STANDARD LIMITATIONS

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The disclosure of any information contained in this report is the sole responsibility of the City. The material in this report and all information relating to this activity reflect MMM’s judgment in light of the information available to us at the time of preparation of this report. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. MMM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

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This Standard Limitations statement is considered part of this report.
EXECUTIVE SUMMARY

Background

This Environmental Study Report (ESR) documents the Ottawa-Trussler Area Sewage Facility Municipal Class Environmental Assessment (EA) Schedule B study. It is important to acknowledge at this early stage that this report has been named an “Environmental Study Report”, or “ESR”, specifically to meet the reporting conventions of the City of Kitchener. The naming of this report as an “ESR” does not infer that this EA has been undertaken in accordance with Schedule C requirements as defined by the Municipal Class EA document (2000, as amended in 2007 & 2011). This EA has instead been undertaken to fulfil Schedule B requirements (as would normally be demonstrated through a Project File Report), as is fitting for the infrastructure works which form the proposed undertaking and the anticipated scale of associated potential environmental effects. As a Schedule B undertaking, this ESR has been undertaken to satisfy Phases 1 and 2 of Municipal Class EA process. This includes the development of a Problem/Opportunity statement, development of alternative solutions and designs, and evaluation of the alternative solutions against relevant natural environment, socio-cultural environment, and construction, financial and technical criteria. The Class EA has followed a comprehensive public and stakeholder consultation program which included two Public Information Centres (PICs).

Problem/Opportunity Statement

To support the development of the Laurentian West Phase 3b Community and surrounding area, sanitary sewage servicing is being planned. Servicing may require a pumping station, forcemain, and downstream upgrades to convey the flow. This study:

- Identifies alternatives for wastewater collection and pumping;
- Identifies alternatives for forcemain and routing;
- Reviews the downstream capacity of the existing sanitary collection system and the Borden Trunk; and
- Recommends the collection, pumping capacity, pumping station location, forcemain route and any other upgrades required in the existing downstream sewage network.

A key objective of the study is to protect the environment, as defined in the Ontario Environmental Assessment Act (EA Act), through the wise management of resources. This has been achieved by identifying appropriate mitigation and monitoring measures to minimize the potential adverse environmental effects. In addition, the participation of a broad range of stakeholders in the study process has allowed for the sharing of ideas and identification of creative solutions that are acceptable to affected and interested parties.

Alternative Solutions

A number of alternative solutions were developed to address the problem/opportunity statement as summarized in Table ES1 and presented graphically in Figure ES1.
<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do Nothing</td>
</tr>
</tbody>
</table>
| 2A          | • Construct new pumping station on development property **within the Activa Trussler North Subdivision (ATNS)**.  
• Construct new forcemain **routed through ATNS** and then along Ottawa Street South for discharge to new maintenance hole (MH) structure at the intersection of Ottawa Street South and David Bergey Drive.  
• Existing Mannheim Estates Sewage Pumping Station (MESPS) and forcemain would remain unchanged. |
| 2B          | • Construct new pumping station on property **along Trussler Road**.  
• Construct new forcemain **routed along Trussler Road** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
• Existing MESPS and forcemain would remain unchanged. |
| 3A          | • Construct new pumping station on property **along Trussler Road**.  
• Construct new forcemain **routed through ATNS** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
• Existing MESPS and forcemain would remain unchanged. |
| 3B          | • Construct new pumping station on property along Trussler Road  
• Construct new forcemain **routed along Trussler Road** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
• Existing MESPS and forcemain would remain unchanged. |
| 4A          | • Construct new gravity sewer from ATNS to existing MESPS capturing flow from ATNS and serviceable/developable properties along Trussler Road and Ottawa Street South.  
• Upgrade existing MESPS and construct new forcemain **routed through existing development, across Trussler Road, through ATNS** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive. |
| 4B          | • Construct new gravity sewer from ATNS to existing MESPS capturing flow from ATNS and serviceable/developable properties along Trussler Road and Ottawa Street South.  
• Upgrade existing MESPS and construct new forcemain **routed through existing development, along Trussler Road, and then along Ottawa Street South** for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive. |
| 5A          | • Construct new pumping station on development property **within ATNS**.  
• Construct new forcemain **through ATNS** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
• Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain or retain as backup connection. |
| 5B          | • Construct new pumping station on development property **within ATNS**.  
• Construct new forcemain **along Trussler Road** and Ottawa Street South and discharge to MH on Ottawa Street South  
• Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain or retain as backup connection. |
| 6A          | • Construct new pumping station on property **along Trussler Road**  
• Construct new forcemain **through ATNS** and discharge to MH on Ottawa Street South.  
• Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain or retain as backup connection. |
| 6B          | • Construct new pumping station on property along Trussler Road  
• Construct new forcemain **along Trussler Road** and Ottawa Street South and discharge to MH on Ottawa Street South.  
• Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain along Trussler Road and Ottawa Street South or retain as backup connection. |
These alternative solutions (excluding Alternatives 3 and 6 – which were screened out at an earlier stage) were evaluated against a set of defined evaluation criteria covering the Natural Environment, Sociocultural Environment, Construction, Financial and Technical categories.

The preferred alternative was determined to be Alternative 2A. In comparison to other alternatives, Alternative 2A performs better against socio-cultural criteria, construction criteria, financial criteria and technical criteria. While the Do Nothing does not result in any potential adverse environmental effects, it clearly does not address the problem/opportunity and study objectives, and does not provide the necessary infrastructure to support future servicing needs or City-wide growth targets.

Preferred Alternative

The recommended Pumping Station concept design depicted in Figure ES2 integrates form and function into a unified and compact structure; incorporating architectural, landscaping and security features to enhance its visual appearance and help the facility integrate within the proposed Activa Trussler North Subdivision (ATNS). The recommended facility design is based on a projected ultimate peak pumping (firm) capacity of at least 60 litres per second (L/s) and would include an automated pumping system with Supervisory Control and Data Acquisition (SCADA) integration, emergency wastewater storage, a diesel powered emergency generator, and appropriate odour, emissions and noise controls.
Flow collected at the pumping station will be pumped through a dedicated 250 mm diameter sewage forcemain, which exits the pumping station site as shown in Figure ES3 below.

The proposed forcemain will then be routed initially along roadways within the proposed ATNS and then routed within the Ottawa Street South right-of-way (shown in Figure ES4 below), initially passing the Region of Waterloo Mannheim Water Treatment Plant (WTP), water storage facility and buried water transmission infrastructure.
Following a carefully planned and designed route along the existing Ottawa Street South right-of-way, the forcemain will pass existing and future residential lands, open areas as well as environmentally sensitive lands. The forcemain design will incorporate appropriate mitigation measures and controls to protect all adjacent and nearby lands as required during and following construction activities.

The sewage forcemain is designed to connect into the City of Kitchener’s (the City) existing gravity sewer system, currently proposed to be at the intersection of Ottawa Street South and David Bergey Drive, as shown in Figure ES5.

This connection point was determined to have sufficient local and downstream capacity, verified using the City’s InfoSWMM sanitary sewer model to hydraulically analyze the impact of the new pumping station flow and other local inputs on the City’s existing sewer network.
Potential Environmental Effects and Mitigation Measures

Mitigation measures have been identified to mitigate potential adverse environmental effects related to the preferred alternative. The key potential effects and associated mitigation measures are summarized in Table ES2.

**Table ES2 Key Mitigation Measures**

<table>
<thead>
<tr>
<th>Potential Effects</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Environment</strong></td>
<td><strong>Mitigation</strong></td>
</tr>
<tr>
<td>• Sediment release into adjacent Locally Significant Wetland (LSW) and pond</td>
<td>• A portion of the forcemain construction and staging running parallel to Ottawa Street South is constrained within the existing right-of-way</td>
</tr>
<tr>
<td>(assumed fish habitat) if forcemain is constructed on south side of Ottawa</td>
<td>• Sheet pile and/or close couple caisson wall for deeper excavations to reduce construction footprint</td>
</tr>
<tr>
<td>Street South*</td>
<td>• Siltation control fencing and filter bags or settling ponds for pumped groundwater</td>
</tr>
<tr>
<td>• Removal of a portion of a hedgerow and cultural vegetation mosaic and temporary</td>
<td>• Exposed surfaces stabilized and revegetated asap to provide erosion control</td>
</tr>
<tr>
<td>disturbance of active agricultural fields</td>
<td>• Grand River Conservation Authority (GRCA) to be consulted at detailed design to discuss potential permits/approvals</td>
</tr>
<tr>
<td>and roadside cultural meadow</td>
<td><strong>In addition to the above measures:</strong></td>
</tr>
<tr>
<td>*The exact forcemain alignment within the road right-of-way is to be established</td>
<td>• Wildlife exclusion fencing to be installed prior to construction in accordance with the Ontario Ministry of Natural Resources (MNR) best practice guidance (e.g. Reptile &amp; Amphibian Exclusion Fencing)</td>
</tr>
<tr>
<td>during detailed design – the north side of Ottawa Street South would reduce</td>
<td>• No in-water works or works that may alter water levels in the LSW or adjacent pond to be conducted from October to April</td>
</tr>
<tr>
<td>potential effects.</td>
<td>• Consult with MNR SAR biologist during detailed design to discuss potential permits/registrations</td>
</tr>
<tr>
<td>• Excavation along the edge of the LSW (Species at Risk (SAR) turtle habitat) and</td>
<td><strong>Sociocultural Environment</strong></td>
</tr>
<tr>
<td>if SAR turtles enter construction zone during their active period could potentially</td>
<td>• Develop comprehensive Traffic Management Plan in consultation with the City/Region/Ministry of Transportation (MTO)</td>
</tr>
<tr>
<td>result in injury/mortality</td>
<td>• Maintain access to residential properties during construction</td>
</tr>
<tr>
<td>• Eastern Ribbonsnake may also be affected by excavation along the edge of the LSW</td>
<td>• Minor visual impact of pumping station on surrounding future residential landscape</td>
</tr>
<tr>
<td>• Disturbance of cultural meadow habitat and associated brush piles may affect</td>
<td>• Pumping station will be designed to blend into the future residential landscape (e.g. vegetation screening)</td>
</tr>
<tr>
<td>Milksnake</td>
<td><strong>In addition to the above measures:</strong></td>
</tr>
<tr>
<td></td>
<td>• Develop comprehensive Traffic Management Plan in consultation with the City/Region/Ministry of Transportation (MTO)</td>
</tr>
<tr>
<td></td>
<td>• Maintain access to residential properties during construction</td>
</tr>
</tbody>
</table>

FINAL Environmental Study Report | Ottawa-Trussler Area Sewage Facility
Schedule B Class Environmental Assessment
MMM Group Limited | January 2014 | 1013007-001
### Potential Effects

- May be minor/temporary perceptible change in the visual, audible and atmospheric conditions at 632 Trussler Road during construction

### Mitigation

- Distance between property and pumping station will lessen any potential effects
- No construction activities to occur before the Ontario Ministry of Tourism, Culture & Sport (MTCS) has confirmed archaeological licensing and technical review requirements are met

### Construction

- Potential need for dewatering during excavation

### Mitigation

- Use appropriate energy dissipation and settling and filtration measures for discharging water to minimize potential erosion and sediment release to watercourses
- Remove sheet piling after construction to prevent obstruction of groundwater movement
- Requirement for Permit to Take Water (PTTW) to be confirmed with the Ontario Ministry of the Environment (MOE) during detailed design

- Dust, odour and noise emissions during construction

### Mitigation

- Use of dust suppression methods (e.g. water)
- Proper maintenance and operation of equipment and vehicles to reduce dust and noise
- Install noise barriers around construction areas in close proximity to sensitive receptors
- Schedule activities such as cutting and grinding to minimize noise emissions to adjacent properties
- Adhere to City’s noise by-law relating to construction works
- Design odour emission controls during detailed design to meet MOE requirements

### Impact on existing utilities

### Mitigation

- Consult with utility providers (e.g. hydro, Union Gas) during detailed design

### Need to restore disturbed areas

### Mitigation

- Disturbed areas will be returned to previous (or better) condition where possible

### Technical

- Potential for leakage into nearby Well Head Protection Zone

### Mitigation

- Follow MOE and GRCA regulations relating to water resources
- Develop and implement Spill Prevention, Containment and Clean-Up Contingency
As part of overall implementation and monitoring and to ensure long-term operation and servicing goals will be achieved, the City is planning to monitor flow in the vicinity of the discharge point. This will allow the City to measure the combined flow from the new Pumping Station and all adjoining catchment areas. This will help to proactively assess the need for any future system enhancements or upgrades to accommodate future growth and increased sewage flow from the Laurentian West Phase 3B area as outlined in Kitchener’s Growth Management Plan (KGMP).

### Public Consultation

The EA study involved the following public and agency stakeholder consultation:

- **Notice of Commencement** – to introduce the study; this was mailed to residents within the study area, identified agencies and stakeholders, and published in *The Record*.
- **Notice of Public Information Centre 1 and PIC 1** – the notice was mailed to residents within the study area, identified agencies and stakeholders, and published in *The Record*. PIC 1 focused on the study scope and objectives, the technical investigations to be undertaken, and information on the preliminary criteria for evaluating the alternatives.
- **Notice of Public Information Centre 2 and PIC 2** – the notice was mailed to residents within the study area, identified agencies and stakeholders, and published in *The Record*. PIC 2 focused on the evaluation of alternative solutions and the preliminary preferred alternative.
- **Presentation to the City of Kitchener Environmental Committee on the study findings.**
- **Presentation to the City of Kitchener Planning & Strategic Initiatives Committee on the study findings.**
- **Report to City of Kitchener Council.**
- **Notice of Study Completion.**

Additionally, a comment tracking table was maintained throughout the study to document any comments received by members of the public, agencies or other key stakeholders. This also documents how these comments were addressed.

### Next Steps

Permit and approvals will be confirmed during the detailed design stage and may include the following:

- **Ministry of the Environment – Environmental Compliance Approval (ECA) / Environmental Activity and Sector Registry (EASR) (conditional).**
- **Ministry of the Environment – Permit to Take Water (conditional).**
- **Further dialogue with an MNR SAR biologist is required once final construction and excavation requirements are known. ESA SAR permitting or registration with MNR following the new ESA rules effective July 1 2013 would be items of discussion at that time.**
• Any relevant permits or approvals required upon consultation regarding the detailed design with GRCA.
• City of Kitchener – Site Plan Approval and Building Permit.
• Required approvals from the Region of Waterloo.
• Any relevant approvals from utility providers upon consultation (e.g. Hydro, Union Gas).
• Plan of Subdivision approval.

Specific monitoring measures will include the following:

• Provision of flow monitoring by the City to measure actual output from the new subdivision and adjoining catchment areas to assess the need for any future system enhancements or upgrades to accommodate future growth and increased flow from the catchment area.
• Site design and pipeline installation corridor design should incorporate multiple protection barriers to prevent adverse impacts to adjacent or nearby environmentally sensitive areas. Barriers will be designed primarily to prevent intrusion into the active working areas and the erosion and transportation of sediment.
• City requirements as may be applied to this infrastructure.
• Operational Monitoring.
• Asset Management and Preventative Maintenance.

Once all facilities are fully installed and put into operation and disturbed areas have been stabilized, temporary mitigative measures along with regular areal inspections may no longer be required.
## Glossary of Terms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ADF</td>
<td>Average Day Flow</td>
</tr>
<tr>
<td>ATNS</td>
<td>Activa Trussler North Subdivision</td>
</tr>
<tr>
<td>ATS</td>
<td>Automatic Transfer Switch</td>
</tr>
<tr>
<td>City</td>
<td>City of Kitchener</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>EASR</td>
<td>Environmental Activity and Sector Registry</td>
</tr>
<tr>
<td>ECA</td>
<td>Environmental Compliance Approval</td>
</tr>
<tr>
<td>ESA</td>
<td>Endangered Species Act</td>
</tr>
<tr>
<td>ESR</td>
<td>Environmental Study Report</td>
</tr>
<tr>
<td>GRCA</td>
<td>Grand River Conservation Authority</td>
</tr>
<tr>
<td>KGMP</td>
<td>Kitchener Growth Management Plan</td>
</tr>
<tr>
<td>L/s</td>
<td>Litres per second</td>
</tr>
<tr>
<td>LSW</td>
<td>Locally Significant Wetland</td>
</tr>
<tr>
<td>MESPS</td>
<td>Mannheim Estates Sewage Pumping Station</td>
</tr>
<tr>
<td>MH</td>
<td>Maintenance Hole</td>
</tr>
<tr>
<td>MOE</td>
<td>Ontario Ministry of the Environment</td>
</tr>
<tr>
<td>MTCS</td>
<td>Ontario Ministry of Tourism, Culture and Sport</td>
</tr>
<tr>
<td>MTO</td>
<td>Ontario Ministry of Transportation</td>
</tr>
<tr>
<td>PFR</td>
<td>Project File Report</td>
</tr>
<tr>
<td>PIC</td>
<td>Public Information Centre</td>
</tr>
<tr>
<td>PTTW</td>
<td>Permit to Take Water</td>
</tr>
<tr>
<td>Region</td>
<td>Region of Waterloo</td>
</tr>
<tr>
<td>SAR</td>
<td>Species at Risk</td>
</tr>
<tr>
<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
</tr>
<tr>
<td>WTP</td>
<td>Water Treatment Plant</td>
</tr>
</tbody>
</table>
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APPENDICES

Appendix A – Natural Environment Existing Conditions Technical Memo

Appendix B – Stage 1 Archaeological Assessment

Appendix C – Data and Financial Analysis

Appendix D – Evaluation Matrix

Appendix E – Public and Agency Consultation Record
1 INTRODUCTION & BACKGROUND

1.1 STUDY LOCATION AND PURPOSE

The City of Kitchener is located in the Regional Municipality of Waterloo and is the largest municipality of seven within the Region. The study area for this Municipal Class Environmental Assessment (EA) (Figure 1.1) is located on the western edge of the City and is broadly bounded by the Mannheim Estates area to the west (within neighbouring Wilmot Township), Conestoga Parkway/Highway 7 & 8 to the north, Bleams Road to the south, and along Ottawa Street South through the Laurentian Village Subdivision up to David Bergey Drive in the east. A significant portion of the study area is occupied by the Region of Waterloo Mannheim Water Treatment Plant (WTP) property and associated wells, water transmission and storage facilities.

Figure 1.1 Study Area
The study area encompasses the proposed Laurentian West Phase 3B Community (known for the purposes of this study as the Ottawa-Trussler Area) and the study was initiated to support the development of this area by providing sanitary sewage servicing. The City identified this as an opportunity to initiate a Municipal Class EA. Through consultation with stakeholders, including the Region of Waterloo and Township of Wilmot, it was determined that there are no immediate plans to expand the Mannheim Estates, or take existing residences off of septic systems.

The study area was amended following Public Information Centre (PIC) #1 and in advance of PIC #2. The rationale for amending the study area (the final study area is shown in Figure 1.1) was to include potential infrastructure, sewage inputs and environmental effects that may occur outside of the original study area presented in the study Terms of Reference. Addresses included within the amended study area were included in the study mailing list and the public was notified of this amendment (as described in Section 8.4.1).

1.2 THE STUDY PROBLEM / OPPORTUNITY STATEMENT

Phase 1 of the Municipal Class EA process (described later in Section 2 of this report) is based on the identification of a problem or opportunity. The problem/opportunity statement is as follows:

To support the development of the Laurentian West Phase 3b Community and surrounding area, sanitary sewage servicing is being planned. Servicing may require a pumping station, forcemain, and downstream upgrades to convey the flow. This study will:

- Identify alternatives for wastewater collection and pumping;
- Identify alternatives for forcemain and routing;
- Review the downstream capacity of the existing sanitary collection system and the Borden Trunk; and
- Recommend the collection, pumping capacity, pumping station location, forcemain route and any other upgrades required in the existing downstream sewage network.

A key objective of the study is to protect the environment, as defined in the Ontario Environmental Assessment Act (EA Act), through the wise management of resources. This will be achieved by identifying appropriate mitigation and monitoring measures to minimize the potential adverse environmental effects. In addition, the participation of a broad range of stakeholders in the study process will allow for the sharing of ideas and identification of creative solutions that are acceptable to affected and interested parties.

---

1 Environmental Assessment Act R.S.O. 1990
1.3 EXISTING INFRASTRUCTURE
The City is responsible for operating and maintaining the sanitary sewer network and pumping stations within its boundaries, while the Region of Waterloo is responsible for operating and maintaining the wastewater treatment plants within the City of Kitchener’s boundaries. The City also maintains a calibrated sanitary sewer hydraulic model, InfoSWMM®, which is used exclusively by the City to analyze the capacity of the existing sanitary sewer system, seen in Figure 1.2.

![Figure 1.2 City of Kitchener Sanitary Sewer Network](image)

The model is recognized to be particularly useful in assessing the impacts of changes in sewage flows on the conveyance capacity of the sewer network and in identifying potential capacity constraints. The Laurentian West Phase 3B area lies at the upper reaches of the City’s sewer network and is largely undeveloped.

Land to the west of Trussler Road (in the western portion of the study area), known as the Mannheim
Estates subdivision and located in the Township of Wilmot, was developed in 2001. These lands are currently serviced by the Mannheim Estates Sewage Pumping Station (MESPS), rated at about 7 L/s, which conveys sewage through a 1.7 km long by 150 mm diameter forcemain routed along Trussler Road and Ottawa Street South and discharges to a maintenance hole (MH) located close to the high point on Ottawa Street South. This is essentially the current end point of this portion of the existing gravity sewer network along Ottawa Street South and this input must be accounted for in assessing the sanitary sewer system capacity.

Lands northwest of the intersection of Ottawa Street South and David Bergey Drive served by Prosperity Drive and Foxglove Crescent are currently serviced by an existing gravity system which currently acts as a bridge between the existing gravity sewer on Ottawa Street South and David Bergey Drive. Some additional higher density development along and south of Ottawa Street South, adjacent the Region’s Mannheim WTP also discharges to the gravity sewer on Ottawa Street South.

The City’s Terms of Reference for this Class EA study noted that portions of the Borden Trunk sewer, located near Ottawa Street South / Westmount Road East (to the east of the study area) may require upgrading to accommodate future development within the upstream catchment area. Considering flows are projected to increase with proposed development within the study area, this study includes re-evaluating the hydraulic capacity of the City’s sanitary sewers using the City’s InfoSWMM model. Reference should be made to Section 4 (Infrastructure Analysis) for more details.

1.4 STUDY AREA CHARACTERISTICS

The Study Area encompasses two watersheds, with the largest portion of developable land lying within the Alder Creek watershed. There is also a sizable amount of land within the Voisin Greenway watershed to the east. The land north of Ottawa Street South consists mainly of undeveloped agricultural land and lands owned by the Regional Municipality of Waterloo. Lands south of Ottawa Street South consist of some mixed density residential development and more lands owned primarily by the Regional Municipality of Waterloo, dedicated primarily to the Region’s Mannheim Water Treatment Plant. These lands are subject to conditions within the Laurentian West Master Drainage Plan, and fall within the Laurentian West Community Plan.

Lands adjacent to the Study Area are generally characterized as follows:

- To the east/northeast: lands are already serviced by the existing City sewer collection system which is routed to the Kitchener Wastewater Treatment Plant via the Borden Trunk.
- To the east/southeast: lands are already serviced by the existing City sewer collection system which is routed to the Kitchener Wastewater Treatment Plant via a temporary pumping station located on Bleams Road, also currently discharging to the Borden Trunk. The City plans to redirect sewage flow from the portion of lands discharging to the temporary pumping station to the proposed Middle Strasburg Trunk which will offload some flow from the Borden Trunk.
- To the west/southwest in Wilmot Township: most lands slope away from Trussler Road and with the exception of the previously described area serviced by the MESPS on Milne Drive, most properties are on private septic systems.
► To the south in Wilmot Township: there are existing residential properties within the Well Head Protection Zone, which are on septic systems. This area could be serviced with a gravity sewer; however most of those properties would require a separate pumping station in or near the vicinity of Mannheim Road and Bleams Road due to the topography of the area. Sewage collected at this proposed pumping station could be routed to either the Borden Trunk or Middle Strasburg Trunk systems.

► To the south of Bleams Road: lands will be serviced by the proposed Middle Strasburg Trunk.

The Kitchener Growth Management Plan (KGMP), graphically depicted in Figure 1.3, identifies development north of Ottawa Street South, at Trussler Road (#117), development south of Ottawa Street S (#128) and the development north of Ottawa Street S located towards the eastern portion of the Study Area (#13).

Figure 1.3 City of Kitchener Growth Management Plan

Source: City of Kitchener Growth Management Plan (2011-2013)

As will be described in greater detail later in this report, lands within the study area are characterized as being partially serviceable by gravity sewers, with a large portion of lands within the proposed pumping station catchment area, outlined on the following Figure 1.4, being undevelopable due to environmental constraints, designated Well Head Protection Areas and other dedicated Regional lands.

Of the remaining developable lands, the majority is proposed for residential development:

► Development 13 – 11.7 ha;
► Development 128 – 4.3 ha; and
Development 117 – the proposed Activa subdivision, 48.6 ha.

In addition, approximately 19.1 ha of lands and properties located south of Ottawa Street South, east of Trussler Road and north of Bleams Road, fall within the proposed pumping station catchment area. However, due to environmental constraints, only 5 ha of these lands are considered to have development potential. While these lands are currently designated A-1 (Agricultural Zone), it is assumed these lands and properties will be developed in the future at a density of approximately 60 persons/ha.

**Figure 1.4 Study and Pumping Station Catchment Areas**

![Diagram of the study and pumping station catchment areas.](image)
2 PLANNING PROCESS

2.1 ONTARIO’S ENVIRONMENTAL ASSESSMENT ACT

Ontario’s EA Act establishes a process for reviewing the potential environmental effects of a proposed project prior to its approval by the Ministry of the Environment (MOE) and subsequent implementation. It exists to provide for the protection, conservation, and wise management of Ontario’s environment. To achieve this, the proponent must conduct an EA for any undertaking that has the potential for negative environmental effects, including roads, transit, wastewater and stormwater infrastructure projects.

Two main EA planning and approvals processes are established through the EA Act:

1) Class EAs: this process allows specialized categories to be created for similar or comparable projects, which have predictable and manageable environmental effects. After a parent Class EA process has been prepared and approved by the Minister of the Environment for a specific category of project, eligible projects which follow that parent process are pre-approved. Provided that the proponent follows the appropriate parent Class EA approval process for the undertaking, they will be deemed to have met the requirements of the EA Act. The Municipal Class EA is one of the approved parent Class EAs.

2) Individual EAs (Part II of the EA Act): this process applies to projects for which a project-specific Terms of Reference (ToR) and a subsequent Individual Environmental Assessment (IEA) are carried out and submitted to the Minister of the Environment for review and approval.

This study follows the Municipal Class EA planning process, requiring the integration of sound engineering judgement, prudent long-term planning, and measures to protect all aspects of the natural, social, economic and cultural environment. The process also requires consultation with the public and government review agencies in order to obtain input, ensure regulatory compliance, and ultimately achieve acceptance for the preferred alternative.

2.1.1 THE MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Municipal infrastructure projects such as this are included in the Municipal Class Environmental Assessment (MCEA) parent document, prepared by the Municipal Engineers Association (2000, as amended in 2007 & 2011). The MCEA parent process provides a standardized method for considering municipal infrastructure projects that are: recurring; similar in nature; generally limited in scale; exhibit a predictable range of environmental effects; and responsive to mitigation measures.

2.1.1.1 MCEA Study Phases

The MCEA includes up to five phases of assessment as outlined in Figure 2.1. The extent to which each phase must be followed is directed by the Schedule of Class EA, as outlined in the following section.
2.1.1.2 MCEA Project Schedules
Based on their characteristics, the MCEA parent document categorizes eligible projects into one of the following schedules: A, A+, B, or C. The applicable Schedule dictates the depth of the assessment that must be achieved through the planning and design phases of the study.

The following briefly outlines the different steps and level of effort required for each of the schedules. This study will follow the process for a Schedule B project.

2.1.1.2.1 Schedule A / A+
Schedule A projects generally include normal or emergency operational and maintenance projects with minimal environmental effects. Schedule A+ projects require the public to be advised prior to the start of construction work.
2.1.1.2.2 Schedule B
Schedule B projects generally include improvements and minor expansions to existing facilities. Such projects may have the potential for some adverse environmental effects, and so Phases 1 and 2 of the MCEA process must be undertaken. Specifically, the proponent must consult with affected agencies and members of the public, then document the process by preparing a Project File Report (PFR). It is important to acknowledge at this early stage that this report has been named an “Environmental Study Report”, or “ESR”, specifically to meet the reporting conventions of the City of Kitchener. The naming of this report as an “ESR” does not infer that this EA has been undertaken in accordance with Schedule C requirements as defined by the Municipal Class EA document (2000, as amended in 2007 & 2011). This EA has instead been undertaken to fulfill Schedule B requirements (as would normally be demonstrated through a Project File Report), as is fitting for the infrastructure works which form the proposed undertaking and the anticipated scale of associated potential environmental effects. When completed, the proponent must make the EA available for agency and public review for 30 calendar days. If there are no Part II Orders (as described below) then the project may proceed to Phase 5 (Implementation).

This study will follow the process for a Schedule B project.

2.1.1.2.3 Schedule C
This Schedule generally includes the construction of new facilities and major expansion to existing facilities, which may have the potential for significant environmental effects. Projects falling within this Schedule require the proponent to complete Phases 1 through 4 of the MEA process. Specifically, the proponent must:

- Undertake more detailed study, public consultation and documentation. This includes contacting affected members of the public on at least three occasions during the study and consulting with relevant regulatory agencies;
- Prepare an Environmental Study (ESR) Report documenting: the process that was followed; comments received; responses provided; and, commitments made to address potential effects; and
- When completed, make the ESR available for agency and public review for 30 calendar days. If no Part II Orders, or “bump-up requests”, are received, the project may proceed to Phase 5, implementation.

2.1.2 Part II Orders
Part II of the EA Act grants agency and public stakeholders the right to appeal the completion of a Class EA if they believe that a preferred alternative has been selected without sufficient study. The reasons for requesting an appeal, known as a Part II Order request, must be submitted in writing to the Minister of the Environment. Upon receipt, the Minister, or their delegate, will review the request and respond in one of the following ways:

1) Accept the request, elevating the Class EA to an Individual EA and requiring the proponent to undertake a much more rigorous project review;
2) Deny the request outright, or deny the request with conditions. These conditions may include a requirement for the proponent to conduct more consultation with specific parties, review effects or develop new mitigation measures; or,

3) Refer the request to mediation for resolution.

If the Minister does not receive a Part II Order, the Class EA is considered complete and approved, and the proponent may proceed with implementing the project.

For Schedule B projects, a person or party with a concern should bring it to the attention of the proponent (i.e. the City) in Phase 2 of the planning process.

### 2.2 THE PROJECT FILE REPORT

The Municipal Class EA process for Schedule B projects requires the completion of a Project File Report (PFR), which should contain the following information:

- Background to the project and earlier studies;
- The nature and extent of the problem or opportunity, explaining the source of the concern and the need for a solution;
- The existing natural, social and economic environment;
- Alternative solutions to the proposed project;
- Potential effects that the alternative solutions may have on the existing environment and appropriate mitigation measures;
- An evaluation of the alternatives;
- Follow-up commitments including monitoring;
- The consultation process undertaken throughout the study; and
- Selection of the preferred alternative.

Upon the completion of Phases 1 and 2 of the Municipal Class EA process (as required for a Schedule B undertaking), including the development and evaluation of all feasible planning alternatives, a preferred alternative is selected and the Class EA process is documented in the Project File. In support of the Class EA, the preliminary design of the preferred alternative is developed in accordance with relevant municipal, provincial and agency design standards. Preliminary plan and profile drawings are prepared and the design is documented in the Preliminary Design Report. The preliminary design is prepared to sufficient detail to complete the subsequent detailed design phase.

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2 As previously noted, this report is instead referred to as an “Environmental Study Report”, or “ESR”, in order to meet City of Kitchener reporting conventions. However, this report will fulfil the requirements of a Project File Report, as is required for a Schedule B undertaking.
3 INVENTORY OF THE EXISTING ENVIRONMENT

3.1 NATURAL ENVIRONMENT
This section provides a summary of the existing natural environment within the study area. A more detailed account is found in Appendix A.

3.1.1 DESIGNATED NATURAL HERITAGE AREAS
Consultation with GRCA, field studies, and a review of other planning documents determined that the study area contains natural environmental features to be evaluated through this study.

The following designated natural heritage features are present in the study area and are shown on Figure 3.1:

- A portion of the Laurentian West Wetland Complex (Locally Significant Wetland [LSW]) (GRCA 2013);
- Three forested areas are designated ‘Core Environmental Features’ within the Regional Official Plan Greenlands Network (2010, Map 4); and
- Seven small unevaluated wetland pockets.

3.1.2 VEGETATION AND VEGETATION COMMUNITIES
There are four forested features within the study area:

- A relatively isolated Sugar Maple – Beech Deciduous forest in the center of the agricultural field immediately east of Trussler Road;
- A smaller forest that abuts Highway 7/8 and a residential community in the northeast corner;
- A large forest and wetland mosaic that is part of the Laurentian West Wetland Complex; and
- A mosaic of conifer plantation, mixed forest and open field habitats surrounding two residential properties in the southwest corner of the study area.

The forest that is part of the Laurentian West Wetland Complex (as shown in Figure 3.1) is the only one located within the vicinity of the proposed project alternatives described in Section 5.

3 Note that the small wetland pocket immediately east of Trussler Road and north of Ottawa Street South has been reviewed by Grand River Conservation Authority (GRCA) under a separate application. GRCA stated that the wetland “does not merit protection under Section 8.4.2 of the GRCA’s Policies for the Administration of Ontario Regulation 150/06…. A Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit will be required for its removal” (GRCA 2008).
In the vicinity of the proposed pumping station and forcemain alternatives, natural vegetation communities are predominately comprised of culturally-influenced vegetation communities including cultural meadow, cultural thicket and cultural woodland. The most noteworthy vegetation communities are those that are within and surrounding the Laurentian West Wetland Complex along the south side of Ottawa Street South. This area includes a large deciduous forest and forested swamp complex with areas of shallow marsh, shallow aquatic and open water aquatic communities. In addition, there is an open water aquatic community or ‘pond’ surrounded by a band of thicket swamp and cultural thicket vegetation on the north side of Ottawa Street South (only the thicket swamp perimeter of the pond is mapped as part of the Laurentian West Wetland Complex). The central open water aquatic component is not a wetland community therefore it is not mapped as wetland. Finally, there is a stormwater management (SWM) pond north of Ottawa Street South and west of David Bergey Drive that has been naturalized with cultural meadow vegetation and planted trees.

3.1.3 Flora

A total of 94 species were observed within the vicinity of the pumping station and forcemain alternatives (generally 30 m either side of the alignment). Approximately one-third of the species observed are non-native to Ontario. The 61 native species observed are all ‘common and secure’ or ‘apparently secure’ in Ontario. No species of conservation concern or rare vegetation communities were observed within the vicinity of the pumping station or forcemain alternatives.

The MNR Natural Heritage Information Centre (NHIC) Biodiversity Explorer database has historical records of the following provincially rare flora within the study area and general vicinity:

- White-tinged Sedge (last observed in 1968);
- Ram’s-head Lady’s-slipper (last observed in 1900);
- Scarlet Beebalm (last observed in 1892);
- Moss Phlox (last observed in 1974);
- Braun’s Holly Fern (last observed in 1979); and
- Carolina Vetch (last observed in 1948).

The list of Species at Risk (SAR) for the Region of Waterloo includes:

- American Chestnut (Endangered);
- Butternut (Endangered);
- False Hop Sedge (Endangered, historical records only); and
- Green Dragon (Special Concern).

None of these species were observed during the May 24, 2013 site visit, as documented in Appendix A.
Figure 3.1 Natural Environment Features
The study area may provide potential habitat for some of these species. However, encountering any of these species within the vicinity of the forcemain alternatives is unlikely given that the alternatives occur within highly disturbed habitats (agricultural fields and roadsides). Potential habitat is more likely to be found in the interior and less disturbed habitats in the large forest and swamp habitats south of Ottawa Street South.

3.1.4 WILDLIFE
The study area provides habitat for grassland, urban, agricultural, forest, and forest edge associated species.

Six (6) mammal species, 27 bird species, 2 reptile species, and 1 amphibian species were confirmed during the site investigation. The majority of these species are common and expected for the habitat conditions. Three (3) species of conservation concern were observed as discussed below.

The NHIC Biodiversity Explorer database has records of the following SAR wildlife within the study area and general vicinity:

- Black Tern (last observed in 1979);
- Cerulean Warbler (last observed in 1900);
- Eastern Ribbonsnake (Carolinian population) (last observed in 1988); and
- Jefferson x Blue-spotted Salamander (last observed in 2003).

The presence of three additional SAR was confirmed during 2013 field surveys: Barn Swallow (Threatened), Eastern Meadowlark (Threatened) and Snapping Turtle (Special Concern). The presence of potential habitat was also identified for Milksnake (Special Concern), Eastern Ribbonsnake (Special Concern) and Blanding’s Turtle (Threatened) within the study area. Potential habitat for Milksnake occurs throughout the study area as this species can utilize almost any habitat that provides shelter and a food source (including suburban areas). Potential habitat for Eastern Ribbonsnake and Blanding’s Turtle occurs in the LSW south of Ottawa Street South to either side of David Bergey Drive (previously shown in Figure 3.1). Potential habitat for Black Tern, Cerulean Warbler, and Jefferson x Blue Spotted Salamander does not occur within the study area.
3.1.5 Species of Conservation Concern

Blanding's Turtle

Blanding’s Turtle is designated Threatened by COSEWIC\(^4\) and COSSARO\(^5\) and is listed as Threatened on the SARO\(^6\) list. This species is also listed federally and has Threatened status under Schedule 1 of SARA\(^7\). As a Threatened species in Ontario, it receives general habitat protection under the ESA 2007\(^8\) in addition to the prohibitions against killing or harming the species.

Blanding’s Turtle was not observed during the field review by Ecoplans; however, suitable habitat for this species occurs within the LSW south of Ottawa Street S and to either side of David Bergey Drive. Excavation activity along this wetland edge could potentially affect this species and would require further dialogue with MNR SAR biologist at the detailed design once final construction and excavation requirements are known. ESA SAR permitting or registration with MNR following the new ESA rules effective July 1 2013 would be items of discussion at that time.

Barn Swallow

Barn Swallow is designated Threatened by COSEWIC and COSSARO and was recently listed as Threatened on the SARO list. Barn Swallow is not currently listed federally and has no status under SARA. As a newly listed Threatened species in Ontario, Barn Swallow receives general habitat protection under the ESA 2007 in addition to the prohibitions against killing or harming the species. Barn Swallow is also protected under the Migratory Birds Convention Act (MBCA 1994). No work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), or the wounding or killing of birds.

Barn Swallow was observed flying over fields and wetlands within the study limits. Although, no Barn Swallow nests were observed within the study limits, removal of or construction at any structures (i.e. buildings, culverts, bridges, etc.) within the work zone that are found to have nesting at that time may impact this species and would require similar liaison with the MNR SAR biologist as noted above, during detailed design.

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\(^4\) Committee on the Status of Endangered Wildlife in Canada  
\(^5\) Committee on the Status of Species at Risk in Ontario  
\(^6\) Species at Risk in Ontario  
\(^7\) Species at Risk Act (2002)  
\(^8\) Endangered Species Act (2007)
Eastern Meadowlark

Eastern Meadowlark is designated Threatened by COSEWIC and COSSARO and was recently listed as Threatened on the SARO list. It is not currently listed federally and thus, has no status under SARA. As a newly listed Threatened species in Ontario, it receives general habitat protection under the ESA 2007 in addition to the prohibitions against killing or harming the species. It is also protected under the Migratory Birds Convention Act (MBCA 1994). No work is permitted to proceed that would result in the destruction of active nests (nests with eggs or young birds), or the wounding or killing of birds.

One Eastern Meadowlark was heard calling from the hydro line behind 1990 Ottawa Street S (~200m beyond the right-of-way (ROW)). Potential habitat for this species includes the large cultural meadow northwest of the pond at 1990 Ottawa Street. The proposed works are not anticipated to impact Eastern Meadowlark habitat, given the distance of the meadow from the ROW.

Snapping Turtle

Snapping Turtle is designated Special Concern by COSEWIC and COSSARO and is listed as Special Concern on the SARO list. Snapping Turtle is also listed federally and has Special Concern status under Schedule 1 of SARA. As a Special Concern species in Ontario, Snapping Turtle does not receive general habitat protection under the ESA 2007.

This species was confirmed within the LSW south of Ottawa Street S. Local landowners also confirmed that this species regularly crosses the road between the LSW and the SWM pond along Ottawa Street S near David Bergey Drive, and that turtle road mortality has been observed at this location. Potential habitat for this species also occurs within the pond at 1990 Ottawa Street, where several Midland Painted Turtles were confirmed.

Excavation activity along the edge of the LSW may affect this species; however, mitigation efforts for Blanding’s Turtle will also provide protection for Snapping Turtles. Potential habitat for Snapping Turtle at 1990 Ottawa Street is not anticipated to be directly affected given that the pond is located approximately 25 m from the ROW.

Milksnake

Milksnake is designated Special Concern by COSEWIC and COSSARO and is listed as Special Concern on the SARO list. Milksnake is also listed federally and has Special Concern status under Schedule 1 of SARA. As a Special Concern species in Ontario, Milksnake does not receive general habitat protection under the ESA 2007.

Milksnake may utilize all habitat types within the project area including roadside embankments, backyards, and meadows.
This species might be affected by disturbance of the cultural meadow habitat and associated brush piles and structures in the northeast quadrant of the Ottawa-Trussler intersection; however, habitat for this species occurs throughout the project area and within the landscape generally. Mitigation measures to protect wildlife generally and to exclude snakes from the construction zone will be recommended. Furthermore, mitigation measures for Blanding’s Turtles along the LSW will provide protection for Milksnakes that might also be using this habitat.

**Eastern Ribbonsnake**

Eastern Ribbonsnake is designated *Special Concern* by COSEWIC and COSSARO and is listed as *Special Concern* on the SARO list. This species is also listed federally and has *Special Concern* status under Schedule 1 of SARA. As a *Special Concern* species in Ontario, Eastern Ribbonsnake does not receive general habitat protection under the ESA 2007.

The LSW provides potential habitat for Eastern Ribbonsnake and excavation activity along this wetland edge could potentially affect this species. Mitigation measures to protect wildlife generally and to exclude snakes from the construction zone will be recommended. Furthermore, mitigation measures for Blanding’s Turtles along the LSW will provide protection for Ribbonsnake also using this habitat.

**Monarch**

Monarch is designated *Special Concern* by COSEWIC and COSSARO and is listed as *Special Concern* on the SARO list. Monarch is also listed federally and has *Special Concern* status under Schedule 1 of SARA. As a *Special Concern* species in Ontario, Monarch does not receive general habitat protection under the ESA 2007.

Although Monarch was not observed during the May 2013 site visit, its host plant Common Milkweed was observed within the project limits, although no large patches were noted. The proposed works are expected to have negligible impacts on this species given the small numbers of milkweed plants observed and the temporary nature of the disturbance (i.e. milkweed is likely to be present following re-vegetation of the forcemain alignment).

### 3.1.6 Topography and Geology

The study area is located within the Waterloo Sandhills physiographic region and the area is also referred to as the Waterloo Moraine. The terrain is gently rolling with the local high point located on Ottawa Street South roughly midway between Trussler Road to the west and David Bergey Drive to the east. The area is generally sloped from east to west towards the adjacent Wilmot Township, with the local low point just off Trussler Road, southeast of its intersection with Rickert Way. The rolling topography, combined with how the lands are divided and being developed, limits the ability of a gravity

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9 This information is taken from the report entitled *Preliminary Dewatering Requirements – Ottawa Trussler Area Sewage Facility Pumping Station and Forcemain* (MMM Group Ltd., 2013). This report accompanies the Preliminary Design Report associated with this study.
sewer system to service the entire Study Area, necessitating the construction of a new pumping station, forcemain and sewers to convey sewage to the City’s sanitary sewer network.

This moraine is described as an area of ice-contact sand and gravel, overlain / interbedded by glacial till sheets, and an area of relatively higher, and hummocky topography as compared to surrounding areas. They note that the Waterloo Moraine is a significant groundwater recharge area and contains several regionally significant aquifers, which sustain the drinking water supply to the City of Kitchener, as well as other municipalities in Waterloo Region, as well as private well owners, agricultural, and irrigation water uses. Groundwater discharging from the Waterloo Moraine is also noted by Blackport to provide base flow to rivers and streams in the area, including Strasburg Creek and Alder Creek, which are found approximately 2000 m southeast and 200 m west respectively of this study area boundary.

The study area is located on and near the crest of the Waterloo Moraine. A geological cross section along the general alignment of Ottawa Street between Westmount Road and Trussler Road (Ontario Geological Survey, 2007) indicates that the subsurface overburden consists of considerably thick deposits of ice contact sand and gravel (up to 50 meters deep, and locally exceeding this amount), with till sheets embedded within or locally covering these deposits. The till sheets are indicated to be clayey silt to silt till, and referred to as the Maryhill Till. Below the sand and gravel units, older tills are found, ranging from sandy silt to clayey silt till, and there are lenses / layers of sand and gravel within or in between these older till sheets. Total overburden thickness ranges from approximately 50 to 100 meters. Bedrock reportedly consists of the Salina Formation (Shale, dolostone, gypsum, and salt), however bedrock is not anticipated to be encountered during any forcemain or pumping station construction.

In the vicinity of the proposed pumping station and along the forcemain alignment, recent boreholes advanced by SPL Consultants Limited\(^\text{10}\) indicate a general stratigraphic sequence of sandy silt from ground surface to approximately 3 to 4.5 m depth, underlain by up to 7 m thick silty clay till to an approximate depth of 10 to 12 m, which is further underlain by sand to sandy silt. Well graded sand fill materials were encountered from surface to depths of 1.5 to 3.2 m, along the forcemain alignment in the eastern portion of the study area, along Ottawa Street.

3.2 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT
This section provides a contextual summary of the socio-economic environment, including the planning policies, existing and proposed land uses, and the cultural and archaeological characteristics of the study area.

\(^{10}\) The report entitled *Geotechnical/Geo-Environmental Investigation – Ottawa Trussler Area Sewage Facility Class EA and Preliminary Design (SPL Consultants Limited, 2013)* accompanies the Preliminary Design Report associated with this study.
3.2.1 LAND USE & PLANNING POLICY

3.2.1.1 Places to Grow Act 2005: Growth Plan for the Greater Golden Horseshoe 2006
The Places to Grow Act (2005) allows the Province to establish growth plans establishing settlement growth boundaries and policies for urban expansion to which all municipalities in the Growth Plan area must conform. The study area is located within the boundaries of the Growth Plan for the Greater Golden Horseshoe (2006), which is the comprehensive growth management plan for most of Southern Ontario to the year 2031. The Plan directs growth to built-up areas, creates long-term density targets, and mandates a compact, transit-supportive, and efficient form of urban development. The Growth Plan identifies the study area as being within the Built-Up Area. The Built-Up Area is all land within the Built Boundary, which represents the limits of the developed urban area as defined by the Minister of Public Infrastructure Renewal.

3.2.1.2 Provincial Policy Statement, 2005
The Provincial Policy Statement (PPS) provides the framework to focus growth within settlement areas and support efficient development patterns to optimize the use of land, resources and public investment in infrastructure. This includes the wise management of natural heritage resources, water, agricultural lands and archaeological resources. Plan policies focus on housing, infrastructure and public service facilities that are applicable to the proposed sewage facility.

Under the PPS, and in line with the aims of this study, sewage and water facilities shall direct and accommodate expected growth in a manner that promotes the efficient use of existing municipal sewage and water services, while ensuring that these systems are provided in a manner that protects human health and the natural environment (1.6.4.1). Additionally, intensification and redevelopment within settlement areas on existing municipal sewage and water services should be promoted, wherever feasible (1.6.4.2). The proposed Ottawa-Trussler Area Sewage Facility will be integrated with the existing sewage system and therefore will seek to maximize the use of existing infrastructure.

3.2.1.3 Region of Waterloo – Regional Official Policies Plan (2006)
As of January 24, 2011, the Regional Official Plan (ROP) in its entirety is under appeal before the Ontario Municipal Board (OMB). Until such time as some or all of the appeals have been resolved, reference should be made to the September 2006 Consolidation of the Regional Official Policies Plan (ROPP) and its subsequent amendments.11

The ROPP designates the majority of the lands containing study area as a ‘City Urban Area’. City Urban Areas have been designated to provide employment opportunities consistent with the Regional Employment Forecast and to accommodate growth indicated in the Regional Population and Household Forecast for the Cities of Cambridge, Kitchener and Waterloo to the year 2016 (Section 7.3.1.1). The small part of the study area covering the Mannheim Estates is designated as a Non-Prime Agricultural Area and broadly within a Rural Settlement Area (Mannheim). The ROPP also determines that a large part of the study area lies within a Water Resource Protection Area, specifically a Wellhead Protection Sensitivity Area 1, with several municipal wells. There are a variety of land uses not permitted within Sensitivity Area 1 (as described in Section 5.2.1); however these are not expected to occur within the study area as they relate primarily to manufacturing activities.

Within the section on Infrastructure, Principles 2 and 3 respectively state that wastewater treatment and water supply capacity are essential to meet the development requirements of the City and Township Urban Areas, and that wastewater treatment and water supply servicing options must be based on a hierarchy which considers environmental, technical, and long and short term financial factors, to determine the appropriateness of the various servicing options for new development.

3.2.1.4 City of Kitchener Official Plan
The City of Kitchener is currently undertaking an Official Plan Review. Until such time as the new Official Plan is approved, the existing Official Plan from 1994 remains in place and the new draft Official Plan has no formal status.

The existing Official Plan indicates that the study area is largely located in an area designated as an Artificial Water Recharge Area (Map 2A) and identifies Locally Significant Wetlands (LSW) to the immediate south of Ottawa Street S (Map 2B), as has been previously identified in this study. The study area is also shown to be located within an area designated as an Aggregate Resource Area, and contains large areas designated as Agricultural and Low Rise Residential land uses, as well as Municipal Services & Public Utilities and Open Space land uses (Map 5). The West Laurentian Forest/Wetland Special Policy Area is designated in the area covering the afore-mentioned LSW (Map 8).

3.2.1.4.1 Draft City of Kitchener Official Plan (2013)
The following analysis presented in this section reflects the second draft of the New Official Plan text and associated schedules\(^\text{12}\), reflecting the likely policy context when this project is approved for implementation and subsequent construction.

In line with the ROPP, Draft Map 1 (City Urban Area and Countryside) shows that the study area is within the City Urban Area, more specifically within lands containing both the Built up Area and Designated Greenfield Area to both the north and south of Ottawa Street S. The purpose of defining these specific City Urban Areas is to monitor the achievement of density targets.

Draft Map 2 (Urban Structure) shows the study area is largely within a Community Area and contains some Green Areas. Community Areas provide for residential uses and non-residential supporting uses. The function of Green Areas is to protect and conserve the ecological function and recreation opportunities that such areas provide.

Draft Map 3 (Land Use) shows that the majority of the study area is designated as Low Rise Residential in line with the proposed development; however there are also pockets of land designated as Natural Heritage Conservation, Open Space and Major Infrastructure and Utilities. It is important to note that the final boundaries for Open Space and Natural Heritage Conservation designations are still to be determined. Natural Heritage Conservation lands are resources which provide a wide range of public health, recreational, environmental and economic benefits to the city, while Open Space areas also provide residents with a healthy physical environment and high quality of life. Major Infrastructure and Utilities land use designation includes large scale infrastructure and utilities operated by the City, Region, Province, or other public agency.

Draft Map 5 (Special Policy Areas) shows that part of the study area is within the Trussler Road/Highway 7&8/Bleams Road SPA. This is a relatively small SPA that has been designated to apply specific setback requirements for any livestock and/or permanent manure facility located west of Trussler Road in Wilmot Township.

The lands designated as Natural Heritage Conservation overlap with the lands designated on Draft Map 6 (Natural Heritage System) as Kitchener Natural Heritage, which broadly corresponds to a variety of Provincially, Regionally and Locally Significant Wetlands, Woodlands, Valleylands, Wildlife Habitats and other environmental features. The study area also contains a stream within an Ecological Restoration Area.

Draft Map 8 (Source Water Protection Areas) indicates that much of the study area is within Wellhead Protection Area 2, which includes part of the Regional Recharge Area. Municipal wellheads are also located within the study area. Source Water Protection Areas are designated to protect and conserve the City's drinking water resources.

Draft Map 10 (Mineral Aggregate Resource Areas) shows that the area to the south of Ottawa Street S is a Mineral Aggregate Resource Area. These areas are designated to protect these resources for long-term use while ensuring that extraction occurs in a manner that minimizes environmental impacts.

It is important to note that the proposed works for this project are intended to occur largely within an area which will already be developed for residential purposes, or alternatively will be located within the existing municipal road right-of-way. As such, it is not anticipated that there will be any significant impact on existing or proposed land uses within the study area.
3.2.1.5  Kitchener Growth Management Strategy
The Kitchener Growth Management Strategy (KGMS) provides the framework for effectively managing the city’s growth, improving its business processes and contributing to the health and vitality of the community. One of the key implementation items of the strategy is the Kitchener Growth Management Plan (KGMP), which includes the Urban Growth Centre, identified intensification areas, and all of the planning communities/growth areas that still have some Greenfield lands left in Kitchener.

The criteria for staging development in the Biannual Growth Management Plan is based on numerous factors, including the achievement of Provincial, Regional and City growth management objectives. In the latest Growth Management Plan (fall 2011-2013), the Ottawa-Trussler Area Sewage Facility within the Laurentian West Phase 3b Area (which broadly covers the study area) is specifically identified for implementation in 2020 to reflect the 2012 Capital Budget Forecast. The ‘Effective Use of Existing Infrastructure’ is highlighted as a critical factor within the overall area specific priority analysis.

3.2.2  CULTURAL HERITAGE & ARCHAEOLOGY

3.2.2.1  Cultural Heritage
Properties of cultural heritage interest are those properties valued for the important contribution they make to our understanding of the history of a place, an event, or a people. The following properties located within the Study Area are of potential cultural heritage interest as they are identified on existing heritage inventories or lists maintained by the City:

- 632 Trussler Road (discussed in detail below);
- 2219 Ottawa Street S; and
- 2220 Ottawa Street S.

Regarding any potential environmental effects to the property at 632 Trussler Road, it is considered that the distance between the proposed infrastructure alternatives (as later discussed in Sections 6 and 7) and this property will lessen any potential effects and may only produce temporary effects during construction with respect to visual, audible and atmospheric conditions. In addition, this property is well-screened by existing vegetation. This property is not designated as a cultural heritage resource under the Ontario Heritage Act but it is recognized as a property of potential cultural heritage interest by the City. However, it is not subject to the completion of a Heritage Impact Assessment as a statutory requirement.

This specific matter was discussed and confirmed with the City of Kitchener’s Heritage Planner during the Class EA process and it was confirmed that no further assessment was required.

3.2.2.2  Archaeology
A Stage 1 Archaeological Assessment (AA) was completed in May 2013 and subsequently revised in September 2013 by Archeoworks Inc. to account for the amendment to the EA study area. This report is documented in Appendix B.
The Stage 1 AA identified potential for the recovery of Euro-Canadian and Aboriginal archaeological remains within undisturbed portions of the study area due to the presence and proximity of watercourses, which carry archaeological potential within 300 metres of their limits. In addition, a review of historical mapping and local history revealed that the study area was well-settled in the 19th century, contributing to the potential to discover historical Euro-Canadian archaeological remains.

A review of reports documenting archaeological fieldwork within the study area as well as within 50 metres of its limits has revealed that sizeable areas have already been subjected to Stage 1, 2 and 3 AA (as shown in Figure 3.2). With these previous assessments having fulfilled the fieldwork requirements within their respective areas of coverage, it is recommended that the previously assessed areas within the study area be exempt from further assessment.

A property inspection of field conditions has determined that much remains of the study area’s rural character. Areas of obvious disturbance, such as land developments since 1954 (notably the Mannheim WTP), and paved roadways and parking areas, are recommended to be exempt from further assessment, given the significant damage to any underlying archaeological resources that their construction would have caused. Potentially undisturbed areas include (but are not limited to) margins flanking paved roads, lots and frontages of properties that were present in 1954, agricultural fields, woodlots and seasonal wetlands.

It is recommended in the Stage 1 AA report that following the selection of a preferred solution and the identification of areas of proposed construction, a Stage 2 AA be undertaken at all undisturbed locations that have not been previously subjected to archaeological fieldwork. However, as demonstrated in Section 7 of this report and shown in Figure 3.2 below, the preferred alternative is to be located within previously assessed and/or disturbed areas, and as such no Stage 2 AA is required.
Figure 3.2 Areas of Archaeological Potential

Stage 1 Archaeological Assessment for the Ottawa-Trussler Area Sewage Facility Class EA within Lot 47 (Upper Block) and Lots 129-132 (Small Lots), German Company Tract, Geographic Township of Waterloo, City of Kitchener, Regional Municipality of Waterloo, Ontario.

Study Area Limits
- Natural heritage
- Preferred Option 2A alignment
- Pumping station

No further work recommended:
- Previously assessed areas
- Disturbed areas
- Permanently wet areas
- Slope

Stage 2A recommended:
- High archaeological potential areas
- Other undisturbed areas
- St. James Lutheran Cemetery

Drawn by: JV+KM
Date: 23 Sept 2013
4 INFRASTRUCTURE ANALYSIS

4.1 CONTEXT
This section provides a contextual summary of the City’s existing sewage infrastructure as well as a summary of approved and proposed development and new infrastructure to service the fully developed Study Area. On this basis, the City’s InfoSWMM model was run to determine the hydraulic performance of the system and then to help qualify any related impacts on the existing sewer system including local sewers and the downstream Borden Sanitary Trunk Sewer.

4.2 DEVELOPMENT
The following Figure 4.1 shows how land use and development is expected to be allocated within the overall Study Area and the extent of the proposed pumping station catchment area, as defined during the preparation of this Class EA. Based on developable areas and associated planning level densities as per the Kitchener Growth Management Plan (KGMP), the following table summarizes the calculated peak sewage flows from the various areas and delineates which areas are within the proposed pumping station catchment area.

Figure 4.1 Land Use and Development within the Study Area
### Table 4.1 Calculated Peak Sewage Flows – Projected Build Out of Study Area

<table>
<thead>
<tr>
<th>ID</th>
<th>Development</th>
<th>Area (ha)</th>
<th>Equivalent Population</th>
<th>Population Density (persons/ha)</th>
<th>Estimated Peak Flow (L/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>AREAS WITHIN STUDY AREA WITHIN PUMPING STATION CATCHMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>#117 Proposed Activa Trussler North subdivision (ATNS)</td>
<td>48.6</td>
<td>3,415</td>
<td>70</td>
<td>54.2</td>
</tr>
<tr>
<td>#2</td>
<td>Additional Lands (south of Ottawa St. S)</td>
<td>5.0</td>
<td>300</td>
<td>60</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td><strong>Projected Pumping Station Capacity</strong></td>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td><strong>AREAS WITHIN STUDY AREA OUTSIDE PUMPING STATION CATCHMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2</td>
<td>#128 Proposed development</td>
<td>4.3</td>
<td>300</td>
<td>70</td>
<td>5.6</td>
</tr>
<tr>
<td>#3</td>
<td>#13 Proposed development</td>
<td>11.7</td>
<td>362</td>
<td>31</td>
<td>7.7</td>
</tr>
<tr>
<td>#4</td>
<td>Existing Institutional Lands (Cultural Centre on Bleams Rd)</td>
<td>4</td>
<td>240</td>
<td>60</td>
<td>4.6</td>
</tr>
<tr>
<td>#5</td>
<td>Existing Mannheim Estates (Capacity as per C-of-A)</td>
<td>21.9</td>
<td>258</td>
<td>10.3</td>
<td>7.6</td>
</tr>
<tr>
<td>#6</td>
<td>Existing Laurentian Development north side of Ottawa St S.</td>
<td>17.8</td>
<td>1,242</td>
<td>70</td>
<td>21.5</td>
</tr>
<tr>
<td>#7</td>
<td>Existing Condo Development south side Ottawa St. S</td>
<td>1.4</td>
<td>98</td>
<td>70</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Notes:**
- Refer to Figure 1.3 for definition of Plans #117, #128 and #13.
- Refer to Table TM1 in Appendix C for detailed sewage flow calculations

Based on the general lay of the land and sloping topography within the Study Area, it is determined that the proposed pumping station should be rated for a firm capacity of at least 60 L/s (designed to be upgradeable), to service flows primarily from the proposed ATNS (Area #1) and “Additional Lands” (Area #2). The identified 5 ha of additional lands south of Ottawa Street South are generally located outside Core Environmental Feature areas and GRCA Regulation Limits (as depicted in Figure 3.1), derived for the purpose of estimating the proposed pumping station capacity.

Remaining lands within the Study Area lie outside the proposed pumping station catchment area and may be serviced by gravity flow to the City’s existing sanitary sewer network along and tributary to Ottawa Street South as well as Bleams Road.
4.3 CAPACITY ASSESSMENT

To determine the capacity of the existing sewer system, the City's InfoSWMM model was run by the City with inputs as summarized in Table 4.1 for a series of scenarios. These inputs are graphically depicted in Figure 4.2.

![InfoSWMM Model Inputs](image)

Figure 4.2 InfoSWMM Model Inputs

As shown in Figure 4.2, with the exception of flow from the Institutional Lands, each of the identified flows will be routed through the existing and proposed sanitary sewer system and be ultimately combined at the intersection of Ottawa Street South and David Bergey Drive, which then ultimately flows by gravity through to the Borden Trunk Sanitary Sewer.

Three different scenarios were initially run on the existing sewer network to assess the ability of the upper segment of the system (above David Bergey Drive) to accept future flows from the Study Area including the proposed pumping station. The initial model run was based on the proposed sanitary pumping station being discharged into the same location as the existing Mannheim Estates Pumping Station at the MH located at the high point on Ottawa Street South. The resulting model output showed that this scenario would put the existing sanitary sewer into a severe surcharged state. The model demonstrated the sewers being severely surcharged 1.6m to 4.5m in the maintenance holes. Since this section of sewer is undersized to accept this flow, it must be bypassed by the proposed forcemain.

For the next two scenarios, the model was run with cumulative inputs on the next downstream segments of sewers, along Mahogany Street and Everglade Crescent and then on the final sewer segments along Ottawa Street South which tie into the sewer on David Bergey Drive. The resulting model outputs had hydraulic grade lines showing surcharge in the maintenance holes, but the degree of surcharge was noted to be marginally reduced.

Based on the above, the initial analysis demonstrated that the forcemain from the proposed pumping station must bypass the existing sewer system at least all the way to David Bergey Drive. The Borden
Trunk Sanitary Sewer Assessment (Stantec, 2008) also identified the same need to include a bypass sewer/forcemain extending along Ottawa Street South to David Bergey Drive.

At this point, a more detailed review of the hydraulic capacity of the next segments of sanitary sewers along David Bergey Drive was carried out employing standard gravity sewer design calculations. The sewer ranges in size from 375 to 450 mm diameter, with segment capacities ranging from 90 to 145 L/s depending on pipe slope and diameter. The estimated cumulative “peak” flow input from the study area to the MH structure at the intersection of Ottawa Street South and David Bergey Drive, including the proposed pumping station forcemain discharge, is estimated to be 93.4 L/s at build out per current projections. Therefore, on this basis, the majority of this sewer is determined to have sufficient capacity.

It was also noted that when the InfoSWMM model was run using the estimated peak flow of 93.4 L/s as described above, the modeling results indicated that the “pinch point” section of the Borden Sanitary Trunk located near Ottawa Street South/ Westmount Road East, shown in Figure 4.3, was able to convey the proposed flows. While this indicates the sewer is not experiencing significant surcharge conditions which could impact nearby services, the lack of additional carrying capacity is a potential limiting factor and should be carefully monitored.

**Figure 4.3 InfoSWMM Model – Borden Trunk “Pinch Point”**

This result is comparable with the results of previous hydraulic analysis (Stantec, 2008) which recommended that the two segments of existing 525mm diameter sanitary trunk sewer, the “pinch point”, be replaced with a larger 600mm diameter sewer. Given the noted constraints, it may be concluded that the same recommendation to upsize these segments of the existing sewer will be carried forward.
It is important to acknowledge there are other factors which could influence the modeling results and therefore the timing of any proposed sewer upgrade work:

1. The influence of “operational” variables, most notably the conservative per capita sewage flow allocation (350 L/c/d) and the superimposition of peak flow events as the serviced area expands;
2. The total area being serviced by the Borden Trunk. An area within the adjacent Middle Strasburg drainage area is currently being serviced by the Borden Trunk via a temporary pumping station on Bleams Road. As shown on Figure 4.4, this temporary pumping station services approximately 250 residential lots and conveys flows via a forcemain outletting to Commonwealth Street. This facility will ultimately be decommissioned once the Middle Strasburg Trunk Sewer has been extended to service this area, thereby reinstating that corresponding unit capacity in the Borden Trunk; and
3. Ongoing monitoring of flows and correlating field measurements with the model results.

Figure 4.4 Bleams Road Temporary Pumping Station

It is therefore recommended the City develop and implement a detailed flow monitoring program in order to track future increases in sewage flows through to the Borden Trunk “pinch point”. This may include monitoring at multiple locations including flows coming to the intersection of Ottawa Street South and David Bergey Drive. This will help the City to proactively assess in greater detail the need for any future system enhancements or upgrades to accommodate future growth and increased sewage flow from the fully expanded Borden Sanitary Drainage Area and in particular the Laurentian West Phase 3B area.
5 ALTERNATIVE SOLUTIONS

Phase 2 of the Municipal Class EA process focuses on the identification and consideration of alternative solutions to the problem/opportunity statement. These may include other solutions that may avoid or minimize potential adverse environmental effects of the proposed project.

Alternatives to service the Laurentian West Phase 3B Community and surrounding area including proposed and approved subdivisions and some additional lands along Trussler Road and Ottawa Street South, considered the following criteria:

► Identified land uses;
► Environmentally sensitive lands;
► Topography;
► Proximity to access routes; and
► Relative complexity in terms of new capital works.

Based on this assessment and as applied to this study, the following Alternatives are identified in Table 5.1 and graphically illustrated in Figure 5.1 below.

Table 5.1 Alternative Solutions

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do Nothing</td>
</tr>
</tbody>
</table>
| 2A          | Construct new pumping station on development property **within the Activa Trussler North Subdivision (ATNS)**.  
Construct new forcemain routed **through ATNS** and then along Ottawa Street South for discharge to new maintenance hole (MH) structure at the intersection of Ottawa Street South and David Bergey Drive.  
Existing Mannheim Estates Sewage Pumping Station (MESPS) and forcemain would remain unchanged. |
| 2B          | Construct new pumping station on development property within the ATNS.  
Construct new forcemain routed **along Trussler Road** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
Existing MESPS and forcemain would remain unchanged. |
| 3A          | Construct new pumping station on property **along Trussler Road**.  
Construct new forcemain routed **through ATNS** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
Existing MESPS and forcemain would remain unchanged. |
| 3B          | Construct new pumping station on property along Trussler Road  
Construct new forcemain routed along **Trussler Road** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
Existing MESPS and forcemain would remain unchanged. |
| 4A          | Construct new gravity sewer from ATNS to existing MESPS capturing flow from ATNS and serviceable/developable properties along Trussler Road and Ottawa Street South.  
Upgrade existing MESPS and construct new forcemain routed through existing development, |
<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4B          | - Construct new gravity sewer from ATNS to existing MESPS capturing flow from ATNS and serviceable/developable properties along Trussler Road and Ottawa Street South.  
- Upgrade existing MESPS and construct new forcemain routed through existing development, **along Trussler Road, and then along Ottawa Street South** for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive. |
| 5A          | - Construct new pumping station on development property **within ATNS**.  
- Construct new forcemain **through ATNS** and then along Ottawa Street South for discharge to new MH structure at the intersection of Ottawa Street South and David Bergey Drive.  
- Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain or retain as backup connection. |
| 5B          | - Construct new pumping station on development property **within ATNS**.  
- Construct new forcemain **along Trussler Road** and Ottawa Street South and discharge to MH on Ottawa Street South.  
- Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain or retain as backup connection. |
| 6A          | - Construct new pumping station on property **along Trussler Road**  
- Construct new forcemain **through ATNS** and discharge to MH on Ottawa Street South.  
- Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain or retain as backup connection. |
| 6B          | - Construct new pumping station on property **along Trussler Road**  
- Construct new forcemain **along Trussler Road** and Ottawa Street South and discharge to MH on Ottawa Street South.  
- Upgrade the existing MESPS and reroute/modify existing forcemain to new pumping station. Decommission the remaining segment of forcemain along Trussler Road and Ottawa Street South or retain as backup connection. |

**Figure 5.1 Graphic Overview of Alternative Solutions**

Legend:  
- Existing Gravity  
- Existing Forcemain  
- Existing Manhole  
- Proposed Gravity Sewer  
- Proposed Forcemain
5.1 ALTERNATIVE 1: “DO NOTHING”

The MCEA process requires all proponents to consider the “Do Nothing” scenario as a base alternative in order to ensure that all reasonable efforts are made to avoid the unnecessary construction of new or expanded infrastructure and their potential negative environmental effects. In this case, the Do Nothing alternative (see Figure 5.2) is to maintain the existing level of servicing and provide no additional servicing to support future development.

Figure 5.2 Alternative 1 – “Do Nothing”
5.2 ALTERNATIVE 2: “NEW PUMPING STATION WITHIN ACTIVA TRUSSLER NORTH SUBDIVISION & NEW FORCEMAIN”

This alternative involves the construction of a new pumping station rated at about 60 L/s within the Activa Trussler North Subdivision to support future development, while the existing Mannheim Estates Pumping Station and forcemain remains unchanged (see Figure 5.3).

Alternative 2 is broken down into the following sub-alternatives with respect to the proposed alignment of the new forcemain:

- Alternative 2A: A new 250mm diameter forcemain routed through the Activa Trussler North Subdivision and then routed along Ottawa Street South to David Bergey Drive; or
- Alternative 2B: A new 250mm diameter forcemain routed primarily along Trussler Road and Ottawa Street South to David Bergey Drive.

Figure 5.3 Alternative 2 – New Pumping Station within Activa Trussler North Subdivision and New Forcemain
5.3 ALTERNATIVE 3: “NEW PUMPING STATION ON TRUSSLER ROAD & NEW FORCEMAIN”

This alternative involves the construction of a new pumping station rated at about 60 L/s located on Trussler Road to support future development, while the existing Mannheim Estates Pumping Station and forcemain remains unchanged (see Figure 5.4).

Alternative 3 is broken down into the following sub-alternatives with respect to the proposed alignment of the new forcemain:

- Alternative 3A: a new 250mm diameter forcemain routed through the Activa Trussler North Subdivision and then routed along Ottawa Street South to David Bergey Drive; or
- Alternative 3B: a new 250mm diameter forcemain routed primarily along Trussler Road and Ottawa Street South to David Bergey Drive.

Figure 5.4 Alternative 3 – New Pumping Station on Trussler Road and New Forcemain
5.4 ALTERNATIVE 4: “NEW GRAVITY SEWER, UPGRADE MANNHEIM ESTATES PUMPING STATION & NEW FORCEMAIN”

This alternative involves the construction of a new gravity sewer from the Activa Trussler North Subdivision and other serviceable lands along Trussler Road to the existing Mannheim Estates system, to support future development (see Figure 5.5). The existing Mannheim Estates Pumping Station (MESPS) would be essentially replaced with a larger pumping facility rated at approximately 70 L/s to accept the additional flows, while the existing 150mm diameter MESPS forcemain would be totally abandoned. The existing sanitary sewer through Mannheim Estates is not suitable for routing the larger flows from the catchment area to the new MESPS.

Alternative 4 is broken down into the following sub-alternatives with respect to the proposed alignment of the new forcemain:

- **Alternative 4A**: A new 250mm diameter forcemain through the Mannheim Estates subdivision, through the Activa Trussler North Subdivision and then routed along Ottawa Street South to David Bergey Drive; or
- **Alternative 4B**: A new 250mm diameter forcemain through the Mannheim Estates subdivision and then along Trussler Road and Ottawa Street South to David Bergey Drive.

Figure 5.5 Alternative 4 – New Gravity Sewer, Upgrade Mannheim Estates Pumping Station and New Forcemain
5.5 ALTERNATIVE 5: “NEW PUMPING STATION WITHIN ACTIVA SUBDIVISION, UPGRADE MANNHEIM ESTATES PUMPING STATION & NEW FORCemain”

This alternative involves the construction of a new pumping station rated at approximately 60 L/s within the Activa Trussler North Subdivision, to support future development (see Figure 5.6). The existing Mannheim Estates Pumping Station and 150mm diameter forcemain would be modified in order to divert flow to the new pumping station, while the remaining 150mm diameter forcemain running along Trussler Road and Ottawa Street South would be abandoned. This offers the advantage of reducing the pumping head and power required at the existing MESPS (e.g., allowing it to potentially service more lands in the neighbouring vicinity) and in eliminating/abandoning a large portion of the existing 150mm forcemain along Trussler Road and Ottawa Street South.

Alternative 5 is broken down into the following sub-alternatives with respect to the proposed alignment of the new forcemain from the new pumping station:

- Alternative 5A: A new 250mm diameter forcemain routed through the Activa Trussler North Subdivision and then routed along Ottawa Street South to David Bergey Drive; or
- Alternative 5B: A new 250mm diameter forcemain routed along Trussler Road and Ottawa Street South to David Bergey Drive.

Figure 5.6 Alternative 5 – New Pumping Station within Activa Subdivision, Upgrade Mannheim Estates Pumping Station and New Forcemain
5.6 ALTERNATIVE 6: “NEW PUMPING STATION ON TRUSSLER ROAD, UPGRADE MANNHEIM ESTATES PUMPING STATION & NEW FORCEMAIN”

This alternative involves the construction of a new pumping station rated at about 60 L/s located along Trussler Road, to support future development (see Figure 5.7). The existing Mannheim Estates Pumping Station and 150mm diameter forcemain would be modified in order to divert flow to the new pumping station, while the remaining 150mm diameter forcemain running along Trussler Road and Ottawa Street South would be abandoned. As per Alternative 5, this also offers the advantage of reducing the pumping head and power required at the existing MESPS (e.g., allowing it to potentially service more lands in the neighbouring vicinity) and in eliminating/abandoning a large portion of the existing 150mm forcemain along Trussler Road and Ottawa Street South.

Alternative 6 is broken down into the following subalternatives with respect to the proposed alignment of the new forcemain:

- Alternative 6A: A new 250mm diameter forcemain routed through the Activa Trussler North Subdivision and then routed along Ottawa Street South to David Bergey Drive; or
- Alternative 6B: A new 250mm diameter forcemain routed along Trussler Road and Ottawa Street South to David Bergey Drive.

Figure 5.7 Alternative 6 – New Pumping Station on Trussler Road, Upgrade Mannheim Estates Pumping Station and New Forcemain
6 EVALUATION OF ALTERNATIVES

This section outlines the study evaluation criteria that were used to consider the relative advantages and disadvantages of each alternative identified in Section 5.

6.1 ELIMINATION OF ALTERNATIVES

Following the initial Public Information Centre (PIC) 1, where all alternatives were presented to the public, it was determined that Alternatives 3 and 6 (including their “A” and “B” derivatives) should be eliminated from further assessment. The common element and defining characteristic of Alternatives 3 and 6 was the proposed development of a pumping station on Trussler Road. This is not considered to be feasible for the following reasons:

- Proximity to a busy Regional road and stormwater management facilities; and
- Consideration of the future improvements to Trussler Road including potential road widening, installation of major gas pipeline and traffic safety concerns.

As a result, only Alternatives 1 (Do Nothing), 2, 4 and 5 were taken forward for subsequent evaluation.

6.2 EVALUATION CRITERIA

Evaluation criteria were identified and applied to the alternative solutions. The criteria were developed based on previous experience with similar projects and professional opinion on the potential environmental effects that might reasonably be expected. The evaluation included the following criteria:

- **Natural Environment:**
  - Impact on designated natural areas (e.g. environmentally sensitive policy areas [ESPAs] and provincially significant wetlands [PSWs])
  - Impact on natural heritage features (e.g. wetlands, woodlands, valleylands, wildlife, wildlife habitat)
  - Impact on fisheries and aquatic habitat
  - Impact on Species of Conservation Concern and/or Associated Habitat
  - Overall ability to meet regulatory constraints

- **Socio-Cultural Environment:**
  - Potential for disruption/inconvenience to adjacent properties and buildings
  - Impact on local businesses
  - Potential for loss/disruption to community/recreational features
  - Change in community character
  - Consistency with current land use designations, policies and development plans
  - Ability to blend site into surrounding landscape
  - Impact on cultural heritage and archaeological resources
  - Impact on agricultural and rural areas
• **Construction factors:**
  - Ease of excavation and need for dewatering during construction
  - Potential for disruption to local traffic during construction
  - Potential for noise, dust and vibration during construction
  - Construction constraints (permitting requirements, land acquisition)
  - Impact on existing utilities and services (mains sewers, gas, electric)

• **Financial factors:**
  - Capital costs (pumping station, forcemains, sewers)
  - Operations and maintenance costs
  - Property acquisition costs
  - Net Present Value

• **Technical (engineering) factors:**
  - Effectiveness and reliability in achieving study objectives
  - Time required to implement
  - Soil conditions and groundwater table impacts
  - Potential for leakage into Well Head Protection Zone
  - Ease of maintenance
  - Flexibility to institute changes if targets are revised or improvements required
  - Overall constructability.

The alternatives were largely evaluated on a qualitative basis, using “most preferred” to “least preferred” terminology. Where possible, quantitative analysis was performed to derive the preferred alternative for specific criteria. This method of evaluation is considered appropriate for a relatively predictable undertaking, such as this Schedule B project.

### 6.3 RESULTS OF THE EVALUATION PROCESS

Discipline specialists for ecology, land use planning, archaeology, cultural heritage and engineering evaluated each of the alternatives against the identified evaluation criteria. The alternatives were comparatively assessed against one another and ranked from ‘most preferred’ to ‘least preferred’. In some instances, there is negligible difference across the alternatives and so for some criteria there is no clear preferred alternative.

In some cases, the Do Nothing is shown to be the preferred alternative because there are no potential adverse environmental effects associated with it (as no additional infrastructure is proposed). However, as shown in the following sections, the Do Nothing is a benchmark by which to comparatively evaluate all other Alternatives. Importantly, because the Do Nothing does not support the objectives of the study, provide a solution to the problem/opportunity statement, or support future growth needs, it cannot be deemed the overall preferred alternative.
Ranking of the alternatives was given by comparison and analysis of the evaluation criteria as documented below and in Appendix D. A “Most Preferred” ranking was given to the alternative with the least potential environmental effects, down to “Least Preferred” for the alternative with the greatest potential environmental effects. In many instances this is based upon a qualitative assessment; however where possible the assessment was undertaken based on quantitative data.

6.3.1 NATURAL ENVIRONMENT

Overall, since Alternatives 2, 4 and 5 are considered to have similar potential effects to the Natural Environment there is a negligible difference between Alternatives 2, 4 and 5. The Do Nothing does not result in any potential adverse effects to the natural environment.

Impact on designated natural areas:

There is a negligible difference between Alternatives 2, 4 and 5. In all alternatives, there is the potential for sediment release into the adjacent Locally Significant Wetland (LSW) if the forcemain is constructed on the south side of Ottawa Street South. No potential impacts are anticipated during regular operation and there is a low risk of the forcemain rupturing and releasing sewage into the Laurentian West Wetland Complex.

Impact on natural heritage features:

There is a negligible difference between Alternatives 2, 4 and 5. The construction of the pumping station will remove a portion of a hedgerow and cultural vegetation mosaic. The installation of the forcemain will require the temporary disturbance of roadside cultural meadow. No potential impacts are anticipated during regular operation.

Impact on fisheries and aquatic habitat:

There is a negligible difference between Alternatives 2, 4 and 5. In all alternatives, there is the potential for sediment release into the wetland (LSW) (assumed fish habitat) if the forcemain is constructed on the south side of Ottawa Street South. No potential impacts are anticipated during regular operation and there is a low risk of the forcemain rupturing and releasing of sewage into fish habitat (part of the LSW).

Impact on Species of Conservation Concern and/or Associated Habitat:

There is a negligible difference between Alternatives 2, 4 and 5. There is the potential for sediment release into adjacent LSW if the forcemain is constructed on the south side of Ottawa Street South. This may affect confirmed Snapping turtle (Special Concern) and potential Blanding’s turtle (Threatened) habitat. There is a potential SAR turtle injury/mortality risk if construction is conducted during the hibernation period. There is a potential SAR turtle injury/mortality risk if turtles enter the construction zone. No potential impacts are anticipated during regular operation and there is a low risk of the forcemain rupturing and releasing of sewage into the Laurentian West Wetland Complex.
Overall ability to meet regulatory constraints:

There is a negligible difference between Alternatives 2, 4 and 5. The LSW (potentially affected by all Alternatives) provides confirmed habitat for Snapping turtle and potential habitat for Blanding’s turtle. Blanding’s turtle is designated as Threatened under the *Endangered Species Act*. Snapping turtle does not fall under regulatory constraints as it is not protected under the *Endangered Species Act*.

6.3.2 Socio-Cultural Environment

Overall, Alternative 2A is the preferred alternative from a socio-cultural environment perspective. Importantly, the Do Nothing does not support City growth policies, plans or objectives.

Potential for disruption/inconvenience to adjacent properties and buildings during construction and operation:

Alternatives 2 and 5 perform better than Alternative 4 and are therefore given a higher ranking. All Alternatives have a potential minor/temporary disruption to adjacent properties accessed from Ottawa Street South during construction and at its intersection with Prosperity Drive. Additional minor/temporary disruption to adjacent properties may occur within the Mannheim Estates for Alternatives 4 during construction. No potential impacts are anticipated during regular operation.

Impact on local businesses during construction and operation:

There is a negligible difference between Alternatives 2, 4 and 5. No potential impacts are anticipated during construction or regular operation as the surrounding area is primarily residential in nature. The nearest cluster of local businesses is located approximately 500m to the east of the study area at the Sunrise Shopping Centre, which is not expected to be adversely impacted and direct access to this location will not be impacted.

Potential for loss or disruption to community/recreational features during construction and operation:

Alternative 2 performs marginally better than Alternatives 4 and 5 and is therefore considered to be the preferred alternative and is given a higher ranking. No loss or disruption to community/recreational features is anticipated in Alternative 2 during construction or operation. In Alternatives 4 and 5, potential minor/temporary disruption during construction and a loss of adjacent parkland may occur if the existing Mannheim Estates Pumping Station is expanded.

Change in community character:

No change in community character is anticipated for any of the Alternatives given the relative scale of the proposed works, integration with the proposed subdivision development and containment of infrastructure largely within the existing road right-of-way.

Consistency with current land use designations, policies and development plans:
There is a negligible difference between Alternatives 2, 4 and 5. Crucially, these Alternatives perform better than Alternative 1 (Do Nothing). The Do Nothing does not support wider growth objectives for the City of Kitchener. All other Alternatives are consistent with land use designations and support wider development plans and policies.

**Ability to blend into surrounding landscape:**

Alternatives 2 and 4 perform marginally better than Alternative 5 and are therefore given a higher ranking. In Alternative 2, the new pumping station may have a minor visual impact but can be designed to blend into the proposed landscape within the subdivision through appropriate screening measures. Alternative 4 may have a minor visual impact to the existing landscape depending on the extent of the upgrade to the existing Mannheim Estates Pumping Station. In Alternative 5, the combination of a new pumping station and upgrade to the existing Mannheim Estates Pumping Station may have a marginally greater visual impact than Alternatives 2 and 4.

**Impact on cultural heritage and archaeological resources:**

There is a negligible difference between Alternatives 2, 4 and 5. The impact to archaeological and cultural heritage resources is considered to be low for all Alternatives as they will not have a direct physical or visual impact on 2219 and 2220 Ottawa St. S. and a potential minor and temporary impact during construction to 632 Trussler Rd.

**Impact on agricultural and rural areas:**

In all Alternatives, lands within the City of Kitchener, and which are proposed to accommodate the new pumping station and forcemain, are currently zoned as A-1 Agricultural and are largely contained within the proposed Activa subdivision area (except where the forcemain travels along Ottawa Street South to David Bergey Drive). Given these lands will be developed for the purposes of constructing the subdivision, it is not anticipated that the proposed Alternatives will have any additional impact upon these lands zoned as Agricultural, beyond that which is already expected for the subdivision works.

**6.3.3 Construction**

Overall, Alternative 2A is the preferred alternative from a construction perspective.

**Complexity of proposed Works:**

Alternatives 2A and 5A are both located in Greenfield sites within the proposed subdivision development area and involve the minimum level of linear works. Alternative 4B is within the Mannheim Estates development and may be more difficult to control and involves the maximum level of linear works. Therefore, Alternatives 2A and 5A are given a higher ranking.

**Soil conditions and groundwater table impacts:**

All Alternatives involve deep excavations, forcemain trenching and dewatering to be carefully controlled in accordance with the hydrogeological and geotechnical investigation recommendations.
Potential for disruption to local traffic during construction:

Alternatives 2A and 5A are largely limited to within a Greenfield site with the minimum level of linear works. Alternative 4B may have the greatest impacts experienced in the Mannheim Estates, and there is a higher level of linear works required. Therefore, Alternatives 2A and 5A are given a higher ranking.

Potential for noise, dust and vibration during construction:

Alternative 2A is located within a Greenfield site with the minimum level of linear works along Ottawa Street South. Alternative 4B may have the greatest impacts experienced in the Mannheim Estates, along Trussler Road and Ottawa Street South. Therefore, Alternative 2A is given a higher ranking.

Construction constraints (e.g. permitting requirements and land acquisition):

Alternative 2 is located within a Greenfield site within the proposed subdivision development area and linear works are largely within the existing right-of-way. Alternative 4B requires the potential expansion of the existing Mannheim Estates Pumping Station which requires additional approval from Wilmot Township, and it involves the maximum amount of linear works. Therefore, Alternative 2 is given a higher ranking.

Impact on existing utilities and services (e.g. mains sewers, gas, electric):

Alternatives 2A and 5A involve the minimum level of linear works and will be connected to new utilities and services. Alternative 4B requires the potential upgrade of the existing Mannheim Estates Pumping Station which will require modifications to existing utilities and services and involves the maximum level of linear works. Therefore, Alternatives 2A and 5A are given a higher ranking.

6.3.4 Financial

A review of the estimated capital cost for each alternative requires a look at the initial estimated construction costs as well as the future estimated operation and maintenance costs. To gain greater insight into how the alternatives compare to each other, an estimated net present value has been calculated taking into consideration the estimated construction cost as well as future estimated operating, maintenance, rehabilitation and replacement costs. Net present value has been calculated for the 25-year period. A summary of estimated capital, operation and maintenance and total net present value costs is presented in the following table.
Table 6.1 Summary of Estimated Costs

<table>
<thead>
<tr>
<th></th>
<th>Estimated Capital Costs</th>
<th>Projected Operation &amp; Maintenance Costs Net Present Value (25 yrs)</th>
<th>Projected Total Net Present Value (25 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 2A</td>
<td>$3,700,000</td>
<td>$860,000</td>
<td>$4,560,000</td>
</tr>
<tr>
<td>Alternative 2B</td>
<td>$4,200,000</td>
<td>$880,000</td>
<td>$5,080,000</td>
</tr>
<tr>
<td>Alternative 4A</td>
<td>$4,800,000</td>
<td>$1,170,000</td>
<td>$5,970,000</td>
</tr>
<tr>
<td>Alternative 4B</td>
<td>$5,200,000</td>
<td>$1,210,000</td>
<td>$6,410,000</td>
</tr>
<tr>
<td>Alternative 5A</td>
<td>$3,900,000</td>
<td>$1,090,000</td>
<td>$4,990,000</td>
</tr>
<tr>
<td>Alternative 5B</td>
<td>$4,400,000</td>
<td>$1,120,000</td>
<td>$5,520,000</td>
</tr>
</tbody>
</table>

Capital costs (e.g. pumping station, forcemain, sewers):

Alternative 2A will be located within a Greenfield site and the forcemain will require the minimum level of linear works. Alternative 4 requires major modifications to the existing Mannheim Estates Pumping Station, including the provision of emergency storage, larger gen-set, expansion to the site, new and extended gravity sewer, and a new and extended forcemain through the Mannheim Estates, proposed subdivision, Trussler Road and Ottawa Street South. Therefore, Alternative 2A is given a higher ranking.

Operations and maintenance costs:

Operating and maintenance (O&M) costs for gravity sewers and forcemains are generally considered to be minimal. An annual equipment fund of 1% of the capital expenditure has been added to the net present value calculations to account for rehabilitation/replacement cost after the 25 year life cycle.

The maintenance cost for a pumping station is estimated based on 2 employees and a truck required for 2 hours per day, 5 days per week ($600/week, $31,200 per year). The operating costs for pumping stations are calculated using the annual power consumption based on pump operation, assumed efficiency, and flow and head requirements. These are annual costs assuming operation for 365 days/year. The electricity utility cost used is $0.15/kWh. As the various alternatives discharge slightly different volumes at different elevations and forcemain lengths, it is necessary to estimate the pumping costs in order to gain a comprehensive understanding of the operating costs for each alternative.

Operating and maintenance costs including labour, power, disposables and other routine and emergency repairs are estimated to be lowest for Alternative 2A and therefore it is given a higher ranking. For all other alternatives, overall power and linear related maintenance costs, which are considered to be the major O&M cost elements, are greater due to increased forcemain and sewer lengths and greater pump power requirements.
Property acquisition costs:

Alternatives 2 and 5 are located within the proposed subdivision development area with no requirement for further property acquisition. Alternative 4 may require the acquisition of adjacent land in order to expand the existing Mannheim Estates Pumping Station. Therefore, Alternatives 2 and 5 are given a higher ranking.

Restoration costs:

Alternatives 2A and 5A involve the minimum level of infrastructure as well as minimum potential disruption of existing infrastructure (mostly associated with roads and buried services and utilities) and as such have lower estimated restoration costs. Alternatives 4 and 5 may require additional restoration within the existing Mannheim Estates subdivision. Therefore, Alternatives 2A and 5A are given a higher ranking.

Net Present Value:

Net present value costs associated with the construction, operation and maintenance of the recommended assets described for Alternative 2A are projected to be the lowest. Alternatives 4 and 5 are generally characterized by higher construction and O&M costs which yield comparatively higher net present value costs. Therefore, Alternative 2A is given a higher ranking.

Overall, Alternative 2A demonstrates the lowest projected total net present value, and therefore is the preferred alternative from a financial perspective.

A more detailed breakdown of the capital and operation and maintenance costs are presented in Appendix C.

6.3.5 Technical

Overall, Alternative 2A is the preferred alternative from a technical perspective.

Effectiveness and reliability in achieving study objectives:

The Do Nothing does not support the study objectives. All other Alternatives are supportive of the study objectives and therefore are given a higher ranking.

Time required to implement:

Implementation of Alternative 2 will be facilitated by the City and subdivision developer without additional approvals required from Wilmot Township, which would be required for Alternatives 4 and 5. As such, the time to implement for Alternative 2 is likely to be shorter than for other alternatives. Therefore, Alternative 2 is given a higher ranking.
Potential for leakage into Well Head Protection Zone:

For all Alternatives, the risk of sewage leakage into the well head protection zone is identified, although considered extremely low. Identified factors include proximity, extent of buried infrastructure, length of sewers, length of forcemains and number of forcemains. Opportunities to minimize these risk factors were considered in developing the details of each of the pumping station and forcemain Alternatives, although topography and the presence of existing and proposed development and existing infrastructure plays the greatest role in terms of risks, due to proximity to existing Regional wells. Overall, the single pumping station of Alternative 4, located furthest from the Well Head Protection Zone, combined with the elimination of the existing 150mm forcemain from Mannheim Estates, gives Alternative 4 a higher ranking.

Potential for noise and/or odour emissions during operation:

All Alternatives carry some risk of noise and odour during operation. However, there would be negligible difference between all Alternatives as noise, odour and generator emissions are expected to be controlled to within site-specific and MOE requirements on a site by site basis.

Ease of maintenance:

Alternative 4 consolidates maintenance at a single pumping station and forcemain. Alternatives 2 and 5 require maintenance at two pumping station locations; however Alternative 5 only requires maintenance of one forcemain, in comparison to Alternative 2 which has two forcemains. Therefore, Alternative 4 is given a higher ranking.

Flexibility to institute changes if targets revised or improvements required:

The proposed infrastructure for Alternatives 2 and 5 is able to best support future changes/improvements within City limits. The Do Nothing does not provide any additional infrastructure to support future requirements and Alternative 4 is located in adjacent Wilmot Township. Therefore, Alternatives 2 and 5 are given a higher ranking.

Overall constructability:

Alternative 2A is located within a Greenfield site and the proposed subdivision development area and involves the minimum level of linear works. It is therefore given the highest ranking. Alternative 2B involves the construction of a greater forcemain length along Trussler Road and Ottawa St. South. Alternative 4 generally involves more complex construction through existing development, with Alternative 4B requiring the maximum amount of linear works along and through existing road allowances and is therefore given the lowest ranking.
6.3.6 Overall Evaluation

After considering the evaluation of each alternative against the criteria developed for this study, the overall preferred alternative is **Alternative 2A**. In comparison to other alternatives (excluding the Do Nothing), Alternative 2A performs better against socio-cultural criteria, construction criteria, financial criteria and technical criteria. While the Do Nothing does not result in any potential adverse environmental effects and does not require any additional construction or associated costs, it clearly does not address the problem/opportunity and study objectives, and does not provide the necessary infrastructure to support future servicing needs or City-wide growth targets. These are considered to be major flaws which together determine that the Do Nothing is the least preferred alternative. Of the other feasible alternatives that do address these criteria, Alternative 4B is considered to be the least preferred alternative, as it does not perform as well as other alternatives against construction, financial and technical criteria.

**Table 6.2** below summarizes the overall evaluation results. In the summary below a numerical value of 4 was applied to the most preferred alternative (full circle), working down to a value of zero for the least preferred alternative (empty circle).

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 4</th>
<th>Alternative 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Nothing</td>
<td></td>
<td>2A</td>
<td>2B</td>
<td>4A</td>
</tr>
<tr>
<td>Natural Environment</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Socio-Cultural</td>
<td></td>
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<tr>
<td>Construction</td>
<td></td>
<td></td>
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<td>Financial</td>
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</tr>
<tr>
<td>Technical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVERALL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The detailed evaluation matrix is contained within **Appendix D**.
6.4 PREFERRED ALTERNATIVE – ALTERNATIVE 2A

The preferred Alternative 2A includes construction of a new pumping station and forcemain to service lands within the Laurentian West 3B Area (Figure 6.1).

Figure 6.1 Preferred Alternative (Alternative 2A)

The recommended Pumping Station design should integrate form and function into a unified and compact structure; incorporating architectural, landscaping and security features to enhance its visual appearance and help the facility integrate within the proposed Activa Trussler North Subdivision (ATNS). The recommended facility design is based on an ultimate peak pumping capacity of 60 litres per second (L/s) and would include an automated pumping system with Supervisory Control and Data Acquisition (SCADA) integration, emergency wastewater storage, a diesel powered emergency generator, and appropriate odour, emissions and noise controls. The station is located to allow for gravity flow from sewers within the ATNS and from adjacent lands located primarily south of Ottawa Street South by extending the proposed gravity sewer system. However, a sewer alignment along Trussler Road would most likely have to be diverted along Ottawa Street South and then run through the proposed Activa subdivision in order to maintain adequate (minimum) cover over the sewer. A sewer alignment along
Trussler Road to the intersection of the proposed entrance road to the subdivision (Street “Two”) is possible, but would be much deeper and more costly to construct.

**Figure 6.2 Proposed Pumping Station Concept**

Flow collected at the pumping station will be pumped through a dedicated 250 mm diameter sewage forcemain, which exits the pumping station site as shown in **Figure 6.3** below.

**Figure 6.3 Forcemain Exit Point from Pumping Station**

The proposed forcemain (seamless High-density polyethylene (HDPE) or conventional Poly-vinyl chloride (PVC) to appropriate pressure rating) will then be routed initially along roadways within the proposed ATNS and then routed within the Ottawa Street South right-of-way (shown in **Figure 6.4** below), initially passing the Region of Waterloo Mannheim WTP, water storage facility and buried water transmission infrastructure. Given the density and close proximity of existing critical water transmission mains and infrastructure, careful coordination with the Region and utilities will be required during detail design and construction.
Following a carefully planned and designed route within the existing Ottawa Street South right-of-way, the forcemain will pass existing and future residential lands, open areas as well as environmentally sensitive lands. The forcemain design will incorporate appropriate mitigation measures and controls to protect all adjacent and nearby buried infrastructure and lands as required during and following construction activities.

The sewage forcemain is designed to connect into the City of Kitchener’s (the City) existing gravity sewer system, currently proposed to be at the intersection of Ottawa Street South and David Bergey Drive, as shown in Figure 6.5.

This connection point was determined to have sufficient local and downstream capacity, verified using the City’s InfoSWMM sanitary sewer model to hydraulically analyze the impact of the new pumping station flow and other local inputs on the City’s existing sewer network.
7  POTENTIAL EFFECTS & RECOMMENDED MITIGATION MEASURES FOR THE PREFERRED ALTERNATIVE

7.1  POTENTIAL EFFECTS & RECOMMENDED MITIGATION MEASURES

7.1.1  NATURAL ENVIRONMENT

Impact on designated natural areas:

Potential Effect

For the segment of forcemain located along Ottawa Street South primarily between Wilson’s Road and David Bergey Drive, it is recognized that there may be a greater potential for sediment release into the adjacent Locally Significant Wetland (LSW) (as shown previously in Figure 3.1) if the forcemain is constructed on the south side of Ottawa Street South. This is addressed further at the end of Section 7.1.1.

Mitigation

The forcemain alignment within the municipal road right-of-way will be confirmed at the detailed design stage, with a recommendation to route it along the north side of Ottawa Street South where feasible (see the end of Section 7.1.1). Figure 7.1 depicts one possible routing showing the forcemain crossing to the north side of Ottawa Street South at Prosperity Drive.

Figure 7.1 Forcemain Alignment along Ottawa Street South
Pipeline construction and staging will be confined within the right-of-way accordingly. Sheet pile and/or horizontal directional drilling for deeper excavations will minimize the construction footprint where required. Siltation control fencing and filter bags or settling ponds for pumped groundwater will be used during construction. Exposed surfaces will be stabilized and re-vegetated as soon as possible to provide erosion control.

GRCA will be further consulted at the detailed design stage to discuss any required permits or approvals.

**Impact on natural heritage features:**

*Potential Effect*

The construction of the pumping station will remove a portion of a hedgerow and cultural vegetation mosaic. The installation of the forcemain will require the temporary disturbance of roadside cultural meadow. These features are comprised of predominantly non-native species.

*Mitigation*

A portion of the forcemain construction and staging is constrained within the existing right-of-way, from the point where it enters Ottawa Street South from the proposed subdivision to the point where it connects with the existing gravity sewer at David Bergey Drive. Sheet pile and/or close couple caisson wall for deeper excavations will minimize the construction footprint. Siltation control fencing and filter bags or settling ponds for pumped groundwater will be used during construction. Exposed surfaces will be stabilized and re-vegetated as soon as possible to provide erosion control.

GRCA will be further consulted at the detailed design stage to discuss any required permits or approvals.

**Impact on fisheries and aquatic habitat:**

*Potential Effect*

There is the potential for sediment release into the wetland (LSW) (assumed fish habitat) if the forcemain is constructed on the south side of Ottawa Street South. The forcemain alignment within the municipal road right-of-way will be determined at the detailed design stage. This is addressed further at the end of Section 7.1.1.

*Mitigation*

A portion of the forcemain construction and staging is constrained within the existing right-of-way, from the point where it enters Ottawa Street South from the proposed subdivision to the point where it connects with the existing gravity sewer at David Bergey Drive. Sheet pile and/or close couple caisson wall construction for deeper excavations will minimize the footprint. Siltation control fencing and filter bags or settling ponds for pumped groundwater will be used during construction. Exposed surfaces will be stabilized and re-vegetated as soon as possible to provide erosion control.

GRCA will be further consulted at the detailed design stage to discuss any required permits or approvals.
**Impact on Species of Conservation Concern and/or Associated Habitat:**

*Potential Effect*

There is the potential for sediment release into adjacent LSW (SAR turtle habitat) if the forcemain is constructed on the south side of Ottawa Street South. The forcemain alignment within the municipal road right-of-way will be determined at the detailed design stage. This is addressed further at the end of Section 7.1.1.

Excavation activity along the edge of the LSW south of Ottawa Street South and west of David Bergey Drive may potentially result in SAR turtle injury/mortality risk if construction is conducted during the hibernation period. There is also potential SAR turtle injury/mortality risk if the turtles enter the construction zone during their active period. Eastern Ribbonsnake could also be affected by excavations along the edge of the LSW. As noted above, shown in Figure 7.1, and discussed at the end of Section 7.1.1, the alignment may be routed to the north side of Ottawa Street South to maximize the buffer between the LSW and the construction zone.

Milksnake may be affected by the disturbance of the cultural meadow habitat and associated brush piles within the study area.

*Mitigation*

A portion of the forcemain construction and staging running parallel to Ottawa Street South is constrained within the existing right-of-way. Sheet pile and/or close couple caisson wall construction for deeper excavations will minimize the footprint where required. Siltation control fencing and filter bags or settling ponds for pumped groundwater will be used during construction. Exposed surfaces will be stabilized and re-vegetated as soon as possible to provide erosion control.

Wildlife fencing will be installed prior to construction to exclude wildlife (including snake and turtle species) from the construction zone. In designing the exclusion fencing for reptiles and amphibians at the detailed design stage, reference should be given to the *Species at Risk Branch Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing (MNR, 2013)*. This recommends that the fencing be 100 cm high and buried to a depth of 10-20 cm to exclude *Snakes - general*. This would also be adequate to exclude relevant turtle species (Blanding’s turtle and Snapping turtle), as the recommended fence height is only 60 cm for *Turtles – general*.

No in-water works or works that may alter water levels within the LSW or adjacent stormwater management pond should be conducted from October to April.

Further dialogue with an MNR SAR biologist is required at the detailed design stage once final construction and excavation requirements are known. ESA SAR permitting or registration with MNR following the new ESA rules effective July 1 2013 would be items of discussion at that time.
Overall ability to meet regulatory constraints:

Potential Effect

The LSW provides confirmed habitat for Snapping turtle and potential habitat for Blanding’s turtle. Blanding’s turtle is designated as Threatened under the Endangered Species Act and receives general habitat protection under the ESA 2007, in addition to the prohibitions against killing or harming the species. Snapping turtles does not fall under regulatory constraints as it is not protected under the Endangered Species Act.

Mitigation

No in-water works or works that may alter water levels within the Locally Significant Wetland or adjacent stormwater management pond should be conducted from October to April.

As previously described wildlife fencing will be installed prior to construction and will be designed with reference to the Species at Risk Branch Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing (MNR, 2013).

MNR will be consulted at the detailed design stage to discuss and required permit or approvals.

GRCA will be further consulted at the detailed design stage to discuss any required permits or approvals.

Summary of the Potential Effects on the Natural Environment and their Relation to the Detailed Design:

The above analysis demonstrates that potential natural environment effects associated with the Preferred Alternative relate to designated environmental features located on the south side of Ottawa Street South, specifically the presence of the LSW and Core Environmental Feature shown previously in Figure 3.1. Therefore, it is recommended that the north side of Ottawa Street South (as far from the southern edge as feasible within the existing road right-of-way) should be considered as the preferred alignment for the new forcemain during the detailed design stage.

By locating the forcemain on the north side of Ottawa Street South, it would serve to reduce the potential effects on Species of Conservation Concern and/or associated habitat. Furthermore, it would eliminate the potential for any in-water works and associated potential effects on fisheries and aquatic habitat. By reducing the need for more stringent mitigation measures required for construction on the south side of Ottawa Street South, it would also reduce overall expenditure by the City with respect to design, permitting and construction costs.

7.1.2 Socio-Cultural Environment

Overall, there is no anticipated loss of existing community or recreational features.
Potential for disruption/inconvenience to adjacent properties and buildings during construction and operation:

*Potential Effect*

There may be minor/temporary disruption to properties and residential roads accessed from Ottawa Street South during construction along the route and specifically at the intersection with Prosperity Drive, which provides access to the adjacent existing residential development. There will be no disruption or inconvenience to adjacent properties and buildings during regular operation.

*Mitigation*

A comprehensive Traffic Management Plan will be developed to address flows/congestion issues during construction. Access will be maintained at all times to residential areas during construction.

**Impact on local businesses during construction and operation:**

*Potential Effect*

No potential impacts are anticipated during construction or regular operation as the surrounding area is primarily residential in nature. The closest local businesses (e.g. at the Sunrise Shopping Centre) are located approximately 500m further east along Ottawa Street South and are not anticipated to be adversely affected by the proposed works.

*Mitigation*

A comprehensive Traffic Management Plan will be developed to address flows/congestion issues during construction. Access will be maintained at all times to local businesses during construction.

Potential for loss or disruption to community/recreational features during construction and operation:

*Potential Effect*

No loss or disruption to community/recreational features is anticipated.

*Mitigation*

None required.

**Change in community character:**

*Potential Effect*

No change in community character is anticipated given the relative scale of the proposed works, integration with the proposed subdivision development and containment of infrastructure largely within the existing road right-of-way.
**Mitigation**

None required.

**Consistency with current land use designations, policies and development plans:**

**Potential Effect**

The preferred alternative is consistent with current and future land use designations and supports wider City and Regional development and growth plans and policies.

**Mitigation**

None required.

**Ability to blend into surrounding landscape:**

**Potential Effect**

The new pumping station may have a minor visual impact on the surrounding landscape within the proposed subdivision.

**Mitigation**

At the detailed design stage, the pumping station can be appropriately designed to blend into the future landscape within the proposed subdivision. This may include vegetation screening measures.

**Impact on cultural heritage and archaeological resources:**

**Potential Effect**

During construction there may be a perceptible change in the visual, audible and atmospheric conditions at 632 Trussler Road. Vibration may occur, but is likely to be temporary in nature. The property is not presently designated as a cultural heritage resource under the *Ontario Heritage Act*.

There will be no effects on archaeological resources as construction will take place within lands already assessed for archaeological potential and/or previously disturbed (e.g. the existing road right-of-way).

**Mitigation**

The approximate 90m buffer between the proposed pumping station and the primary building on 632 Trussler Road is considered to provide a satisfactory lessening of any potential effects on this property. A preconstruction survey would be carried out as part of the construction of these works, prior to initiating actual construction.

No construction activities shall take place within the study area prior to the MTCS (Heritage Operations Unit) confirming in writing that all archaeological licensing and technical review requirements have been met.
As stated in the Stage 1 AA report, should proposed work fall within 10 metres of the St. James Lutheran Cemetery (1000 Knechtel Court in Wilmot Township) then a Stage 2 AA will be required. This is however not anticipated considering the proposed location and alignment of the preferred alternative.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licenced consultant archaeologist to carry out additional fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.


**Impact on agricultural and rural areas:**

*Potential Effect*

Lands within the City of Kitchener, and which are proposed to accommodate the new pumping station and forcemain, are currently zoned as A-1 Agricultural and are largely contained within the proposed Activa subdivision area (except where the forcemain travels within Ottawa Street South to David Bergey Drive). Given these lands will be developed for the purposes of constructing the subdivision, it is not anticipated that the proposed Alternatives will have any additional impact upon these lands zoned as Agricultural, beyond that which is already expected for the subdivision works.

*Mitigation*

None required.

**7.1.3 Construction**

Overall, the preferred pumping station site and portion of the forcemain will be through the proposed subdivision development and the remaining portion of the forcemain will be constrained within the existing road right-of-way. This is considered to offer the least complex solution with respect to noise, dust, odour and vibration impacts, which may be minimized through the use of appropriate mitigation measures.

**Soil conditions and groundwater table impacts:**

*Potential Effect*

The preferred alternative may involve deep excavations, forcemain trenching and dewatering. There may be a need for dewatering during excavation activities which require a Permit to Take Water (PTTW) from MOE.
Mitigation

Ensure that during all temporary dewatering required for works, appropriate energy dissipation and settling and filtration measures are used for the discharge of dewatering water, to minimize the potential for erosion or sediment release into watercourses or drainage features. A dewatering plan will include properly sized, designed and sited temporary filtration facilities. Site and design discharge points for release of dewatering discharge to prevent erosion and sucking of sediment will ensure that only clean flow is released to watercourses or drainage features.

Sheet pile and/or close couple water tight caisson wall construction combined with wet slab construction techniques for deeper excavations will minimize the dewatering requirements. Sheet piling used to contain dewatering areas will be removed following construction to prevent the obstruction of groundwater movement to streams. As a final consideration, conduct construction during the late summer period where there is a greater potential for lower groundwater levels.

Where groundwater dewatering is required in excess of 50,000 L/day to facilitate construction activities, a Permit to Take Water (PTTW) must be secured from the Ontario Ministry of the Environment (MOE) prior to work being undertaken. The purpose of this PTTW application is to ensure compliance with Ontario Regulation 387/04 under the Ontario Water Resources Act (OWRA).

The dewatering rates as calculated are based on conservative hydraulic conductivity values, groundwater table conditions, and excavation geometry. While it is likely that actual dewatering requirements will be much less than those calculated, an overall upset rate of 400,000 L/day for all potential dewatering sources can be utilized as a factor of safety and to ensure that the project is not delayed on account of the higher than expected dewatering requirements. Given the shallow and temporary nature of the dewatering for the proposed works it is not anticipated that this project will adversely affect the deep regional pumping wells.

If it is practicable for the foundation (and all related groundwater dewatering) of the proposed sanitary pumping station to be completed within 30 days, a Category 2 Permit to Take Water (PTTW) will be required to accommodate construction groundwater dewatering as necessary for the proposed construction activities. If the foundation works and associated groundwater dewatering cannot be completed within 30 days, a Category 3 PTTW will be required, although worst case dewatering rates are calculated to be <400,000L/day.

An assessment of potential temporary effects on nearby natural features as a result of construction dewatering should be conducted as part of the PTTW application report.

Further information on dewatering requirements is contained within the report entitled Preliminary Dewatering Requirements – Ottawa Trussler Area Sewage Facility Pumping Station and Forcemain (MMM Group Ltd., 2013). This report accompanies the Preliminary Design Report associated with this study.
Potential for disruption to local traffic during construction:

Potential Effect
There may be a temporary disruption to local traffic during construction activities, specifically along Ottawa Street South and to the residential area accessed from Prosperity Drive.

Mitigation
Linear works are largely limited to within a Greenfield site with the minimum level of linear works, thus reducing the potential disruption to local traffic. A comprehensive Traffic Management Plan will be developed to address flows/congestion issues during construction.

Potential for noise, dust and vibration during construction:

Potential Effect
There may be a temporary increase in noise, dust and vibration during construction activities.

Mitigation
Install noise barriers around construction areas in close proximity to sensitive receptors (e.g. residences).

Construction activities such as cutting and grinding are to be scheduled to minimize noise emissions to adjacent properties.

During construction the City’s noise by-law relating to construction work will be adhered to (By-law 2000-71, 8 May, 2000). This prohibits the sound or noise arising between 7pm-7am from any excavation or construction work, including the erection, demolition, alteration or repair of any building or structure except in case of urgent necessity.

The preferred alternative is largely limited to within a Greenfield site with the minimum level of linear works along Ottawa Street South, thus reducing the potential effects of a temporary increase in dust and vibration.

Dust suppression methods (water or other suppressant as appropriate) will be used in dust sensitive areas as required to control off-site migration of particulates. Other dust control measures may include:

- On-site vehicle and equipment idling will be discouraged where practical;
- Tracking of earth or soil from the site on trucks should be minimized through the use of mud mats located at the site entrance – if this is not effective then the physical removal of earth or soil from vehicles should be implemented;
- Vehicles hauling soil, aggregates or other dusty material should be covered to minimize dust generation;
- Construction activities should be scheduled to limit areas of exposed soil and dust generation;
• On-site (including roadways) flushing, sweeping and cleaning are to be performed on a regular basis, with consideration for the containment of wash water; and
• Exposed sources of fugitive dust are to be covered where practical and soil surfaces are to be restored and re-vegetated as soon as practical.

Vibration monitoring during any required pile driving operation in close proximity to existing structures and buried infrastructure would be recommended to ensure any established allowable thresholds are not exceeded.

Construction constraints (e.g. permitting requirements and land acquisition):

Potential Effect

The preferred alternative is located within a Greenfield site within the proposed subdivision development and linear works are largely located within the existing right-of-way. There is no requirement for additional land acquisition.

Mitigation

None required.

Impact on existing utilities and services (e.g. mains sewers, gas, electric):

Potential Effect

While no direct impacts are anticipated as a result of implementing the preferred alternative, some accommodation for temporary disruption to existing utilities and services to make tie-ins and diversions may be required during construction.

Mitigation

The preferred alternative involves the minimum level of linear works, thus reducing the potential disruption to utilities and services, and will also be connected to new utilities and services. The Region and utility providers (e.g. Hydro, Union Gas) will be consulted during the detailed design stage to determine requirements.

7.1.4 Financial

Overall, the preferred alternative has the lowest estimated capital, operation/maintenance and Net Present Value costs.

Capital costs (e.g. pumping station, forcemains and sewers):

Potential Effect

The preferred alternative has the lowest estimated capital expenditure at $3.7 million.
Mitigation
N/A

Operations and maintenance costs:

Potential Effect

The preferred alternative has the lowest estimated operations and maintenance costs.

Mitigation

N/A

Property acquisition costs:

Potential Effect

The preferred alternative pumping station is located within the proposed subdivision development, while the forcemain will be located in the road right-of-way, with no requirement for additional property acquisition.

Mitigation

None required.

Restoration costs:

Potential Effect

The construction of the preferred alternative may result in the need to restore any disturbed areas to previous condition (or better, where this is feasible).

Mitigation

The preferred alternative involves the minimum level of infrastructure relative to other Alternatives, which reduces the need for restoration. All disturbed surfaces will be returned to their previous condition (or better, where this is feasible).

Net Present Value:

Potential Effect

The preferred alternative has the lowest estimated Net Present Value costs.

Mitigation

N/A
7.1.5 **TECHNICAL**

Overall, the preferred alternative requires the least amount of time to implement and provides the flexibility to institute changes if targets are revised or future improvements are required.

**Effectiveness and reliability in achieving study objectives:**

*Potential Effect*

The preferred alternative is supportive of the study objectives.

*Mitigation*

N/A

**Time required to implement:**

*Potential Effect*

The preferred alternative may be implemented by the City and developer without the need for additional approvals from adjacent municipalities. Therefore, it is considered to require the least amount of time to implement.

*Mitigation*

N/A

**Potential for leakage into Well Head Protection Zone:**

*Potential Effect*

There is a potential for leakage into nearby Well Head Protection Zone during construction and operation.

*Mitigation*

As previously noted, the risk of sewage leakage into the well head protection zone is identified, although considered extremely low. Identified factors include proximity, extent of buried infrastructure, length of sewers, length of forcemains and number of forcemains. To minimize the potential impact of the preferred alternative, the recommended detail design of the pumping station and forcemain should include emergency storage tank and seamless piping which will enhance the reliability and operability of the system.

During the detailed design phase, the MOE's Guideline B-6 (Guidelines for Evaluating Construction Activities Impacting on Water Resources) will be followed along with any other applicable municipal and GRCA regulations, and also in consultation with the Region.
An appropriate spill prevention, containment and clean-up contingency plan for hydrocarbons and other deleterious substances shall be put into place by the contractor prior to construction work and appropriate spill containment and clean-up supplies shall be available on-site. All Operational personnel should be familiar with the requirements of the plan. Any spills or leaks will be captured, contained and cleaned up immediately and the MOE will be notified of all reportable spills.

Equipment and vehicles should be refuelled on impermeable pads or buried liners designed to allow full containment of spills.

**Potential for noise/odour emissions during operation:**

*Potential Effect*

It is anticipated that the preferred alternative may have negligible noise and/or odour emissions during operation.

*Mitigation*

Noise and odour emission controls will be designed to meet site specific and MOE requirements. For noise, this may include muffling, shrouding and cladding of noise sources including ventilation fans and louvers and installing barrier walls to meet height and sound absorption specifications to meet the site design requirements. For potential odour sources, including the pumping station, wet well and emergency storage tank, foul air may be collected and treated by an odour control device.

**Ease of maintenance:**

*Potential Effect*

It is anticipated that the proposed infrastructure associated with the preferred alternative may be easily maintained by the City.

*Mitigation*

N/A

**Flexibility to institute changes if targets are revised or improvements required:**

*Potential Effect*

It is anticipated that the preferred alternative provides the necessary flexibility to adapt to future servicing requirements.

*Mitigation*

N/A
**Overall constructability:**

*Potential Effect*

The preferred alternative is considered to provide the best overall constructability.

*Mitigation*

N/A
8 PUBLIC & AGENCY CONSULTATION

All materials relating to Public and Agency Consultation, including public notices, PIC information boards, handouts, correspondence received from agencies, and a summary of any comments received, are contained within Appendix E – Public and Agency Consultation Record.

8.1 NOTICE OF COMMENCEMENT

The Notice of Commencement was published on March 15, 2013 and March 22, 2013 in The Record. A mailing list for the study was developed to include relevant agencies, municipal contacts and addresses within the study area. The Notice of Commencement was also delivered by mail to these addresses.

The Notice of Commencement contained information concerning the study objectives, study area, details of the Schedule B Municipal Class EA process to be followed, and contact information for further enquiries.

8.2 PUBLIC INFORMATION CENTRE 1

The Notice of Public Information Centre (PIC) 1 was published on April 19, 2013 and May 3, 2013 in The Record, as well as being sent out by mail to contacts on the study mailing list. The Notice of PIC 1 contained further information on the study area, Municipal Class EA process, details of the PIC location and its purpose, and contact information.

PIC 1 was held on Tuesday, May 7, 2013, from 7pm-9pm at the W.T. Townshend Public School in Kitchener. Approximately 20 local residents attended the PIC.

The purpose of PIC 1 was to present the study scope and objectives, outline the technical investigations to be undertaken, provide information on the preliminary criteria for evaluating the alternatives, and provide an opportunity for the public and relevant agencies to review and comment. Attendees were provided with a handout to take home which summarized the key information presented at the PIC.

Discussion with attendees during the PIC was generally focused on explaining the purpose of the project and no significant concerns were raised by any attendees. One individual enquired about the effects of increased traffic along Trussler Road, but this was in relation to the proposed subdivision itself and not this specific EA study. Comment forms were available at the PIC for attendees to fill out with their thoughts; however none were received at the PIC or during the commenting period after the PIC.

The PIC 1 presentation boards were also posted on the City’s study webpage following the PIC.

8.3 PUBLIC INFORMATION CENTRE 2

The Notice of Public Information Centre (PIC) 2 was published on September 6, 2013 and September 20, 2013 in The Record, as well as being sent out by mail to contacts on the study mailing list. Importantly, this Notice also explained why the study area had been amended. This is described in more detail in Section 8.4.1 below. The Notice of PIC 2 contained further information on the study objectives, Municipal Class EA process, details of the PIC location and its purpose, and contact information.
PIC 2 was held on Wednesday, September 25, 2013, from 7pm-9pm at the W.T. Townshend Public School in Kitchener. Approximately 30 local residents attended the PIC.

The purpose of PIC 2 was to review the study objectives and amended study area, discuss the evaluation of alternative solutions and present the preliminary preferred alternative for discussion and feedback. Attendees were provided with a handout to take home which summarized the key information presented at the PIC. Comment forms were available at the PIC for attendees to fill out to provide their thoughts; however none were received at the PIC or during the commenting period after the PIC.

The PIC 2 presentation boards were also posted on the City’s study webpage following the PIC.

Discussion with some attendees was generally focused on the following themes:

- The financial implications of the proposed works – how it will be financed, what the estimated capital costs included, and what the timing of the works will be. It was explained that the developer will pay for the proposed works and that the timing is largely developer driven and somewhat uncertain, but likely to be within the next 3-5 years. It was also explained that the capital costs were construction related and include the proposed pumping station and forcemain.
- Concerns over potential odour emissions relating to the proposed facility. It was explained that appropriate odour controls will be implemented which have been proven to work on other similar projects and meet regulatory requirements.
- Questions concerning the scope of the EA and whether it will involve connections to the Mannheim Estates. It was explained that this EA will not address properties currently on septic tanks and that this would necessarily be an initiative led by the Township of Wilmot.
- Concerns about impacts on environmentally sensitive lands. It was explained that the routing of the forcemain will remain within the existing Ottawa Street South road right-of-way where required and that additional mitigation measures would be implemented during construction to prevent encroachment into sensitive areas, as demonstrated on the presentation boards.

8.4 OTHER CONSULTATION

In order to keep a record of comments received by members of the public and relevant agencies, a comment tracking table was developed to document all correspondence by email, letter or telephone.

Over the course of the study, comments were received and these were addressed in a timely and appropriate manner by a member of the study team where required (i.e. a direct email reply or via telephone). A summary of any comments received is presented in Appendix E.

The majority of comments received from members of the public related to enquiries to find out more information about how they may connect their own property to the proposed works. In such cases, and where feasible, a professional opinion was generally provided as to whether this may be possible; however it was stated that further consultation with the City and/or other agencies would be required for specific requests such as this. Where feasible, members of the public were urged to attend upcoming PICs to find out more details about the study.
Consultation was ongoing with the Region to discuss additional flows at the Mannheim WTP, source water protection and impacts to Regional roads. The Region advised no further sanitary capacity is needed for the Mannheim WTP. The Township of Wilmot was consulted with respect to the Mannheim Estates, and it was confirmed that there are no immediate plans to expand the Mannheim Estates or to take existing residences off of septic systems. GRCA was consulted to discuss conservation concerns within the area, which are reflected in the documentation of existing conditions and evaluation of alternatives.

In some instances, agencies specifically asked to be excluded from further consultation.

**8.4.1 Study Area Amendment**

Some comments raised by members of the public initially related to whether or not the study would include an assessment of connections to the Mannheim Estates, and if specific properties within the Mannheim Estates would be addressed. At the time, the study area did not consider any connections to the Mannheim Estates (as they are within the jurisdiction of the Township of Wilmot), while it was not considered that any infrastructure would be required in the Mannheim Estates area to support the project. However, as the study progressed and alternatives were identified, it was subsequently determined that while properties in the Mannheim Estates area would not be connected to the project, there would potentially be a need to construct infrastructure within the Mannheim Estates area to support the project. As such, the study area was amended to include the Mannheim Estates area, and also another area to the east of the original study area which had not previously been covered but would require new infrastructure to be constructed. The rationale for this amendment to the study area was provided in the Notice of PIC 2 and this was also explained at the PIC 2 itself.

The expansion of the study area meant that further archaeological assessment and other field studies were necessary. These were subsequently undertaken as documented earlier in this report.

The amended and final study area is that which is presented in Figure 1.1.

**8.4.2 Presentation to the City of Kitchener Environmental Committee**

On Thursday October 17, 2013 between approximately 4:00pm and 5:00pm, a presentation was made to the City’s Environmental Committee at City Hall. This presentation summarized the EA process to date, from the identification of the problem/opportunity statement through to the identification of a preferred alternative.

Attendees included the following:

- Ms. A. McDonald, Vice-Chair
- Councillors Y. Fernandes and P. Singh, Ms. E. Donaher and S. Danckert and Messrs. C. Priddle and D. Hoshowsky
- B. Sloan, Manager of Long Range Planning
- B. Korah, Manager of Development Engineering
- B. Steiner, Senior Environmental Planner
• H. Anderson, Environmental Planner
• T. Jacobs, Project Manager of Development Engineering
• D. Saunderson, Committee Administrator.

Minutes of the meeting are found in Appendix E. Comments were solicited from the Committee by an October 31, 2013 deadline. No comments were received during this period.

8.4.3 Presentation to the City of Kitchener Planning and Strategic Initiatives Committee

On Monday January 13, 2014, between approximately 6:15pm and 7:00pm, a presentation was made to the City's Planning and Strategic Initiatives (P&SI) Committee at City Hall. This presentation summarized the EA process and study findings, and recommended that the draft EA be received and further that the EA be filed. The presentation was accompanied by a Staff report, which is found in Appendix E.

The P&SI Committee carried the recommendations.

8.5 Notice of Completion

On January 27, 2014, City Council approved the recommendation to file the EA.

On Friday January 31, 2014, and February 7, 2014, a Notice of Study Completion was published in The Record. A copy of the EA was issued to the MOE Regional Office in advance of the Notice to allow for additional review time. This Notice marked the completion of the study and began the mandatory 30-day review period. A copy of the Notice is found in Appendix E.
9 NEXT STEPS

9.1 PERMIT AND APPROVAL REQUIREMENTS
Permit and approvals will be confirmed during the detailed design stage and may include the following:

- Ministry of the Environment – Environmental Compliance Approval (ECA) / Environmental Activity and Sector Registry (EASR) (conditional);
- Ministry of the Environment – Permit to Take Water (conditional);
- Further dialogue with an MNR SAR biologist is required once final construction and excavation requirements are known. ESA SAR permitting or registration with MNR following the new ESA rules effective July 1 2013 would be items of discussion at that time;
- Any relevant permits or approvals required upon consultation regarding the detailed design with GRCA;
- City of Kitchener – Site Plan Approval and Building Permit;
- Required approvals from the Region of Waterloo;
- Any relevant approvals from utility providers upon consultation (e.g. Hydro, Union Gas); and
- Plan of Subdivision approval.

9.2 MONITORING
Specific monitoring measures will include the following:

- Provision of flow monitoring by the City to measure actual output from the new subdivision and adjoining catchment areas to assess the need for any future system enhancements or upgrades to accommodate future growth and increased flow from the catchment area.
- Site design and pipeline installation corridor design should incorporate multiple protection barriers to prevent adverse impacts to adjacent or nearby environmentally sensitive areas. Barriers will be designed primarily to prevent intrusion into the active working areas and the erosion and transportation of sediment.
- City requirements as may be applied to this infrastructure.
- Operational Monitoring
- Asset Management and Preventative Maintenance

Once all facilities are fully installed and put into operation and disturbed areas have been stabilized, temporary mitigative measures along with regular areal inspections may no longer be required.
10 BIBLIOGRAPHY

Archeoworks, Inc, (2013): Stage 1 Archaeological Assessment for the Ottawa-Trussler Area Sewage Facility Class Environmental Assessment, Within Lot 47 (Upper Block) and Lots 129-132 (Small Lots) German Company Tract, Geographic Township of Waterloo, City of Kitchener, Regional Municipality of Waterloo, Ontario.


