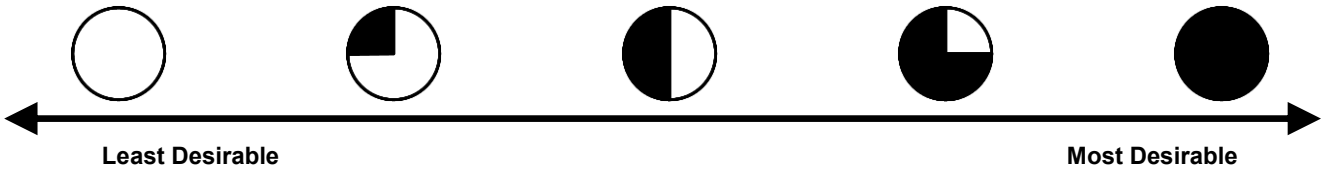


Figure 6-1 - Evaluation Criteria Rating Scale

The following sections discuss the factors leading to the evaluation of each alternative.

6.2 Alternative 1 Evaluation

With the “Do Nothing” alternative, no construction would be required and therefore there would be no construction related impacts to the natural environment. There is however a considerable risk to the natural environment in the event of a structural failure of the existing river crossing sewers. Maintenance costs to prevent such a failure will be prohibitively high. This alternative also does not provide capacity for any proposed intensification. Since this alternative does not address the problem statement, it is not considered a viable alternative.

6.3 Alternative 2 Evaluation

6.3.1 Environmental

6.3.1.1 Terrestrial and Vegetation Impacts

The Mineral Cultural Woodland along the west bank of the Speed River at the proposed and existing crossing is characterized by a Manitoba maple sub canopy and a common buckthorn shrub layer. The vegetation composition of this community is consistent with that of a naturalized community that has been disturbed by various factors that are commonly associated with an urbanized environment.

A total of 94 trees with a DBH of 10 cm or greater, included in Appendix D, were documented along the west bank of the Speed River between Macdonell Street and Neeve Street. Some of the more common species include Manitoba maple, Colorado blue spruce (*Picea pungens*) and Siberian elm (*Ulmus pumila*). The majority of these trees were classified as being in moderate biological and structural condition.

An analysis of the potential effects from works associated with Alternative 2 includes the disturbance of the narrow band of the CUW1 along the west bank of the Speed River approximately 20 m upstream of the existing sewer and at the location of the existing sewer crossing. Although there will be impacts to the terrestrial environment and vegetation, these impacts can be mitigated by implementing the following:

- Time the removal of woody vegetation so it occurs outside of the breeding bird season, which typically ranges from May 1st to July 31st. If the removal of woody vegetation is required during this period the area(s) that the removal is to occur will be surveyed for nesting birds by a qualified professional; and
- The development of a restoration plan using native species that are typically associated with the vegetation communities within the study area will be utilized where feasible.

6.3.1.2 Aquatic Habitat Impacts

This crossing is located approximately 20 m upstream from the existing sewer crossing. The Speed River at this crossing is approximately 15 m wide and approximately 0.50 m deep at the time of the investigation. The substrates within this reach consist of in order of dominance cobble, sand, boulder, gravel and silt. In-stream habitat is provided by cobble and boulder, woody debris and detritus. The Speed River is very uniform in this reach. Both sides of the river have been reinforced with a wall on the west bank and an old factory building with a retaining wall on the east bank. Near the proposed crossing the west bank becomes naturalized and the canopy cover and riparian vegetation provides some shading to the river which is mostly provided by trees and shrubs. Stream flow is evenly dispersed across the stream channel and there are no signs of erosion or undercutting of the river banks.

An analysis of the potential effects from works associated with Alternative 2 includes the disturbance of the river bed of the Speed River approximately 20 m upstream of the existing sewer crossing during the installation of the proposed sewer.

Although there will be impacts to the aquatic environment, these impacts can be mitigated by implementing the following:

- Timing the in water works to be completed within the appropriate window to minimize potential impacts to the fisheries community. These dates will be established through correspondence with the OMNR and GRCA;

- Develop and implement the appropriate mitigation and contingency measures (i.e. dewatering plans, sediment and erosion control plans, emergency spill plans, etc.) to address any known or potential impacts from the proposed works.

6.3.1.3 Watercourse Crossing

Alternative 2 crosses the Speed River with a gravity sewer. Available information indicates that while the sewer would be at a lower elevation than the existing gravity sewer, it would not be possible to get it fully below the river bed due to downstream elevation constraints. In order to minimize the obstruction to the river flow, the crossing would be made with two or three smaller sewers rather than one larger pipe. The crossing would be made by open cut in the dry with cofferdams providing protection to the working area and the work carried out in two stages. Restoration work would need to re-instate the retaining walls at the river banks.

6.3.2 Social

6.3.2.1 Traffic Impacts

In addition to work on local streets, this alternative requires major reconstruction on Wellington Street. This work will have a substantial impact on businesses and public access to the downtown core. Construction contracts will need to include for significant traffic detour planning, staging and signage. Work on less travelled local streets will need to be staged to allow for access to residential properties.

6.3.2.2 Archaeological Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to determine the potential for archaeological impacts. Since this option requires the crossing of the river, the checklist indicates there may be a requirement for an archeological assessment. The disturbance to the area on the east side of the river caused by the historic industrial development and site remediation indicates that there is low potential for archaeological impacts. The extent of past disturbance on the west side of the river is unknown; therefore, it is recommended that further archaeological investigation would need to be carried out if this is determined to be the preferred alternative. A professional archaeologist licensed under the Ontario Heritage Act should be retained to carry out a minimum Stage 1 archaeological assessment report should this alternative be selected.

6.3.2.3 Heritage Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to help determine whether the project could affect known or potential cultural heritage resources. There are known heritage sites in the area of the project (see City of Guelph Municipal Register of Cultural Heritage Properties) however none of the alternatives will impact these properties. Since the construction of the new trunk sewer will not be on any heritage site and will not alter the landscape or drainage patterns, impacts to heritage resources were deemed to be negligible.

6.3.3 Economic

6.3.3.1 Capital Costs

The preliminary construction cost estimate for this alternative is $10.9 Million, including engineering, contingencies and taxes. Further details can be found in Appendix G.

6.3.3.2 Operating and Maintenance Costs

No life cycle costing was completed as part of this study, but rather the alternatives were rated based on a qualitative assessment of expected relative maintenance costs. This alternative features a gravity river crossing sewer, which would have a lower maintenance cost than a siphon. The sewer would be partially within an easement on private property that would make access more difficult and therefore more expensive maintenance cost than a sewer on a road allowance. The river crossing maintenance access would also be more difficult than for a sewer on a road allowance.

6.3.3.3 Land Acquisition

This alternative will require an easement across the private property on the east side of the Speed River. The City and the property Developer have had initial discussions regarding the easement. The Developer indicated that they would conditionally accept an easement on their property.

6.4 Alternative 3 Evaluation

6.4.1 Environmental

6.4.1.1 Terrestrial and Vegetation Impacts

The Mineral Cultural Woodland along the west bank of the Speed River at the proposed and existing crossing is characterized by a Manitoba maple sub canopy and a common buckthorn shrub layer. A small park with a mix of planted coniferous and deciduous trees and a mowed lawn is also present at this location at the corner of Wellington Street and Neeve Street. The vegetation composition of this community is consistent with that of a naturalized community that has been disturbed by various factors that are commonly associated with an urbanized environment.

A total of 94 trees with a DBH of 10 cm or greater, included in Appendix D, were documented along the western bank of the Speed River between Macdonell Street and Neeve Street. Some of the more common species include Manitoba maple, Colorado blue spruce (*Picea pungens*) and Siberian elm (*Ulmus pumila*). The majority of these trees were classified as being in moderate biological and structural condition.

An analysis of the potential effects from the works associated with Alternative 3 includes the disturbance of the narrow band of the CUW1 community along the western bank of the Speed River approximately 10 m upstream of the Neeve Street Bridge. Although there will be impacts to the terrestrial environment and vegetation, these impacts can be mitigated by implementing the following:

- Time the removal of woody vegetation so it occurs outside of the breeding bird season, which typically ranges from May 1st to July 31st. If the removal of woody vegetation is required during this period the area(s) that the removal is to occur will be surveyed for nesting birds by a qualified professional; and
- The development of a restoration plan using native species that are typically associated with the vegetation communities within the study area will be utilized where feasible.

6.4.1.2 Aquatic Habitat Impacts

The Speed River at the proposed crossing is approximately 20 m wide and approximately 0.30 m deep at the time of the investigation. The substrates within this reach consist of in order of dominance cobble, sand, gravel and boulder. In-stream habitat is provided by cobble, boulder, woody debris and detritus. Stream morphology in this

reach consisted of 60% riffle and 40% run. Both the east and west banks have a 5-10 m riparian buffer following by a concrete wall. A large Common Carp was observed swimming near the bridge during the assessment.

An analysis of the potential effects from the works associated with Alternative 3 includes the disturbance of the river bed of the Speed River approximately 10 m upstream of the Neeve Street Bridge.

Although there will be impacts to the aquatic environment, these impacts can be mitigated by implementing the following:

- Timing the in water works to be completed within the appropriate window to minimize potential impacts to the fisheries community. These dates will be established through correspondence with the OMNR and GRCA;
- Develop and implement the appropriate mitigation and contingency measures (i.e. dewatering plans, sediment and erosion control plans, emergency spill plans, etc.) to address any known or potential impacts from the proposed works.

6.4.1.3 Watercourse Crossing

Alternative 3 crosses the Speed River with a siphon sewer just upstream of the Neeve Street bridge. The siphon would be constructed with two or three smaller barrels across the river. The siphon would be less grade sensitive than the gravity sewer of Alternate 2, so the sewer would be fully below the river bed. There is a 150mm gasmain and a 300mm watermain crossing the river at this location, therefore requiring more demanding construction controls. The crossing would be made by open cut in the dry with cofferdams providing protection to the working area and the work carried out in two stages. Restoration work would need to re-instate the retaining walls at the river banks.

6.4.2 Social

6.4.2.1 Traffic Impacts

In addition to work on local streets, this alternative requires major reconstruction on Wellington Street. This work will have a substantial impact on businesses and public access to the downtown core. Construction contracts will need to include for significant traffic detour planning, staging and signage. Work on less travelled local streets will need to be staged to allow for access to residential properties.

6.4.2.2 Archaeological Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to determine the potential for archaeological impacts. Since this option requires the crossing of the river, the checklist indicates there may be a requirement for an archeological assessment. The disturbance to the area on the east side of the river caused by the historic industrial development and site remediation indicates that there is low potential for archaeological impacts. The extent of past disturbance on the west side of the river is unknown, therefore, it is recommended that further archaeological investigation would need to be carried out if this is the preferred alternative. A professional archaeologist licensed under the Ontario Heritage Act should be retained to carry out a minimum Stage 1 archaeological assessment report should this alternative be selected.

6.4.2.3 Heritage Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to help determine whether the project could affect known or potential cultural heritage resources. There are known heritage sites in the area of the project (see City of Guelph Municipal Register of Cultural Heritage Properties) however none of the alternatives will impact these properties. Since the construction of the new trunk sewer will not be on any heritage site and will not alter the landscape or drainage patterns, impacts to heritage resources were deemed to be negligible.

6.4.3 Economic

6.4.3.1 Capital Costs

The preliminary construction cost estimate for this alternative is $11.1 Million, including engineering, contingencies and taxes. Further details can be found in Appendix G.

6.4.3.2 Operating and Maintenance Costs

No life cycle costing was completed as part of this study, but rather the alternatives were rated based on a qualitative assessment of expected relative maintenance costs. This alternative features a siphon river crossing sewer, which would have a higher maintenance cost than a gravity crossing due to more frequent and higher cost flushing requirements. The river crossing maintenance access would also be more difficult than for a sewer on a road allowance.

6.4.3.3 Land Acquisition

No easements or property acquisition is required for this alternative.

6.5 Alternative 4 Evaluation

6.5.1 Environmental

6.5.1.1 Terrestrial and Vegetation Impacts

The Mineral Cultural Woodland along the east bank of the Speed River between Neeve Street and Wyndham Street is characterized by a Manitoba maple and American elm sub canopy and a common buckthorn shrub layer. The vegetation composition of this community is consistent with that of a naturalized community that has been disturbed by various factors that are commonly associated with an urbanized environment. A small community trail/park with a row of planted white ash trees and a mowed lawn was also present along the river adjacent this community. Another community park with mowed lawn and a row of planted Freemans maple is also present at the east end of this proposed option.

A total of 75 trees with a DBH of 10 cm or greater, included in Appendix D, were documented along the eastern bank of the Speed River between Neeve Street and Wyndham Street, the south side of Wyndham Street and within the footprint of east end of the proposed option. The majority of these trees were classified as being in moderate biological condition and structural condition.

An analysis of the potential effects from the works associated with Alternative 4 includes the potential disturbance of the narrow band of the CUW1 community along the eastern bank of the Speed River between Neeve Street and Wyndham Street and the potential disturbance of some street trees along Wyndham Street and York Street.

Although there will be impacts to the terrestrial environment and vegetation, these impacts can be mitigated by implementing the following:

- Time the removal of woody vegetation so it occurs outside of the breeding bird season, which typically ranges from May 1st to July 31st. If the removal of woody vegetation is required during this period the area(s) that the removal is to occur will be surveyed for nesting birds by a qualified professional; and
- The development of a restoration plan using native species that are typically associated with the vegetation communities within the study area will be utilized where feasible.
- This option has the potential to impact the largest number of trees as the location for the proposed main appears to be along the eastern edge of the Speed River within the root zone of the CUW1 community. While the species composition of the vegetation in this community is not overly desirable it still provides habitat for wildlife within the City and erosion control functions for the adjacent Speed River. If this option was selected as the preferred option a comprehensive restoration plan would be required to ensure that these functions are maintained.

6.5.1.2 Aquatic Habitat Impacts

Alternative 4 does not cross the Speed River but runs adjacent to the river on the right bank for approximately 200 m within the riparian corridor. The Speed River within this reach is approximately 15 m wide and approximately 0.45 m deep at the time of the investigation. The substrates consist of in order of dominance cobble, boulder, sand, gravel and silt. In some locations there are exposed low bedrock shelves where the water cascades downstream. These areas are not barriers to fish passage. In-stream habitat is provided by cobble and boulder, large and small woody debris and detritus. The stream morphology is riffle/run with some small pools and backwater areas. The east bank south of Neeve Street is a reinforced wall that supports an apartment building. Downstream of here a riparian buffer approximately 5 m wide begins. Sections of the east bank have been reinforced with walls or gabion rock which has been overgrown with vegetation. There are also large blocks of concrete in the river. Stream flow is evenly dispersed across the stream channel and there are no signs of erosion or undercutting of the river banks. Canopy cover is low and provided by large trees and overhanging shrubs. Several stormwater outlets were observed within this reach.

An analysis of the potential effects from the works associated with Alternative 4 includes the disturbance of the river bed and east bank approximately 10 to 20 m south of the Neeve Street Bridge.

Although there will be impacts to the aquatic environment, these impacts can be mitigated by implementing the following:

- Timing the in water works to be completed within the appropriate window to minimize potential impacts to the fisheries community. These dates will be established through correspondence with the OMNR and GRCA;
- Develop and implement the appropriate mitigation and contingency measures (i.e. dewatering plans, sediment and erosion control plans, emergency spill plans, etc.) to address any known or potential impacts from the proposed works.

6.5.1.3 Watercourse Crossing

Alternative 4 does not cross the river but does cross under the Neeve Street bridge at the east river bank. The new trunk sewer would need to be constructed below the existing 150mm gasmain and 300mm watermain that cross the river at this location. Fabricated bends would be necessary in order to avoid having maintenance holes within the river. Both these will require more demanding construction controls. The work within the river would be made by open cut in the dry with cofferdams providing protection and the working area dewatered using conventional pumping methods. Since the work is restricted to one side of the river, the cofferdam and dewatering will be less challenging than for Alternatives 2 & 3. Restoration work would need to re-instate the retaining walls at the river banks.

6.5.2 Social

6.5.2.1 Traffic Impacts

This alternative does not require major reconstruction on Wellington Street, therefore there will be less of impact on businesses and public access to the downtown core. Work on Wyndham Street can be staged to allow for two lanes to remain open for traffic which will reduce the inconvenience of detours. Work on less travelled local streets will need to be staged to allow for access to residential properties.

6.5.2.2 Archaeological Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to determine the potential for archaeological impacts. Since this option requires work within the river, the checklist indicates there may be a requirement for an archeological assessment. The disturbance to the area on the east side of the river caused by past construction (buildings and site development) indicates that there is low potential for archaeological impacts. However, if there is no existing archaeological investigation report for the area along the river trail, it is recommended that further archaeological investigation would need to be carried out if this is the preferred alternative. A professional archaeologist licensed under the Ontario Heritage Act should be retained to carry out a minimum Stage 1 archaeological assessment report should this alternative be selected.

6.5.2.3 Heritage Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to help determine whether the project could affect known or potential cultural heritage resources. There are known heritage sites in the area of the project (see City of Guelph Municipal Register of Cultural Heritage Properties) however none of the alternatives will impact these properties. Since the construction of the new trunk sewer will not be on any heritage site and will not alter the landscape or drainage patterns, impacts to heritage resources were deemed to be negligible.

6.5.3 Economic

6.5.3.1 Capital Costs

The preliminary construction cost estimate for this alternative is $6.1 Million, including engineering, contingencies and taxes. Further details can be found in Appendix G.

6.5.3.2 Operating and Maintenance Costs

No life cycle costing was completed as part of this study, but rather the alternatives were rated based on a qualitative assessment of expected relative maintenance costs. This alternative features a section of gravity sewer within the river. The fabricated bends and difficult access would lead to more expensive maintenance cost than a sewer on a road allowance.

6.5.3.3 Land Acquisition

No easements or property acquisition is required for this alternative.

6.6 Alternative 5 Evaluation

6.6.1 Environmental

6.6.1.1 Terrestrial and Vegetation Impacts

With this alternative, the route is entirely on existing road allowance/right-of-way and as such, the impacts to existing trees and vegetation will be minimal. Existing street trees will be protected by minimizing trench widths using trench boxes during excavation. Any branches overhanging the street could be identified prior to construction and pruned by certified specialists.

6.6.1.2 Aquatic Habitat Impacts

This alternative does not involve a water crossing or river access, therefore there will be no impacts to the aquatic habitat.

6.6.1.3 Watercourse Crossing

This alternative does not involve a water crossing or river access. The trunk sewer will outlet to the proposed York Trunk sewer.

6.6.2 Social

6.6.2.1 Traffic Impacts

This alternative does not require reconstruction on Wellington Street, therefore there will be less of impact on businesses and public access to the downtown core. Work on Wyndham Street can be staged to allow for two lanes to remain open for traffic which will reduce the inconvenience of detours. Work on less travelled local streets will need to be staged to allow for access to residential properties.

6.6.2.2 Archaeological Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to determine the potential for archaeological impacts. Since this option includes work within the existing road allowances which have been disturbed with prior construction, there is a very low potential of archaeological resources being found. No further study is expected with this alternative.

6.6.2.3 Heritage Impacts

The Ministry of Tourism, Culture and Sport provided a checklist to help determine whether the project could affect known or potential cultural heritage resources. There are known heritage sites in the area of the project (see City of Guelph Municipal Register of Cultural Heritage Properties) however none of the alternatives will impact these properties. Since the construction of the new trunk sewer will not be on any heritage site and will not alter the landscape or drainage patterns, impacts to heritage resources were deemed to be negligible.

6.6.3 Economic

6.6.3.1 Capital Costs

The preliminary construction cost estimate for this alternative is $6.2 Million, including engineering, contingencies and taxes. Further details can be found in Appendix G.

6.6.3.2 Operating and Maintenance Costs

No life cycle costing was completed as part of this study, but rather the alternatives were rated based on a qualitative assessment of expected relative maintenance costs. This alternative does not include a new river crossing and makes use of the York Trunk Sewer Crossing. This alternative includes all gravity sewers located on existing road allowances. This alternative is expected to have the lowest maintenance costs.

6.6.3.3 Land Acquisition

No easements or property acquisition is required for this alternative.

6.7 Evaluation Summary

Figure 6-2 summarizes the evaluation of each alternative.

	Alternative 1 Do Nothing	Alternative 2 Gravity Crossing to Speed Trunk	Alternative 3 Siphon Crossing to Speed Trunk	Alternative 4 Under Bridge to York Trunk	Alternative 5 Along Existing Streets to York Trunk
Addresses Problem Statement	○ does not address problem statement	● addresses problem statement	● addresses problem statement	● addresses problem statement	● addresses problem statement
Environmental Effects					
• Impact on Trees and Vegetation	◔ pipe failure may impact vegetation	◔ trees and vegetation at watercourse crossing impacted	◔ trees and vegetation at watercourse crossing impacted	◔ trees and vegetation along existing trail impacted	◔ limited impact to street trees
• Impact on Fisheries	○ pipe failure would impact fisheries	○ some temporary impacts to fish habitat	○ some temporary impacts to fish habitat	◔ some temporary impacts to fish habitat	● limited impacts since work is on road ROW
• Watercourse Crossing	○ existing crossings	○ crossing required	○ crossing required	◑ crossing required	● no crossing required
Social and Cultural Effects					
• Traffic Impacts	● no traffic impacts	◔ disruption to Wellington Street and Waterloo Avenue traffic	◔ disruption to Wellington Street and Waterloo Avenue traffic	◑ disruption to Wyndham Street traffic	◑ disruption to Wyndham Street and local street traffic
• Archaeological Impacts	● no change to archaeologic impacts	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◑ limited impacts since work is on road right of way
• Heritage Resource Impacts	● no change to heritage impacts	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◔ some impacts possible - additional study requried	◑ limited impacts since work is on road right of way
Economic Effects					
• Estimated Capital Cost	● maintenance of existing no new capital works	○ $10.9 Million	○ $11 1Million	◔ $6.1Million	◔ $6.2 Million
• Operating and Maintenance Costs	○ highest expected O & M cost	◔ river crossing impacts O & M cost	○ higher O & M due to siphon river crossing maintenance	◔ bridge crossing impacts O & M cost	◔ least expected O & M cost
• Land Acquistion Requirements	○ easement across private property requried	○ easement across private property required	◔ no easement required	◔ no easement required	◔ no easement required
					Recommended Alternative

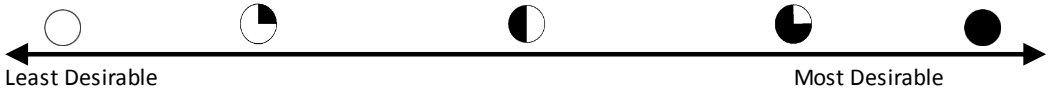


Figure 6-2 - Evaluation Summary

7. Preferred Solution

7.1 Description

Based on the evaluation, the preferred solution is Alternative 5 where the trunk sewer is constructed on existing road allowances and is connected to the proposed York Trunk Sewer.

The upstream end of the trunk sewer will connect the recently constructed trunk at Macdonell Street at Arthur Street to a new sewer on Arthur Street. The route will follow along under Arthur Street, under the railway tracks by open cut, to Cross Street, down Cross Street to Neeve Street, along Neeve Street to Howitt Street, along Howitt Street, across Margaret Street to Wyndham Street and along Wyndham Street to York Road Park where it connects to the proposed new York Trunk Sewer. The existing local sanitary sewers on these streets will be replaced by the new trunk sewer or will be reconstructed above the new trunk where the depth of the new trunk is greater than 5.0m. With the construction of the new trunk, the existing sewer crossing private property will become redundant and can be removed as part of the redevelopment of the property.

Construction will be contained within the road allowance using trench boxes for the excavation to limit impacts to street trees and residences. Extensive rock excavation is expected and additional geotechnical and hydrogeological investigation will be included in the detailed design phase. Condition surveys of the existing residences and structures within the vicinity of construction will be completed prior to construction.

7.2 Modeling

The hydraulic sewer model prepared for the Sanitary Sewer Master Plan study was used to model the preferred alternative. The upstream sewer at Macdonell Street is 825mm diameter and this size was used for all downstream sections to the York Trunk Sewer. The model found that both the proposed Arthur Trunk Sewer and the York Trunk Sewer were adequately sized to convey the existing and projected sewage flows. Sizing for the proposed trunk sewer will be confirmed at detailed design.

7.3 Additional Work

Once the new Arthur Trunk Sewer is constructed it will be necessary to decommission the existing siphon and gravity sewer river crossings. It is proposed that the siphon and sewer that are to be abandoned will have the sewage pumped from them and disposed at the sewage treatment plant and then be pumped full of grout. This would eliminate the need for access to or disturbance of the river.

There is an existing 1200mm diameter storm sewer that outlets to the river in the vicinity of the existing gravity sanitary sewer crossing. Since the City does not have an easement for this sewer, it is proposed to relocate this sewer as part of the reconstruction work to the road allowance and outlet it to the river at the Neeve Street bridge. A separate application for approval for this work will be made during the detailed design phase.

7.4 Phasing and Implementation

The construction of the new trunk sewer can be phased in separate contracts or over a period of time as required to suit the City’s budget for the work. For example, it may be desirable for the work on Arthur Street to be carried out coincidental with the redevelopment of the property at 5 Arthur Street.

Construction cannot commence until the proposed new York Trunk is constructed to the park. Construction will commence in the park and proceed upstream. Construction on existing streets will be phased on a block by block basis to minimize disruption of the businesses and residents. Local sewers and service connections will be installed as work proceeds. Once the complete new trunk sewer is installed, the decommissioning of the existing siphon and gravity sewer can commence.

8. Mitigation Measures

8.1 Summary of Mitigation Measures

It is recognized that construction of the proposed works may have potential negative impacts on the environment and surrounding area. To understand the net effect of construction and operation, an assessment of the impacts and the mitigation measure to mitigate or negate these potential negative impacts has been prepared and is discussed in the following section. It is important to note that for this Municipal Class EA potential impacts related to the new trunk sewer are limited and short term based on construction schedule and methods. By incorporating proper construction techniques and controls as outline in
Table 8-1 below, these impacts can be minimized.

Table 8-1 - Construction Related Impacts and Mitigation Measures

Potential Impact	Mitigation Measure
Contamination of Soils Through Spills and Leaks	• This can be avoided by ensuring that fuel storage, refuelling and maintenance of construction equipment are handled properly and not allowed in or adjacent to watercourses; and • Contingency plans must be prepared before projects begin for the control and clean up of a spill if one should occur.
Noise, Vibration and Dust	• Construction operations will be restricted to the day shift (wherever possible). In addition, the contractor will be required to adhere to local noise by-laws; • To address construction related vibration impacts on nearby buildings, pre-construction surveys will be completed prior to construction; and • Dust control by spraying water, street sweeping.
Traffic	• Develop traffic plan for deliveries; provide separate construction access to site; and • Make contractor responsible for maintaining road conditions.
Public Communications	• Develop communications plan so that the public is aware of activities and planned work that could impact the public.
Vegetation and Loss of Tree Cover	• Removal of vegetation including large trees or large stands of trees has been avoided by the preferred design concept; and • Restore disturbed areas to natural or better conditions.
Sediment and Erosion Control	• Extensive sediment and erosion control measures (e.g., silt fencing, mud mats, etc.) should be established prior to the commencement of any construction activities and remain in place until all disturbed areas are fully stabilized to retain sediment on site and prevent its entry to the river

9. Consultation

9.1 Notice of Commencement

As part of the planning process, several steps have been undertaken to inform various stakeholders including government agencies, First Nations, affected landowners and the local community/general public of the nature and scope of the project and to solicit any comments. To inform review agencies of the project and solicit comments, at the beginning of the study a notice of study commencement was sent to review agencies outlining the proposed project and inviting comments. In addition, a Notice of study commencement including an offer to be put on project mailing list was first published in the Guelph Tribune in January 2013. A copy of the Notice and agencies contacted is included in Appendix F.

9.2 Public Information Centre

A Public Information Center (PIC) was held on December 12th, 2013, between 6:30pm and 8:30pm, in the /Galleria of City Hall. The Notice of PIC was delivered to local residents and was published in the Guelph Tribune in November 2013.

The information center included display boards depicting the study purpose, process, alternatives and evaluation matrix. Staff from AECOM and the City of Guelph were present to answer any questions and assist the public with developing an understanding of the project and process.

Attendance at the PIC included a City Councillor and one other interested person. One comment sheet was completed (by a representative of the Developer of the property on the east side of the river) indicating their interest in this project proceeding and desire to be kept advised of the schedule.

PIC display materials and the public comment sheet are included in Appendix F.

10. Conclusions and Recommendations

10.1 Conclusions

Through the completion of this Class EA, it has been determined that the preferred solution to meet the objectives of the problem statement is Alternative 5. The implementation of this solution resolves the problems and maximizes the opportunities identified in Section 3.

10.2 Recommendations

Considering the above, it is recommended that:

- Following EA Approval, Alternative 5 (Along Existing Streets to the York Trunk) proceed to detailed design;
- Required approvals be obtained; and
- The mitigation measures identified in Section 8 should be implemented as part of construction.

References

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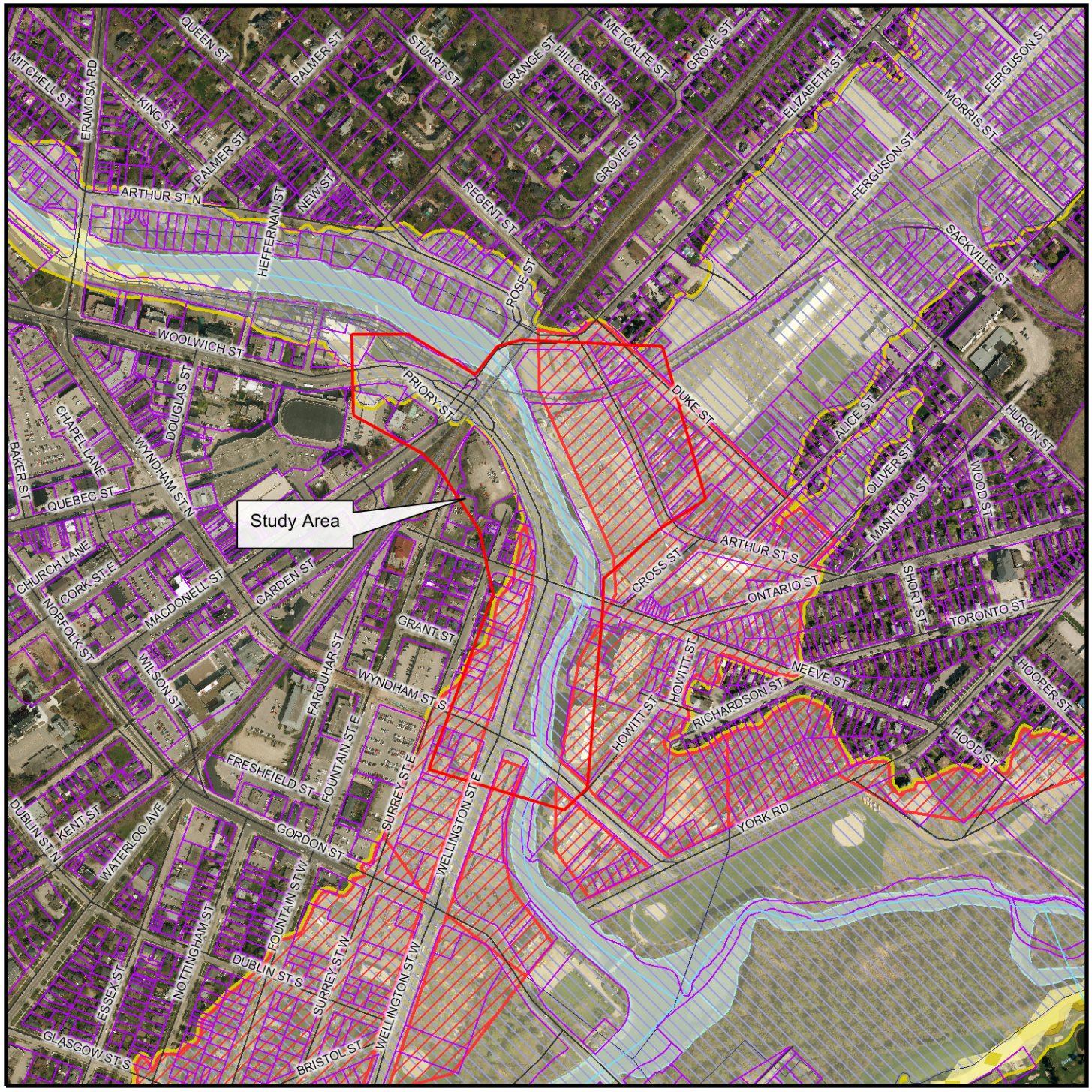
Appendix A

GRCA Information



THIS MAP IS NOT TO BE USED FOR NAVIGATION

Grand River Conservation Authority

Map created: December 14, 2012

Arthur Trunk Sewer EA

LEGEND

- WATERSHED BOUNDARY (GRCA)
- UTILITY LINE (NRVIS)
- ROADS-ADDRESSED (MNR)
- RAILWAY (NRVIS)
- CLASSIFIED STREAMS - NEW (NRVIS)
  - COLD WATER
  - COOL WATER
  - UNKNOWN
  - WARM WATER
- DRAINAGE-NETWORK (GRCA)
- PARCELS-ASSESSMENT (MPAC)
- FLOODPLAIN-SPECIAL POLICY AREA (GRCA)
- FLOODPLAIN (GRCA)
  - ENGINEERED
  - APPROXIMATE
  - ESTIMATED
- WETLAND (GRCA)
- SLOPE VALLEY (GRCA)
  - STEEP
  - OVERSTEEP
- SLOPE EROSION (GRCA)
  - STEEP
  - OVERSTEEP
  - TOE
- REGULATION LIMIT (GRCA)
- DRAINAGE-POLY (NRVIS)
- 2010 ORTHO (ONT)

GRCA Disclaimer

This map is for illustrative purposes only. Information contained hereon is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to:

http://grims.grandriver.ca/docs/SourcesCitations1.htm

0 90 180 270 360 m.

NAD 1983, UTM Zone 17 Scale 1:7,714

N

Aitken, Robert

From: Heather Ireland <hireland@grandriver.ca>
Sent: Friday, December 14, 2012 3:05 PM
To: Lisa Beth Bulford; Shorney, Tom
Cc: Piette, Jessica; Deman, Jillian
Subject: RE: Arthur Trunk Sewer EA - Status of request
Attachments: Arthur Trunk Sewer EA.pdf

Hello Tom,

I have attached GRCA mapping for the study area. The majority of the project is within the Special Policy Area and Floodway of the Speed River. Further, I have indicated where additional information can be found below.

Regards,
Heather

Heather Ireland
Resource Planner
Grand River Conservation Authority
400 Clyde Road
PO Box 729
Cambridge ON N1R 5W6
tel. 519-621-2763 x2320
fax 519-621-4844
web www.grandriver.ca

From: Shorney, Tom [mailto:Tom.Shorney@aecom.com]
Sent: December-11-12 8:57 AM
To: Lisa Beth Bulford
Cc: Piette, Jessica; Deman, Jillian
Subject: Arthur Trunk Sewer EA - Status of request

Good morning Lisa,

On August 17th, 2012 we had contacted you in regards to the Arthur Trunk Sewer Environmental Assessment for the City of Guelph. A request was made for background information regarding:

- Natural areas (ESA, PSW, ANSI, significant woodlands – City of Guelph OP)
- Thermal regime - MNR
- Fish records - MNR
- Fisheries Management designations - MNR
- Recovery strategies
- Presences of critical habitat
- Species at Risk MNR/DFO
- Evaluated wetlands including wetland evaluation records N/A
- Watercourse names and locations Speed River (Eramosa River to the south)

Would you be able to provide us with the status of this information?

Thank you so much and look forward to hearing back,

Tom Shorney

Tom Shorney

Ecologist, Environment
D 519.650.8647
Tom.Shorney@aecom.com

AECOM
50 Sportsworld Crossing Road, Suite 290
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T 519.650.5313 F 519.650.3424
www.aecom.com

Appendix B

Atlas of the Breeding Birds of Ontario Data Summary

Common Name	Scientific Name	Status			Wellington	
		SARA (*Species at Risk Act*) status	SARA Schedule	Species at Risk (SARO)[a]	Level	Habitat
Alder Flycatcher	*Empidonax alnorum*				Level 3	Forest
American Crow	*Corvus brachyrhynchos*					
American Goldfinch	*Cardeulis tristis*				Level 3	Open Country
American Kestrel	*Falco sparverius*				Level 2	Open Country
American Redstart	*Setophaga ruticilla*				Level 2	Forest
American Robin	*Turdus migratorius*					
American Woodcock	*Scolopax minor*				Level 4	Forest
Baltimore Oriole	*Icterus galbula*					
Bank Swallow	*Riparia riparia*				Level 1	Open Country
Barn Swallow	*Hirundo rustica*			THR	Level 3	Open Country
Belted Kingfisher	*Ceryle alcyon*					
Black-and-white Warbler	*Mniotilta varia*				Level 3	Forest
Black-billed Cuckoo	*Coccyzus erythropthalmus*				Level 1	Forest
Blackburnian Warbler	*Dendroica fusca*				Level 2	Forest
Black-capped Chickadee	*Poecile atricapillus*				Level 4	Forest
Black-throated Green Warbler	*Dendroica virens*				Level 2	Forest
Blue Jay	*Cyanocitta cristata*					
Blue-winged Warbler	*Vermivora pinus*				Level 1	Forest
Bobolink	*Dolichonyx oryzivorus*			THR	Level 2	Open Country
Broad-winged Hawk	*Buteo platypterus*				Level 3	Forest
Brown Creeper	*Certhia americana*				Level 2	Forest
Brown Thrasher	*Toxostoma rufum*				Level 1	Open Country
Brown-headed Cowbird	*Molothrus ater*					
Canada Goose	*Branta canadensis*					
Carolina Wren	*Thryothorus ludovicianus*					
Cedar Waxwing	*Bombycilla cedrorum*					
Chestnut-sided Warbler	*Dendroica pensylvanica*				Level 1	Forest
Chimney Swift	*Chaetura pelagica*	THR	Schedule 1	THR		
Chipping Sparrow	*Spizella passerina*					
Clay-colored Sparrow	*Spizella pallida*				Level 1	Open Country
Cliff Swallow	*Petrochelidon pyrrhonota*				Level 3	Open Country
Common Grackle	*Quiscalus quiscula*					
Common Loon	*Gavia immer*				Level 2	Marsh
Common Merganser	*Mergus merganser*					
Common Raven	*Corvus corax*					
Common Snipe	*Gallinago gallinago*					
Common Yellowthroat	*Geothlyphis trichas*					
Cooper's Hawk	*Accipiter cooperi*				Level 3	Forest
Downy Woodpecker	*Picoides pubescens*					
Eastern Bluebird	*Sialia sialis*				Level 1	Open Country
Eastern Kingbird	*Tyrannus tyrannus*				Level 3	Open Country
Eastern Meadowlark	*Sturnella magna*			THR	Level 2	Open Country
Eastern Phoebe	*Sayornis phoebe*				Level 3	Forest
Eastern Screech-Owl	*Megascops asio*					
Eastern Towhee	*Pipilio erythrophthalmus*				Level 2	Forest
Eastern Wood-Pewee	*Contopus virens*					
European Starling	*Sturnus vulgaris*					
Field Sparrow	*Spizella pusilla*				Level 3	Open Country
Grasshopper Sparrow	*Ammodramus savannarum*				Level 3	Open Country
Gray Catbird	*Dumetella carolinensis*				Level 4	Forest
Great Blue Heron	*Ardea herodias*					
Great Crested Flycatcher	*Myiarchus crinitus*					
Great Horned Owl	*Bubo virginianus*					
Green Heron	*Butorides virescens*				Level 4	Marsh

Common Name	Scientific Name	Status			Wellington	
		SARA (*Species at Risk Act*) status	SARA Schedule	Species at Risk (SARO)[a]	Level	Habitat
Hairy Woodpecker	*(Picoides villosus*					
Horned Lark	*Eremophila alpestris*				Level 3	Open Country
House Finch	*Carpodacus mexicanus*					
House Sparrow	*Passer domesticus*					
House Wren	*Troglodytes aedon*					
Indigo Bunting	*Passerina cyanea*					
Killdeer	*Charadrius vociferus*					
Least Bittern	*Ixobrychus exilis*	THR	Schedule 1	THR	Level 1	Marsh
Least Flycatcher	*Empidonax minimus*				Level 3	Forest
Long-eared Owl	*Asio otus*				Level 1	Forest
Magnolia Warbler	*Dendroica magnolia*				Level 1	Forest
Mallard	*Anas platyrhynchos*					
Marsh Wren	*Cistothorus palustris*				Level 3	Marsh
Mourning Dove	*Zenaida macroura*					
Mourning Warbler	*Oporornis philadelphia*				Level 2	Forest
Nashville Warbler	*Vermivora ruficapilla*				Level 1	Forest
Northern Cardinal	*Cardinalis cardinalis*					
Northern Flicker	*Colaptes auratus*					
Northern Harrier	*Circus cyaneus*				Level 4	Marsh
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*				Level 2	Open Country
Northern Waterthrush	*Seiurus noveboracensis*				Level 2	Forest
Osprey	*Pandion haliaetus*				Level 3	Marsh
Ovenbird	*Seiurus aurocapillus*				Level 4	Forest
Pied-billed Grebe	*Podilymbus podiceps*				Level 1	Marsh
Pileated Woodpecker	*Dryocopus pileatus*				Level 2	Forest
Pine Siskin	*Cardeulis pinus*					
Pine Warbler	*Dendroica pinus*				Level 3	Forest
Purple Finch	*Carpodacus purpureus*				Level 2	Forest
Red-breasted Nuthatch	*Sitta canadensis*				Level 3	Forest
Red-eyed Vireo	*Vireo olivaceus*					
Red-headed Woodpecker	*Melanerpes erythrocephalus*	THR	Schedule 1	SC	Level 1	Forest
Red-tailed Hawk	*Buteo jamaicensis*					
Red-winged Blackbird	*Agelaius phoeniceus*					
Rock Pigeon	*Columba livia*					
Rose-breasted Grosbeak	*Pheucticus ludovicianus*					
Ruby-throated Hummingbird	*Archilochus colubris*				Level 3	Forest
Ruffed Grouse	*Bonasa umbellus*				Level 3	Forest
Savannah Sparrow	*Passerculus sandwichensis*				Level 1	Open Country
Scarlet Tanager	*Piranga olivacea*				Level 2	Forest
Sharp-shinned Hawk	*Accipiter striatus*				Level 2	Forest
Song Sparrow	*Melospiza melodia*					
Sora	*Porzana carolina*				Level 1	Marsh
Spotted Sandpiper	*Actitis macularia*				Level 3	Open Country
Swamp Sparrow	*Melospiza georgiana*				Level 1	Marsh
Tree Swallow	*Tachycineta bicolor*					
Turkey Vulture	*Cathartes aura*				Level 3	Forest
Veery	*Catharus fuscescens*				Level 2	Forest
Virginia Rail	*Rallus limicola*				Level 1	Marsh
Warbling Vireo	*Vireo gilvus*					
White-breasted Nuthatch	*Sitta carolinensis*					
White-throated Sparrow	*Zonotrichia albicollis*				Level 1	Forest
Wild Turkey	*Meleagris gallopavo*				Level 4	Forest
Willow Flycatcher	*Empidonax traillii*					
Winter Wren	*Troglodytes troglodytes*				Level 3	Forest
Wood Duck	*Aix sponsa*				Level 4	Forest
Wood Thrush	*Hylocichla mustelina*					
Yellow Warbler	*Dendroica petechia*					

Common Name	Scientific Name	Status			Wellington	
		SARA (*Species at Risk Act*) status	SARA Schedule	Species at Risk (SARO)[a]	Level	Habitat
Yellow-rumped Warbler	*Dendroica coronata*				Level 3	Forest

KEY
END = Endangered, THR = Threatened, SC = Special Concern

[b] SRANK (from Natural Heritage Information Centre) shown for breeding status if: S1 (Critically Imperiled, often < 5 occurrences),
S2 (Imperiled, often <20 occurences), S3 (Vulnerable, often 80 or fewer), S3S4 (uncertain between S3 and S4),
or T (tracked species) that are S4 or S5; SRANK not shown if: S4 (apparently secure, uncommon), S5 (secure, common).

Area-sensitive sources:
c Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.
[d] Ontario Ministry of Natural Resources (OMNR). 1993 (Revised 1994, 2002 draft). Ontario Wetland Evaluation System, Southern Manual. 3rd Edition. NEST Technical Manual TM-

Appendix C

Species at Risk Habitat Screening

With respect to Species at Risk (SAR) within the study area, the Natural Heritage Information Centre (NHIC) was searched via the Biodiversity Explorer internet tool available at www.biodiversityexplorer.mnr.gov.on.ca. A list of SAR known to occur within the City of Guelph and their preferred habitat was obtained using the NHIC database. The following table provides an assessment of these species and the applicability to the Arthur Trunk Sewer Environmental Assessment.

Common Name	**Scientific Name**	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	**Source of Information**	**Known Populations** (ROM – Range Maps, MNR Publications & COSEWIC Reports)	**Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)**
Endangered Species					
Henslow's Sparrow	*Ammodramus henslowii*	This species prefers large, fallow, grassy areas with ground mats of dead vegetation, dense herbaceous vegetation, ground litter and some song perches. Can also be found in neglected weedy fields, wet meadows, cultivated uplands. This species requires a moderate amount of moisture, as well as a tract of grasslands >40 ha, but usually in areas >100 ha. Can be associated with the following ELC codes: **CUM1-1, MAM, CUW.**	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	The species has experienced a serious decline in Ontario and no definite evidence of breeding has been reported in the province for several years.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Loggerhead Shrike	*Lanius ludovicianus*	Species inhabits grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows. As well as fence posts, wires and associated low-lying wetland; alvars which are located on core areas of limestone plain adjacent to Canadian Shield. The greatest threat is fragmentation of suitable habitat due to natural succession. Species requires at least 25 ha of suitable habitat.	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	Until the 1970s, the Loggerhead Shrike could be found at many locations throughout southern Ontario and other parts of northeastern North America, but populations have declined dramatically. Although	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.

Common Name	Scientific Name	Preferred Habitat (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (ROM – Range Maps, MNR Publications & COSEWIC Reports)	Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)
		Can be associated with the following ELC codes: **SWT, CUM, ALO, ALS.**		the occasional bird is still found within the broader former range, most remaining species are now found in two core grassland habitats – the Carden Plain north of Lindsay, and the Napanee Limestone Plain.	
Threatened Species					
Barn Swallow	*Hirundo rustica*	Can be found in farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water. This species can be associated with the following ELC codes: Forages in **TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1;** nest on suitable structures.	Atlas of Breeding Birds of Ontario – Square 17NJ62	Found throughout Ontario.	**Yes** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Blanding's Turtle	*Emydoidea blandingii*	Species is generally situated in shallow water marshes, bogs, ponds or swamps. As well as in coves in larger lakes with soft muddy bottoms and aquatic vegetation. Species basks on logs, stumps, or banks. The surrounding natural habitat is important in summer as they frequently move from	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	In Ontario Blanding's Turtle can be found throughout the southern and central portions of the province except along the Bruce Peninsula and the far	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field

Common Name	Scientific Name	Preferred Habitat (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (ROM – Range Maps, MNR Publications & COSEWIC Reports)	Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)
		aquatic habitat to terrestrial habitats. Species generally hibernates in bogs, and is not readily observed. Can be associated with the following ELC codes: **SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1,** where open water present.		southeast.	investigations.
Bobolink	*Dolichonyx oryzivorus*	Nests primarily in forage crops, particularly **hayfields and pastures**, dominated by a variety of species such as clover, tall grasses and broadleaved plants; also occurs in wet prairie, graminoid, peatlands and abandoned fields; **generally requires tracts of grassland >5 ha**. Also nests in lightly grazed pastures, fallow and abandoned fields and shallow grassy marshes. This species can be associated with the following ELC Codes: **TPO, TPS, CUM1, MAM2.**	Atlas of Breeding Birds of Ontario – Square 17NJ62	In Ontario, Bobolink is widely distributed throughout most of the province south of the boreal forest. It could also potentially be found in the north where suitable habitat exists.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Chimney Swift	*Chaetura pelagica*	Formerly nested in the trunks of large, hollow trees. Today, mainly use chimneys or abandoned buildings as nesting sites. May forage over wide variety of habitats. It **requires dead trees >30 cm** for roosting and possibly nesting. Where swifts observed foraging only, is not Significant	Atlas of Breeding Birds of Ontario – Square 17NJ62	In Ontario, the Chimney Swift is most widely distributed in the Carolinian zone in the south and southwest portions of the province, however has been	**No** – Suitable habitat is not present within this site. The subject lands does not provide chimneys or abandoned buildings for nesting habitat.

Common Name	Scientific Name	Preferred Habitat (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (ROM – Range Maps, MNR Publications & COSEWIC Reports)	Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)
		habitat. This species can be associated with the following ELC codes: Forages in TPO**, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1**; nest in any communities where buildings with chimneys present.		detected throughout most of the province south of the 49th parallel.	Species was not observed during AECOM field investigations.
Eastern Meadowlark	*Sturnella magna*	Most common in native grasslands, savannah, old fields, hayfields, lightly grazed pastures, weedy meadows, fields with occasional shrubs. **Minimum area of grassland required is about 5 ha**. This species can be associated with the following ELC codes: **TPO, TPS, CUM1, MAM2, MAS2**	Atlas of Breeding Birds of Ontario – Square 17NJ62	In Ontario, the Eastern Meadowlark's current breeding range extends from the southwestern part of the province more or less continuously north to include southern Algoma, Sudbury and Nipissing districts. It also occurs in a northern pocket of agricultural lands associated with the Little Clay Belt in Timiskaming District.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Jefferson Salamander	*Ambystoma jeffersonianum*	Jefferson Salamanders inhabit deciduous forests with suitable breeding areas like limestone sinkhole ponds, kettle ponds and other natural basins. These bodies of water are often ephemeral (temporary) and are fed by spring runoff, groundwater, or	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	Its distribution is not completely known, but data confirm that it exists at a total of 13 localities in three main areas of southern	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed

Common Name	Scientific Name	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	**Known Populations** (ROM – Range Maps, MNR Publications & COSEWIC Reports)	**Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)**
		springs. In Canada, the species is associated with mature, Carolinian forests, which have permanent or temporary ponds for breeding. This species can be associated with the following ELC codes: **FOD.**		Ontario. The species' secretive nature makes population estimates difficult, as does the presence of triploid individuals in the population. Given that Jefferson Salamanders are found in a very densely populated area of Ontario, and that there is evidence of a decline in one Ontario population.	during AECOM field investigations.
Least Bittern	*Ixobrychus exilis*	Occurs in large marshes (especially cattail) with good interspersion of emergents and open water. Nests sit on platforms of stiff stems; nests within 10m of open water. Prefers large marshes that have relatively stable water levels throughout the nesting period. Can be associated with the following ELC codes: **MAS2-1, MAS3-1, SA, OAO**.	Atlas of Breeding Birds of Ontario – Square 17NJ62	In Ontario, Least Bitterns are mainly found in marshes near the Great Lakes.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Special Concern					
Eastern Ribbonsnake	*Thamnophis sauritus*	Inhabits sunny grassy areas with low dense vegetation near bodies of shallow	NHIC – Lower Tier Municipality for City of	The range for the Eastern Ribbonsnake in	**No** – Suitable habitat is not present within this site. The

Common Name	Scientific Name	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	**Known Populations** (ROM – Range Maps, MNR Publications & COSEWIC Reports)	**Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)**
		permanent quiet water; wet meadows, grassy marshes or sphagnum bogs; borders of ponds, and lakes or streams. Species hibernates in groups.	Guelph using the Spatial Boundary Tool	Canada is concentrated in Ontario, following the southern edge of the Canadian Shield with the majority of the sightings occurring in the Georgian Bay region, particularly Bruce County.	subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Milksnake	*Lampropeltis triangulum*	Species can be found in farmlands, meadows, hardwood or aspen stands. As well as pine forest with brushy or woody cover; river bottoms or bog woods. Occasionally hides under logs, stones, or boards or in outbuildings, and often uses communal nest sites.	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	In Ontario, Milksnakes are widespread and locally common within the southern portion of the province, and ranges as far north as Lake Nipissing and Sault Ste. Marie.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Northern Map Turtle	*Craptemys geographica*	Species inhabits large bodies of water with soft bottoms, and aquatic vegetation. Can be found basking on logs or rocks as well as beaches and grassy edges. Usually uses soft soil or clean dry sand for nest sites, and may nest at some distance from water. It's home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas. Their aquatic corridors (e.g. stream) are required for	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	In southern Ontario, the Northern Map Turtle is found primarily on the shores of Georgian Bay, Lake St. Clair, Lake Erie and Lake Ontario. It can also be found along larger rivers including the Thames, Grand and Ottawa.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.

Common Name	Scientific Name	Preferred Habitat (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	Known Populations (ROM – Range Maps, MNR Publications & COSEWIC Reports)	Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)
		movement. Species is not readily observed.			
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Species requires open, deciduous forest with little understory; fields or pasture lands with scattered large trees; wooded swamps; orchards, small woodlots or forest edges. Can also be found among groves of dead or dying trees. Feeds on insects and stores nuts or acorns for winter; loss of habitat is limiting factor; requires cavity trees with at least 40 cm dbh. Requires about 4 ha for a territory. Can be associated with the following ELC codes: **FOD, SWD, CUW.**	Atlas of Breeding Birds of Ontario – Square 17NJ62	Information from the recent Ontario Breeding Bird Atlas indicates that the Red-headed Woodpecker population in that province consists of 500 to 1900 pairs. The Atlas data suggest that Red-headed Woodpecker populations in that province have declined by 64% between 1985 and 2005. A continuing decline in population is expected with the ongoing loss and degradation of habitat.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Tuberous Indian-Plantain	*Arnoglossum plantagineum*	Species requires wet, calcium-rich meadows or shoreline fens. Can be associated with the following ELC codes: **MAM, FEO.**	NHIC – Lower Tier Municipality for City of Guelph using the Spatial Boundary Tool	In Ontario, it grows in about 15 sites near Lake Huron, especially the west side of the Bruce Peninsula.	**No** – Suitable habitat is not present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.
Yellow-breasted Chat	*Icteria virens*	Thickets, tall tangles of shrubbery beside	NHIC – Lower Tier	In Canada, it occurs in	**No** – Suitable habitat is not

Common Name	Scientific Name	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity - ROM)	Source of Information	**Known Populations** (ROM – Range Maps, MNR Publications & COSEWIC Reports)	**Habitat located within the Arthur Trunk Sewer Assessment EA Study Area (yes or no)**
		streams, ponds; overgrown bushy clearings with deciduous thickets; nests above ground in bush, vines etc. Can be associated with the following ELC codes: **CUW, CUT.**	Municipality for City of Guelph using the Spatial Boundary Tool	southern British Columbia, the Prairies, and southwestern Ontario where it is concentrated in Point Pelee National Park and Pelee Island in Lake Erie.	present within this site. The subject lands are within the city limits in an urban setting. Species was not observed during AECOM field investigations.

Appendix D

Tree Inventory Data

Common Name	Scientific Name	DBH (cm)	Biological Condition	Structural Condition	Crown Reserve	Comments
South Bank of Speed River McDonnell Street to Neeve Street						
Manitoba maple	*Acer negundo*	32, 10, 13	H	M(H)	16	
Manitoba maple	*Acer negundo*	26, 24, 21	M	L	16	
Manitoba maple	*Acer negundo*	22	M	M(H)	10	
Manitoba maple	*Acer negundo*	26	M(H)	M(H)	12	
Manitoba maple	*Acer negundo*	31	M	L	10	
Manitoba maple	*Acer negundo*	28/33	M(H)	M(H)	12	
Manitoba maple	*Acer negundo*	24	M(H)	L	8	
Manitoba maple	*Acer negundo*	21, 16, 19, 16	M(L)	L	20	
Manitoba maple	*Acer negundo*	33	M	M(L)	10	
Manitoba maple	*Acer negundo*	36	M(H)	M	14	
Manitoba maple	*Acer negundo*	21	M	M	10	
Manitoba maple	*Acer negundo*	21	M(H)	M	10	
Manitoba maple	*Acer negundo*	19, 28	M	M	18	
Manitoba maple	*Acer negundo*	22	M(H)	M(L)	18	
Manitoba maple	*Acer negundo*	21, 18, 9	M(H)	M(L)	16	
Manitoba maple	*Acer negundo*	32, 33, 25, 40	M(H)	M(L)	20	
Manitoba maple	*Acer negundo*	35, 22	M	H	18	
Manitoba maple	*Acer negundo*	20, 30, 31, 31	M	M	18	
Manitoba maple	*Acer negundo*	42	M	L	14	
Manitoba maple	*Acer negundo*	33, 19	M	M	16	
Manitoba maple	*Acer negundo*	34, 28, 32, 29	M	L	16	
Manitoba maple	*Acer negundo*	74	M(H)	M	18	
Manitoba maple	*Acer negundo*	75	M(H)	M(L)	8	
Manitoba maple	*Acer negundo*	37, 28, 26	M(L)	M(L)	>20	Tree overhanging watercourse
Manitoba maple	*Acer negundo*	32	M	M(L)	10	
Manitoba maple	*Acer negundo*	27, 16	M(H)	M(L)	12	
Manitoba maple	*Acer negundo*	18	M(H)	M(L)	16	
Manitoba maple	*Acer negundo*	17, 43, 15, 25	M(H)	M(L)	>20	Tree overhanging watercourse
Manitoba maple	*Acer negundo*	17	M(H)	M(H)	6	
Manitoba maple	*Acer negundo*	24	M(H)	M(L)	12	
Manitoba maple	*Acer negundo*	19, 27, 18	M(H)	M	10	
Manitoba maple	*Acer negundo*	19	M(H)	M(H)	8	
Manitoba maple	*Acer negundo*	37	M(H)	M(H)	14	
Manitoba maple	*Acer negundo*	35, 39	M(H)	M	20	
Manitoba maple	*Acer negundo*	15	M(H)	M(H)	6	
Manitoba maple	*Acer negundo*	33, 25	M(H)	M(H)	18	
Norway maple	*Acer platanoides*	25	H	H	6	
Norway maple	*Acer platanoides*	16	H	M(H)	6	
Norway maple	*Acer platanoides*	15	H	H	8	
amur maple	*Acer tataricum subsp. Ginnala*	16	M(H)	L	4	
Freeman's maple	*Acer x freemanii*	24	M	M(H)	8	
freeman's maple	*Acer x freemanii*	20	M(H)	M	6	
freeman's maple	*Acer x freemanii*	33	M(H)	M(H)	9	
white ash	*Fraxinus americana*	31	M	M	12	

Common Name	Scientific Name	DBH (cm)	Biological Condition	Structural Condition	Crown Reserve	Comments
South Bank of Speed River McDonnell Street to Neeve Street						
white ash	*Fraxinus americana*	36	M(H)	M(H)	13	
white ash	*Fraxinus americana*	23	M(H)	M	9	
common crabapple	*Malus pumila*	26	M	M	6	
common crabapple	*Malus pumila*	19	M(H)	M	6	
common crabapple	*Malus pumila*	22	M(H)	M	6	
white spruce	*Picea glauca*	21	M(H)	H	5	
Colarado blue spruce	*Picea pungens*	28	M(H)	H	8	
Colarado blue spruce	*Picea pungens*	31	M(H)	M(H)	8	
Colarado blue spruce	*Picea pungens*	28	M(H)	H	8	
Colarado blue spruce	*Picea pungens*	28	M(H)	M(H)	9	
Colarado blue spruce	*Picea pungens*	31	M	M(H)	8	
Colarado blue spruce	*Picea pungens*	33	M(H)	M	6	Lean
Colarado blue spruce	*Picea pungens*	30	M(H)	M(H)	9	
Colarado blue spruce	*Picea pungens*	27	M(H)	M	6	Lean
Colarado blue spruce	*Picea pungens*	32	M(H)	M(H)	9	
Colarado blue spruce	*Picea pungens*	35	M(H)	M(H)	6	Lean
Colarado blue spruce	*Picea pungens*	15	M(H)	H	6	
Colarado blue spruce	*Picea pungens*	33	M(H)	M	6	Lean
Colarado blue spruce	*Picea pungens*	21	M(L)	M(H)	8	
Colarado blue spruce	*Picea pungens*	26	M(H)	M(H)	6	
Colarado blue spruce	*Picea pungens*	32	M(H)	M(H)	8	
Colarado blue spruce	*Picea pungens*	26	M(H)	M(H)	6	
Colarado blue spruce	*Picea pungens*	30	H	H	6	
Colarado blue spruce	*Picea pungens*	35	M	M(H)	6	
Austrian pine	*Pinus nigra*	35	M(L)	M(L)	8	
Austrian pine	*Pinus nigra*	35	M(L)	M(H)	9	
Austrian pine	*Pinus nigra*	32	M	M(L)	10	
Austrian pine	*Pinus nigra*	34	M(H)	H	10	
Austrian pine	*Pinus nigra*	39	M(H)	H	12	
balsam poplar	*Populus balsamifera*	16	M(H)	M	4	
burr oak	*Quercus macrocarpa*	16	M(H)	H	4	
staghorn sumac	*Rhus typhina*	17	M(H)	M	9	
black locust	*Robinia pseudoacacia*	22	M(H)	H	10	
black locust	*Robinia pseudoacacia*	30	M(H)	M(H)	10	
American Elm	*Ulmus americana*	16	M	M(H)	5	
American elm	*Ulmus americana*	25	M(H)	L	6	
American Elm	*Ulmus americana*	14, 12	M(H)	M(H)	8	
American Elm	*Ulmus americana*	12	M(H)	H	8	
American Elm	*Ulmus americana*	64	H	M(H)	15	
Siberian elm	*Ulmus pumila*	35	M(H)	M(H)	12	
Siberian elm	*Ulmus pumila*	60	M(H)	M(H)	16	
Siberian elm	*Ulmus pumila*	45	M(H)	M	19	Lean
Siberian elm	*Ulmus pumila*	40	M(H)	M	15	Lean
Siberian elm	*Ulmus pumila*	46	M(H)	M	12	

Common Name	Scientific Name	DBH (cm)	Biological Condition	Structural Condition	Crown Reserve	Comments
South Bank of Speed River McDonnell Street to Neeve Street						
Siberian elm	*Ulmus pumila*	26	M	M(H)	10	
Siberian elm	*Ulmus pumila*	47	M(H)	M	15	
Siberian elm	*Ulmus pumila*	34	M(H)	M	10	
Siberian elm	*Ulmus pumila*	46	M(H)	M	18	
Siberian elm	*Ulmus pumila*	51	M(H)	M	18	
red elm	*Ulmus rubra*	46	H	M(H)	20	

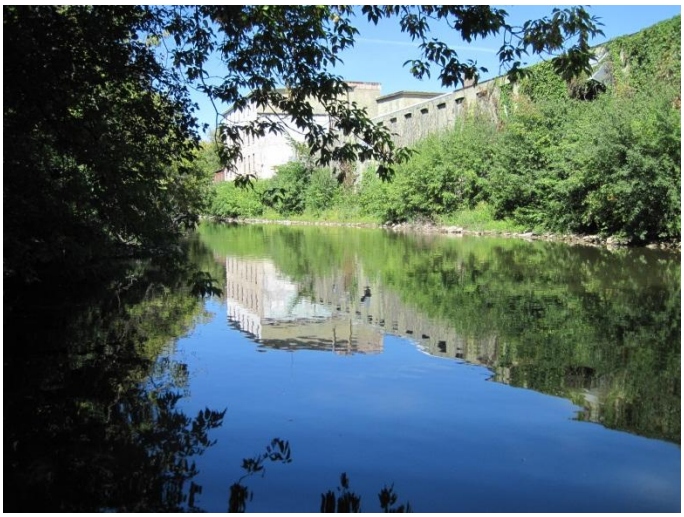
Common Name	Scientific Name	DBH (cm)	Biological Condition	Structural Condition	Crown Reserve	Comments
North Bank of Speed River Neeve Street to Wyndham Street						
Manitoba maple	*Acer negundo*	22	M	M(L)	6	Lean
Manitoba maple	*Acer negundo*	23, 14, 11, 12	M	M(L)	12	Lean
Manitoba maple	*Acer negundo*	15, 19	M(H)	M	10	
Manitoba maple	*Acer negundo*	32, 17	M(H)	M(L)	15	Lean
Manitoba maple	*Acer negundo*	53, 47	M	M	13	
Manitoba maple	*Acer negundo*	42	M(H)	M(H)	9	
Manitoba maple	*Acer negundo*	39	M	M	12	Lean
Manitoba maple	*Acer negundo*	28	M(H)	M	8	Lean
Manitoba maple	*Acer negundo*	50	M(H)	M	10	Lean
Manitoba maple	*Acer negundo*	31, 28, 47, 42	M	M(L)	14	Cavity in tree
Manitoba maple	*Acer negundo*	32	M(H)	M	10	Lean
Manitoba maple	*Acer negundo*	24	M	M	6	Lean/broken crown
Manitoba maple	*Acer negundo*	40, 25	M(H)	M(H)	10	Lean
Manitoba maple	*Acer negundo*	19	M	M	8	
Manitoba maple	*Acer negundo*	34, 11, 11	M(H)	M	14	
Manitoba maple	*Acer negundo*	15	M(H)	M(H)	8	Lean
Manitoba maple	*Acer negundo*	20, 14, 39	M(H)	M(H)	14	
Manitoba maple	*Acer negundo*	24, 11, 19	M(L)	M(L)	12	Lean
Manitoba maple	*Acer negundo*	33	M(H)	M(H)	10	
Manitoba maple	*Acer negundo*	32	M(H)	M(H)	10	
Manitoba maple	*Acer negundo*	37, 28	M(H)	M(H)	14	
Manitoba maple	*Acer negundo*	17	M	M	6	Lean
Manitoba maple	*Acer negundo*	36	M(H)	M(H)	10	
Manitoba maple	*Acer negundo*	27	M	M	6	Lean
Manitoba maple	*Acer negundo*	28	M(H)	M(H)	8	
Manitoba maple	*Acer negundo*	20	M(H)	L	6	Lean
Manitoba maple	*Acer negundo*	22	M	M	8	Lean
Manitoba maple	*Acer negundo*	40, 25	M(H)	M(H)	14	
Manitoba maple	*Acer negundo*	30, 29, 11, 25, 25	M(H)	M	18	Lean
Manitoba maple	*Acer negundo*	39, 37	M(L)	M(L)	10	Lean
Manitoba maple	*Acer negundo*	16	M	M	6	
Manitoba maple	*Acer negundo*	36	M(H)	M(H)	8	Lean
Manitoba maple	*Acer negundo*	16	M(H)	M(H)	5	
Norway maple	*Acer platanoides*	34	H	H	8	
silver maple	*Acer saccharinum*	112	H	M(H)	24	
silver maple	*Acer saccharinum*	103	H	H	15	
silver maple	*Acer saccharinum*	20	H	H	5	Memorial tree.
horse chestnut	*Aesculus hippocastanum*	42	M	M(H)	8	
green ash	*Fraxinus pennsylvanica*	34	M(H)	M(L)	10	Lean
green ash	*Fraxinus pennsylvanica*	13	H	H	6	
green ash	*Fraxinus pennsylvanica*	13	H	H	5	
white ash	*Fraxinus americana*	19	M	M(H)	7	
white ash	*Fraxinus americana*	22	M(H)	H	6	
white ash	*Fraxinus americana*	20	M(H)	M(H)	7	

Common Name	Scientific Name	DBH (cm)	Biological Condition	Structural Condition	Crown Reserve	Comments
North Bank of Speed River Neeve Street to Wyndham Street						
white ash	*Fraxinus americana*	20	M(H)	M	6	Lean
white ash	*Fraxinus americana*	19	M(H)	M(H)	8	
white ash	*Fraxinus americana*	23	M(H)	M(H)	8	
white ash	*Fraxinus americana*	18	M(H)	M(H)	7	
white ash	*Fraxinus americana*	19	M	M(H)	7	
white ash	*Fraxinus americana*	18	M(H)	M(H)	6	
white ash	*Fraxinus americana*	28	M(H)	M(H)	7	
black walnut	*Juglans nigra*	14	H	H	6	
black walnut	*Juglans nigra*	14	H	H	6	
black walnut	*Juglans nigra*	28	H	M(H)	10	
black walnut	*Juglans nigra*	32	H	M(H)	7	
black walnut	*Juglans nigra*	16	M(H)	H	5	
crabapple species	*Malus species*	34	M(H)	M(H)	9	
willow species	*Salix species*	85, 85	M(L)	M(H)	18	
basswood	*Tilia americana*	32	M(L)	M(L)	6	
basswood	*Tilia americana*	15	M(H)	M	4	
basswood	*Tilia americana*	20, 11, 15	H	M(H)	6	
American Elm	*Ulmus americana*	16	M	M	4	
American Elm	*Ulmus americana*	18	M	M	4	
American Elm	*Ulmus americana*	28	M(H)	M(L)	6	Growing out of concrete.
American Elm	*Ulmus americana*	22	M	M	8	
American Elm	*Ulmus americana*	39	M(H)	M(H)	13	
American Elm	*Ulmus americana*	30	M(L)	M(L)	10	Decay at base
American Elm	*Ulmus americana*	42	H	M(H)	12	
American Elm	*Ulmus americana*	26	M(H)	M(H)	8	
American Elm	*Ulmus americana*	20	M(H)	M	4	
Siberian elm	*Ulmus pumila*	29, 31, 32	H	M(H)	14	
Siberian elm	*Ulmus pumila*	30, 25	M(H)	M(H)	12	
Siberian elm	*Ulmus pumila*	18	M	M(H)	8	
Siberian elm	*Ulmus pumila*	28	M(L)	M(L)	2	
Siberian elm	*Ulmus pumila*	48	M(H)	M(H)	12	

Appendix E

AECOM Photo Log

Photograph 1. Speed River downstream of McDonnell Street



Photograph 2. Speed River upstream of Option B crossing

Photograph 3. Speed River at existing main crossing

Photograph 4. Speed River at Option C crossing

Photograph 5. East bank of Speed River at Option 3 location

Photograph 6. Ground/Shrub layer of CUW1 along west bank of Speed River

Appendix F

Consultation

Notice of project commencement and Invitation to Participate

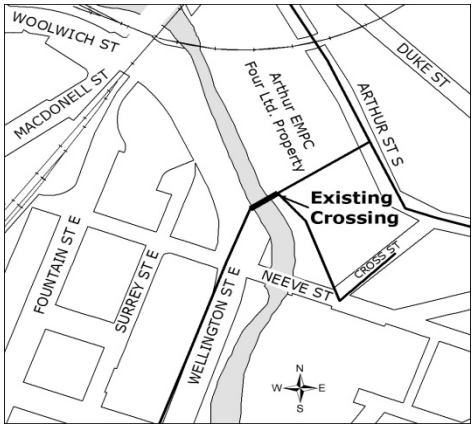
Speed River Crossing for Arthur Street Sanitary Sewer
Class Environmental Assessment

The Project

The City of Guelph is initiating a Class Environmental Assessment study for a crossing of the Speed River for the Arthur Street Sanitary Sewer.

Background

Currently, a 300mm diameter gravity sewer and a 400 mm siphon crossing the Speed River from the north side of Neeve Street and connects to sanitary sewers on Wellington Street and Arthur Street. East of the river, the 300 mm diameter sewer passes through a private property.



The two sewers are aging infrastructure and need to be replaced to ensure continued reliable service for the northeast parts of the City. While upgrading the sewers, the City will relocate them to accommodate nearby development.

The Process

The Environmental Assessment will be conducted as a Schedule B project in accordance with the "Municipal Class Environmental Assessment" (Municipal Engineers Association, June 2000 as amended in 2007 & 2011) which is an approved process under the Ontario Environmental Assessment Act. The Class EA process includes public and review agency consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed improvements, and identification of reasonable measures to mitigate any adverse impacts that may result.

How to Participate

In March 2013, neighbourhood residents, community members and interested parties will be invited to attend the Public Information Centre to review and discuss issues related to the EA study. Meeting notices will also be circulated to neighbourhood residents, advertised in the City News pages in The Guelph Tribune and posted online at **guelph.ca/meetings**.

For more information

Please contact either one of our project management team members if you have questions, comments or would like to be added to the project mailing list:

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AECOM
50 Sportsworld Crossing Road, Unit 290
Kitchener, ON N2P 0A4
T (519) 650-8710
E rick.clement@aecom.com

Last Name	First Name	Organization	Title	Category	Address	City	Province	Postal Code	Telephone	Email
Ministry of the Environment										
Glassco	Jane	Ministry of the Environment	District Manager	A. Federal/Provincial Agencies & First Nations	Guelph District Office, 1 Stone Road West, 4th Floor	Guelph	ON	N1G 4Y2	(519) 826-4258	jane.glassco@ontario.ca
Odom	Paul	Ministry of the Environment	Surface Water Group Leader	A. Federal/Provincial Agencies & First Nations	Water Resources Unit, 12th Floor, 119 King Street West	Hamilton	ON	L8P 4Y7	905-521-7674	paul.odom@ontario.ca
Slattery	Barb	Ministry of the Environment	EA/Planning Coordinator	A. Federal/Provincial Agencies & First Nations	Hamilton District Office, 9th Floor, 119 King Street West	Hamilton	ON	L8P 4Y7	905-521-7864	barbara.slattery@ontario.ca
Ministry of Culture										
Schiller	Chris	Ministry of Tourism, Culture and Sport	Manager, Culture Services Unit	A. Federal/Provincial Agencies & First Nations	Suite 1700, 401 Bay Street	Toronto	ON	M7A 0A7	416-314-7144	chris.schiller@ontario.ca
Ministry of Natural Resources										
Cornelisse	Ken	Minsitry of Natural Resources	Water Resources Coordinator	A. Federal/Provincial Agencies & First Nations	GUELPH DISTRICT, 1 Stone Rd West	Guelph	ON	N1G4Y2	519-826-6849	ken.cornelisse@ontario.ca
Hagman	Ian	Minsitry of Natural Resources	District Manager	A. Federal/Provincial Agencies & First Nations	GUELPH DISTRICT, 1 Stone Rd West	Guelph	ON	N1G4Y2	519-826-4931	Ian.hagman@ontario.ca
Ministry of Municipal Affairs and Housing										
Curtis	Bruce	Ministry of Municipal Affairs and Housing	Manager Community Planning & Development	A. Federal/Provincial Agencies & First Nations	Southwest Municipal Services Office, 659 Exeter Road, 2nd Floor	London	ON	N6E 1L3	(519) 873-4026	Bruce.Curtis@ontario.ca
City of Guelph										
Grand River Conservation Authority										
Natolochny	Fred	Grand River Conservation Authority	Supervisor of Resource Planning - North & South	A. Federal/Provincial Agencies & First Nations	400 Clyde Road, P.O. Box 729	Cambridge	ON	N1R 5W6	(519) 621-2763 x2229	fnatolochny@grandriver.ca
Palmer	John	Grand River Conservation Authority		A. Federal/Provincial Agencies & First Nations	400 Clyde Road, P.O. Box 729	Cambridge	ON	N1R 5W6	(519) 621-2763 x2289	jpalmer@grandriver.ca
Utilities										
Boulton	Brad	Bell Canada	Manager		Access Network Department, 575 Riverbend Drive	Kitchener	ON	N2K 3S3	(519) 744-0023	bradley.boulton@bell.ca
Schimus	Kevin	Union Gas	Project Manager		P.O. Box 340 603 Kumpf Drive	Waterloo	ON	N2J 4A4	519-885-7513	KSchimus@uniongas.com
Murray	Brian	Rogers Cable			Box 488, 85 Grand Crest Place	Kitchener	ON	N2G 4A8	(519) 758-0833	BrianA.Murray@rci.rogers.com
Bolton	Ian	Guelph Hydro	Distribution Design Supervisor		395 Southgate Drive	Guelph	ON	N1G 4Y1	519 837-4717	ibolton@guelphhydro.com
School Boards										
Imm	Heather	Upper Grand District School Board	Senior Planner		Planning and Development, Planning Department, 500 Victoria Road North	Guelph	ON	N1E 6K2	519-822-4420 x 824	
Dauszczyszyn	Dan	Wellington Catholic District School Board	Superintendent of Business		75 Woolwich Street P.O. Box 1298	Guelph	ON	N1H 6A6		
First Nations - Agencies										
Boswell	Don	Aboriginal Affairs and Northern Development Canada	Senior Claims Analyst	A. Federal/Provincial Agencies & First Nations	10 Wellington Street	Gatineau	QC	K1A 0H4	819-953-1188	
Levecque	Heather	Ministry of Aboriginal Affairs, Consultation Unit	Manager	A. Federal/Provincial Agencies & First Nations	9th Floor-160 Bloor Street East	Toronto	ON	M7A 2E6	416-325-4044	Heather.Levecque@Ontario.ca send emails to MAA.EA.Review@ontario.ca
First Nations - Bands										
Montour	Bill	Six Nations of the Grand River Territory	Chief	A. Federal/Provincial Agencies & First Nations	P.O. Box 5000, 1695 Chiefswood Road	Ohsweken	ON	N0A 1M0	(519) 445-2201	wkm@sixnations.ca arleenmaracle@sixnations.ca
LaForme	M. Bryan	Mississaugas of the New Credit	Chief		2789 Mississauga Road,	R.R. 6 Hagersville	ON	N0A 1H0	(905) 768-1133	bryanlaforme@newcreditfirstnation.com
Hill	Hohahes Leroy	Haudeosaunee Confederacy Council	Secretary to Haudenosaunee		2634 6th Line Road RR #2	Ohsweken	ON	N0A 1M0	Cell: 519-717-7326	jocko@sixnationsns.com

Speed River Crossing for Arthur Street Sanitary Sewer Class EA
Correspondance Tracking

Legend:
Notice of Commencement

Last updated: April 15, 2013

No.	Correspondent	Date	Correspondence Type	Comment	Received By	Status/Response
1	AECOM	March 20, 2013	Letter / mailout - Notice of Commencement	n/a	External Agency contact list	n/a
2	City of Guelph	January 17, 2013	Newspaper advertisement - Notice of Commencement	n/a	?	n/a
3	City of Guelph	03/__/2013	Letter / mailout - Notice of Commencement	n/a	Internal Contact List	n/a
4	Association of Iroquois and Allied Indians	April 2, 2013	Letter	Requested to be removed from project contact list.	Rick Clement	MM removed from contact list (2013-04-15)
5	Ministry of Aboriginal Affairs	April 19, 2013	Letter	Requested that future correspondence to MAA.EA.Review@ontario.ca or Ministry of Aboriginal Affairs, Consultation Unit, 160 Bloor Street East, 4th Floor, Toronto, Ontario, M7A 2E6 Provided constact info for 3 First Nations in the area	Rick Clement	MM added email and verified that 3 First Nations were already included in the contact list (2013-05-13)
6	Ministry of Tourism, Culture and Sport	May 3, 2013	Letter (email)	Provided Checklists for Archaeological Potential and Impacts to Built Heritage and Cultural Heritage	Rick Clement	

noted in email from Arun Hindupur (City of Guelph) 2013-02-22

Ministry of Aboriginal Affairs

160 Bloor St. East, 9th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-4740
Fax: (416) 325-1066
www.aboriginalaffairs.gov.on.ca

Ministère des Affaires Autochtones

160, rue Bloor Est, 9e étage
Toronto ON M7A 2E6
Tél. : (416) 326-4740
Téléc. : (416) 325-1066
www.aboriginalaffairs.gov.on.ca

Ontario

Reference: 119

April 19, 2013

Rick Clement
AECOM
50 Sportsworld Crossing Road, Unit 290
Kitchener, Ontario
N2P 0A4

Re: Speed River Crossing for Arthur Street Sanitary Sewer Class Environmental Assessment

Dear Rick Clement:

Thank you for informing the Ministry of Aboriginal Affairs (MAA) of your project. Please note that MAA treats all letters, emails, general notices, etc. about a project as a request for information about which Aboriginal communities may have rights or interests in the project area.

For future Environmental Assessment (EA) inquiry correspondence to MAA, please take note of the following:

1. please send all future EA correspondence to the following email address: MAA.EA.Review@ontario.ca ; or
2. if you prefer to send a hard copy rather than email, please address your correspondence as follows:
   Ministry of Aboriginal Affairs, Consultation Unit
   160 Bloor Street East, 4th floor
   Toronto, Ontario, Canada
   M7A 2E6.

As a member of the government review team, the Ministry of Aboriginal Affairs (MAA) identifies First Nation and Métis communities who may have the following interests in the area of your project:

- reserves;
- land claims or claims in litigation against Ontario;
- existing or asserted Aboriginal or treaty rights, such as harvesting rights; or
- an interest in the area of the project.

MAA is not the approval or regulatory authority for your project, and receives very limited information about projects in the early stages of their development. In circumstances where

a Crown-approved project may negatively impact a claimed Aboriginal or treaty right, the Crown may have a duty to consult the Aboriginal community advancing the claim. The Crown often delegates procedural aspects of its duty to consult to proponents. Please note that the information in this letter should not be relied on as advice about whether the Crown owes a duty to consult in respect of your project, or what consultation may be appropriate. Should you have any questions about your consultation obligations, please contact the appropriate ministry.

You should be aware that many First Nations and/or Métis communities either have or assert rights to hunt and fish in their traditional territories. For First Nations, these territories typically include lands and waters outside of their reserves.

In some instances, project work may impact aboriginal archaeological resources. If any Aboriginal archaeological resources could be impacted by your project, you should contact your regulating or approving Ministry to inquire about whether any additional Aboriginal communities should be contacted. Aboriginal communities with an interest in archaeological resources may include communities who are not presently located in the vicinity of the proposed project.

With respect to your project, and based on the brief materials you have provided, we can advise that the project appears to be located in an area where First Nations may have existing or asserted rights or claims in Ontario's land claims process or litigation, that could be impacted by your project. Contact information is below:

Six Nations of the Grand River Territory P.O. Box 5000, 1695 Chiefswood Road OHSWEKEN, Ontario N0A 1M0	Chief William K. Montour (519) 445-2201 (Fax) 445-4208 wkm@sixnations.ca arleenmaracle@sixnations.ca
Haudenosaunee Confederacy Chiefs Council 2634 6th Line Road RR 2 Ohsweken, ON N0A 1M0	Hohahes Leroy Hill Secretary to Haudenosaunee Confederacy Chiefs Council Cell 519 717 7326 jocko@sixnationsns.com
Mississaugas of the New Credit First Nation 2789 Mississauga Rd., R.R. #6 HAGERSVILLE, Ontario N0A 1H0	Chief Bryan LaForme (905) 768-1133 (Fax) 768-1225 bryanlaforme@newcreditfirstnation.com

The information upon which the above comments are based is subject to change. First Nation or Métis communities can make claims at any time, and other developments can occur that could result in additional communities being affected by or interested in your undertaking.

Through Aboriginal Affairs and Northern Development (AANDC), the Government of Canada sometimes receives claims that Ontario does not receive, or with which Ontario does not become involved. AANDC's Consultation and Accommodation Unit (CAU) established a "single window" to respond to requests for baseline information held by AANDC on established or potential Aboriginal Treaty and rights. To request information from the Ontario Subject Matter Expert send an email to: UCA-CAU@aadnc-aandc.gc.ca

Additional details about your project or changes to it that suggest impacts beyond what you have provided to date may necessitate further consideration of which Aboriginal communities may be affected by or interested in your undertaking. If you think that further consideration may be required, please bring your inquiry to whatever government body oversees the regulatory process for your project. MAA does not wish to be kept informed of the progress of the project; please be sure to remove MAA from the mailing list.

Yours truly,

Heather Levecque
Manager, Consultation Unit
Aboriginal Relations and Ministry Partnerships Division

HEAD OFFICE:
ONEIDA NATION OF THE
THAMES

LONDON OFFICE:
387 PRINCESS AVENUE
LONDON, ONTARIO
N6B 2A7

PHONE:(519) 434-2761
FAX:(519) 675-1053

www.aiai.on.ca

2 April 2013

Rick Clement, P. Eng.
Project Engineer
AECOM
50 Sportsworld Crossing Road, Unit 290
Kitchener, ON N2P 0A4

Re: Speed River Crossing for Arthur Street Sanitary Sewer Class EA

We are in receipt of documentation outlining your project and activities as legally required by the Supreme Court that upholds the duty of the Crown to consult and accommodate the economic/land rights of Indigenous peoples. This letter is a response to your invitation/notice and shall not be construed an act of consultation.

The Association of Iroquois and Allied Indians (AIAI) is mandated as a political territorial organization to defend and enhance the Indigenous and Treaty rights of its eight member First Nations. In doing this work, however, the Association does not and cannot act as a proxy or agent for Indigenous people or their communities. The ability to exercise inherent and constitutionally protected Inherent Indigenous rights (such as consultation) lies solely with individual First Nation communities.

Therefore, consultation must occur directly with the potentially affected First Nation communities. In doing so, proponents and agents of the Crown are required to uphold the internationally recognized principles of **free, prior and informed consent** as outlined in the United Nations *Declaration on the Rights of Indigenous Peoples.*

Please remove AIAI from your mailing list, and ensure that the contact information for our member First Nations is up to date (www.aiai.on.ca).

Regards,

Victoria S. Delearey
for

Gordon Peters
Grand Chief

Batchewana First Nation
Caldwell First Nation
Delaware Nation
Hiawatha First Nation
Mississaugas of New Credit
Mohawks of the Bay of Quinte
Oneida Nation of the Thames
Wahta Mohawks

Ministry of Tourism, Culture and Sport

Culture Services Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Tel. 416 314-7145
Fax: 416 314 7175

Ministère du Tourisme, de la Culture et du Sport

Unité des services culturels
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél. : 416 314-7145
Téléc. : 416 314 7175

Ontario

May 3, 2013 (EMAIL ONLY)

Rick Clement, P.Eng
AECOM
50 Sportsword Crossing Road, Unit 290
Kitchener, ON N2P 0A4
E: rick.clement@aecom.com

RE: Speed River Crossing for Arthur Street Sanitary Sewer
City of Guelph, Ontario
MTCS file no. 23EA042

Dear Rick Clement:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for your project. For this undertaking, it is the mandate of MTCS, under the *Ontario Heritage Act* (*OHA*), to conserve, protect and preserve Ontario's cultural heritage, including:

- Archaeological resources;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, a determination of the project's potential impact on these cultural heritage resources is required. Please advise MTCS whether archaeological and/or heritage impact assessments will be completed for your EA project, and forward them to MTCS, before issuing a Notice of Completion.

Archaeological Resources
Screening your EA project with the attached MTCS *Criteria for Evaluating Archaeological Potential* determines whether it may impact archaeological resources. MTCS archaeological sites data are available at *archaeologysites@ontario.ca*. If your EA project area exhibits archaeological potential, then an archaeological assessment (AA) by an *OHA* licensed archaeologist is recommended and the AA report forwarded to MTCS for review.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes* checklist attached determines whether your EA project may impact these cultural heritage resources: the clerk for the City of Guelph can provide information on property listed or designated under the *Ontario Heritage Act*. If your EA project may impact known or potential cultural heritage resources, MTCS recommends that a Heritage Impact Assessment (HIA) be prepared by a qualified consultant. The MTCS *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send completed HIAs to MTCS and the local municipality for review, and make it available to local heritage organizations with an interest.

Environmental Assessment Reporting
HIA and AA reports and their recommendations are part of the EA project. Determinations that no cultural heritage resources are impacted and no technical studies are warranted should be documented and summarized as part of the EA process, and included in the final Environmental Study report. MTCS is in no way liable if the information in the completed checklists is found to be inaccurate or incomplete.

Thank-you for circulating MTCS on this project: please continue to do so through the EA process, and contact me for any questions or clarification.

Sincerely,

Joseph Muller
Heritage Planner
joseph.muller@ontario.ca

Copied to: Rajan Philips, City of Guelph

Ministry of Tourism and Culture
Criteria for Determining Archaeological Potential

A Checklist for the Non-Specialist

Feature of Archaeological Potential		Yes	No	Unknown
1.	Known archaeological sites within 300 m of property	❑	❑	❑

Physical Features		Yes	No	Unknown
2.	Water on or near the property If yes, what kind of water?	❑	❑	❑
	a) Primary water source (lake, river, large creek, etc) ▪ within 300 m, OR ▪ 50 m for properties in northern Ontario and Canadian Shield terrain*	❑	❑	❑
	b) Secondary water source (stream, spring, marsh, swamp, etc) ▪ within 300 m, OR ▪ 50 m for properties in northern Ontario and Canadian Shield terrain*	❑	❑	❑
	c) Past water source (beach ridge, river bed, relic creek, ancient shoreline, etc) ▪ within 300 m, OR ▪ 150 m for properties in northern Ontario and Canadian Shield terrain*	❑	❑	❑
3.	Elevated topography on property (knolls, drumlins, eskers, plateaus, etc)	❑	❑	❑
4.	Pockets of sandy soil in a clay or rocky area on property	❑	❑	❑
5.	Distinctive land formations on property (mounds, caverns, waterfalls, peninsulas, etc)	❑	❑	❑

Cultural Features		Yes	No	Unknown
6.	Known burial site or cemetery on or adjacent to the property (cemetery is registered with the Cemeteries Regulation Unit)	❑	❑	❑
7.	Food or scarce resource harvest areas on property (traditional fishing locations, agricultural/berry extraction areas, etc)	❑	❑	❑
8.	Indications of early Euro-Canadian settlement within 300 m of property (monuments, cemeteries, structures, etc)	❑	❑	❑
9.	Early historic transportation routes within 100 m of property (historic road, trail, portage, rail corridor, etc)	❑	❑	❑

Property-specific Information		Yes	No	Unknown
10.	Property is designated and/or listed under the *Ontario Heritage Act* (municipal register and lands described in Reg. 875 of the *Ontario Heritage Act*)	❑	❑	❑
11.	Local knowledge of archaeological potential of property (from aboriginal communities, heritage organisations, municipal heritage committees, etc)	❑	❑	❑
12.	Recent ground disturbance[†] (post-1960, extensive and deep land alterations)	❑	❑	❑

The entire property should be screened for archaeological potential, not only the footprint where work is proposed.

*Northern Ontario is defined as Manitoulin Island, the Districts of Muskoka, Haliburton and Nipissing, and areas to the north. The Canadian Shield is defined as the area of Ontario underlain by the Precambrian Shield.

[†] Archaeological potential can be determined not to be present for either the entire property or a part(s) of it when the area under consideration has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. This is commonly referred to as 'disturbed' or 'disturbance', and may include: quarrying, major landscaping involving grading below topsoil, building footprints, sewage and infrastructure development. Activities such as agricultural cultivation, gardening, minor grading and landscaping do not necessarily affect archaeological potential.

Scoring the results:

If **Yes** to <u>any</u> of **1**, **2a-c, 6** or **11**	→ archaeological potential is **determined –** assessment is required
If **Yes** to <u>two or more</u> of **3 to 5 or 7-10**	→ archaeological potential is **determined –** assessment is required
If **Yes** to **12** <u>or</u> **No** to **1 to 10**	→ **low** archaeological potential is **determined –** assessment may or may not be required (depending on answers from 1-11)
If 3 or more **Unknown**	→ more research is required **(See note below for more information)**

Note: If archaeological potential features are unknown, a professional archaeologist licensed under the *Ontario Heritage Act* should be retained to carry out a minimum Stage 1 archaeological assessment report confirming potential or low potential. All reports are to be in compliance with provincial archaeological assessment standards and guidelines.

Screening for Impacts to Built Heritage and Cultural Heritage Landscapes

This checklist is intended to help proponents determine whether their project could affect known or potential cultural heritage resources. The completed checklist should be returned to the appropriate Heritage Planner or Heritage Advisor at the Ministry of Tourism and Culture.

Step 1 – Screening for Recognized Cultural Heritage Value

YES	NO	Unknown	
❑	❑	❑	1. Is the subject property designated or adjacent* to a property designated under the *Ontario Heritage Act*?
❑	❑	❑	2. Is the subject property listed on the municipal heritage register or a provincial register/list? (e.g. Ontario Heritage Bridge List)
❑	❑	❑	3. Is the subject property within or adjacent to a Heritage Conservation District?
❑	❑	❑	4. Does the subject property have an Ontario Heritage Trust easement or is it adjacent to such a property?
❑	❑	❑	5. Is there a provincial or federal plaque on or near the subject property?
❑	❑	❑	6. Is the subject property a National Historic Site?
❑	❑	❑	7. Is the subject property recognized or valued by an Aboriginal community?

Step 2 – Screening Potential Resources

YES	NO	Unknown	
			Built heritage resources
			1. Does the subject property or an adjacent property contain any buildings or structures **over forty years old**† that are:
❑	❑	❑	▪ Residential structures (e.g. house, apartment building, shanty or trap line shelter)
❑	❑	❑	▪ Farm buildings (e.g. barns, outbuildings, silos, windmills)
❑	❑	❑	▪ Industrial, commercial or institutional buildings (e.g. a factory, school, etc.)
❑	❑	❑	▪ Engineering works (e.g. bridges, water or communications towers, roads, water/sewer systems, dams, earthworks, etc.)
❑	❑	❑	▪ Monuments or Landmark Features (e.g. cairns, statues, obelisks, fountains, reflecting pools, retaining walls, boundary or claim markers, etc.)
❑	❑	❑	2. Is the subject property or an adjacent property associated with a known architect or builder?
❑	❑	❑	3. Is the subject property or an adjacent property associated with a person or event of historic interest?
❑	❑	❑	4. When the municipal heritage planner was contacted regarding potential cultural heritage value of the subject property, did they express interest or concern?
YES	NO	Unknown	**Cultural heritage landscapes**
			5. Does the subject property contain landscape features such as:
❑	❑	❑	▪ Burial sites and/or cemeteries
❑	❑	❑	▪ Parks or gardens
❑	❑	❑	▪ Quarries, mining, industrial or farming operations
❑	❑	❑	▪ Canals
❑	❑	❑	▪ Prominent natural features that could have special value to people (such as waterfalls, rocky outcrops, large specimen trees, caves, etc.)
❑	❑	❑	▪ Evidence of other human-made alterations to the natural landscape (such as trails, boundary or way-finding markers, mounds, earthworks, cultivation, non-native species, etc.)
❑	❑	❑	6. Is the subject property within a Canadian Heritage River watershed?
❑	❑	❑	7. Is the subject property near the Rideau Canal Corridor UNESCO World Heritage Site?
❑	❑	❑	8. Is there any evidence from documentary sources (e.g., local histories, a local recognition program, research studies, previous heritage impact assessment reports, etc.) or local knowledge or Aboriginal oral history, associating the subject property/ area with historic events, activities or persons?

Note:

If the answer is "yes" to any question in Step 1, proceed to Step 3.

The following resources can assist in answering questions in Step 1:

Municipal Clerk or Planning Department – Information on properties designated under the Ontario Heritage Act (individual properties or Heritage Conservation Districts) and properties listed on a Municipal Heritage register.

Ontario Heritage Trust – Contact the OHT directly regarding easement properties. A list of OHT plaques can be found on the website: Ontario Heritage Trust

Parks Canada – A list of National Historic Sites can be found on the website: Parks Canada

Ministry of Tourism and Culture – The Ontario Heritage Properties Database includes close to 8000 identified heritage properties. Note while this database is a valuable resource, it has not been updated since 2005, and therefore is not comprehensive or exhaustive. Ontario Heritage Properties Database

Local or Provincial archives

Local heritage organizations*, such as the municipal heritage committee, historical society, local branch of the Architectural Conservancy of Ontario, etc.*

Consideration should also be given to obtaining oral evidence of CHRs. For example, in many Aboriginal communities, an important means of maintaining knowledge of cultural heritage resources is through oral tradition.

If the answer is "yes" to any question in Step 2, an evaluation of cultural heritage value is required. If cultural heritage resources are identified, proceed to Step 3.

If the answer to any question in Step 1 or to questions 2-4, 6-8 in Step 2, is “unknown”, further research is required.

If the answer is "yes" to any of the questions in Step 3, a heritage impact assessment is required.

If uncertainty exists at any point, the services of a qualified person should be retained to assist in completing this checklist. All cultural heritage evaluation reports and heritage impact assessment reports must be prepared by a qualified person. Qualified persons means individuals (professional engineers, architects, archaeologists, etc.) having relevant, recent experience in the identification and conservation of cultural heritage resources. Appropriate evaluation involves gathering and recording information about the property sufficient to understand and substantiate its heritage value; determining cultural heritage value or interest based on the advice of qualified persons and with appropriate community input. If the property meets the criteria in Ontario Regulation 9/06 under the Ontario Heritage Act, it is a cultural heritage resource.

† The 40 year old threshold is an indicator of potential when conducting a preliminary survey for identification of cultural heritage resources. While the presence of a built feature that is 40 or more years old does not automatically signify cultural heritage value, it does make it more likely that the property could have cultural heritage value or interest. Similarly, if all the built features on a property are less than 40 years old, this does not automatically mean the property has no cultural heritage value. Note that age is not a criterion for designation under the *Ontario Heritage Act*.

Step 3 – Screening for Potential Impacts		
YES	**NO**	**Will the proposed undertaking/project involve or result in any of the following potential impacts to the subject property or an adjacent* property?**
❑	❑	**Destruction, removal or relocation** of any, or part of any, heritage attribute or feature.
❑	❑	**Alteration** (which means a change in any manner and includes restoration, renovation, repair or disturbance).
❑	❑	**Shadows** created that alter the appearance of a heritage attribute or change the exposure or visibility of a natural feature or plantings, such as a garden.
❑	❑	**Isolation** of a heritage attribute from its surrounding environment, context or a significant relationship.
❑	❑	**Direct or indirect obstruction** of significant views or vistas from, within, or to a built or natural heritage feature.
❑	❑	**A change in land use** such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.
❑	❑	**Soil disturbance** such as a change in grade, or an alteration of the drainage pattern, or excavation, etc.

* For the purposes of evaluating potential impacts of development and site alteration “adjacent” means: contiguous properties as well as properties that are separated from a heritage property by narrow strip of land used as a public or private road, highway, street, lane, trail, right-of way, walkway, green space, park, and/or easement or as otherwise defined in the municipal official plan.

Notice of Public Information Centre and Invitation to Participate

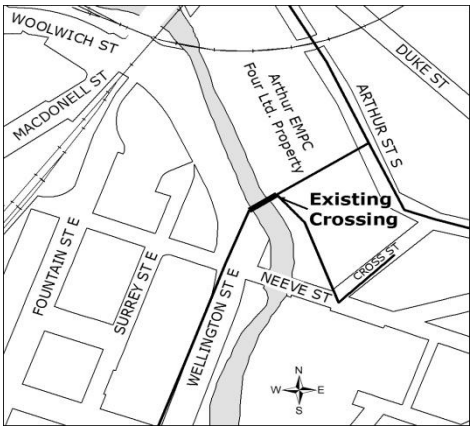
Speed River Crossing for Arthur Street Sanitary Sewer Class Environmental Assessment

The Project

The City of Guelph has initiated a Class Environmental Assessment study for a crossing of the Speed River for the Arthur Street Sanitary Sewer.

Background

As part of the City's sanitary sewer drainage network, a 300mm diameter gravity sewer and a 400mm siphon cross the Speed River in the area north of Neeve Street. They connect the Arthur Street trunk sanitary sewer to the Speed River trunk sanitary sewer on Wellington Street. East of the river the 300mm diameter sewer passes through a private property. The two sewers which service a drainage area of approximately 965ha in the northeast part of the City are at the end of their service life and require replacement. Due to their age and size, they lack capacity to convey projected sewage flows. The City is undertaking a Class Environmental Assessment to identify the future location of the Speed River Crossing for the Arthur Street Sanitary Sewer or an alternative to crossing the Speed River.



You're Invited to Attend

You're invited to attend a Public Information Centre to learn more about the process and project. The Open House will run from 6:30 to 8:30 p.m. You're welcome to drop–in anytime during the open house. Project team members will be on-hand to discuss any questions or comments that you may have.

Thursday, December 12, 2013
6:30 p.m. to 8:30 p.m.
Front Foyer/Galleria of City Hall
1 Carden Street, Guelph

To find out more about the project, visit guelph.ca/, or contact:

Mr. Arun Hindupur, M.Sc., P. Eng.
Infrastructure Planning Engineer
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1
Telephone: (519) 822-1260 Ext 2282
Email: arun.hindupur@guelph.ca

Mr. Rick Clement, P. Eng.
Senior Project Manager
AECOM
50 Sportsworld Crossing Road, Suite 290
Kitchener, ON N2P 0A4
Telephone: (519) 650-8710
Email: rick.clement@aecom.com

City Hall
59 Carden St
Guelph, ON
Canada
N1H 3A1

T 519-822-1260
TTY 519-826-9771

Clement, Rick

From: Marton, Jackie
Sent: Wednesday, November 27, 2013 4:04 PM
To: 'MAA.EA.Review@ontario.ca'
Cc: Clement, Rick
Subject: Notice of Public Information Centre
Attachments: Speed River Arthur Street Sanitary Sewer System.pdf

Good afternoon,

Please find attached a Notice for a Public Information Centre for Speed River Crossing for Arthur Street Sanitary Sewer Class Environmental Assessment.

Regards,

Jackie Marton
Administrative Assistant - Buildings + Places
D: 519.650.8641
Cisco Ext: 3208641
jackie.marton@aecom.com

AECOM
50 Sportsworld Crossing Road, Suite 290
Kitchener, ON N2P 0A4
T 519.650.5313 F 519.650.3424
www.aecom.com

Class Environmental Assessment

Arthur Street Trunk Sewer

The City of Guelph

Public Information Centre

December 12, 2013

Welcome

- Please sign in on the sheet provided. Then feel free to walk around and view the displays.
- If you have any questions, our representatives will be pleased to discuss the project with you.
- Comment sheets are provided for those who wish to provide comments in writing. Please place your completed sheets in the Comment Box or send them to one of the identified Project Team Members listed below.
- Please contact one of the following Team Members for additional information:

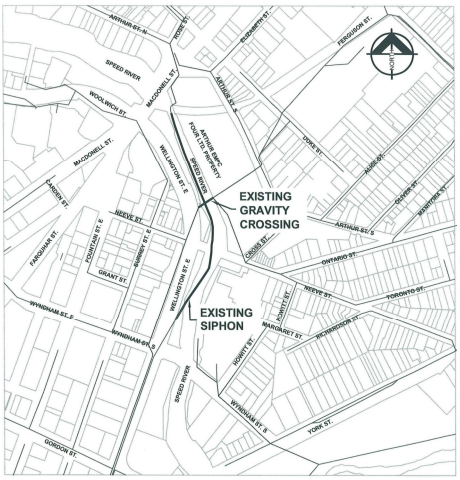
Mr. Arun Hindupur, M.Sc., P. Eng.
Infrastructure Planning Engineer
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1
Telephone: (519) 822-1260 Ext 2282
Email: arun.hindupur@guelph.ca

Mr. Rick Clement, P. Eng.
Senior Project Manager
AECOM
50 Sportsworld Crossing Road, Suite 290
Kitchener, ON N2P 0A4
Telephone: (519) 650-8710
Email: rick.clement@aecom.com

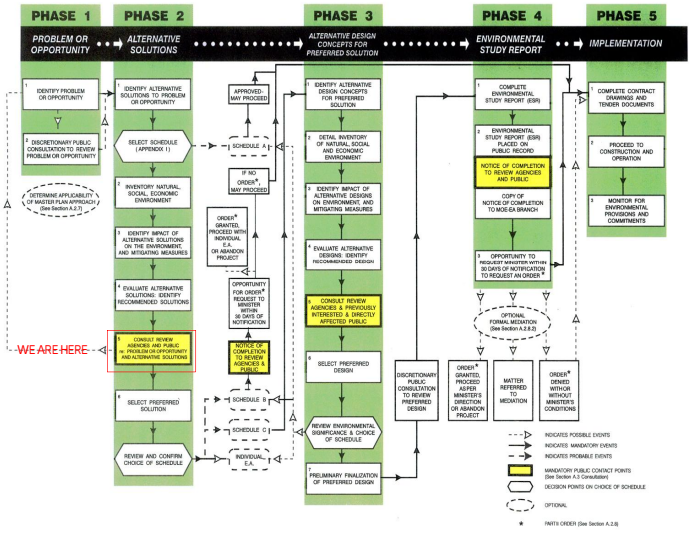
Arthur Street Trunk Sewer

Background

As part of the City's sanitary sewer drainage network, a 300mm diameter gravity sewer and a 400mm siphon cross the Speed River in the area north of Neeve Street. They connect the Arthur Street trunk sanitary sewer to the Speed River trunk sanitary sewer on Wellington Street. East of the river the 300mm diameter sewer passes through a private property. The two sewers which service a drainage area of approximately 965ha in the northeast part of the City are at the end of their service life and require replacement. Due to their age and size, they lack capacity to convey projected sewage flows. The City is undertaking a Class Environmental Assessment to identify the future location of the Speed River Crossing for the Arthur Street Sanitary Sewer or an alternative to crossing the Speed River.



Class Environmental Assessment Planning Process



Problem/Opportunity Statement

Problem Statement

Much of the City's sanitary sewer infrastructure is aging and in need of replacement. The existing Speed River crossings pose several risks due to their age and location within the river. Additionally, the ability for this portion of the Arthur Trunk Sewer to convey peak flows under existing and future growth scenarios is limited given its current condition.

Opportunity Statement

There is the opportunity to provide a new route and alignment for the Arthur Street Trunk Sewer downstream of Macdonell Street which will address environmental impacts associated with the existing infrastructure currently located in the Speed River. The new trunk sewer will also be able to convey peak flows under existing and future growth scenarios.

Alternative Solutions

❖Alternative 1: Do Nothing. This alternative is considered as the "benchmark" for which all other alternative for which all other alternatives are evaluated against. "Do Nothing" represents what would likely occur if none of the alternatives were to be implemented. With this option, there are no impacts to natural features resulting from construction activities, however, there is a potential impact to the natural environment in the event of sewer surcharging or structure failure as the current alignment will continue through the Speed River. This alternative does not address the problem statement.

❖Alternative 2: Replace the existing gravity and siphon sewers with a single gravity crossing, just upstream of the existing gravity crossing. An easement would be required across private property on the east side of the river. Sewers on Cross Street and Arthur Street would be rerouted to the new river crossing sewer. On the west side of the river, the sewer on Wellington Street would be upgraded from the new river crossing to Gordon Street. Downstream improvements would also be required to convey the design flows on the Speed River Trunk Sewer from St. Arnaud Street along Waterloo Avenue to Silvercreek Parkway South.

❖Alternative 3: Similar to Alternative 2, except there would be a siphon crossing of the Speed River, just upstream of the Neeve Street Bridge, rather than the gravity crossing.

❖Alternative 4: Replace the existing gravity and siphon sewers with a new trunk sewer along Arthur Street, down Cross Street, along Neeve Street to the river, under the Neeve Street bridge along the east river bank to the existing trail along the east side of the river, to Wyndham Street and connect to the new York Trunk Sewer in the park east of York Street.

❖Alternative 5: Similar to Alternative 4, except going along Neeve Street to Howitt Street to Wyndham Street.

Arthur Street Trunk Sewer

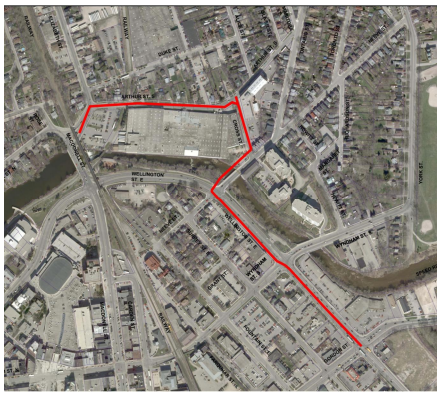
Alternative 2

LEGEND

PROPOSED TRUNK SANITARY SEWER

Arthur Street Trunk Sewer

Alternative 3

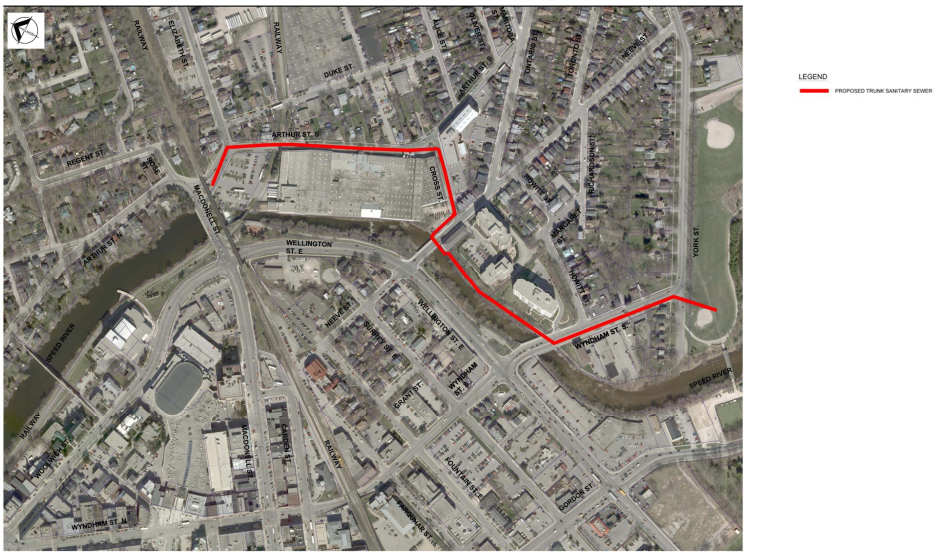


LEGEND

PROPOSED TRUNK SANITARY SEWER

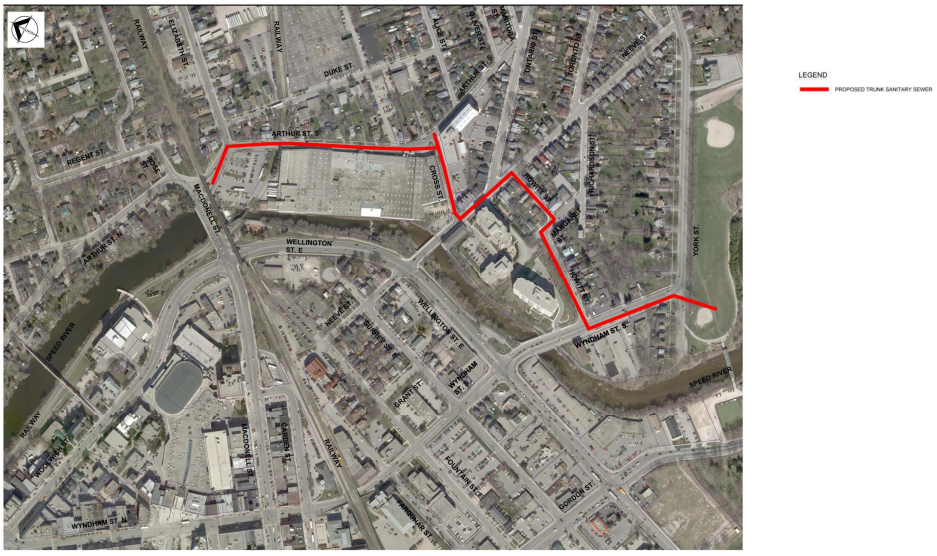
Arthur Street Trunk Sewer

Alternative 4



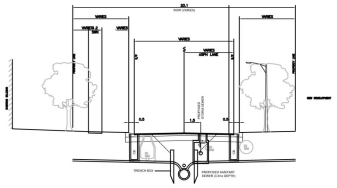
Arthur Street Trunk Sewer

Alternative 5

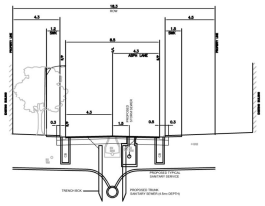


Arthur Street Trunk Sewer

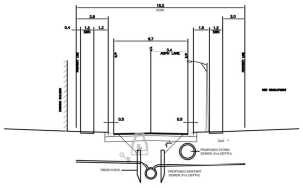
Typical Cross-Sections



SECTION TYPICAL ARTHUR STREET FROM ELIZABETH ST. TO CROSS ST. ①



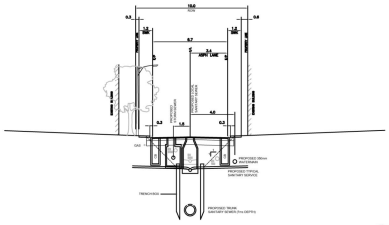
SECTION TYPICAL NEEVE STREET FROM CROSS ST. TO HOWITT ST. ③



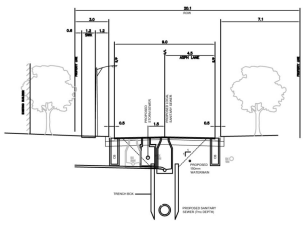
SECTION TYPICAL CROSS STREET ②

Arthur Street Trunk Sewer

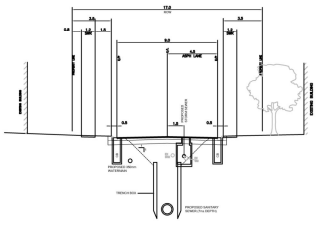
Typical Cross-Sections



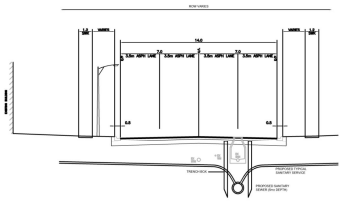
SECTION TYPICAL HOWITT STREET FROM NEEVE ST. TO MARGARET ST. ④



SECTION TYPICAL HOWITT STREET FROM MARGARET ST. TO WYNDHAM ST. S. ⑥



SECTION TYPICAL MARGARET STREET ⑤



SECTION TYPICAL WYNDHAM STREET S. FROM HOWITT ST. TO YORK RD. ⑦

Arthur Street Trunk Sewer

Evaluation Criteria of Alternative Solutions

	Alternative 1 Do Nothing	Alternative 2 Gravity Crossing to Speed Trunk	Alternative 3 Siphon Crossing to Speed Trunk	Alternative 4 Under Bridge to York Trunk	Alternative 5 Along Existing Streets to York Trunk
Addresses Problem Statement	○ does not address problem	● addresses problem	● addresses problem	● addresses problem	● addresses problem
Environmental Effects					
• Impact on Trees and Vegetation	◔ pipe failure may impact vegetation	◔ trees and vegetation at watercourse crossing impacted	◔ trees and vegetation at watercourse crossing impacted	◔ trees and vegetation along existing trail impacted	◔ limited impact to street trees
• Impact on Fisheries	○ pipe failure would impact fisheries	○ some temporary impacts to fish habitat	○ some temporary impacts to fish habitat	◔ some temporary impacts to fish habitat	● limited impacts since work is on road ROW
• Watercourse Crossing	○ existing crossings	○ crossing required	○ crossing required	◐ crossing required	● no crossing required
Social and Cultural Effects					
• Traffic Impacts	● no traffic impacts	◔ disruption to Wellington Street and Waterloo Avenue traffic	◔ disruption to Wellington Street and Waterloo Avenue traffic	◐ disruption to Wyndham Street traffic	◐ disruption to Wyndham Street and local street traffic
• Archaeological Impacts	● no change to archaeologic impacts	◔ some impacts possible - additional study required	◔ some impacts possible - additional study required	◔ some impacts possible - additional study required	◐ limited impacts since work is on road ROW
• Heritage Resource Impacts	● no change to heritage impacts	◔ some impacts possible - additional study required	◔ some impacts possible - additional study required	◔ some impacts possible - additional study required	◐ limited impacts since work is on road ROW
Economic Effects					
• Estimated Capital Cost	● maintenance of existing no new capital works	○ $329 Million	○ $153M illion	◔ $61 Million	◔ $62 Million
• Operating and Maintenance Costs	○ highest expected O & M cost	◔ river crossing impacts O & M cost	○ higher O & M due to siphon river crossing maintenance	◔ bridge crossing impacts O & M cost	◔ least expected O & M cost
• Land Acquistion Requirements	○ easement across private property required	○ easement across private property required	◔ no easement required	◔ no easement required	◔ no easement required
					Recommended Alternative

Level of Impact

- ○ *Least Preferred*
- ◔ *Low to Moderate Preference*
- ◐ *Moderate Preference*
- ◔ *Moderate to High Preference*
- ● *Most Preferred*

Arthur Street Trunk Sewer

Project Schedule

February 2013 — **December 2013** — **January 2014** — **February 2014** — **Spring 2015**

Notice of Project Initiation February, 2013

- ❖Introduce Study
- ❖Request early input
- ❖Identify stakeholders- prepare mailing list

Public Information Centre December 2013

- ❖Input required on:
  - ➢Evaluation & analysis of alternatives
  - ➢Project impacts- mitigation
  - ➢Implementation

- ❖Prepare Project File documentation

Notice of Completion & Public Review

Tentative Construction Start

Ongoing Consultation as Required

Arthur Street Trunk Sewer

Next Steps

Following the PIC, comments received from agencies & the public will be reviewed for consideration.

Alternative solution will be evaluated and a preferred solution established.

Once a preferred alternative has been selected, the project file documentation will be prepared. Review agencies & the public will be notified of the completion of the Class EA and will be provided the opportunity to comment during the 30 day period following the notification. If agencies &/or the public do not agree with the preferred solution, they can contact the Ministry of Environment and request a Part II Order for additional studies to be completed. If the Ministry agrees, a Part II Order will be issued and the proponent will be required to further the study.

Upon completion of the 30 day review period and no comments from agencies or the public, the study will be complete. The project may proceed to detailed design, tender & construction

THANK YOU FOR ATTENDING!

Your comments will be considered.

Please remember to place your completed sheets in the comment box provided.

COMMENT SHEET

Arthur Street Trunk Sewer
Class Environmental Assessment Study

Public Information Centre

We welcome and appreciate your comments. Please take some time to comment on any aspect of the Project that you consider to be important. Drop your completed Comment Sheet in the box provided, or mail/fax/e-mail your comments to either of the following individuals by **December 23, 2013**:

Mr. Arun Hindupur, M.Sc., P. Eng.
Infrastructure Planning Engineer
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1
Telephone: (519) 822-1260 Ext 2282
Email: arun.hindupur@guelph.ca

Mr. Rick Clement, P. Eng.
Senior Project Manager
AECOM
50 Sportsworld Crossing Road, Suite 290
Kitchener, ON N2P 0A4
Telephone: (519) 650-8710
Email: rick.clement@aecom.com

COMMENTS:

Thank you for your participation. Please provide your contact information below should you wish to be added to our Project Mailing List.

NAME: _____
(please print)

ADDRESS: _____

_____

POSTAL CODE: _____

PHONE: _____
(day)

NOTE: Comments and information regarding this study are being collected to assist in meeting the requirements of the *Environmental Assessment Act*. This material will be maintained on file for use during the study and may be included in project documentation. Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

PUBLIC INFORMATION CENTRE QUESTIONNAIRE

Your answers to the following questions will help us ensure future meetings take into account any concerns you may have.

How did you hear about this public meeting?

[ ] Newspaper ad [ ] Notice in mail [ ] Other (Please Specify)

_____

Please indicate your satisfaction with the following:

	***Satisfied* (Y/N)**	***If Not Satisfied, Please Specify Your Preference Here***
Location of Meeting	_____	_____
Time of Meeting	_____	_____
Day of the Week	_____	_____

On a scale from 1 to 5, where "1" is "very" and "5" is "not at all", please rate the following by circling the appropriate number:

How informative were the display materials?

Very		Somewhat		Not at all
1	*2*	*3*	*4*	*5*

How helpful were the staff and consultants in attendance?

Very		Somewhat		Not at all
1	*2*	*3*	*4*	*5*

Were all your questions answered satisfactorily?

[ ] Yes [ ] No

Other Comments:

_____

_____

_____

_____

_____

_____

_____

NOTE: Comments and information regarding this study are being collected to assist in meeting the requirements of the *Environmental Assessment Act*. This material will be maintained on file for use during the study and may be included in project documentation. Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Clement, Rick

From: Muller, Joseph (MTCS) <Joseph.Muller@ontario.ca>
Sent: Tuesday, January 14, 2014 10:31 AM
To: Clement, Rick
Cc: arun.hindupur@guelph.ca
Subject: RE: Speed River Crossing for Arthur Street Sanitary Sewer

Thanks Rick, much appreciated, and my apologies for the delayed acknowledgement, but as you infer we don't have any major concerns. I do not foresee any input on our behalf on the PIC materials, other than a reiteration of prior comments. I look forward to seeing the project file – will it be posted? Take care,

Joe

Joseph Muller, RPP, MCIP

Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Culture Services Unit

401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7

Tel. 416.314.7145 | Fax. 416.314.7175

From: Clement, Rick [mailto:Rick.Clement@aecom.com]
Sent: December 19, 2013 3:24 PM
To: Muller, Joseph (MTCS)
Cc: arun.hindupur@guelph.ca
Subject: RE: Speed River Crossing for Arthur Street Sanitary Sewer

Attached are the PIC display boards. We will be preparing the project file report in January. Our preferred alternative keeps the new trunk sewer on the road ROWs and no river crossing is required. The boards will also be available on the City's web site.

Let me know if additional information is required.

Rick Clement, P. Eng.
Senior Municipal Engineer
D 519.650.8710
rick.clement@aecom.com

AECOM
50 Sportsworld Crossing Road, Unit 290
Kitchener ON N2P 0A4
T 519.650.5313 F 519.650.3424
www.aecom.com

From: Muller, Joseph (MTCS) [Joseph.Muller@ontario.ca]
Sent: December 16, 2013 1:24 PM
To: Clement, Rick
Cc: arun.hindupur@guelph.ca
Subject: Speed River Crossing for Arthur Street Sanitary Sewer

Hello Rick Clement:

I understand that a PIC was held for the above project on December 12, 2013, but was unable to attend. Will the panels/presentation material be available online, or could digital copies be sent to me for my information? Thank-you for your assistance,

Joe

Joseph Muller, RPP, MCIP
Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Culture Services Unit
401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7
Tel. 416.314.7145 | Fax. 416.314.7175

400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

Phone: 519.621.2761 **Toll free:** 866.900.4722 **Fax:** 519.621.4844 **Online:** www.grandriver.ca

December 11th, 2013

Mr. Arun Hindupur, M. Sc. P.Eng
Infrastructure Planning Engineer
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1

Mr. Rick Clement, P. Eng.
Senior Project Manager
AECOM
50 Sportsworld Crossing Road, Suite 290
Kitchener, ON N2P 0A4

Dear Sirs;

RE: Notice of Public Meeting
Speed River Crossing for Arthur Street Sanitary Sewer, City of Guelph
Class Environmental Assessment

Thank-you for providing the Grand River Conservation Authority (GRCA) staff notice of a public meeting of the Speed River Crossing for the Arthur Street Sanitary Sewer Class Environmental Assessment.

At this time, GRCA staff will be unable to attend the Public Information Centre Open House however we would request that a copy of the slides or presentations be sent to our office to the attention of Nathan Garland or at ngarland@grandriver.ca.

The Grand River Conservation Authority is interested in continuing our involvement with this project. Please be advised that we wish to receive additional information as it becomes available. We will provide additional comments upon receipt of further details related to this project.

Should you have any questions or require further information, please do not hesitate to contact Nathan Garland at 519-621-2763 ext. 2236.

We trust this information is of assistance.

Yours truly,

Nathan Garland
Resource Planner
Grand River Conservation Authority

Appendix G

Cost Estimates

Preliminary Cost Estimate November 11, 2013
Alternative 2
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
SECTION 'A' - GENERAL ITEMS					
A1	Contract Administration				
A2	a) Mobilization and Demobilization	1	LS	$50,000.00	$50,000.00
A3	b) Bonding and Insurance	1	LS	$80,000.00	$80,000.00
A4	c) Layout by Contractor	1	LS	$25,000.00	$25,000.00
A5	d) Construction Office for Inspection Team	1	LS	$7,500.00	$7,500.00
A6	Precondition and post condition survey	1	LS	$20,000.00	$20,000.00
A7	Traffic & Pedestrian Control	1	LS	$100,000.00	$100,000.00
A8	Clearing and grubbing	1	LS	$10,000.00	$10,000.00
A9	Erosion Control	1	LS	$10,000.00	$10,000.00
TOTAL SECTION 'A'					**$302,500.00**
SECTION 'B' - CONSTRUCTION					
Waterloo Avenue					
B1	Removals	1	LS	$51,000.00	$51,000.00
B2	Sanitary sewer including rock excavation	850	m	$1,500.00	$1,275,000.00
B3	Supply and install sanitary manholes	9	ea	$12,000.00	$108,000.00
B4	Watermain and appurtenances	850	m	$300.00	$255,000.00
B5	Storm sewer and appurtenances	850	m	$600.00	$510,000.00
B6	Allowance for services	1	LS	$100,000.00	$100,000.00
B7	Road excavation	6120	m^3	$10.00	$61,200.00
B8	Road granulars	15300	tonne	$15.00	$229,500.00
B9	Asphalt	2550	tonne	$100.00	$255,000.00
B10	Topsoil and sod	8500	m^2	$10.00	$85,000.00
Subtotal					**$2,929,700.00**
Wellington Street					
B11	Removals	1	LS	$38,500.00	$38,500.00
B12	Sanitary sewer including rock excavation	550	m	$1,500.00	$825,000.00
B13	Supply and install sanitary manholes	6	ea	$12,000.00	$72,000.00
B14	Watermain and appurtenances	550	m	$300.00	$165,000.00
B15	Storm sewer and appurtenances	550	m	$600.00	$330,000.00
B16	Allowance for services	1	LS	$75,000.00	$75,000.00
B17	Road excavation	4620	m^3	$10.00	$46,200.00
B18	Road granulars	11550	tonne	$15.00	$173,250.00
B19	Asphalt	1925	tonne	$100.00	$192,500.00
B20	Topsoil and sod	2750	m^2	$10.00	$27,500.00
Subtotal					**$1,944,950.00**
Watercourse and Easement Work					
B21	Cofferdam and dewatering	1	LS	$300,000.00	$300,000.00
B22	Retaining wall work	1	LS	$100,000.00	$100,000.00
B23	Sanitary sewer including rock excavation	130	m	$1,800.00	$234,000.00
Subtotal					**$634,000.00**
Arthur Street					
B24	Removals	1	LS	$20,000.00	$20,000.00
B25	Sanitary sewer including rock excavation	400	m	$1,200.00	$480,000.00
B26	Supply and install sanitary manholes	7	ea	$12,000.00	$84,000.00
B27	Watermain and appurtenances	400	m	$300.00	$120,000.00
B28	Storm sewer and appurtenances	400	m	$500.00	$200,000.00
B29	Allowance for services	1	LS	$80,000.00	$80,000.00
B30	Allowance for railway crossings	1	LS	$250,000.00	$250,000.00
B31	Road excavation	2400	m^3	$10.00	$24,000.00

Preliminary Cost Estimate November 11, 2013
Alternative 2
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
B32	Road granulars	6000	tonne	$15.00	$90,000.00
B33	Curb and gutter	800	m	$40.00	$32,000.00
B34	Asphalt	1000	tonne	$100.00	$100,000.00
B35	Topsoil and sod	4000	m^2	$10.00	$40,000.00
Subtotal					**$1,520,000.00**
Cross Street					
B36	Removals	1	LS	$6,500.00	$6,500.00
B37	Sanitary sewer including rock excavation	130	m	$500.00	$65,000.00
B38	Supply and install sanitary manholes	3	ea	$12,000.00	$36,000.00
B39	Watermain and appurtenances	130	m	$300.00	$39,000.00
B40	Storm sewer and appurtenances	190	m	$600.00	$114,000.00
B41	Allowance for services	1	LS	$20,000.00	$20,000.00
B42	Road excavation	780	m^3	$10.00	$7,800.00
B43	Road granulars	1950	tonne	$15.00	$29,250.00
B44	Curb and gutter	260	m	$40.00	$10,400.00
B45	Asphalt	325	tonne	$100.00	$32,500.00
B46	Topsoil and sod	650	m^2	$10.00	$6,500.00
Subtotal					**$366,950.00**
TOTAL SECTION 'B'					**$7,395,600.00**

SUBTOTAL CONCEPTUAL COST ESTIMATE	**$7,698,100.00**
ENGINEERING AND CONTINGENCY ALLOWANCE (25%)	**$1,924,525.00**
SUBTOTAL	**$9,622,625.00**
HST	**$1,250,941.00**
TOTAL ESTIMATED COST	**$10,873,566.00**

Preliminary Cost Estimate November 11, 2013
Alternative 3
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
SECTION 'A' - GENERAL ITEMS					
A1	Contract Administration				
A2	a) Mobilization and Demobilization	1	LS	$50,000.00	$50,000.00
A3	b) Bonding and Insurance	1	LS	$80,000.00	$80,000.00
A4	c) Layout by Contractor	1	LS	$25,000.00	$25,000.00
A5	d) Construction Office for Inspection Team	1	LS	$7,500.00	$7,500.00
A6	Precondition and post condition survey	1	LS	$20,000.00	$20,000.00
A7	Traffic & Pedestrian Control	1	LS	$100,000.00	$100,000.00
A8	Clearing and grubbing	1	LS	$10,000.00	$10,000.00
A9	Erosion Control	1	LS	$10,000.00	$10,000.00
TOTAL SECTION 'A'					**$302,500.00**
SECTION 'B' - CONSTRUCTION					
Waterloo Avenue					
B1	Removals	1	LS	$51,000.00	$51,000.00
B2	Sanitary sewer including rock excavation	850	m	$1,500.00	$1,275,000.00
B3	Supply and install sanitary manholes	9	ea	$12,000.00	$108,000.00
B4	Watermain and appurtenances	850	m	$300.00	$255,000.00
B5	Storm sewer and appurtenances	850	m	$600.00	$510,000.00
B6	Allowance for services	1	LS	$100,000.00	$100,000.00
B7	Road excavation	6120	m^3	$10.00	$61,200.00
B8	Road granulars	15300	tonne	$15.00	$229,500.00
B9	Asphalt	2550	tonne	$100.00	$255,000.00
B10	Topsoil and sod	8500	m^2	$10.00	$85,000.00
Subtotal					**$2,929,700.00**
Wellington Street					
B11	Removals	1	LS	$35,000.00	$35,000.00
B12	Sanitary sewer including rock excavation	500	m	$1,500.00	$750,000.00
B13	Supply and install sanitary manholes	6	ea	$12,000.00	$72,000.00
B14	Watermain and appurtenances	500	m	$300.00	$150,000.00
B15	Storm sewer and appurtenances	500	m	$600.00	$300,000.00
B16	Allowance for services	1	LS	$75,000.00	$75,000.00
B17	Road excavation	4200	m^3	$10.00	$42,000.00
B18	Road granulars	10500	tonne	$15.00	$157,500.00
B19	Asphalt	1750	tonne	$100.00	$175,000.00
B20	Topsoil and sod	2500	m^2	$10.00	$25,000.00
Subtotal					**$1,781,500.00**
Watercourse and Easement Work					
B21	Cofferdam and dewatering	1	LS	$300,000.00	$300,000.00
B22	Retaining wall work	1	LS	$100,000.00	$100,000.00
B23	Allowance for working around gas and watermain	1	LS	$50,000.00	$50,000.00
B24	Sanitary sewer including rock excavation	130	m	$1,800.00	$234,000.00
Subtotal					**$684,000.00**
Arthur Street					
B25	Removals	1	LS	$20,000.00	$20,000.00
B26	Sanitary sewer including rock excavation	400	m	$1,500.00	$600,000.00
B27	Supply and install sanitary manholes	7	ea	$12,000.00	$84,000.00
B28	Watermain and appurtenances	400	m	$300.00	$120,000.00
B29	Storm sewer and appurtenances	400	m	$500.00	$200,000.00
B30	Allowance for services	1	LS	$80,000.00	$80,000.00
B31	Allowance for railway crossings	1	LS	$250,000.00	$250,000.00

Preliminary Cost Estimate November 11, 2013
Alternative 3
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
B32	Road excavation	2400	m^3	$10.00	$24,000.00
B33	Road granulars	6000	tonne	$15.00	$90,000.00
B34	Curb and gutter	800	m	$40.00	$32,000.00
B35	Asphalt	1000	tonne	$100.00	$100,000.00
B36	Topsoil and sod	4000	m^2	$10.00	$40,000.00
Subtotal					**$1,640,000.00**
Cross Street					
B37	Removals	1	LS	$6,500.00	$6,500.00
B38	Sanitary sewer including rock excavation	130	m	$1,500.00	$195,000.00
B39	Supply and install sanitary manholes	3	ea	$12,000.00	$36,000.00
B40	Watermain and appurtenances	130	m	$300.00	$39,000.00
B41	Storm sewer and appurtenances	190	m	$600.00	$114,000.00
B42	Allowance for services	1	LS	$20,000.00	$20,000.00
B43	Road excavation	780	m^3	$10.00	$7,800.00
B44	Road granulars	1950	tonne	$15.00	$29,250.00
B45	Curb and gutter	260	m	$40.00	$10,400.00
B46	Asphalt	325	tonne	$100.00	$32,500.00
B47	Topsoil and sod	650	m^2	$10.00	$6,500.00
Subtotal					**$496,950.00**
TOTAL SECTION 'B'					**$7,532,150.00**

SUBTOTAL CONCEPTUAL COST ESTIMATE	**$7,834,650.00**
ENGINEERING AND CONTINGENCY ALLOWANCE (25%)	**$1,958,663.00**
SUBTOTAL	**$9,793,313.00**
HST	**$1,273,131.00**
TOTAL ESTIMATED COST	**$11,066,444.00**

Preliminary Cost Estimate November 11, 2013
Alternative 4
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
SECTION 'A' - GENERAL ITEMS					
A1	Contract Administration				
A2	a) Mobilization and Demobilization	1	LS	$50,000.00	$50,000.00
A3	b) Bonding and Insurance	1	LS	$80,000.00	$80,000.00
A4	c) Layout by Contractor	1	LS	$25,000.00	$25,000.00
A5	d) Construction Office for Inspection Team	1	LS	$7,500.00	$7,500.00
A6	Precondition and post condition survey	1	LS	$20,000.00	$20,000.00
A7	Traffic & Pedestrian Control	1	LS	$50,000.00	$50,000.00
A8	Clearing and grubbing	1	LS	$10,000.00	$10,000.00
A9	Erosion Control	1	LS	$10,000.00	$10,000.00
TOTAL SECTION 'A'					**$252,500.00**
SECTION 'B' - CONSTRUCTION					
Park to York Street					
B1	Removals	1	LS	$500.00	$500.00
B2	Sanitary sewer including rock excavation	70	m	$1,500.00	$105,000.00
B3	Supply and install sanitary manholes	2	ea	$12,000.00	$24,000.00
B4	Topsoil and sod	1000	m^2	$10.00	$10,000.00
Subtotal					**$139,500.00**
York Street/Wyndham Street					
B5	Removals	1	LS	$15,800.00	$15,800.00
B6	Sanitary sewer including rock excavation	225	m	$1,500.00	$337,500.00
B7	Supply and install sanitary manholes	2	ea	$12,000.00	$24,000.00
B8	Watermain and appurtenances	225	m	$300.00	$67,500.00
B9	Allowance for services	1	LS	$5,000.00	$5,000.00
B10	Road excavation	1890	m^3	$10.00	$18,900.00
B11	Road granulars	4725	tonne	$15.00	$70,875.00
B12	Asphalt	787.5	tonne	$100.00	$78,750.00
B13	Topsoil and sod	1125	m^2	$10.00	$11,250.00
Subtotal					**$629,575.00**
Trail along River					
B14	Removals	1	LS	$3,400.00	$3,400.00
B15	Sanitary sewer including rock excavation	195	m	$1,500.00	$292,500.00
B16	Supply and install sanitary manholes	3	ea	$12,000.00	$36,000.00
B17	Allowance for services	1	LS	$10,000.00	$10,000.00
B18	Trail restoration	585	m^2	$50.00	$29,250.00
B19	Trees	1	LS	$20,000.00	$20,000.00
B20	Topsoil and sod	1365	m^2	$10.00	$13,650.00
Subtotal					**$404,800.00**
Watercourse Work					
B21	Cofferdam and dewatering	1	LS	$300,000.00	$300,000.00
B22	Retaining wall work	1	LS	$100,000.00	$100,000.00
B23	Allowance for support of gas and water	1	LS	$100,000.00	$100,000.00
B24	Sanitary sewer including rock excavation	50	m	$2,500.00	$125,000.00
Subtotal					**$625,000.00**
Neeve Street					
B25	Removals	1	LS	$1,800.00	$1,800.00
B26	Sanitary sewer including rock excavation	50	m	$1,500.00	$75,000.00
B27	Supply and install sanitary manholes	2	ea	$12,000.00	$24,000.00
B28	Allowance for services	1	LS	$5,000.00	$5,000.00
B29	Road excavation	210	m^3	$10.00	$2,100.00

Preliminary Cost Estimate November 11, 2013
Alternative 4
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
B30	Road granulars	525	tonne	$15.00	$7,875.00
B31	Asphalt	87.5	tonne	$100.00	$8,750.00
B32	Topsoil and sod	250	m^2	$10.00	$2,500.00
Subtotal					**$127,025.00**
Cross Street					
B33	Removals	1	LS	$6,500.00	$6,500.00
B34	Sanitary sewer including rock excavation	130	m	$1,500.00	$195,000.00
B35	Supply and install sanitary manholes	3	ea	$12,000.00	$36,000.00
B36	Watermain and appurtenances	130	m	$300.00	$39,000.00
B37	Storm sewer and appurtenances	190	m	$600.00	$114,000.00
B38	Allowance for services	1	LS	$20,000.00	$20,000.00
B39	Road excavation	780	m^3	$10.00	$7,800.00
B40	Road granulars	1950	tonne	$15.00	$29,250.00
B41	Curb and gutter	260	m	$40.00	$10,400.00
B42	Asphalt	325	tonne	$100.00	$32,500.00
B43	Topsoil and sod	650	m^2	$10.00	$6,500.00
Subtotal					**$496,950.00**
Arthur Street					
B44	Removals	1	LS	$20,000.00	$20,000.00
B45	Sanitary sewer including rock excavation	400	m	$1,500.00	$600,000.00
B46	Supply and install sanitary manholes	7	ea	$12,000.00	$84,000.00
B47	Watermain and appurtenances	400	m	$300.00	$120,000.00
B48	Storm sewer and appurtenances	400	m	$500.00	$200,000.00
B49	Allowance for services	1	LS	$80,000.00	$80,000.00
B50	Allowance for railway crossings	1	LS	$250,000.00	$250,000.00
B51	Road excavation	2400	m^3	$10.00	$24,000.00
B52	Road granulars	6000	tonne	$15.00	$90,000.00
B53	Curb and gutter	800	m	$40.00	$32,000.00
B54	Asphalt	1000	tonne	$100.00	$100,000.00
B55	Topsoil and sod	4000	m^2	$10.00	$40,000.00
Subtotal					**$1,640,000.00**
TOTAL SECTION 'B'					**$4,062,850.00**

SUBTOTAL CONCEPTUAL COST ESTIMATE	**$4,315,350.00**
ENGINEERING AND CONTINGENCY ALLOWANCE (25%)	**$1,078,838.00**
SUBTOTAL	**$5,394,188.00**
HST	**$701,244.00**
TOTAL ESTIMATED COST	**$6,095,432.00**

Preliminary Cost Estimate November 11, 2013
Alternative 5
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
SECTION 'A' - GENERAL ITEMS					
A1	Contract Administration				
A2	a) Mobilization and Demobilization	1	LS	$50,000.00	$50,000.00
A3	b) Bonding and Insurance	1	LS	$80,000.00	$80,000.00
A4	c) Layout by Contractor	1	LS	$25,000.00	$25,000.00
A5	d) Construction Office for Inspection Team	1	LS	$7,500.00	$7,500.00
A6	Precondition and post condition survey	1	LS	$20,000.00	$20,000.00
A7	Traffic & Pedestrian Control	1	LS	$50,000.00	$50,000.00
A8	Clearing and grubbing	1	LS	$10,000.00	$10,000.00
A9	Erosion Control	1	LS	$10,000.00	$10,000.00
TOTAL SECTION 'A'					**$252,500.00**
SECTION 'B' - CONSTRUCTION					
Park to York Street					
B1	Removals	1	LS	$500.00	$500.00
B2	Sanitary sewer including rock excavation	70	m	$1,500.00	$105,000.00
B3	Supply and install sanitary manholes	2	ea	$12,000.00	$24,000.00
B4	Topsoil and sod	1000	m^2	$10.00	$10,000.00
Subtotal					**$139,500.00**
York Street/Wyndham Street					
B5	Removals	1	LS	$9,800.00	$9,800.00
B6	Sanitary sewer including rock excavation	140	m	$1,500.00	$210,000.00
B7	Supply and install sanitary manholes	2	ea	$12,000.00	$24,000.00
B8	Watermain and appurtenances	140	m	$300.00	$42,000.00
B9	Allowance for services	1	LS	$3,000.00	$3,000.00
B10	Road excavation	1176	m^3	$10.00	$11,760.00
B11	Road granulars	2940	tonne	$15.00	$44,100.00
B12	Asphalt	490	tonne	$100.00	$49,000.00
B13	Topsoil and sod	700	m^2	$10.00	$7,000.00
Subtotal					**$400,660.00**
Howitt and Margaret Streets					
B14	Removals	1	LS	$15,000.00	$15,000.00
B15	Sanitary sewer including rock excavation	300	m	$1,800.00	$540,000.00
B16	Supply and install sanitary manholes	6	ea	$12,000.00	$72,000.00
B17	Watermain and appurtenances	300	m	$300.00	$90,000.00
B18	Storm sewer and appurtenances	300	m	$600.00	$180,000.00
B19	Allowance for services	1	LS	$50,000.00	$50,000.00
B20	Road excavation	1800	m^3	$10.00	$18,000.00
B21	Road granulars	4500	tonne	$15.00	$67,500.00
B22	Curb and gutter	600	m	$40.00	$24,000.00
B23	Asphalt	750	tonne	$100.00	$75,000.00
B24	Topsoil and sod	3000	m^2	$10.00	$30,000.00
Subtotal					**$1,161,500.00**
Neeve Street					
B25	Removals	1	LS	$3,900.00	$3,900.00
B26	Sanitary sewer including rock excavation	110	m	$1,500.00	$165,000.00
B27	Supply and install sanitary manholes	2	ea	$12,000.00	$24,000.00
B28	Allowance for services	1	LS	$25,000.00	$25,000.00
B29	Road excavation	462	m^3	$10.00	$4,620.00
B30	Road granulars	1155	tonne	$15.00	$17,325.00
B31	Asphalt	192.5	tonne	$100.00	$19,250.00

Preliminary Cost Estimate
Alternative 5
Arthur Trunk Sanitary Sewer Class EA

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Estimated Total
B32	Topsoil and sod	550	m^2	$10.00	$5,500.00
Subtotal					**$264,595.00**
Cross Street					
B33	Removals	1	LS	$6,500.00	$6,500.00
B34	Sanitary sewer including rock excavation	130	m	$1,500.00	$195,000.00
B35	Supply and install sanitary manholes	3	ea	$12,000.00	$36,000.00
B36	Watermain and appurtenances	130	m	$300.00	$39,000.00
B37	Storm sewer and appurtenances	190	m	$600.00	$114,000.00
B38	Allowance for services	1	LS	$20,000.00	$20,000.00
B39	Road excavation	780	m^3	$10.00	$7,800.00
B40	Road granulars	1950	tonne	$15.00	$29,250.00
B41	Curb and gutter	260	m	$40.00	$10,400.00
B42	Asphalt	325	tonne	$100.00	$32,500.00
B43	Topsoil and sod	650	m^2	$10.00	$6,500.00
Subtotal					**$496,950.00**
Arthur Street					
B44	Removals	1	LS	$20,000.00	$20,000.00
B45	Sanitary sewer including rock excavation	400	m	$1,500.00	$600,000.00
B46	Supply and install sanitary manholes	7	ea	$12,000.00	$84,000.00
B47	Watermain and appurtenances	400	m	$300.00	$120,000.00
B48	Storm sewer and appurtenances	400	m	$500.00	$200,000.00
B49	Allowance for services	1	LS	$80,000.00	$80,000.00
B50	Allowance for railway crossings	1	LS	$250,000.00	$250,000.00
B51	Road excavation	2400	m^3	$10.00	$24,000.00
B52	Road granulars	6000	tonne	$15.00	$90,000.00
B53	Curb and gutter	800	m	$40.00	$32,000.00
B54	Asphalt	1000	tonne	$100.00	$100,000.00
B55	Topsoil and sod	4000	m^2	$10.00	$40,000.00
Subtotal					**$1,640,000.00**
TOTAL SECTION 'B'					**$4,103,205.00**

SUBTOTAL CONCEPTUAL COST ESTIMATE	**$4,355,705.00**
ENGINEERING AND CONTINGENCY ALLOWANCE (25%)	**$1,088,926.00**
SUBTOTAL	**$5,444,631.00**
HST	**$707,802.00**
TOTAL ESTIMATED COST	**$6,152,433.00**