Distribution List

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</tr>
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<tbody>
<tr>
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</tr>
</tbody>
</table>

Revision History

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<th>Date</th>
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</tr>
</thead>
<tbody>
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<td>NA, NM</td>
<td>As per City Comments (April 18, 2017)</td>
</tr>
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<td>3</td>
<td>April 27th</td>
<td>BAT, NA</td>
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</tr>
</tbody>
</table>
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Quality Information

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Project Manager
## List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AANDC</td>
<td>Aboriginal Affairs &amp; Northern Development Canada</td>
</tr>
<tr>
<td>ANSI</td>
<td>Area of Natural or Scientific Interest</td>
</tr>
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<td>ATRIS</td>
<td>Aboriginal and Treaty Rights Information System</td>
</tr>
<tr>
<td>BOD</td>
<td>Biochemical Oxygen Demand</td>
</tr>
<tr>
<td>CAS</td>
<td>Conventional Activated Sludge</td>
</tr>
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<td>CEAA</td>
<td>Canadian Environmental Assessment Act</td>
</tr>
<tr>
<td>Class EA</td>
<td>Municipal Class Environmental Assessment</td>
</tr>
<tr>
<td>CofA</td>
<td>Certificate of Approval</td>
</tr>
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<td>COSEWIC</td>
<td>Committee on the Status of Endangered Wildlife in Canada</td>
</tr>
<tr>
<td>COTTFN</td>
<td>Chippewa of the Thames First Nation</td>
</tr>
<tr>
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</tr>
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</tr>
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</tr>
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</tr>
<tr>
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</tr>
<tr>
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<td>Ecological Land Classification</td>
</tr>
<tr>
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</tr>
<tr>
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<td>Environmental Study Report</td>
</tr>
<tr>
<td>HDD</td>
<td>Horizontal Directional Drilling</td>
</tr>
<tr>
<td>HONI</td>
<td>Hydro One Network Inc.</td>
</tr>
<tr>
<td>INAC</td>
<td>Indigenous and Northern Affairs Canada</td>
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<td>MAA</td>
<td>Ontario Ministry of Aboriginal Affairs</td>
</tr>
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<td>MTCS</td>
<td>Ontario Ministry of Tourism, Culture &amp; Sport</td>
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<td>MEA</td>
<td>Ontario Municipal Engineers Association</td>
</tr>
<tr>
<td>MLD</td>
<td>Million litres per day</td>
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<td>MAH</td>
<td>Ontario Ministry of Municipal Affairs/Ministry of Housing</td>
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<td>MNRF</td>
<td>Ontario Ministry of Natural Resources &amp; Forestry</td>
</tr>
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<td>Ontario Ministry of the Environment &amp; Climate Change</td>
</tr>
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<td>MIO</td>
<td>Ministry of Infrastructure Ontario</td>
</tr>
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<td>NHIC</td>
<td>Natural Heritage Index Classification</td>
</tr>
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<td>OHA</td>
<td>Ontario Heritage Act</td>
</tr>
<tr>
<td>OP</td>
<td>Official Plan</td>
</tr>
<tr>
<td>PIC</td>
<td>Public Information Centre</td>
</tr>
<tr>
<td>PPS</td>
<td>Provincial Policy Statement</td>
</tr>
<tr>
<td>ROW</td>
<td>Right-of-Way</td>
</tr>
<tr>
<td>SAR</td>
<td>Species at Risk</td>
</tr>
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<td>SARA</td>
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<td>SWH</td>
<td>Significant Wildlife Habitat</td>
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<td>TVP</td>
<td>Thames Valley Parkway</td>
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<td>UTRCA</td>
<td>Upper Thames River Conservation Authority</td>
</tr>
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<td>WWTP</td>
<td>Wastewater Treatment Plant</td>
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</tbody>
</table>
Executive Summary

Introduction

The City of London (the City), through its consultant, AECOM, has completed a Municipal Class Environmental Assessment (Class EA) study to evaluate the feasibility of interconnecting the Vauxhall and Pottersburg sewersheds as part of a long term servicing strategy. Interconnection of the sewersheds will provide additional operational flexibility and facilitate future upgrades as the assets approach the end of their service life. This Class EA study was completed in accordance with the Ontario Environmental Assessment Act (EAA), and followed Approach # 2 of the Municipal Engineers Association (MEA) Master Planning Process (see Section 2.1.2). The key components of this Class EA study are the conceptual siting of new transfer pumping stations and wastewater linear infrastructure (forcemains and/or gravity sewers) that will connect the Pottersburg and Vauxhall WWTPs.

The City has two WWTPs servicing the City’s southeast area; Pottersburg and Vauxhall. The Pottersburg and Vauxhall plants are located approximately 2 km from one another, both on the north shore of the Thames River. The Vauxhall sewershed is encapsulated by those of adjacent treatment plants (Pottersburg, Greenway and Adelaide), while the Pottersburg sewershed encompasses the southeast limits of the City and is subject to continued growth. A recent desktop evaluation of the plants (by others) identified additional available capacity at both plants through optimization of existing processes, technological improvements and bottleneck reductions. An estimated 28.7 MLD of potential capacity may be available at the Vauxhall plant while 53.4 MLD may be available at Pottersburg. Based on historical flows, Pottersburg has approximately 7 MLD of unused ‘theoretical’ rated capacity, although recent stress testing has shown Pottersburg’s rated capacity to be negatively impacted by limited secondary clarifier capacity. Similarly, Vauxhall has approximately 5 MLD available of ‘theoretical’ rated capacity.

Both the Pottersburg and Vauxhall plants have aging infrastructure that will require life cycle replacement over the next 20 year planning cycle. Major equipment and structural rehabilitation may require entire process trains to be removed from service for an extended period of time. The available capacity and proximity of the Pottersburg and Vauxhall plants presents the City with a unique opportunity to ‘transfer’ wastewater flow between these plants to facilitate life-cycle improvements, among other benefits.

Consultation

The involvement of the community – residents, agencies, stakeholders, Indigenous Communities, and those who may be potentially affected by a project – is an integral part of the Class EA process. The purpose of the Class EA study consultation process is to provide an opportunity for stakeholder groups and the public to gain an understanding of the study process; contribute to the process for development and selection of alternatives/design concepts; and provide feedback and advice at important stages in the Municipal Class EA process. Specifically, the objectives of the consultation efforts are to:
generate awareness of the project and provide opportunities for involvement throughout the planning process; and
facilitate constructive input from public and agency stakeholders at key points in the Class EA process, prior to decision-making.

A consultation program was incorporated into the study in order to meet the above objectives. The consultation program included:

- Posting project milestones on the City of London website;
- Conducting meetings with agencies and stakeholders at key phases during the project;
- Publishing notices in The Londoner for all project milestones;
- Notifying stakeholders, affected residents, the general public and review agencies regarding project milestones;
- Conducting one Public Information Centre to inform the public, review agencies and stakeholders and obtain input; and
- Issuing a Notice of Completion.

Identification of the Problem/Opportunity

The Class EA Problem/Opportunity statement provides the basis for the need and justification for this project and is presented below:

The Vauxhall and Pottersburg WWTPs are located relatively close to each other and represent important assets to the City. Both WWTPs have aging infrastructure that will require replacement over the next 20 years and both have available capacity that can serve future growth.

Considering the above, the City is looking to identify opportunities to transfer wastewater flow between the two WWTPs by interconnecting the Vauxhall and Pottersburg sewersheds. Interconnection of the sewersheds is part of a long term servicing strategy that will utilize available treatment capacity, provide additional operational flexibility and facilitate future upgrades to WWTP components as they approach the end of their service life.

Alternative Solutions

A list of alternative solutions to meet the project needs was established. This list was subject to a screening process that considered the ability to maximize the use of existing infrastructure, impact to existing WWTP operations, and avoidance of excessive capital and operating costs. The results of the screening process are presented in Table ES1.

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>SCREENING RESULT</th>
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<tr>
<td>Alternative 1: Do Nothing</td>
<td>Not carried forward</td>
</tr>
<tr>
<td>Alternative 2: Interconnect upstream gravity sewers</td>
<td>Not carried forward</td>
</tr>
<tr>
<td>Alternative 3: Expand Pottersburg WWTP</td>
<td>Not carried forward</td>
</tr>
<tr>
<td>Alternative 4:</td>
<td></td>
</tr>
</tbody>
</table>
The Master Plan has identified **Alternative 7: Provide permanent infrastructure for transmission of flows between the two plants** (Schedule B undertaking) to be carried forward for further investigation.

The project will be completed in two phases:

1. Phase 1 will include the installation of three forcemains, two 450 mm to 750 mm diameter forcemains for transferring raw sewage flows between the two plants and a third 150 mm forcemain for transfer of biosolids between the plants. The forcemains will be approximately 2.3 km in length between the two plants. Valve chambers and other infrastructure interconnections to allow for the transfer from both facilities will also be completed.
2. Phase 2 will include provisions for pump stations and equalization tanks located within the property of each facility to facilitate future operational flexibility and storage options. Preliminary locations of these facilities are shown on **Figures 6.1 and 6.2**. The interconnection is intended to have different operating conditions in the short term and long term.

Future growth in the Vauxhall sewershed will be limited due to the encapsulated nature of the service area. Some infill may be anticipated but will not affect the capacity at Vauxhall significantly. The major increase in future flow will be in the Pottersburg sewershed as the bulk of the area is currently undeveloped. The construction of forcemains between the two facilities will provide for immediate operational flexibility between the two plants, especially during any major upgrades at each facility and the potential to remove a treatment train from service for rehabilitation.
Permanent Pumping Alignment Alternatives

Several potential sanitary forcemain routing alignments were developed based on the design criteria. A detailed assessment of each alignment alternative was completed based on evaluation components that included social, cultural, natural heritage, technical and financial factors. These options are listed below:

**Option 1:** The forcemain will be located within existing City right-of-way (ROW) and easements. There are two sub-options for Option 1, Option 1A and 1B with slightly different alignment as shown on Figure 6.3.

**Option 2A:** The alignment will be directed from the Vauxhall WWTP east along Tommy Hunter Way, across St. Julien Park, and several municipal ROWs as shown in Figure 6.4A.

**Option 2B:** This option is similar to Option 2A but longer as shown on Figure 6.4A.

**Option 2C:** This option is similar to Option 2A but longer as shown on Figure 6.4A.

**Option 2D:** This option is similar to Option 2A; however, the forcemains will be installed within a Hydro One ROW for approximately 780 m east of Highbury Avenue, as shown on Figure 6.4B.

**Option 3:** This option places the forcemain close to the Thames River along the existing TVP multi-use pathway and through Pottersburg Park and the off-leash dog par, as shown on Figure 6.5.

Preferred Alternative

Based on the comparative evaluation, the preferred alignment alternative is **Option 2A** which provides a direct route between the two WWTPs and avoids surrounding natural heritage features. The preferred route alignment follows Tommy Hunter Way from the Vauxhall WWTP, passes through the edge of St. Julien Park, and follows Elgin Street to Highbury Avenue. The pathway crosses Highbury Avenue, follows Norlan Avenue, and passes through two small wooded areas and an open meadow to reach the Pottersburg WWTP (refer to Figure ES1).

Rationale for selecting Option 2A includes the following:

**Natural Heritage**

- Avoids significant natural environment features including:
  - Construction adjacent to the Thames River, including Upper Thames River Conservation Authority (UTRCA) regulated floodplain;
  - Wetland hazard area;
  - Wooded areas to the greatest extent possible; and
  - Species at Risk habitats.

**Technical**

- Provides a direct route between the two WWTPs;
- Second shortest routes of all alignments considered;
- Minimal traffic impacts;
- Reduced utilities coordination;
- Shorter construction period due to shorter route and some directional drilling installation method; and
- Smaller pumps with lower lift requirements.
Social/Cultural

- No permanent loss of parkland/open space;
- Fewer residential properties impacted; and
- Minimizes impacts to the travelling public by avoiding major traffic routes and limiting right-of-way (ROW) construction.

Financial

- Second Lowest Costs of all the options; and
- Low operations and maintenance costs for the forcemain.

Project Details

The two WWTPs will be interconnected using bidirectional forcemains and other infrastructure for sewage and biosolids transfer between the two facilities. Construction will be completed in two phases as listed below:

Phase 1 will include the following:
1. Two 450 to 750 mm diameter forcemains for raw sewage transfer;
2. One 150 mm forcemain for biosolids transfer;
3. Multiple valve chambers; and
4. Structural and instrumentation upgrades to facilitate the transfer between the two facilities.

Phase 2 will include the following:
1. Transfer Pump Station within the property of each facility;
2. Equalization tank within the property of each facility; and
3. Electrical, structural, instrumentation and civil upgrades to facilitate the upgrades at each facility.

Cost Estimate

The costs to install three forcemains (2 for wastewater transfer, 1 for biosolids transfer) in one common trench varies based on the final selected pipe size, but is anticipated to range between approximately $5.5 to $9.2 million dollars. The costs do not include costs for pump stations, equalization tanks, and any upgrades associated with Phase II upgrades. The costs also do not include Engineering but include a Construction Contingency of 10%. A breakdown of costs is shown in Table ES2 below.

### Table ES2: Preferred Option Cost Estimate

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<th>Estimated 2017 Cost</th>
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<td>Open Cut Installation in a paved road (3 pipes in a common trench - approximately 700 m)</td>
<td>$1,330,000 – $2,065,000</td>
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<tr>
<td>Open Cut Installation in a greenfield (3 pipes in a common trench - approximately 1,500 m)</td>
<td>$2,709,000 – $4,286,250</td>
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<td>Tunnel Installation under Highbury Avenue (3 separate bores, total length approximately 180 m)</td>
<td>$279,000 – $945,000</td>
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<td>Underground Chambers, air release valves and Interconnections</td>
<td>$250,000 – $350,000</td>
</tr>
<tr>
<td>Construction Requirements (e.g., Traffic Management, bond, trailers etc.) - 10%</td>
<td>$456,800 – $754,925</td>
</tr>
<tr>
<td>Construction Contract Contingency - 10%</td>
<td>$502,480 – $840,117</td>
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<tr>
<td>TOTAL ESTIMATED CONTRACT COST*</td>
<td>$5,500,000 - $9,200,000</td>
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*Rounded to nearest $100,000
Mitigation Measures

Impacts related to construction of the forcemains will be limited to the duration and location of construction. Impacts will be minimized by incorporating proper best management practices and construction techniques and controls, including specific measures such as traffic management, dust control and erosion and sediment control. It is expected that construction may cause temporary traffic disruptions, including lane restrictions along the preferred route. The City will continue to inform the public of construction plans as this project proceeds. It is recommended that the mitigating measures further described in Section 7 of this report be further confirmed and defined during detailed design, and employed during construction to reduce the potential impacts of the proposed works.

Remaining Approvals

During detailed design and prior to construction, approvals will be required from several review agencies including the Ministry of the Environment and Climate Change (MOECC), Upper Thames River Conservation Authority (UTRCA), Ministry of Transportation (MTO), Ministry of Natural Resources and Forestry (MNRF), Ministry of Tourism, Culture and Sport (MTCS), London Hydro, Hydro One (potential), City of London and various utility companies as further described below:

- The MOECC will require a sanitary sewer application be reviewed by the City for the sanitary forcemains in which a final approval Environmental Compliance Approval (ECA) would be issued by the MOECC. MOECC approvals will also be required for new pumping stations and/or equalization storage tanks as necessary to complete Phase 2 of the project.
- Forcemain routing within proximity to the Thames River will require review by the UTRCA and will require the submission of an “Application for Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses”.
- A Butternut tree located near the proposed forcemain alignment must be assessed by a Butternut Health Advisor. If the tree is determined to be of good health, a Notice of Butternut Impact form must be submitted to MNRF.
- MTCS clearance will be required prior to construction, including completion of the Stage 2 archaeological assessment as part of preliminary design.
- Various utilities will have to review and approve some utility re-locations in order to accommodate the forcemains along some sections of the alignment.

Summary

In summary, many steps were undertaken to proactively inform stakeholders about this Municipal Class EA study, obtain their input, and address their comments or concerns as much as possible as they arose. Through preliminary and detailed design, it is expected that further comments will be received from those having a direct interest in the project, and if necessary, meetings will be convened to discuss stakeholder comments and resolve any remaining issues, where possible. It is not anticipated that any further concerns will be raised that the City cannot address during detailed design.
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Preferred Alignment

Jan 2017

Datum: NAD83 UTM 17N

Source: City of London

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# Table of Contents

Distribution List  
Statement of Qualification and Limitations  
List of Acronyms  
Executive Summary  

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Background and Purpose of this Master Plan</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Study Objectives</td>
<td>1</td>
</tr>
<tr>
<td>1.3 Study Team Organization</td>
<td>3</td>
</tr>
<tr>
<td>2. Planning Process</td>
<td>4</td>
</tr>
<tr>
<td>2.1 Municipal Class Environmental Assessment Process</td>
<td>4</td>
</tr>
<tr>
<td>2.2 Planning Studies and Policy Context</td>
<td>8</td>
</tr>
<tr>
<td>3. Consultation</td>
<td>10</td>
</tr>
<tr>
<td>3.1 Consultation and Communication Program</td>
<td>10</td>
</tr>
<tr>
<td>3.2 Public Consultation</td>
<td>10</td>
</tr>
<tr>
<td>3.3 Agency Consultation</td>
<td>12</td>
</tr>
<tr>
<td>3.4 Indigenous Consultation</td>
<td>13</td>
</tr>
<tr>
<td>4. Existing Conditions</td>
<td>15</td>
</tr>
<tr>
<td>4.1 Technical Environment</td>
<td>15</td>
</tr>
<tr>
<td>4.2 Socio-Economic Environment</td>
<td>17</td>
</tr>
<tr>
<td>4.3 Cultural Environment</td>
<td>18</td>
</tr>
<tr>
<td>4.4 Natural Environment</td>
<td>22</td>
</tr>
<tr>
<td>4.5 Federally Recognized Features and Species</td>
<td>27</td>
</tr>
<tr>
<td>4.6 Provincially Recognized Features and Species</td>
<td>28</td>
</tr>
<tr>
<td>4.7 Municipally Recognized Features and Species</td>
<td>28</td>
</tr>
<tr>
<td>5. Phase 1: Project Need and Justification</td>
<td>29</td>
</tr>
<tr>
<td>5.1 Project Need and Justification</td>
<td>29</td>
</tr>
<tr>
<td>5.2 Problem/Opportunity Statement</td>
<td>29</td>
</tr>
<tr>
<td>6. Phase 2: Alternative Solutions</td>
<td>31</td>
</tr>
<tr>
<td>6.1 Identification of Alternative Solutions</td>
<td>31</td>
</tr>
<tr>
<td>6.2 Evaluation of Alternative Solutions</td>
<td>33</td>
</tr>
<tr>
<td>6.3 Preferred Servicing Strategy</td>
<td>35</td>
</tr>
<tr>
<td>6.4 Identification of Solutions for Permanent Pumping</td>
<td>38</td>
</tr>
<tr>
<td>6.5 Evaluation of Alignment Alternatives</td>
<td>46</td>
</tr>
<tr>
<td>6.6 Recommended Alignment Alternative</td>
<td>50</td>
</tr>
<tr>
<td>6.7 Public Information Centre</td>
<td>52</td>
</tr>
<tr>
<td>7. Project Description</td>
<td>53</td>
</tr>
<tr>
<td>7.1 Schedule B Projects</td>
<td>53</td>
</tr>
</tbody>
</table>
8. **Recommended Mitigation Measures** ........................................................................................................56
   8.1 Proposed Mitigation Measures .............................................................................................................56
   8.2 Proposed Construction Monitoring ...................................................................................................58
   8.3 Post Construction Monitoring ..........................................................................................................58
   8.4 Review Agency Approvals .................................................................................................................58

9. **Summary** ...............................................................................................................................................60

**List of Figures**

- Figure 1.1: Study Area
- Figure 2.1: Class EA Process
- Figure 3.1: Notification Area Map
- Figure 4.1: Existing WWTP Sewersheds
- Figure 4.2: Study Area Land Use
- Figure 4.3: Archaeological Potential
- Figure 4.4: Natural Heritage Features
- Figure 4.5: Ecological Land Classifications
- Figure 4.6: Ecological Land Classification Communities.
- Figure 6.1: Vauxhall WWTP – Allocation for Future Transfer Pump Station and Equalization Tank
- Figure 6.2: Pottersburg WWTP – Allocation for Future Transfer Pump Station and Equalization Tank
- Figure 6.3: Permanent Pumping Solution Options 1A-B
- Figure 6.4A: Permanent Pumping Solution Options 2A-2C
- Figure 6.4B: Permanent Pumping Solution Options 2D
- Figure 6.5: Permanent Pumping Solution Option 3
- Figure 6.6: Preferred Alignment
- Figure 7.1: Construction Method

**List of Tables**

- Table 3.1: Public Consultation Notices
- Table 3.2: Agency Comments
- Table 4.1: Current and Future Capacities at Pottersburg and Vauxhall
- Table 4.2: NHIC Species at Risk Records
- Table 6.1: Screening of Long List of Alternatives
- Table 6.2: Evaluation Components
- Table 6.3: Criteria for Evaluating Alignment Alternatives
- Table 6.4: Evaluation of Alignment Alternatives
- Table 6.5: PIC Comments
- Table 7.1: Preliminary Cost Estimate
- Table 7.2: Preliminary Project Schedule
- Table 8.1: Proposed Mitigation Measures
- Table 8.2: Environmental Management Recommendations
Appendices

Appendix A. Consultation and Communications
   A.1 Notice of Study Commencement
   A.2 Public Information Centre
   A.3 Notice of Study Completion
   A.4 Agency Correspondence
   A.5 Indigenous Community Consultation

Appendix B. Background Reports
   B.1 Environmental Impact Study (under separate cover)
   B.2 Stage 1 Archaeological Assessment

Appendix C. Preliminary Cost Estimate
1. Introduction

1.1 Background and Purpose of this Master Plan

The City of London (the City), through its consultant AECOM, has completed a Municipal Class Environmental Assessment (Class EA) study to evaluate the feasibility of interconnecting the Vauxhall and Pottersburg sewersheds as part of a long term servicing strategy. Interconnection of the sewersheds will provide additional operational flexibility and facilitate future upgrades as the WWTP assets approach the end of their service life. This Class EA study was completed in accordance with the Ontario Environmental Assessment Act (EAA), and followed Approach # 2 of the Municipal Engineers Association (MEA) Master Planning Process (see Section 2.1.2). The key component of this Class EA study is the siting of wastewater linear infrastructure (forcemains) and future transfer pumping stations and equalization tanks sited within the fence line of the existing Vauxhall and Pottersburg wastewater treatment plants. Refer to Figure 1.1 for the Study Area between the two facilities.

1.2 Study Objectives

The purpose of this Municipal Class EA study is to provide a comprehensive and environmentally sound planning process, which is open to public participation, to select the preferred wastewater infrastructure improvements for the Pottersburg-Vauxhall Sewershed Optimization. The objectives of this study include:

- Protection of the environment, as defined in the EAA, through the wise management of resources;
- Extensive consultation with all affected and interested parties, including participation of a broad range of stakeholders to allow for the sharing of ideas, education, testing of creative solutions and developing alternatives;
- Facilitating dialogue between those with different or contrasting interests;
- Documentation of the study process in compliance with Phases 1 and 2 of the Municipal Class EA planning process; and
- Documentation of mitigation and monitoring requirements which will ensure minimal disruption during construction to residents, businesses and the natural environment and fulfillment of commitments, as required.

By completing the Class EA planning process, the preferred servicing strategy should be endorsed by the majority of residents and the general public and acceptable to stakeholders and review agencies.
Figure 1.

Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Study Area

Jan 2017

Datum: NAD83 UTM 17N
Source: City of London

P#: 60480821 V#

Approximate Location of Study Area

Legend

- Stream/Drain
- Study Area
- 250 Year Flood Limits
- Lot Line

Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 1-1 Study Area.mxd
Date Saved: 1/30/2017 12:43:45 PM

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1.3 Study Team Organization

This Class EA study was undertaken as a collaborative effort between the City of London and AECOM. General direction was provided by representatives from the City with project team meetings being held at key points throughout the planning process. Key members of the project team included the following individuals:

<table>
<thead>
<tr>
<th>City of London</th>
<th>AECOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirby Oudekerk, P.Eng., Project Manager</td>
<td>Neil Awde, P. Eng., Project Manager</td>
</tr>
<tr>
<td>Brad Weber, C.E.T., Project Coordinator</td>
<td>Karl Grueneis, B.A., Senior Environmental Planner</td>
</tr>
<tr>
<td></td>
<td>Adria Grant, BA, CAHP, Senior Archaeologist</td>
</tr>
<tr>
<td></td>
<td>Gary Epp, M.Sc., Ph.D., Senior Ecologist</td>
</tr>
</tbody>
</table>
2. Planning Process

2.1 Municipal Class Environmental Assessment Process

All municipalities in Ontario, including the City of London, are subject to the provisions of the EAA and its requirements to prepare an Environmental Assessment for applicable public works projects. The Ontario MEA “Municipal Class Environmental Assessment” document (October 2000, as amended in 2007, 2011 and 2015) provides municipalities with a five-phase planning procedure, approved under the EAA, to plan and undertake all municipal sewage, water, stormwater management and transportation projects that occur frequently, are usually limited in scale and have a predictable range of environmental impacts and applicable mitigation measures.

In Ontario, infrastructure projects such as the proposed site servicing for the Pottersburg and Vauxhall sewersheds are subject to the Municipal Class EA process and must follow a series of mandatory steps as outlined in the Municipal Class EA document. The Class EA consists of five phases as summarized below:

- **Phase 1 – Problem or Opportunity:** Identify the problems or opportunities to be addressed and the needs and justification;
- **Phase 2 – Alternative Solutions:** Identify alternative solutions to the problems or opportunities by taking into consideration the existing environment, and establish the preferred solution taking into account public and agency review and input;
- **Phase 3 – Alternative Design Concepts for the Preferred Solution:** Examine alternative methods of implementing the preferred solution based upon the existing environment, public and agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects;
- **Phase 4 – Environmental Study Report:** Document in an Environmental Study Report (ESR), a summary of the rationale, planning, design and consultation process for the project as established through Phases 1 to 3 above and make such documentation available for scrutiny by review agencies and the public; and
- **Phase 5 – Implementation:** Complete contract drawings and documents, proceed to construction and operation, and monitor construction for adherence to environmental provisions and commitments. Also, where special conditions dictate, monitor the operation of the completed facilities.

The Class EA process ensures that all projects are carried out with effectiveness, efficiency and fairness. This process serves as a mechanism for understanding economic, social and environmental concerns while implementing improvements to municipal infrastructure.

Figure 2.1 illustrates the process followed in the planning and design of projects covered by a Municipal Class EA, including this project.
Figure 2.1: Municipal Class Environmental Assessment Schedule B Master Plan Process (Approach #2)

Phase 1: Problem and Opportunity
- Identify problem or opportunity

Phase 2: Alternative Solutions
- Identify alternative solutions to problem or opportunity
- Document existing conditions of natural, social and economic environments
- Consult the public and agencies regarding problem or opportunity and alternative solutions
- Identify impacts of alternative solutions on the environment, and mitigation measures
- Evaluate alternative solutions and identify recommended solution
- Consult the public and agencies regarding the problem or opportunity and alternative solutions
- Select preferred solution
- Project file placed on public record
- Notice of Completion issued for Schedule ‘B’ Projects, 30 Day Review Period

Implementation
- Complete drawings and documents
- Proceed to construction and operation
- Monitor for environmental provisions and commitments

LEGEND
Mandatory point of contact
2.1.1 Project Planning Schedules

The Class EA defines four types of projects and the processes required for each (referred to as Schedule A, A+, B, and C). The selection of the appropriate schedule is dependent on the anticipated level of environmental impact, and for some projects, the anticipated construction costs. Projects are categorized according to their environmental significance and their effects on the surrounding environment. Planning methodologies are described within the Class EA and are different according to Class type, such as the following:

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

Schedule A+: The purpose of Schedule A+ is to ensure some type of public notification for certain projects that are pre-approved under the Class EA. It is appropriate to inform the public of municipal infrastructure project(s) being constructed or implemented in their area; however, there would be no ability for the public to request a Part II Order.

Schedule B: These projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process (Phases 1 and 2), involving mandatory contact with directly affected public and with relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. At the end of Phase 2, a Project File documenting the planning process followed through Phases 1 and 2 shall be finalized and made available for public and agency review. However; if the screening process raises a concern which cannot be resolved, a Part II Order may be requested and considered by the Ministry of the Environment and Climate Change (MOECC). Alternatively, the proponent may elect voluntarily to plan the project as a Schedule C undertaking.

Schedule C: Such projects have the potential for significant adverse environmental effects and must proceed under the full planning and documentation (Phases 1 to 4) procedures specified in the Municipal Class EA document. Schedule C projects require that an ESR be prepared and filed for review by the public and review agencies. If concerns are raised that cannot be resolved then a Part II Order may be requested.

This Municipal Class EA study is addressing requirements for Schedule B projects and as such, follows Phases 1 and 2 described in the previous section.

2.1.2 Municipal Class EA Master Planning Process

The MEA Municipal Class EA document recognizes that, in many cases, it is beneficial to utilize the master planning process for projects which have common elements, looking at the overall infrastructure system rather than dealing exhaustively with project specific issues. The City has utilized this approach in preparation of this master plan study as the project:

- Has a broad scope and includes an analysis of several municipal infrastructure systems rather than a site-specific problem; and
- Recommends a set of works which are distributed geographically throughout the study area, some of which may be implemented over a period of time (ie. Pump Stations, Equalization Tanks).

By planning in this way, the need and justification for individual projects and the associated broader context are better defined.

---

1 Part II Order refers to a request to the Minister of the Environment and Climate Change for a project to comply with Part II (addresses Individual Environmental Assessments) of the Environmental Assessment Act. The need for an Individual EA is based on the conclusion that based on predicted project impacts the MEA Class EA planning process is not sufficient and a more comprehensive EA planning process is required. The requirement to prepare an Individual EA involves the preparation of Terms of Reference and EA document that are submitted to the Ministry of the Environment and Climate Change, other government agencies and the public for review.
The MEA Municipal Class EA document outlines four (4) approaches to the master planning process. At a minimum, Master Plans address Phases 1 and 2 of the Municipal Class EA process. Master Plan Approach #2 involves the preparation of a master plan document (i.e., Master Plan Project File Report) at the conclusion of Phases 1 and 2 of the Municipal Class EA process where the level of investigation, consultation and documentation are sufficient to fulfill the requirements for all Schedule B projects. For this study, Schedule B projects include the conceptual siting of new sanitary pumping stations, equalization tanks, changes to a sewage collection system (eg. new pipes) occurring outside of an existing road allowance or utility. The City has utilized this approach in preparation of this master plan study.

As such, the final public notice for the master plan serves as the Notice of Completion for all Schedule B projects within the study.

2.1.3 Class EA Documentation and Filing

This Master Plan Project File comprises the documentation for this Schedule B Master Planning Municipal Class EA study. Placement of the Master Plan Project File for public review completes the planning stage of the project.

This Master Plan Project File is available for public review and comment for a period of 30 calendar days starting on May 8th, 2017 and ending on June 7th, 2017. A public notice (Notice of Completion) was published to announce commencement of the review period. To facilitate public review of this document, copies are available at the following locations:

**City of London City Hall**
300 Dufferin Avenue, London
Wastewater & Drainage Engineering
Division, 9th Floor

**City of London**
[http://www.london.ca/residents/Environment/EAs/Pages/Pottersburg-and-Vauxhall-Sewershed-Optimization.aspx](http://www.london.ca/residents/Environment/EAs/Pages/Pottersburg-and-Vauxhall-Sewershed-Optimization.aspx)

The Notice of Completion advises that if, after reviewing the report, stakeholders have questions or concerns they should follow this procedure:

- Contact Kirby Oudekerk, City of London Project Manager at the address below to discuss questions or concerns.
- Arrange a meeting with the above, if there are significant concerns that require more detailed explanations.

Kirby Oudekerk, P.Eng.,
Environmental Services Engineer
City of London
109 Greenside Avenue
London, Ontario, N6J 2X5
519.471.1537
koudeker@london.ca

If major concerns arise, the City will attempt to resolve the issue(s). A mutually acceptable time period to address concerns will be set. If the issues remain unresolved, a person or party may request that the MOECC, by order, to request the City of London comply with Part II of the EAA before proceeding with the project. A Part II Order if granted would elevate the project to an Individual Environmental Assessment. The Minister may make one of the following decisions:
Deny the request with or without conditions;
- Refer the matter to mediation; or
- Require the City to comply.

Anyone wishing to request a Part II Order for the Pottersburg – Vauxhall Sewershed Optimization Master Plan Class EA may submit a written request by the end of the thirty (30) calendar day review period (date) to the MOECC at the following address, with a copy sent to the City of London.

The Ministry/Minister of the Environment and Climate Change
77 Wellesley Street West, 11th Floor
Toronto ON, M7A 2T5

Kirby Oudekerk, P.Eng
Environmental Services Engineer, City of London
109 Greenside Avenue
London ON, N6J 2X5

Subject to the completion of the mandatory thirty (30) day review period and no Part II Order requests, the City of London intends to proceed with detailed design and implementation in 2017/2018.

Information is collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act. All comments, with the exception of personal information, will become part of the public record.

2.1.4 Ministry of Infrastructure Class EA Triggers

The requirement for real estate activities such as ownership transfer or easement acquisitions transacted by Infrastructure Ontario (formerly the Ontario Realty Corporation) triggers the Ministry of Infrastructure (MOI) Class EA process. However, through this Municipal Class EA planning process, no MOI Class EA triggers were identified.

2.1.5 Canadian Environmental Assessment Act Triggers

Under the 2012 Canadian Environmental Assessment Act (CEAA), a proposal to construct new forcemains and pumping stations are not “designated projects”, as such, no CEAA triggers were identified.

2.2 Planning Studies and Policy Context

2.2.1 Provincial Policies

The 2014 Provincial Policy Statement3 came into effect on April 30, 2014 and replaces the 2005 Provincial Policy Statement. It provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario’s policy-led planning system, the PPS sets the policy foundation for regulating the development and use of land. It provides for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural environment. Key policies relevant to wastewater services include the following:

---

2 Ministry of Infrastructure Public Work Class Environmental Assessment (2012 Office Consolidation).
• 1.6.6.1 (Sewage, Water and Stormwater) – Planning for sewage services to accommodate future growth that promotes efficient use and optimization.

• 2.1.1 (Natural Heritage) – Diversity and connectivity of natural features should be maintained, restored and improved where possible.

• 2.1.8 (Natural Heritage) – development or site alteration can occur on lands adjacent to natural heritage features if no negative impacts on ecological functions will result.

• 2.6.2 (Cultural Heritage and Archaeology) – Development and site alteration are permitted on lands containing archaeological potential when archaeological resources have been conserved.

Relevance to Study: Where applicable, the policies of the PPS have been incorporated into the selection and evaluation of alternatives.

2.2.2 Municipal Policies

The need to optimize the WWTP sewersheds at the municipal level will consider the following policies from the London Plan (2016).

The London Plan

The London Plan (2016) is the new policy direction document for the City and will replace the existing OP. The London Plan has been adopted by Council but, at the time of writing this report has not been approved by Ministry of Municipal Affairs/Ministry of Housing (MAH). However, the policies of the Plan have been considered in the selection and evaluation of alternatives.

- Policy 468: civic infrastructure should be located outside of the natural heritage system.
- Policy 469: green technologies and construction methods will be used for developing new or replacing old infrastructure.
- Policy 473: wastewater treatment plants will be provided to accommodate existing and future development.
- Policy 1395: Municipal services are permitted uses within environmental areas but are subject to the completion of an EIS.

Relevance to Study: As they relate to this Class EA, relevant servicing policies and natural environment policies have been considered and incorporated into the generation of planning alternatives and design concepts. Additionally, an EIS was undertaken and the results were applied to the evaluation of servicing alternatives.
3. Consultation

3.1 Consultation and Communication Program

The involvement of the community – residents, agencies, stakeholders, Indigenous communities, and those who may be potentially affected by a project – is an integral part of the Class EA process. The purpose of the Class EA study consultation process is to provide an opportunity for stakeholder groups and the public to gain an understanding of the study process; contribute to the process for development and selection of alternatives/design concepts; and provide feedback and advice at important stages in the Class EA process. Specifically, the objectives of the consultation efforts are to:

- Generate awareness of the project and provide opportunities for involvement throughout the planning process; and
- Facilitate constructive input from public and agency stakeholders at key points in the Class EA process, prior to decision-making.

A summary of the consultation activities undertaken for the Pottersburg – Vauxhall Sewershed Optimization Master Plan is provided in the next section.

3.2 Public Consultation

3.2.1 Project Mailing List

A mailing list was developed at the outset of the Class EA study based on a list of public and stakeholder, as well as a list of homeowners residing within approximately 120 m of the study area, provided by the City of London (Refer to Figure 3.1). As the Class EA study progressed, the list was updated to include individuals who requested to be notified of future public consultation efforts and study updates.

3.2.2 Project Website

A project website page (http://www.london.ca/residents/Environment/EAs/Pages/Pottersburg-and-Vauxhall-Sewershed-Optimization.aspx) was developed at the outset of this study. Study notices and presentation materials were posted on the project website throughout the project duration.
Figure 3.1

Treatment Optimization of the Vauxhall and Pottersburg Sewersheds
Master Plan

Notification Area Map

Jan 2017
Datum: NAD83 UTM 17N
Source: City of London

Legend
- Stream/Drain
- Study Area
- Lot Line
- Notification Area
- 250 Year Flood Limits

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3.2.3 Public Notices

Table 3.1 identifies public consultation notices for the project.

### Table 3.1: Public Consultation Notices

<table>
<thead>
<tr>
<th>Notice</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notice of Commencement (Appendix A.1)</td>
<td></td>
</tr>
<tr>
<td>Posted on the City of London website and mailed out to relevant agencies and stakeholders.</td>
<td>December 17, 2015</td>
</tr>
<tr>
<td>Published in The Londoner</td>
<td>December 24, 2015 and December 31, 2015</td>
</tr>
<tr>
<td>Notice of PIC #1 (Appendix A.2)</td>
<td></td>
</tr>
<tr>
<td>Posted on the City of London website and mailed out to relevant agencies and stakeholders.</td>
<td>April 08, 2016</td>
</tr>
<tr>
<td>Published in The Londoner</td>
<td>April 14, 2016 and April 21, 2016</td>
</tr>
<tr>
<td>Notice of Completion (Appendix A.3)</td>
<td></td>
</tr>
<tr>
<td>Posted on the City of London website and mailed out to relevant agencies and stakeholders.</td>
<td>May 3rd, 2017</td>
</tr>
<tr>
<td>Published in The Londoner</td>
<td>May 4th, and May 11th, 2017</td>
</tr>
</tbody>
</table>

3.3 Agency Consultation

At the initiation of this study, a mailing list was created comprising regulatory agencies and potentially interested stakeholders. Throughout the study, this list was used to notify agencies and stakeholders of study milestones and public consultation events. The list was updated regularly.

Table 3.2 identifies the comments received from agencies as part of this project.

### Table 3.2: Agency Comments

<table>
<thead>
<tr>
<th>Agency</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOECC</td>
<td>• Provided information on the process and requirements to consult Indigenous Communities</td>
</tr>
<tr>
<td>December 17, 2015</td>
<td></td>
</tr>
<tr>
<td>UTRCA</td>
<td>• Provided natural heritage information including benthic, fish and mussel records and mapping.</td>
</tr>
<tr>
<td>February 29, 2016</td>
<td></td>
</tr>
</tbody>
</table>

Agency correspondence is provided in Appendix A.4.
3.4 Indigenous Consultation

The following provides a summary of Indigenous Consultation undertaken for this project. All Indigenous correspondence is included in Appendix A.5.

Indigenous and Northern Affairs Canada (INAC), formerly Aboriginal Affairs and Northern Development Canada (AANDC) maintains a record of information related to Indigenous treaty information, claims and litigation data. In addition, the location of Indigenous communities and groups is also recorded by AANDC. A search of the Aboriginal and Treaty Rights Information System (ATRIS) was conducted to confirm the location and nature of established and potential Indigenous and Treaty rights which may relate to the study area. A subsequent search confirmed the following Indigenous or treaty rights which may apply.

- Southern Ontario Treaties (1764-1862)
- Metis Nation of Ontario Region.

A letter was sent to the Ministry of Indigenous Relations and Reconciliation, formerly Ministry of Aboriginal Affairs, on March 08, 2016 detailing the study and requesting information on Indigenous communities that may have an interest in the study. To date, no response has been received.

However, the following Indigenous communities and/or organizations were contacted at the study commencement stage and throughout the project:

- Aamjiwnaang First Nation
- Bkejwanong Territory
- Chippewas of Kettle and Stony Point First Nation
- Oneida Nation of the Thames
- Southern Ontario First Nation Secretariat
- Chippewas of the Thames First Nation
- Munsee-Delaware First Nation
- Delaware Nation (Moravian of the Thames)
- Caldwell First Nation

The Notice of Commencement was circulated to MOECC and a response was received on December 17, 2015. MOECC provided details relevant to the Crown’s Duty to Consult with First Nation and Metis communities to determine potential impacts to Indigenous treaty rights.

Correspondence was received from the following Indigenous communities:

- Chippewas of the Thames First Nation (COTTFN) (March 21, 2016) indicating the scope of the project is within the London Township Treaty area and the Big Bear Creek Additions to Reserve Land selection area as well as the COTTFN Traditional territory. COTTFN requested continued communication regarding this project and encouraged the project team to respect Aboriginal and Treaty Rights.
- Aamjiwnaang First Nation (June 16, 2016) indicating the community does not require engagement in a full consultation process with regards to this project at this time. However, they would like to continue to receive project information for their future review.

Meetings with Indigenous Communities

- On January 30th, 2017, City of London staff met personally with staff of COTTFN to discuss various City of London projects relating to wastewater treatment, including this EA Master Plan.
• On February 16th, 2017, City of London staff met with the First Nations Engagement Committee – Thames River Clear Water Revival, to discuss various City of London projects relating to wastewater treatment, including this EA Master Plan. Meeting minutes will subsequently be prepared by Upper Thames River Conservation Authority staff and circulated to the various First Nations members and government agencies that form this Engagement Committee.

**Note:** All works associated with this project apply to urban areas and linear corridors and are not expected to impact treaty rights or land claims.
4. Existing Conditions

4.1 Technical Environment

4.1.1 Existing Wastewater System

The City of London’s sanitary sewage system consists of over 1,230 km of sanitary sewers and 35 pumping stations with over 45 km of forcemains. This infrastructure collects and conveys sanitary sewage to the City’s six WWTPs (Adelaide, Greenway, Oxford, Pottersburg, Southland and Vauxhall). The Pottersburg and Vauxhall sewersheds service the southeast areas of the City. Figure 4.1 illustrates the existing wastewater treatment sewersheds for the City.

Capacity assessments for some of the City’s WWTPs were completed in 2013 (Capacity Assessment of the City of London’s Wastewater Treatment Plants Report, XCG Consultants Ltd., 2013). This report identified the long term wastewater treatment needs for four WWTPs, including the Pottersburg WWTP and the Vauxhall WWTP. The report identified additional available capacity at both plants through optimization of existing processes, technological improvements and bottleneck reductions. An estimated 28.7 MLD of potential additional capacity is available at the Vauxhall WWTP, while 53.4 MLD of potential additional capacity is available at the Pottersburg WWTP with some process upgrades and operations changes. Based on historical flows, Pottersburg has approximately 7 MLD of unused ‘theoretical’ rated capacity, although recent stress testing has shown Pottersburg’s rated capacity to be negatively impacted by limited secondary clarifier capacity. Similarly, Vauxhall has approximately 5 MLD available of ‘theoretical’ rated capacity.

Pottersburg

The Pottersburg sewershed encompasses the southeast area of the City and extends to Highway 401 to the south and to the City limits to the east. Pottersburg WWTP was constructed in the 1950s with major upgrades in the 1960s and 1990s. The rated Certificate of Approval (CoA) capacity or maximum amount of sewage that can be treated at the plant for the Pottersburg WWTP is 39.1 MLD. The plant is not running at rated capacity and approximately 7 MLD of treatment capacity is still available at the plant for future growth. Once future growth utilizes this available capacity, then additional treatment capacity will be required to provide capacity for further future development in this sewershed. The servicing of growth in the Pottersburg sewershed will need to be accomplished through optimization of existing facilities, or else an upgrade or expansion would be required. Flows are currently below rated capacity; however, recent stress testing has identified that the rated capacity is negatively impacted by the design of the secondary clarifiers.

The Pottersburg WWTP consists of three treatment trains, downstream of the common headworks. Sewage received at the Pottersburg WWTP is a combination of residential and industrial wastewater. Flows reach the WWTP via a gravity sewer system and a forcemain from the East Park Pumping Station. Sewage flows are conveyed through treatment without additional pumping. Biosolids are trucked to the Greenway WWTP for dewatering and incineration. Plant effluent is discharged to the south branch of the Thames River, just downstream of its confluence with Pottersburg Creek. The Pottersburg WWTP is an activated sludge plant, as are all of the WWTPs within the City. The activated sludge process is a process whereby the organic matter in wastewater is aerated in an aerated basin where micro-organisms metabolize the suspended matter. The organic matter is synthesized into new cells, flocculent, and is removed in settling tank. Part of this settled mass is returned to the aeration tank and the rest is removed as excess sludge using additional downstream processes.
Figure 4.1

Legend

Study Area

- Existing Pumping Station
- Wastewater Treatment Plants
- Major Roads
- City Boundary
- Sewersheds

Adelaide WWTP Sewersheds
Greenway WWTP Sewersheds
Lambeth WWTP Sewersheds
Medway PS Greenway/Adelaide WWTP Sewersheds
Oxford WWTP Sewersheds
Pottersburg WWTP Sewersheds
Vauxhall WWTP Sewersheds

Toronto, ON

Key Map

Approimate Location of Study Area

Legend

Study Area

- Existing Pumping Station
- Wastewater Treatment Plants
- Major Roads
- City Boundary
- Sewersheds

Adelaide WWTP Sewersheds
Greenway WWTP Sewersheds
Lambeth WWTP Sewersheds
Medway PS Greenway/Adelaide WWTP Sewersheds
Oxford WWTP Sewersheds
Pottersburg WWTP Sewersheds
Vauxhall WWTP Sewersheds

Toronto, ON

Treatmet Optimization of the Vauxhall and Pottersburg Sewersheds
Master Plan

Existing Wastewater Treatment Plant Sewersheds

Jan 2017 1:91,522

Datum: NAD83 UTM 17N

Source: City of London

Figure 4.1

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Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 4-1 CoL WWTP Catchment Areas.mxd

Date Saved: 1/31/2017 11:14:10 AM
Vauxhall

The Vauxhall WWTP is an activated sludge plant with two sections to treat regular flows. Section 1 was constructed in the 1950s and Section 2 was constructed in the 1970s. Excess flows that bypass the secondary treatment during high rain events are treated using a recently added (2012) Chemically Enhanced Primary Treatment (CEPT) system. CEPT is the process by which chemicals are added to primary influent flows to provide sufficient treatment prior to discharge to the Thames River. The plant has a total rated capacity of 20.9 MLD. It currently operates below its rated capacity and has approximately 5 MLD of available capacity for future growth. There is minimal future development anticipated in the Vauxhall sewershed and this excess capacity could potentially be used to treat flows from other sewersheds. Sewage flows received at the Vauxhall WWTP are a combination of residential, commercial and industrial wastewater. Flows reach the plant via a gravity sewer system and an onsite pumping station, Chelsea Heights PS.

Summary

Equipment upgrades continue to be made at both WWTPs; however, some infrastructure is approaching the end of its service life and major refurbishments are anticipated in the future. The opportunity to utilize excess capacity at either WWTP to treat sewage from either sewershed is a solution to facilitate future upgrades or delay expansions at either WWTP. Section 4.1.2 provides a summary of current flows and potential future flows at the WWTPs without any major upgrades as recommended in the recent capacity assessment report (2013).

4.1.2 Future Capacity

Table 4.1 identifies the current and potential treatment capacities with system optimization and enhancements, for Pottersburg and Vauxhall WWTPs as reported in the capacity assessment report.

### Table 4.1: Current and Rated Capacities at Pottersburg and Vauxhall

<table>
<thead>
<tr>
<th>Condition</th>
<th>Pottersburg</th>
<th>Vauxhall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate of Approval (CofA) Rated Capacity</td>
<td>39.1</td>
<td>20.9</td>
</tr>
<tr>
<td>Potential Rated Capacity (2013)</td>
<td>54 - 80</td>
<td>30 - 47</td>
</tr>
<tr>
<td>Historical Average Flows (2008-2012)</td>
<td>26.6</td>
<td>18.3</td>
</tr>
<tr>
<td>Available Capacity (low)</td>
<td>12.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Available Capacity (high)</td>
<td>27.4 - 53.4</td>
<td>11.7 - 28.7</td>
</tr>
</tbody>
</table>

1- Based on recommended optimization and upgrades on the existing infrastructure without adding more processes.
2- Based on the CofA rated capacity and historical flows. Recent stress testing has suggested that upgrades to the existing secondary clarifiers would be required to accommodate this capacity.
3- Based on potential rated capacity and historical flows from the capacity assessment report (2013).

4.2 Socio-Economic Environment

Highbury Avenue South bisects the study area which is bordered by the Vauxhall and Pottersburg WWTPs to the east and west respectively. The north limit of the study area is Hamilton Road and the Thames River is to the south. Highbury Avenue conveys 45,000 vehicles per day and Hamilton Road conveys 19,500 and 24,500 vehicles east and west of Highbury Avenue respectively. Land use within and surrounding the study area is a combination of residential and commercial land use, as well as designated natural areas. The areas adjacent to Hamilton Road are designated as Low-density Residential and Commercial land use. The lands adjacent to the Thames River are designated as Open Space Areas. See [Figure 4.2: Study Area Land Use](#).
Open space within the study area contains several significant recreational uses including the Thames Valley Parkway (TVP), St. Julien Park, Pottersburg Park and Norlan Avenue Open Space. The TVP is a multi-use pathway system along the Thames River corridor and connects to other secondary pathways within the City. The pathway accommodates active recreational uses including cycling, running, walking and rollerblading. Within the study area, the TVP connects with pathways in St. Julien Park and Pottersburg Park. Hamilton Road, between Hale Street and Gore Road has dedicated bike lanes in both directions.

St. Julien Park is adjacent to Vauxhall WWTP and contains tennis courts, soccer fields, a basketball court, baseball field, skateboard park, the River’s Edge Disc golf course and is home to the East London Soccer Club.

Pottersburg Park is a large park adjacent to Pottersburg WWTP. Within the park is an off-leash dog area and a paved parking area. There are no sports fields located within the park.

Adjacent to the study area along Hamilton Road are two schools (Ealing Public School and Fairmont Public School) and the Bob Hayward branch of the YMCA. There are no schools within the study area. See Figure 4.3 for the existing community facilities.

### 4.3 Cultural Environment

#### 4.3.1 Archaeology

A Stage 1 archaeological assessment study for the Pottersburg-Vauxhall Optimization Master Plan was conducted by AECOM. The study determined that the potential for the recovery of both First Nation and Euro-Canadian archaeological resources within parts of the current study area is high. As a result of extensive urban development, some portions of the study area have been previously disturbed and archaeological potential has been removed; however, areas of manicured lawn and wooded areas within the study area limits are included as areas where archaeological integrity may remain intact. Based on these findings a Stage 2 archaeological assessment is recommended for all areas of potentially undisturbed lands within the preferred project alternative area limits. See Figure 4.4 for the archaeological potential in the service area.

The Stage 1 archaeological assessment is contained in Appendix B.2.

#### 4.3.2 Cultural Heritage

There are no properties within the study area that have been recognized or designated by the City as having cultural heritage potential.
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Official Plan - Schedule A Land Use
London Plan - Place Types (Map 1)

Jan 2017 1:7,500
Datum: NAD83 UTM 17N
Source: City of London

Figure 4.2

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Key Map

Legend
- Study Area
- Schools
- CatholicElementarySchools
- Community Centres
- Existing Secondary Recreational Bike Route
- Existing Multi-Use Pathway
- Stream/Drain
- Parks
- Sports Fields and Recreation
  - Baseball
  - Basketball
  - Soccer
  - Skateboard Park
  - Tennis

Figure 4.3

Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Existing Community Facilities

Jan 2017 1:10,000
Datum: NAD83 UTM 17N
Source: City of London

Figure 4.3
Figure 4.4
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Archaeological Potential

Study Area
Stream/Drain
Lot Line
Archaeological Potential
Areas Where Archaeological Potential Has Been Removed
Areas Retaining Archaeological Potential (Stage 2 Required)
Thames River

Approximate Location of Study Area

Key Map

Legend

P#: 60480821 V#: 
Datum: NAD83 UTM 17N
Source: City of London

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Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 4-4 Archaeological Potential.mxd
Date Saved: 2/1/2017 9:35:41 AM

Jan 2017 1:7,500
Datum: NAD83 UTM 17N
Source: City of London

Figure 4.4
4.4 Natural Environment

The existing conditions for the natural environment in the study area were identified based on desktop analysis and field investigations and the results for the terrestrial and aquatic environments and Species at Risk are summarized below. The Environmental Impact Study is located in Appendix B.1.

4.4.1 Terrestrial Environment

Under the current City of London OP, the Thames River (included as part of the study area) is designated as a Significant Corridor which are areas that connect natural heritage features, provide habitat, and encourage species movement and diversity.

The Thames River Valley Corridor is within proximity to a Big Picture Meta-Corridor. The Big Picture concept identifies natural areas, corridors, and linkages that connect the natural heritage system together within and beyond City limits. This concept is not considered a component of the City of London’s Natural Heritage System but may be used to guide restoration and stewardship activities if required.

A wooded area occurs within the Project Study Area east of Meadowlily Road and is designated as an Unevaluated Vegetation Patch as per Schedule B1 of the City’s OP (Figure 4.5). This wooded area was evaluated according to the City of London’s Guidelines for the Evaluation of Ecologically Significant Woodlands, and exceeded the criteria required for designation as a Significant Woodland. These criteria follow recommendations made under the PPS, which defines woodlands as treed areas that provide environmental and economic benefits including habitat, recreation, erosion prevention, water retention and the sustainable harvesting of wood.

A total of 14 vegetation communities were delineated within the study area, 12 of which are located in the eastern half of the study area between Meadowlily Road North and the Pottersburg WWTP. A large portion of this area is part of Pottersburg Park, a City park used for recreational purposes. A large wooded area adjacent to the Thames River consists of two forest (FOD), two thicket (CUT, SWT) and one swamp (SWD) community. Another portion of the park is a fenced-in dog park which contains one thicket (CUT), one forest (FOD) and one meadow (CUM) community. North of this park is a large cultural meadow (CUM) which lies adjacent to a hydro corridor and two small woodlots (both FOD communities). A shallow marsh (MAS) community lies partially within the hydro corridor. Paved and dirt trails wind through these communities, indicating ongoing light disturbance through human use.

The western half of the Study Area mainly consists of residential areas, a generator station and St. Julien Park, a large mowed park used for sports and recreation. A small shrub thicket (CUT) community lies adjacent to Tommy Hunter Way. A cultural woodland (CUW) community lies adjacent to the Vauxhall WWTP. This wooded area is part of a Frisbee golf course indicating ongoing light disturbance through human use.

A total of 105 plant species were observed, including 51 native species. One Endangered species, Butternut was observed within three (3) communities within the Study Area: CUT1-4, FOD4 and SWD4-1.

A total of three (3) wetland communities were identified within the project study area:

- MAS3-1 – Cattail Organic Shallow Marsh
- SWD4-1 – Willow Mineral Deciduous Swamp
- SWT2-1 – Alder Mineral Thicket Swamp

The MAS3-1 community is located north of Pottersburg Park and partially lies within the hydro corridor that passes through the project study area. The SWD4-1 community is located east of the Meadowlily Road Bridge, and is encompassed by a forest community.
London Plan Map 5 Natural Heritage

Key Map

Study Area
Stream/Drain
Lot Line
ESA
Unevaluated Wetlands
Woodlands
Unevaluated Vegetation Patches
Significant Valley Lands

Approximate Location of Study Area

Vauxhall WWTP

Pottersburg WWTP

Figure 4.5
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Official Plan - Schedule B1 Natural Heritage Features
London Plan - Natural Heritage (Map 5)

Jan 2017 1:7,500
Datum: NAD83 UTM 17N
Source: City of London

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Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 4-5 OP Natural Env London Plan.mxd
Date Saved: 4/19/2017 2:53:18 PM
The SWT2-1 community could not be fully assessed as it is located within private property at 4 Meadowlily Road North and access was not granted by the landowner. The location of this community appears to correspond to the Unevaluated Wetland identified on Schedule B-1 of the OP (Refer to Figure 4.6: Ecological Land Classification Communities).

Breeding bird point count surveys were conducted in order to determine the breeding activity and composition of avian species within the project study area. A review of Ontario Breeding Bird Atlas data identified 92 species within the Study Area.

A total of 40 species were observed during the breeding bird surveys. Of these species, probable evidence of breeding was observed for nine (9) species and possible evidence of breeding was observed for 19 species. Confirmed evidence of breeding was observed for two (2) species.

Three (3) Species at Risk (SAR) were observed, including Barn Swallow, Chimney Swift and Eastern Wood-pewee. Under the Endangered Species Act (ESA), Barn Swallow and Chimney Swift are designated as Threatened, and receive habitat protection. Eastern Wood-pewee is designated as Special Concern and therefore does not receive habitat protection under the ESA.

4.4.1 Aquatic Environment

The project study area lies within the Upper Thames River watershed and is within the jurisdiction of the UTRCA. Wetlands are important source water protection areas with groundwater recharge/discharge functions that affect the temperature, flow, and quality of water. Wetland areas help offset peak flows following storm events and also provide important habitat for vegetation and wildlife. The City’s OP (Schedule B1) identifies an area within the study area boundary, east of Meadowlily Road, as an unevaluated wetland. Areas designated as unevaluated vegetation or wetland patches are natural areas for which significance has not yet been determined. Such areas may include woodlots, swamps, wetlands, savannahs, and fields. Public utility and municipal service development is permitted within these areas but requires an Environmental Impact Study (EIS) or Subject Lands Status Report to be conducted.

Fish sampling records from four (4) locations in the Thames River within the project study area were provided by UTRCA. The data included both historical and recent records from 1974, 1989, 2002, and 2010. Of the species recorded only one, Silver Shiner, was identified as a Species at Risk.

Mussel sampling records from a location in the Thames River downstream from the Meadowlily Woods walking bridge were also provided by UTRCA. The location was sampled on July 8, 2004. Two species were identified as SAR: Round Pigtoe; and Wavy-rayed Lampmussel.

UTRCA Regulation Limits, Hazard, and Natural Heritage Lands mapping indicated that lands designated as Natural Heritage lands include the wooded areas adjacent to the Thames River as well as several open space areas. The mapping also shows that flooding and erosion hazard lands extend into these wooded areas. A large wetland hazard area lies east of Meadowlily Road and includes a large portion of a wooded area. Additionally, several parcels of land within the study area are owned by UTRCA.
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

ELC Communities

Jan 2017
Scale: As Shown
Datum: NAD83 UTM 17N
Source: City of London

Figure 4.6

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4.4.2 Species at Risk

In order to determine the potential for SAR occurrence within the study area, AECOM conducted a SAR Habitat Screening. This screening is done as a requirement that addresses Species at Risk legislation at various levels of government. The relevant legislation affecting SAR are described below.

Species at Risk Act (SARA)

The Species at Risk Act is Federal legislation that legally protects wildlife species designated as “at risk” and their critical habitat, and requires recovery/management strategies to be developed for these species (Government of Canada, 2014). Under SARA, species are classified into the following categories:

- **Extirpated** – a species that is no longer found in the wild in Canada, but exists elsewhere;
- **Endangered** – a species that is facing imminent extirpation/extinction;
- **Threatened** – a species that will become endangered if no conservation effort is made; and
- **Special Concern** – a species that may become threatened or endangered due to biological characteristics and identified threats.

Endangered Species Act

The Endangered Species Act is Provincial legislation that legally protects wildlife species designated as “threatened” or “endangered”, and their critical habitat. Species designated as “special concern” do not receive protection under the ESA. The ESA also requires that recovery strategies (for threatened or endangered species) and management plans (for special concern species) are created to help species recover and to minimize impacts of human activity.

A review of background information revealed that 75 SAR may potentially occur within the study area. A habitat assessment and SAR screening was completed using data obtained from background review and field investigations to identify suitable habitat. It was determined that potential habitat for 42 species is present within the study area. Under the ESA, nineteen (19) species are listed as Endangered, twelve (12) species are listed as Threatened, and eleven (11) are listed as Special Concern.

According to NHIC records, ten (10) species listed under the ESA and COSEWIC have been observed in the study area. Table 4.2 lists NHIC SAR data within the study area.

Table 4.2: NHIC Species at Risk Records

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>ESA Status</th>
<th>COSEWIC Status</th>
<th>NHIC S-Rank</th>
<th>Last Observation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Ash</td>
<td><em>Fraxinus quadrangulata</em></td>
<td>Special Concern</td>
<td>Special Concern</td>
<td>S2</td>
<td>1977</td>
</tr>
<tr>
<td>Bird’s Foot Violet</td>
<td><em>Viola pedata</em></td>
<td>Endangered</td>
<td>Endangered</td>
<td>S1</td>
<td>1890</td>
</tr>
<tr>
<td>Drooping Trillium</td>
<td><em>Trillium flexipes</em></td>
<td></td>
<td></td>
<td>S1</td>
<td>1883</td>
</tr>
<tr>
<td>Eastern Flowering Dogwood</td>
<td><em>Cornus florida</em></td>
<td>Endangered</td>
<td>Endangered</td>
<td>S2</td>
<td>1987</td>
</tr>
<tr>
<td>Eastern Ribbonsnake</td>
<td><em>Thamnophis sauritus</em></td>
<td>Special Concern</td>
<td>Special Concern</td>
<td>S3</td>
<td>1933</td>
</tr>
<tr>
<td>Green Dragon</td>
<td><em>Arisaema dracontium</em></td>
<td>Special Concern</td>
<td>Special Concern</td>
<td>S3</td>
<td>1979</td>
</tr>
</tbody>
</table>
It should be noted that Bird’s foot violet and Drooping trillium were listed as extirpated. Additionally, two observations of a Restricted Species were documented in 1966 and 1981; no further details were provided.

### 4.4.1 Significant Wildlife Habitat

As stated in PPS, development and site alteration is not permitted within Significant Wildlife Habitat. Additionally, the PPS states that development is not permitted within adjacent lands to Significant Wildlife Habitat unless “ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions”.

As such, a Significant Wildlife Habitat (SWH) screening exercise was conducted using the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E to determine the presence of Candidate SWH. Species listed as Special Concern provincially, with an S-Rank of S1 to S3, or species that are listed as Endangered or Threatened federally (under COSEWIC) are referred to as Species of Conservation Concern. Species with these designations are not afforded protection; however, their habitat is considered Significant Wildlife Habitat under the Significant Wildlife Habitat Technical Guide. Habitat for these species is afforded protection under the PPS (2014).

One (1) Significant Wildlife Habitat was confirmed within the project study area: Special Concern / Rare Wildlife Species (Butternut). Butternut (S-Rank S3) was confirmed within the FOD4, SWD4-1, and CUT1-4 communities.

The features found within the study area have been assessed using federal, provincial and municipal ranking and evaluation systems outlined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the MNRF, UTRCA and the City of London. The following sections summarize the identified significant features found within the study area.

### 4.5 Federally Recognized Features and Species

Two (2) federally ranked species listed on Schedule 1 of the Federal Species at Risk Act (SARA) were observed:

- Butternut – Endangered on Schedule 1; and
- Monarch – Special Concern on Schedule 1.

However, as there are no Federal Lands found within the study area the SARA does not apply to the subject lands. Consequently, federal SAR have not been carried forward.
4.6 Provincially Recognized Features and Species

Six (6) provincially ranked SAR were observed during AECOM field investigations:

- Barn Swallow;
- Butternut;
- Chimney Swift;
- Eastern Wood-pewee;
- Monarch; and
- Snapping Turtle.

One (1) Significant Wildlife Habitat was confirmed within the Project Study Area during AECOM field investigations:

- Special Concern / Rare Wildlife Species (Butternut).

4.7 Municipally Recognized Features and Species

The Thames River is recognized as a Significant River Corridor under the City of London’s OP. Schedule B-1 of the City of London’s OP identifies an Unevaluated Vegetation Patch east of Highbury Road and Meadowlily Bridge. This woodland has been evaluated according to the City of London’s Guidelines for the Evaluation of Ecologically Significant Woodlands. The evaluation of the Unevaluated Vegetation Patch resulted in a High score for six (6) criteria, a Medium score for one (1) criterion, and a Low score for one (1) criterion. A woodland will be designated as Significant if it receives at least one (1) High score; therefore, the Unevaluated Vegetation Patch within the project study area is a Significant Woodland.
5. Phase 1: Project Need and Justification

5.1 Project Need and Justification

The City has two WWTPs servicing the City's southeast area; Pottersburg and Vauxhall. The Pottersburg and Vauxhall WWTPs are located approximately 2 km from one another, both on the north side of the Thames River. The Vauxhall sewershed is encapsulated by those of adjacent treatment plants (Pottersburg, Greenway and Adelaide), while the Pottersburg sewershed encompasses the southeast limits of the City and is subject to continued growth.

A Capacity Assessment of the City of London’s Wastewater Treatment Plants Report identified the long term wastewater treatment needs for four WWTPs in the City including Pottersburg WWTP and Vauxhall WWTP. The report identified additional available capacity at both WWTPs through optimization of existing processes, technological improvements and bottleneck reductions. An estimated 28.7 MLD of capacity is available at the Vauxhall plant while 53.4 MLD is available at Pottersburg with some process upgrades and operations changes. Based on historical flows, Pottersburg has approximately 7 MLD of unused ‘theoretical’ rated capacity, although recent stress testing has shown Pottersburg’s rated capacity to be negatively impacted by limited secondary clarifier capacity. Similarly, Vauxhall has approximately 5 MLD available of ‘theoretical’ rated capacity.

Both the Pottersburg and Vauxhall WWTPs have aging infrastructure that will require replacement over the next 20 year planning cycle. Major equipment and structural replacements will require entire process trains to be removed from service for extended periods of time. The available capacity and proximity of the Pottersburg and Vauxhall plants presents the City with a unique opportunity to ‘transfer’ wastewater flows between these plants to facilitate life-cycle improvements, among other benefits. An interconnection essentially links the two plants, allowing them to operate as a single facility and enabling the best use of available facilities for providing secondary treatment to the wastewater received.

5.2 Problem/Opportunity Statement

Phase 1 of the five-phase Municipal Class EA planning process requires the proponent of an undertaking (i.e. the City) to first document factors leading to the conclusion that the improvement is needed, and to develop a clear statement of the identified problems or opportunities to be addressed. As such, the Problem/Opportunity Statement is the main starting point in the undertaking of a Municipal Class EA and becomes the central theme and integrating element of the project. It also assists in setting the scope of the project. The Problem/Opportunity Statement for this Class EA Master Plan is given below:

*The Vauxhall and Pottersburg Wastewater Treatment Plants (WWTPs) are located relatively close to each other and represent important assets to the City. Both WWTPs have aging infrastructure that will require replacement over the next 20 years and both have spare capacity that can serve future growth.*

*Considering the above, the City is looking to identify opportunities to transfer wastewater flow between the two WWTPs by interconnecting the Vauxhall and Pottersburg sewersheds. Interconnection of the*
sewersheds is part of a long term servicing strategy that will utilize available treatment capacity, provide additional operational flexibility and facilitate future upgrades to WWTP components as they approach the end of their service life.
6. Phase 2: Alternative Solutions

6.1 Identification of Alternative Solutions

This section provides a description of the alternative servicing strategies. A list of alternative solutions to meet the project needs was established. The list was subject to a screening process that considered ability to maximize use of existing infrastructure, impact to existing WWTP operations and avoidance of excessive capital and operating costs.

Alternative 1: Do Nothing

The ‘Do Nothing’ alternative entails maintaining operations at each plant without any major improvements or expansions. The current annual average flow at Vauxhall is approximately 18.3 MLD; Vauxhall is rated for 20.9 MLD. There is little anticipated growth in the Vauxhall sewershed and the excess capacity would not be utilized within the Vauxhall sewershed. The average flow at Pottersburg is approximately 26.6 MLD; Pottersburg is rated for 39.1 MLD, but operational experience and stress testing have indicated that actual plan capacity is below this. The Pottersburg sewershed extends to the City’s east and southern boundaries and development in this area would continue until the reserve capacity at Pottersburg is exhausted. Once the operating capacity at Pottersburg is reached, growth in this area will be halted until additional treatment is provided.

Alternative 2: Interconnection Upstream Gravity Sewers

The Vauxhall and Pottersburg sewer collection systems share a large boundary extending from north of Oxford Street to south of Hamilton Road. This option considers the transfer of flow between sewersheds by interconnecting the gravity system along this boundary. Multiple connections would be required to transfer sufficient flow.

Alternative 3: Expand Pottersburg WWTP

The Pottersburg sewershed extends to the City’s east and south boundaries and it is anticipated that future growth will exceed the available capacity at the plant. New development in the City’s southeast corridor that exceeds the reserve capacity at Pottersburg WWTP would trigger an expansion of the plant. A 1999 study identified a plan for the 20 and 40 year expansions to service future demands. The expansion would be located outside the existing fenceline on City owned property.

Alternative 4: Decommission Vauxhall WWTP and Transfer Flow to Pottersburg WWTP

Due to the proximity of the WWTPs, it is feasible to consider decommissioning of the Vauxhall WWTP and transfer flows to the Pottersburg WWTP. However, there has been significant investment in the Vauxhall WWTP including the following upgrades:

- Section 1 aeration (2000);
- UV disinfection (2002);
- Section 1 primary (mid 2000);
- Electrical system (2008);
- Section 2 aeration (2011);
- Return activated sludge and waste activated sludge pumping (2013);
- Advanced wet weather treatment system (Chemical enhanced primary treatment (2013);
- New headworks facility (2012); and

**Alternative 5: Expand Vauxhall WWTP**

Portions of the Vauxhall WWTP were built in the 1950’s and some of the structural components are nearing the end of their service life. This option considers that the Vauxhall WWTP could be upgraded in order to replace sections that are nearing the end of their service life. Under this option, the rated capacity would not change. The service life of these sections can be extended through refurbishment. In order to refurbish the concrete tanks, a treatment section must be taken offline for an extended period. Since both sections are required to treat the average daily flow, taking one section offline is not feasible. Prior to refurbishment, the plant would need to be expanded and a new section would need to be constructed to maintain the plant capacity. As no significant growth is anticipated within the Vauxhall sewershed, the old section would likely be decommissioned. The old tanks could remain and be available for future uses.

**Alternative 6: Provide Temporary Flow Transfer to Facilitate WWTP Repairs**

**Alternative 6A: Trucking**

The City of London has a truck fleet used for biosolids haulage. This option considers trucking raw sewage to other WWTPs as a temporary solution to facilitate rehabilitation of aging infrastructure. These trucks have an individual capacity of 11 m$^3$. Should Section 2 of Vauxhall WWTP be taken offline for refurbishment, 13,000 m$^3$/d would need to be trucked to the Pottersburg WWTP. If trucks of a similar capacity were to be utilized, 1,300 truckloads per day would be needed to transfer the flow. At a rate of 20 min loading time, 72 truckloads could be hauled in a 24 hour period. Trucking would be unable to meet the demand and therefore, trucking to transfer flow is not a viable option.

**Alternative 6B: Temporary Pipeline**

This option considers the use of temporary pumps and a temporary/removable pipeline connecting the two plants to facilitate rehabilitation of aging infrastructure. The temporary pipeline would be installed above grade to facilitate easy construction and removal of piping and fittings.

Temporary lines are not guaranteed to be leak proof at the joints and a detailed monitoring and spill contingency plan would be required. Temporary sewage pipelines cannot be installed over roadways and the only feasible route would be along the Thames River Trail.

**Alternative 7: Provide Permanent Infrastructure for Transmission of Flows**

This option considers the use of pump stations and forcemains to convey flows from each sewershed. Flow into each WWTP would be diverted upstream of primary treatment and transferred to the alternate WWTP. The pump stations would be located within the properties of the respective WWTPs. Each pump station would be sized to accommodate the largest treatment section at each plant in order to facilitate section refurbishments. The variance in capacity of each pump station may warrant multiple forcemains to be installed. The forcemain(s) would be installed underground and have limited or no visible surface features. The project would be completed in two phases. Phase 1 would include the installation of three forcemains, two 450 mm to 750 mm diameter pipes for transferring raw sewage flows between the two plants and a third 150 mm diameter pipe is for transferring biosolids between the plants. Valve chambers and other structural changes to allow for the transfer from both facilities will also be completed in this phase. Phase 2 will include provisions for a pump station and equalization tank, to be located within the property of each facility to facilitate future operational flexibility and storage options.
Existing infrastructure such as the East Park Pump Station and/or the old Chelsea Heights Pump Station could be considered for interim pumping options, albeit upgrades may be required to accommodate such options. The City’s existing East Park PS is currently planned for an upgrade that would allow it to form part of the Phase 1 solution.

**Alternative 8: Increase Capacity within Existing Infrastructure at the Vauxhall WWTP**

The Vauxhall WWTP uses a conventional activated sludge (CAS) process to treat wastewater. There are opportunities through process performance and new technologies that could facilitate increasing the capacity of the plant within the existing fenceline. This option requires the ability to transfer flow between Vauxhall and Pottersburg WWTPs to allow for continued operations at Vauxhall and to prevent taking down one of the sections during the upgrades. The 2013 capacity assessment report indicates that the capacity at Vauxhall can be increased up to 47 MLD allowing up to 28.7 MLD of additional capacity to be treated at the plant.

**Alternative 9: Increase Capacity within Existing Infrastructure at the Pottersburg WWTP**

The Pottersburg WWTP uses a conventional activated sludge (CAS) process to treat wastewater. Similar to the Vauxhall WWTP, there are opportunities through evaluation of process performance and new technologies that would facilitate increasing the capacity of the WWTP within the existing fenceline. This option requires the ability to transfer flow between Vauxhall and Pottersburg WWTPs to allow for continued operations at Pottersburg by transferring flows for treatment at Vauxhall. The 2013 capacity assessment indicates that the capacity at Pottersburg can be increased up to 80 MLD allowing up to 53.4 MLD of additional capacity to be treated at the plant, although the scale of the required upgrades is somewhat increased by limited performance in the existing facility.

### 6.2 Evaluation of Alternative Solutions

The evaluation of the alternatives carried forward (Table 6.1) was based on an assessment to consider the suitability of the alternatives and to identify how well each alternative is able to fulfill the problem statement in Section 5.2. This forms the rationale for the selection of the alternatives to be carried forward for further evaluation.

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>SCREENING RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1: Do Nothing</td>
<td>The do nothing option does not utilize existing available capacity at the Vauxhall WWTP. In this scenario, the City could impose restrictions to limit the extent and locations of urban development within the Pottersburg WWTP sewershed. Limiting growth does not comply with the Provincial Policy Statement and also requires amendments to the City’s official plan.</td>
</tr>
<tr>
<td>Not carried forward.</td>
<td></td>
</tr>
<tr>
<td>Alternative 2: Interconnect upstream gravity sewers</td>
<td>Interconnecting the sewers does not provide any operational control over the flow volume and direction. The additional flow to either WWTP could not be consistent or predictable. There is an increased risk of wet weather flows bypassing treatment at the WWTPs, also, adding sewage to an existing collection system increases the risk of basement flooding to the upstream and downstream connections. Significant capital investment will be required to increase gravity pipe capacity within the collection system.</td>
</tr>
<tr>
<td>Not carried forward.</td>
<td></td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>SCREENING RESULT</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
| **Alternative 3:** Expand Pottersburg WWTP | Previous documentation for an expansion at Pottersburg considers an expansion outside the fenceline. The expansion would still be within the City’s property limits and no additional land acquisition would be required. This option does not utilize existing available capacity of 5 MLD at Vauxhall or potential additional capacity of up to 28.7 MLD if optimization and strategic upgrades are completed at the Vauxhall WWTP. The costs of adding additional sections at Pottersburg to accommodate future growth is very high compared to interconnecting the two WWTPs.  
Not carried forward. |
| **Alternative 4:** Decommission Vauxhall WWTP and transfer flow to Pottersburg WWTP | Sending all flows from Vauxhall to Pottersburg would exceed the available capacity at Pottersburg and would trigger an expansion necessary to accommodate increased flow. Consolidating treatment at a single site could provide operational efficiencies; however, constructing new capacity is cost prohibitive and utilizing the existing capacity is preferred. Furthermore, many upgrades were completed to the Vauxhall WWTP within the past 15-20 years including Section 1 aeration (2000), UV disinfection (2002), Section 1 primary (mid 2000), electrical system (2008), Section 2 aeration (2011), Return activated sludge and waste activated sludge pumping (2013), Advanced wet weather treatment system (Chemical enhanced primary treatment (2013), and a new headworks facility and energy efficient turbo blowers (2014). The preference is to continue to use this newer equipment at full capacity before any further upgrades or taking equipment out of service.  
Not carried forward. |
| **Alternative 5:** Expand Vauxhall WWTP | Some structural and process components at Vauxhall will need to be refurbished in the future which will require taking one of the treatment sections offline. Since the plant requires both sections to be online to treat average flows then taking any part of the process is not feasible as it will reduce capacity drastically. The only option is to expand by adding a third treatment section. There is available land within the Vauxhall WWTP property for expansion; however, constructing new treatment sections is often more costly than refurbishment. There is limited growth in the Vauxhall sewershed and adding additional treatment capacity without an interconnection is not necessary and will result in the need to decommission one of the existing sections. As discussed earlier, several major upgrades were completed on the existing system and decommissioning any of the existing treatment sections is not preferred.  
Not carried forward. |
| **Alternative 6:** Provide temporary pumping to facilitate WWTP repairs | The cost of a temporary pipeline is less than a permanent line due to the reduced need for rehabilitation; however, there are significant environmental risks associated with installing the temporary line so close to the Thames River and public space. Leaks can develop on the main as it will most likely be installed closer to the surface where it can be damaged by traffic, vandalism, animals and/or other construction activities. This is also a large cost with no gained assets as the temporary pumping system costs are significant and include the costs for delivery, installation, commissioning, maintenance, protection at road crossing(s), heat tracing if pumping is required during winter, decommissioning, and removing when the need for it is complete.  
Not carried forward. |
| **Alternative 7:** | This option could facilitate section upgrades within the WWTPs and utilize available... |
### 6.3 Preferred Servicing Strategy

The Master Plan has identified **Alternative 7: Provide permanent infrastructure for transmission of flows between the two plants** (Schedule B undertaking) to be carried forward for further investigation.

The project will be completed in two phases:

1. **Phase 1** will include the installation of three forcemains, two 450 mm to 750 mm diameter pipes for transferring raw sewage flows between the two plants and a third 150 mm diameter pipe is for transferring biosolids between the plants. The forcemains will be approximately 2.3 km in length between the two plants. Valve chambers and other structural changes to allow for the transfer from both facilities will also be completed in this phase.

2. **Phase 2** will include provisions for a pump station and equalization tank, to be located within the property of each facility to facilitate future operational flexibility and storage options. Preliminary locations of these facilities are shown on **Figures 6.1 and 6.2**. The interconnection is intended to have different operating conditions in the short term and long term.

Future growth in the Vauxhall sewershed will be limited due to the encapsulated nature of the service area. Some infill may be anticipated but will not affect the capacity at Vauxhall significantly. The major increase in future flow will be in the Pottersburg sewershed as the bulk of the area is currently undeveloped. The construction of forcemains between the two facilities will provide for immediate operational flexibility between the two plants especially during any major upgrades at each facility, and provides the potential to remove a treatment train from service for rehabilitation.
Figure 6.1

Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Vauxhall WWTP - Potential Areas for Future Transfer Pump Station and Equalization Tank

Key Map

Legend

Stream/Drain
Potential Areas for Future Transfer Pump Station and Equalization Tank
250 Year Flood Limits
Lot Line
Existing Fence

Datum: NAD83 UTM 17N
Source: City of London

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Figure 6.2
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Pottersburg WWTP - Potential Area for Future Transfer Pump Station and Equalization Tank

Datum: NAD83 UTM 17N
Source: City of London

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6.4 Identification of Solutions for Permanent Pumping

The selection of alternative interconnection forcemain routing options for the permanent pumping option was based on the following factors:

- Existing and future transportation corridors;
- Utility corridors;
- Potential use of green field alignments that can provide a direct route between each WWTP;
- Preference to avoid or minimize impacts to sensitive areas;
- Preference to avoid or minimize impacts to traveling public;
- Availability of public land;
- Ease of construction and interconnection to the existing systems; and
- Future capacity and pumping requirements.

The forcemains between the two WWTPs will be installed along the most appropriate route taking into consideration distance, costs, pump sizing, road restoration, method of installation and other factors in pipe sizing and siting. Section 6.4.1 provides a comparison of permanent pumping alternatives.

6.4.1 Permanent Pumping – Forcemain(s) Route Alternatives

For all options, one 150 mm pipe is required for biosolids transfer and twin 450 mm to 750 mm diameter forcemains for sewage flows are required for flow transfer. Twinned forcemains are recommended to allow for partial redundancy, and flow management between the two facilities. Potential sanitary forcemain sewer routing alignments were developed based on the above design criteria, as follows:

Option 1 – Municipal ROW

This option considers that the forcemains be located within existing City right-of-way (ROW) and easements. The forcemain(s) can be located outside paved portions of roadways, where available, and beneath shoulder, boulevard, or ditch areas. Figure 6.3 illustrates two slightly different routes for Option 1 through ROWs for the City. The length of the forcemain(s) between the two WWTPs along this route is approximately 2,650 m for the options presented, and the total pumping lift required from either facility is approximately 27 m.

Flows will be pumped up to a high point at the intersection of Hamilton Road and Gore Road where the flow will start to flow downhill towards either plant. At the high point, an air release chamber will be installed to allow for air entrapped within the forcemain to be released that could reduce/stop flows. There may be the need for several additional air release chambers along the route to reduce potential transients.

Option 2 A-D – Combination of ROW and open space

Several options were presented including a mix of road ROW, utilities ROW and greenfield construction as shown in Figures 6.4A and 6.4B. The forcemain route for this option is relatively lower in elevation than in Option 1, reducing the head required to pump from either plant. This reduces capital costs for the pumps and will reduce pumping costs. This route may require the purchase of additional land from private owners and/or requesting the use of utilities ROW such as Hydro One.

Option 2A: The forcemains will be directed from the Vauxhall WWTP east along Tommy Hunter Way, across St. Julien Park along the existing multi-use pathway and through the parking lot for the East London Soccer Club. It will then be directed south along Elgin Street and east along Power Street to cross Highbury Avenue. St. Julien Park is
an abandoned landfill with existing methane collection system which will require consideration during detailed design activities.

East of Highbury Avenue, the forcemain alignment continues along Norlan Avenue and crosses Meadowlily Road and is directed across an existing City of London easement and into Pottersburg Park where it travels south into Pottersburg WWTP. Figure 6.4A illustrates the route of options 2A-D. The length of the forcemain(s) between the two facilities along this route is approximately 2,260 m, and the total lift from either facility is approximately 22 m.

**Option 2B:** This option is similar to Option 2A but the alignment is directed north on Meadowlily Road North, traverses private property and travels across the condominium development within the private road allowance and across an existing parking lot before travelling south to the Pottersburg WWTP. The length of the forcemain(s) between the two WWTPs along this route is approximately 2,465 m, and the total lift from either WWTP is approximately 23 m.

**Option 2C:** This option is also similar to Option 2A but the forcemain alignment is directed north on Meadowlily Road North and east on Hamilton Road within the existing ROWs. The forcemains will travel south along the access road into Pottersburg WWTP. The length of the forcemain(s) between the two WWTPs along this route is approximately 2,713 m, and the total lift from either WWTP is approximately 30 m.

**Option 2D:** This option is similar to Option 2A; however, the forcemains are installed within Hydro One corridor for approximately 780 m east of Highbury Ave. This option is superior to Option 2A with respect to ease of construction, avoiding road closures, and cutting/clearing trees. Hydro One technical approval is required for the City to install the forcemain(s) within their corridor. This process may delay construction depending upon Hydro One approval requirements. The length of the forcemain(s) between the two WWTPs along this route is approximately 2,184 m, and the total lift from either WWTP is approximately 20 m. Figure 6.4B illustrated the route for this option.

**Option 3 – Thames River Path**

This option places the forcemain close to the Thames River along the existing TVP multi-use pathway and through Pottersburg Park and the off-leash dog park. The alignment is at the lowest elevation compared to the previous options which means a lower pumping head is required which translates to reduced operating and maintenance and capital costs. The forcemains will also mostly be installed on lands owned by the City and are not in the ROW, which reduces construction costs. Figure 6.5 illustrates the route for this option. The length of the forcemains between the two WWTPs along this route is approximately 2,237 m, and the total lift from either facility is approximately 17 m.
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds

Master Plan

Permanent Pumping Solutions
Option 1 A-B

Jan 2017

Datum: NAD83 UTM 17N
Source: City of London

Figure 6.3

Profile of Forcemain Option 1A
Profile of Forcemain Option 1B

Vauxhall WWTP
Pottersburg WWTP

Legend
- Existing Sanitary Outfall
- Existing Sanitary Manhole
- Existing Combined Sewer
- Existing Gravity Sanitary Sewer
- Forcmain
- — 250 Year Flood Limits
- Lot Line
- Thames River

Option 1 Routes
Forcmain Option 1 (both 1A and 1B follow this route)
Forcmain Option 1A (Total Length ~ 2646m)
Forcmain Option 1B (Total Length ~ 2645m)

Key Map

Approximate Location of Study Area

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Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 6-3 Permanent Pumping Solutions Option 1.mxd
Date Saved: 1/31/2017 11:28:47 AM
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds
Master Plan
Permanent Pumping Solutions
Option 2

Jan 2017

Datum: NAD83 UTM 17N
Source: City of London

Figure 6.4B

Legend
- 250 Year Flood Limits
- Existing Sanitary Outfall
- Existing Sanitary Manhole
- Existing Combined Sewer
- Existing Gravity Sanitary Sewer
- Stream/Drain
- Lot Line
- Thames River
- Option No.
- Option 2D (Total Length ~ 2184m)

Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 6-3b Permanent Pumping Solutions Option 2.mxd

Date Saved: 1/6/2017 9:57:20 AM
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Permanent Pumping Solutions
Option 3

Approximate Location of Study Area

Legend
- Existing Combined Sewer
- Existing Gravity Sanitary Sewer
- Existing Sanitary Outfall
- Existing Sanitary Manhole
- Stream/Drain
- 250 Year Flood Limits
- Lot Line
- Thames River

Option No.

Forcemain Option 3 (Total Length ~ 2237m)

Datum: NAD83 UTM 17N
Source: City of London

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Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 6-5 Permanent Pumping Solutions Option 3.mxd
Date Saved: 1/5/2017 4:04:46 PM

Figure 6.5
6.4.2 Evaluation Framework and Criteria

A framework for evaluation of the options was developed and is presented in Table 6.2. This evaluation framework includes technical considerations and environmental components that address the broad definition of the environment as described in the EAA in addition to considering comments received from review agencies.

**Table 6.2: Evaluation Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social- Cultural Environment</td>
<td>Considers the potential effects on residents, neighbourhoods, institutions, businesses, community features/character, social cohesion. Considers potential impacts on community features and historical/archaeological and heritage components.</td>
</tr>
<tr>
<td>Natural Environment</td>
<td>Considers the physical and natural environment, including potential impacts on vegetation, fish and wildlife, surface drainage and groundwater, areas of natural and scientific interest, environmentally sensitive areas, and soils/geology.</td>
</tr>
<tr>
<td>Technical</td>
<td>Considers the technical suitability and other engineering aspects, including factors such as constructability, phasing, level of service, security and reliability, climate change adaptation, potential impacts on existing infrastructure and operations and maintenance.</td>
</tr>
<tr>
<td>Financial</td>
<td>Considers the potential financial costs, including construction, operations and maintenance (life-cycle) costs and flexibility for scheduling the works.</td>
</tr>
</tbody>
</table>

Based on the above components, evaluation criteria were developed and used to evaluate the routing alternatives presented in Section 6.4.2. Evaluation criteria are described in Table 6.3 below.

**Table 6.3: Criteria for Evaluating the Alignment Alternatives**

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment</td>
<td>Potential effects to water resources, including:</td>
<td>Proximity to feature and/or degree of disruption or intrusion</td>
</tr>
<tr>
<td></td>
<td>• Fisheries/aquatic habitat (e.g., stream crossings)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Species at Risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Wetlands</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Floodplains</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential effects to natural heritage features, including:</td>
<td>Proximity to feature and/or degree/amount of disruption or intrusion-displacement</td>
</tr>
<tr>
<td></td>
<td>• Significant Woodlands (as per City’s Official Plan)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Significant Wetlands</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Environmentally Sensitive Areas (ESAs)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Environmental Protection Areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Environmental Conservation Areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sensitive species habitat (provincially significant)</td>
<td></td>
</tr>
</tbody>
</table>

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4 The Environmental Assessment Act (Section 1.(c)(i) to (vi) defines the “environment” as: “air, land, water, plant and animal life including human life; the social and cultural conditions that influence the life of humans or a community; any building, structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the human activities, or; any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.” This definition of the environment is used and is reflected in the environmental components used in the Phase 2 evaluation.
<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>habitat, Species at Risk)</strong></td>
<td></td>
</tr>
<tr>
<td>Social/Cultural</td>
<td>Climate Change Considerations</td>
<td>Potential impacts affecting climate change</td>
</tr>
<tr>
<td></td>
<td>Land use</td>
<td>Effect on existing residences, institutions, businesses and community features</td>
</tr>
<tr>
<td></td>
<td>Construction impacts</td>
<td>Amount and duration of disruption (e.g., noise, vibration, traffic management, access, detours)</td>
</tr>
<tr>
<td></td>
<td>Effects on:</td>
<td>Loss or disruption to known features</td>
</tr>
<tr>
<td></td>
<td>- Known or potential significant archaeological resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Built heritage resources and cultural landscape features</td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>Potential effects the route will impose on technical design requirements or operational constraints</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Route path between the two WWTPs</td>
<td>Proximity to private, public, and natural environment.</td>
</tr>
<tr>
<td></td>
<td>Conservation Authority Regulations</td>
<td>Potential impact to UTRCA Regulations and permit requirements.</td>
</tr>
<tr>
<td></td>
<td>Length of the forcemains</td>
<td>Effect of forcemain length on pump sizing.</td>
</tr>
<tr>
<td></td>
<td>Utilities &amp; ROW Coordination</td>
<td>Extent of coordination with utilities on public or private land.</td>
</tr>
<tr>
<td></td>
<td>Method of Installation</td>
<td>Ability to construct using open cut versus Horizontal Directional Drilling.</td>
</tr>
<tr>
<td></td>
<td>Traffic Management</td>
<td>Extent of traffic management on high traffic roads versus low traffic streets and walking paths.</td>
</tr>
<tr>
<td></td>
<td>Operations &amp; Maintenance</td>
<td>Extent of typical life-cycle operation and maintenance requirements.</td>
</tr>
<tr>
<td></td>
<td>Transfer pump sizing</td>
<td>Pump sizing depends on elevation, pipe size and length.</td>
</tr>
<tr>
<td></td>
<td>Easements and Property Acquisitions/Purchase:</td>
<td>Amount of easements/acquisitions</td>
</tr>
<tr>
<td>Financial</td>
<td>Costs associated with the installation of the forcemain and all requirements to transfer flows between the two WWTPs</td>
<td>Capital costs, Operating and maintenance costs</td>
</tr>
</tbody>
</table>
6.5 Evaluation of Alignment Alternatives

A detailed assessment of each routing alternative was completed based on the evaluation components and criteria. A comparative evaluation in a matrix format was prepared to present the evaluation of alternative forcemain alignments as shown in Table 6.4.

The evaluation used for this study was not based on a numerical ranking system, which would use statistical methods that are difficult to understand by many stakeholders. Instead, a descriptive or qualitative evaluation was used to consider the suitability and feasibility of alternative wastewater servicing options. In this evaluation approach, trade-offs consider the advantages and disadvantages of each alternative to address the problem and opportunity statement with the least environmental effects and the most technical benefits and form the rationale for the identification of the preferred routing.
### Table 6.4: Evaluation of Alternative Forecmain Routes

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Social/Cultural</td>
<td>Impacts to existing/future land uses</td>
<td>Temporary impacts to park/open space users.</td>
<td>Temporary impacts to park/open space users.</td>
<td>Temporary impacts to park/open space users.</td>
<td>Temporary impacts to park/open space users.</td>
<td>Temporary impacts to park/open space users.</td>
<td>Temporary impacts to park/open space users.</td>
<td>Temporary impacts to park/open space users.</td>
</tr>
<tr>
<td>Social/Cultural</td>
<td>Temporary construction impacts to residents and businesses (access, noise, dust)</td>
<td>No permanent loss of park/open space.</td>
<td>No permanent loss of park/open space.</td>
<td>No permanent loss of park/open space.</td>
<td>No permanent loss of park/open space.</td>
<td>No permanent loss of park/open space.</td>
<td>No permanent loss of park/open space.</td>
<td>Significant temporary impacts to park/open space uses.</td>
</tr>
<tr>
<td>Social/Cultural</td>
<td>Visual impacts to adjacent properties/land uses</td>
<td>Temporary construction impacts to residents adjacent to construction area.</td>
<td>Temporary construction impacts to residents adjacent to construction area.</td>
<td>Temporary construction impacts to residents adjacent to construction area.</td>
<td>Temporary construction impacts to residents adjacent to construction area.</td>
<td>Temporary construction impacts to residents adjacent to construction area.</td>
<td>Temporary construction impacts to residents adjacent to construction area.</td>
<td>No construction impacts to residents.</td>
</tr>
<tr>
<td>Social/Cultural</td>
<td>Minimal traffic impacts along local and arterial streets.</td>
<td>Fewer residential properties impacted compared to Alternative 1.</td>
<td>Minimal traffic impacts along local streets.</td>
<td>Temporary traffic impacts along local streets and arterial road but less significant than Alternative 1 which has more impact on arterial road.</td>
<td>Temporary traffic impacts along local streets and arterial road but less significant than Alternative 1 which has more impact on arterial road.</td>
<td>Temporary traffic impacts along local streets and arterial road but less significant than Alternative 1 which has more impact on arterial road.</td>
<td>Minimal traffic impacts likely along local streets.</td>
<td>No traffic impacts along local and/or arterial streets</td>
</tr>
<tr>
<td>Archaeology</td>
<td>Potential impacts to archaeological resources within existing open space areas.</td>
<td>A Stage 2 archaeological assessment may be required.</td>
<td>A Stage 2 archaeological assessment may be required.</td>
<td>A Stage 2 archaeological assessment may be required.</td>
<td>A Stage 2 archaeological assessment may be required.</td>
<td>A Stage 2 archaeological assessment may be required.</td>
<td>A Stage 2 archaeological assessment may be required.</td>
<td>Largest area of study required</td>
</tr>
<tr>
<td>Archaeology</td>
<td>Disruption of site having significant archaeological value</td>
<td>Potential for archaeological resources within existing open space areas.</td>
<td>Potential for archaeological resources within existing open space areas.</td>
<td>Potential for archaeological resources within existing open space areas.</td>
<td>Potential for archaeological resources within existing open space areas.</td>
<td>Potential for archaeological resources within existing open space areas.</td>
<td>Potential for archaeological resources within existing open space areas.</td>
<td>Potential impacts to archaeological resources within existing open space areas.</td>
</tr>
<tr>
<td>Terrestrial Wildlife &amp; Vegetation</td>
<td>Effects on wildlife and habitat</td>
<td>Proposed sewer route located outside of wooded areas and natural areas.</td>
<td>Proposed sewer route located within wooded areas.</td>
<td>Proposed sewer route located adjacent to construction footprint.</td>
<td>Proposed sewer route located outside of wooded areas and natural areas.</td>
<td>Proposed sewer route located within wooded area and wetland.</td>
<td>Proposed sewer route located within and adjacent to construction footprint.</td>
<td>Proposed sewer route located within wooded areas and natural areas.</td>
</tr>
<tr>
<td>Terrestrial Wildlife &amp; Vegetation</td>
<td>Tree removal may be required in city parks and residential areas</td>
<td>Proposed sewer route located outside of residential areas and natural areas.</td>
<td>Proposed sewer route located adjacent to construction footprint.</td>
<td>Proposed sewer route located adjacent to construction footprint.</td>
<td>Proposed sewer route located outside of residential areas and natural areas.</td>
<td>Proposed sewer route located outside of residential areas and natural areas.</td>
<td>Proposed sewer route located outside of residential areas and natural areas.</td>
<td>Proposed sewer route located outside of residential areas and natural areas.</td>
</tr>
<tr>
<td>Aquatic Life &amp; Vegetation</td>
<td>Effects on aquatic life and habitat</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>Proposed sewer route located within unevaluated vegetation patch.</td>
</tr>
<tr>
<td>Aquatic Life &amp; Vegetation</td>
<td>Effects on aquatic vegetation</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>No aquatic communities present along proposed sewer route.</td>
<td>Proposed sewer route located within unevaluated vegetation patch.</td>
</tr>
<tr>
<td>Species at Risk</td>
<td>Amount and quality of SASS and/or habitat removal or disruption</td>
<td>Potential for loss of bat roosting sites through tree removal</td>
<td>Temporary loss of foraging habitat for Barn Swallow and Chimney Swift</td>
<td>Temporary loss of foraging habitat for Barn Swallow and Chimney Swift</td>
<td>Temporary loss of potential</td>
<td>Temporary loss of foraging habitat for Barn Swallow and Chimney Swift</td>
<td>Temporary loss of potential</td>
<td>Proposed sewer route located within unevaluated vegetation patch.</td>
</tr>
</tbody>
</table>
| Species at Risk | Potential for loss of bat roosting sites through tree removal | Temporary loss of foraging habitat for Barn Swallow and Chimney Swift | Temporary loss of foraging habitat for Barn Swallow and Chimney Swift | Temporary loss of foraging habitat for Barn Swallow and Chimney Swift | Temporary loss of foraging habitat for Barn Swallow and Chimney Swift | Temporary loss of foraging habitat for Barn Swallow and Chimney Swift | Proposed sewer route located within una
| Natural Environment | Erosion/sedimentation | Contamination from spills/leaks. | | | | | | |

**Social Cultural Summary**

- Potential impacts to aquatic life & vegetation
- Vegetation
- Terrestrial wildlife & habitat
- Socio-economic
- Temporary construction impacts to residents and businesses (access, noise, dust)
- Visual impacts to adjacent properties/land uses
- Significant temporary impacts to park/open space uses
- No permanent loss of park/open space
- Temporary traffic impacts along local streets and arterial road but less significant than Alternative 1 which has more impact on arterial road
- Minimal traffic impacts likely along local streets
- Proposed sewer route located outside of Thames River corridor
- No permanent loss of park/open space
- No permanent loss of park/open space
- Temporary traffic impacts along local streets and arterial road but less significant than Alternative 1 which has more impact on arterial road
- Minimal traffic impacts likely along local streets
- Proposed sewer route located within unevaluated vegetation patch
- No traffic impacts along local and/or arterial streets
- No traffic impacts along local and/or arterial streets
<table>
<thead>
<tr>
<th>Component</th>
<th>Criteria</th>
<th>Alternative 1 (A &amp; B)</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment Summary</td>
<td></td>
<td>Monarch habitat (meadow containing milkweed)</td>
<td>Monarch habitat (meadow containing milkweed)</td>
<td>Monarch habitat (meadow containing milkweed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential impacts to wooded areas that provide habitat for Eastern Wood-pewee and Butternut</td>
<td>Potential impacts to wooded areas that provide habitat for Eastern Wood-pewee and Butternut</td>
<td>Potential impacts to wooded areas that provide habitat for Eastern Wood-pewee and Butternut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impacts to confirmed Butternut locations not anticipated</td>
<td>Impacts to confirmed Butternut locations not anticipated</td>
<td>Impacts to confirmed Butternut locations not anticipated</td>
</tr>
<tr>
<td>Climate Change Considerations</td>
<td>• Avoids climate change concerns - outside of floodplain.</td>
<td>• Avoids climate change concerns - outside of floodplain.</td>
<td>• Avoids climate change concerns - outside of floodplain.</td>
<td>• Avoids climate change concerns - outside of floodplain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Avoids climate change concerns - outside of floodplain.</td>
<td>• Avoids climate change concerns - outside of floodplain.</td>
<td>• Involves installation of infrastructure in regulated floodplain. Potential risk of infrastructure failure related to severe flooding and possible shifting of Thames River belt meander over time.</td>
</tr>
<tr>
<td>Technical</td>
<td></td>
<td>• Long and indirect route between the two WWTPs. Routing in very close proximity to existing homes.</td>
<td>Provides a direct route between the two WWTPs. Routing avoids close proximity to existing homes.</td>
<td>Provides the shortest direct route between the two WWTPs.</td>
</tr>
<tr>
<td>Route</td>
<td>• Long and indirect route between the two WWTPs. Routing in very close proximity to existing homes.</td>
<td>Provides a semi-direct route between the two WWTPs. Routing in very close proximity to existing homes.</td>
<td>Provides the shortest direct route between the two WWTPs.</td>
<td>Second shortest direct route between the two WWTPs.</td>
</tr>
<tr>
<td>Length</td>
<td>2,645 m</td>
<td>2,265 m</td>
<td>2,465 m</td>
<td>2,184</td>
</tr>
<tr>
<td>Utilities &amp; ROW Coordination</td>
<td>• Open cut construction for the full length of construction, including a long stretch of recently paved Hamilton Rd.</td>
<td>• Option to install most piping in non-paved areas using open cut method but with reduced road reconstruction. Some directional drilling is required across Highbury Ave.</td>
<td>• Option to install most piping in non-paved areas using open cut method but with reduced road reconstruction. Some directional drilling is required to cross Highbury Ave.</td>
<td>• Reduced utilities coordination requirements.</td>
</tr>
<tr>
<td>Method of installation</td>
<td>• Significant traffic management required.</td>
<td>• Some traffic management required, but less than option 1A/B.</td>
<td>• Some traffic management required, but less than option 1A/B.</td>
<td>• Most of the piping will need to be installed using directional drilling due to sensitivity of the area.</td>
</tr>
<tr>
<td>Traffic management</td>
<td>• Long term coordination between the City and Hydro One and other utilities.</td>
<td>• Reduced traffic control requirements.</td>
<td>• Long term coordination between the City and Hydro One and other utilities.</td>
<td>• Long term coordination between the City and Hydro One and other utilities.</td>
</tr>
<tr>
<td>Operations &amp; Maintenance</td>
<td>• Potential future maintenance work will require road works in heavily traffic areas.</td>
<td>• Future maintenance work will require some road works in heavily traffic areas.</td>
<td>• Potential future maintenance work will require coordination with Hydro One.</td>
<td>• Potential future maintenance work will be in low traffic area with limited road reconstruction.</td>
</tr>
<tr>
<td>Pump Sizing</td>
<td>• High pump lift based on the need to pump up to Hamilton Road. 39 m of head (depends on pipe size and flow).</td>
<td>• Routing avoids installation on Hamilton Rd (high point). Lower lift than option 1A/B. 35 m of head (depends on pipe size and flow).</td>
<td>• High TDH for pumps based on the need to pump up to Hamilton Road. 40 m of head of head (depends on pipe size and flow).</td>
<td>• Lowest lift as the piping will be closer to the river. 33 m of head (depends on pipe size and flow).</td>
</tr>
<tr>
<td>Easements and Property Acquirements/Purchase</td>
<td>• Municipal easements required for forcemain alignment on City lands outside of existing ROW. Temporary easements required for trenchless crossing of Highbury Avenue.</td>
<td>• Municipal easements required for forcemain alignment on City lands outside of existing ROW. Temporary easements required for trenchless crossing of Highbury Avenue.</td>
<td>• Municipal easements required for forcemain alignment on City lands outside of existing ROW. Temporary easements required for trenchless crossing of Highbury Avenue.</td>
<td>• Municipal easements required for forcemain alignment on City lands outside of existing ROW. Temporary easements required for trenchless crossing of Highbury Avenue.</td>
</tr>
<tr>
<td>Component</td>
<td>Criteria</td>
<td>Alternative 1 (A &amp; B)</td>
<td>Alternative 2</td>
<td>Alternative 3</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>-----------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Timing</strong></td>
<td>• Construction within a reasonable time frame. • Longest construction period compared to all other options. • Requires coordination with other utilities and extensive traffic control. • Less construction time compared to Alternative 1 as some of the piping can be installed using directional drilling. • Longer construction period compared to option 2A. • Requires coordination with other utilities and extensive traffic control. • Long construction period that will require partial road reconstruction, traffic control, utilities co-ordination. • Less construction time compared to Alternative 1 as some of the piping can be installed using directional drilling. • Shortest construction period compared to all other options</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Technical Summary | ☒ | ☐ | ☒ | ☒ |
| Financial | Cost | • Capital Costs (400 mm – 750 mm) | • $ 6.3 M - $ 9.9 M | • $ 5.5 M - $ 9.3 M | • $ 6 M - $ 10 M | • $ 6.6 M - $ 10.9 M | • $ 5.3 M – $ 8.9 M | • $ 5.6 M – 9.3 M |
| Financial Summary | ☒ | ☐ | ☔ | ☒ | ☐ | ☒ |
| Overall Summary | ☑ | ☐ | ☒ | ☒ | ☐ | ☒ | ☐ | ☒ |

**Legend**

- **Least Impact (Most Preferred)**
- **Low to Moderate Impact**
- **Moderate Impact**
- **Moderate to High Impact**
- **Highest Impact (Least Preferred)**
6.6 Recommended Alignment Alternative

Based on the comparative evaluation, the preferred alignment alternative is Option 2A which provides a route that limits impacts to residents. The preferred pathway alignment follows Tommy Hunter Way from the Vauxhall WWTP, passes through the edge of St. Julien Park, and follows Elgin Street to Highbury Avenue. The route crosses Highbury Avenue, follows Norlan Avenue, and passes through two small wooded areas and an open meadow to reach the Pottersburg WWTP. Figure 6.6 illustrates the preferred route.

Rationale for selecting Option 2A includes the following:

Natural Heritage

β Avoids significant natural environment features including:
   o Construction adjacent to the Thames River;
   o Wetland hazard area;
   o Woodland areas to the greatest extent possible; and
   o Species at Risk habitats.

Technical

β Direct route between the two WWTPs;
β Second shortest routes of all alignments considered;
β Minimal traffic impacts;
β Reduced utilities coordination;
β Shorter construction period due to shorter route and some directional drilling installation method;
β Smaller pumps with lower lift requirements; and

Social/Cultural

β No permanent loss of parkland/open space;
β Fewer residential properties impacted; and
β Minimizes impacts to the traveling public by utilizing mainly ROW alignment and by avoiding major traffic routes.

Financial

β The second lowest cost compared to all options.
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Data Saved: 4/19/2017 3:07:27 PM

Map location: P:\60480821 CoL Vaux-Potts Class EA\900-Work\920-929 (GIS-Graphics)\Maps\Final\Report_Figures\Figure 6-6 preferred alignment.mxd

Legend
- Preferred Forcemain Alignment
- Existing Gravity Sanitary Sewer
- Stream/Drain
- Lot Line
- Thames River
- Study Area

Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Preferred Alignment

Jan 2017  1:7,500

Datum: NAD83 UTM 17N

Source: City of London

Figure 6.6
6.7 Public Information Centre

The public and stakeholders were invited to comment on the study through a Public Information Centre (PIC) held on April 26, 2016 at Ealing Public School. The purpose of the PIC was to identify the purpose and scope of the project, confirm the project need, and identify and evaluate alternatives to address the problem/opportunity statement and any further issues or concerns to be addressed. A total of 10 participants signed in at the PIC. Comments are summarized below in Table 6.5 and located in Appendix A.3.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred Option</td>
<td>• Member of the public supports Option 2</td>
<td>Noted</td>
</tr>
<tr>
<td>Sensitive areas to be considered</td>
<td>• Consideration should be given to plants, animals and archaeology</td>
<td>Natural Environment and Archaeology assessments have been undertaken for this project and have been considered in the evaluation and design of the project</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>• A road connection is needed from Hale Street to Tommy Hunter Way.</td>
<td>Beyond the scope of this project. Contact should be made through the City of London Transportation department</td>
</tr>
<tr>
<td></td>
<td>• Residents were previously told the park could not be impacted.</td>
<td>Beyond the scope of this project. Contact should be made through the City of London Transportation department</td>
</tr>
<tr>
<td></td>
<td>• The St. Julien Park Festival will be held in September 2016. Will the festival be impacted by the project?</td>
<td>No impacts to the festival this year. Construction of the project is likely to begin in 2018. Efforts will be made to ensure the park is available in annual for the festival.</td>
</tr>
</tbody>
</table>
7. Project Description

7.1 Schedule B Projects

This section describes Schedule B projects for the Master Plan, including new pumping stations, storage tanks and WWTP interconnection forcemains.

7.1.1 Description

The Pottersburg and Vauxhall WWTPs will be interconnected via two forcemains for raw sewage transfer and one additional forcemain for biosolids transfer.

The project will be completed in two phases:

1. Phase 1 will include the installation of three forcemains, two 450 mm to 750 mm diameter pipes for transferring raw sewage flows between the two plants and a third 150 mm diameter pipe is for transferring biosolids between the plants. The forcemains will be approximately 2.3 km in length between the two plants. Valve chambers and other structural changes to allow for the transfer from both facilities will also be completed in this phase.

2. Phase 2 will include provisions for a pump station and equalization tank, to be located within the property of each facility to facilitate future operational flexibility and storage options as illustrated in Figures 6.1 and 6.2.

7.1.2 Proposed Construction Methods

It is recommended to locate the forcemains outside the paved portion of the roadway on Tommy Hunter Way, Power Street and Norlan Avenue when possible. There will be two road crossings at Highbury Avenue North and on Meadowlily Road North. The forcemains between Meadowlily Road and the Pottersburg WWTP will be in an existing utilities right-of-way owned by the City, which is also a greenfield. Two methods of construction can be used for construction:

1. Open trench excavation or open cut is the most common method of piping construction. It consists of excavating down to the required depth below the frost line, installing the pipe(s) as per specifications and then backfilling the trench and restoring the ground to previous condition (pavement or just backfill and seeding).

2. Horizontal Directional Drilling (HDD) is a trenchless technology used for the installation of utility pipelines (normally flexible type piping) along a desired profile using a surface-launched drill rig. This is the least invasive type of construction as it only requires pilot holes to setup the equipment for horizontal drilling along the desired path. This is also the fastest method for installation and requires no backfilling/restoration, except for the pilot holes.

Where possible HDD would be the preferred and recommend method of construction for major road crossings. This method costs more than the traditional open excavation method; however, the reduction in manpower, traffic control, and the time to complete the work make this preferable. Figure 7.1 illustrates the suggested location for HDD construction along the preferred route.
Treatment Optimization of the Vauxhall and Pottersburg Sewersheds Master Plan

Construction Method

Jan 2017
Datum: NAD83 UTM 17N
Source: City of London

Figure 7.1

Legend

- Preferred Forcemain Alignment
- Existing Gravity Sanitary Sewer
- Stream/Drain

Drilling
- Directional Drill
- Open Cut Without Road Restoration
- Open Cut/Directional Drill
- Road Restoration Required
- Lot Line
- Thames River
- Study Area
- Directional Drill Launch/Receiving Pit

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7.1.3 Property Requirements/Easement Requirements

Where forcemain construction is proposed outside of an existing ROW, permanent easements from either public agencies or private landowners will be required. Permanent easements are registered on title and no development is permitted within the area. In addition, temporary easements to accommodate construction equipment access and storage will also be required at all HDD pit locations and where the existing ROW width is insufficient to accommodate construction access. The City will negotiate compensation for property owners where easements are required during detailed design.

7.1.4 Estimated Servicing Costs

The costs to install three forcemains, two for wastewater transfer, and one for biosolids transfer, in one common trench is approximately $4.7 million. The costs do not include costs for pump stations, equalization tanks, and any upgrades within the properties associated with Phase II of the project. The costs also do not include engineering but include construction contingency of 10%. A breakdown of costs is shown in Table 7.1 below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Estimated 2017 Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Cut Installation in a paved road (3 pipes in a common trench - approximately 700 m)</td>
<td>$1,330,000 – $2,065,000</td>
</tr>
<tr>
<td>Open Cut Installation in a greenfield (3 pipes in a common trench - approximately 1,500 m)</td>
<td>$2,709,000 – $4,286,250</td>
</tr>
<tr>
<td>Tunnel Installation under Highbury Avenue (3 separate bores, total length approximately 180 m)</td>
<td>$279,000 – $945,000</td>
</tr>
<tr>
<td>Underground Chambers, air release valves and Interconnections</td>
<td>$250,000 – $350,000</td>
</tr>
<tr>
<td>Construction Requirements (e.g., Traffic Management, bond, trailers etc.) - 10%</td>
<td>$456,800 – $754,925</td>
</tr>
<tr>
<td>Construction Contract Contingency - 10%</td>
<td>$502,480 – $840,117</td>
</tr>
<tr>
<td><strong>TOTAL ESTIMATED CONTRACT COST</strong></td>
<td><strong>$5,500,000 - $9,200,000</strong></td>
</tr>
</tbody>
</table>

*Rounded to nearest $100,000

7.1.5 Preliminary Schedule

The anticipated project schedule for the proposed works is shown in Table 7.2.

<table>
<thead>
<tr>
<th>Task</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed Design including permits-approvals easements</td>
<td>July 2017 – November 2017</td>
</tr>
<tr>
<td>Tendering and Award</td>
<td>November 2017 – January 2018</td>
</tr>
<tr>
<td>Start Construction</td>
<td>January 2018</td>
</tr>
<tr>
<td>Complete Construction (Phase I)</td>
<td>September 2018</td>
</tr>
</tbody>
</table>
8. Recommended Mitigation Measures

8.1 Proposed Mitigation Measures

Impacts related to construction of the wastewater infrastructure will be limited to the duration and location of construction. Based on the preferred servicing options and roadway improvements, construction is expected to have varying environmental effects. By incorporating proper best management practices and construction techniques, adverse construction related effects can be minimized. In order to address the effects, the following approach was taken:

- **Avoidance**: The first priority is to prevent the occurrence of negative or adverse environmental effects associated with construction of the servicing options and roadway improvements;

- **Mitigation**: Where adverse environmental effects cannot be avoided, it will be necessary to develop appropriate measures to eliminate, or reduce to some degree, the negative effects associated with construction of the new water and wastewater servicing options and roadway improvements; and

- **Compensation**: In situations where appropriate mitigation measures are not available, or significant net adverse effects will remain following the application of mitigation measures, compensation measures may be required to counter balance the negative effect through replacement in kind, or provision of a substitute or reimbursement.

The following mitigation measures are recommended to ensure that any disturbances are managed by the best available methods. These measures will be further confirmed and developed during detailed design and preparation of tender documents. Table 8.1 provides a detailed assessment of the potential impacts associated with the project and the recommended mitigation measures required to reduce these effects.

### Table 8.1: Proposed Mitigation Measures

<table>
<thead>
<tr>
<th>Potential Impacts</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Environment</strong></td>
<td><strong>Water Quality</strong></td>
</tr>
<tr>
<td>Where construction is within or near the floodplain or UTRCA regulated area, ensure compliance with Ontario Regulation 155/06 (submit permit application for work in regulated areas).</td>
<td></td>
</tr>
<tr>
<td>Minimizing open trench lengths and durations, prompt restoration of disturbed areas and properly secure materials storage.</td>
<td></td>
</tr>
<tr>
<td>Site drilling pits outside of regulated floodplain, where possible.</td>
<td></td>
</tr>
<tr>
<td>Ensure any equipment storage and refueling be kept at the minimum distance of 30 m from watercourse crossings.</td>
<td></td>
</tr>
<tr>
<td><strong>Erosion and Sedimentation Control (to be confirmed during detailed design)</strong></td>
<td><strong>The erosion and sedimentation control plan will be developed in accordance with City of London requirements.</strong></td>
</tr>
<tr>
<td>Ensure that grading, drainage and structural operations during construction prevent sedimentation of sensitive areas.</td>
<td></td>
</tr>
<tr>
<td>The erosion and sedimentation control plan will include the following provisions:</td>
<td></td>
</tr>
<tr>
<td>– Silt fencing should be provided (i.e., according to OPSD 219.110</td>
<td></td>
</tr>
<tr>
<td>Potential Impacts</td>
<td>Mitigation Measures</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>or OPSD 219.130 as appropriate) adjacent to construction areas to prevent runoff from migrating toward nearby watercourses;</td>
</tr>
<tr>
<td></td>
<td>– Rock checks (OPSD 219.210) or silt fence flow checks (OPSD 219.190) should be placed in all ditches flowing toward watercourses and immediately upstream of their discharge into a watercourse;</td>
</tr>
<tr>
<td></td>
<td>– All excavated materials requiring stockpiling should be placed in pre-determined locations. The perimeters of stockpiles should be encircled with silt fencing according to OPD 219.110 or OPD 219.130;</td>
</tr>
<tr>
<td></td>
<td>– All exposed surfaces susceptible to erosion should be re-vegetated through the placement of seed, mulch or sod immediately upon completion of construction activities;</td>
</tr>
<tr>
<td></td>
<td>– Excess silt fence and rip-rap should be maintained on site, prior to the commencement of grading operations and throughout the duration of construction in case of an emergency (e.g., sediment spill, etc.);</td>
</tr>
<tr>
<td></td>
<td>– The integrity of all sediment trapping devices should be monitored regularly (i.e., weekly and following rain events) and properly maintained. Such structures should be removed only after the soils of the construction areas have been stabilized and after the trapped sediments have been removed;</td>
</tr>
<tr>
<td></td>
<td>– Standard wetland mitigation measures should include heavy duty silt fencing (OPSD 219.130) adjacent to marsh communities, and heavy duty silt fencing (OPD 219.130) and/or a barrier for tree protection (OPSD 220.10) adjacent to swamp communities; and</td>
</tr>
<tr>
<td></td>
<td>– Sending/receiving pits for trenchless crossings should be located outside all regulatory flood and fill lines, away from river banks and existing vegetation where possible.</td>
</tr>
<tr>
<td>Trees and Vegetation including Natural Heritage Protection Zones</td>
<td>• Breeding Birds - in accordance with the <em>Migratory Birds Convention Act</em>, any tree trimming or site clearing should take place between September 1\textsuperscript{st} and March 31\textsuperscript{st}.</td>
</tr>
<tr>
<td></td>
<td>• Should tree or site clearing be scheduled from May 1\textsuperscript{st} to July 31\textsuperscript{st}, comprehensive breeding bird surveys will be required.</td>
</tr>
<tr>
<td></td>
<td>• Refer to Environmental Management Plan Recommendations in the EIS (Appendix B.1).</td>
</tr>
<tr>
<td>Contaminated Soils</td>
<td>• Prepare and follow contingency plans for control and cleanup should a spill occur.</td>
</tr>
<tr>
<td>Social/Cultural</td>
<td></td>
</tr>
<tr>
<td>Noise/Vibration/Dust</td>
<td>• Construction operations to occur during day shift and in compliance with City noise by-laws.</td>
</tr>
<tr>
<td></td>
<td>• Complete preconstruction condition surveys of buildings, if required.</td>
</tr>
<tr>
<td></td>
<td>• Undertake regular dust control and street cleaning as required.</td>
</tr>
<tr>
<td>Archaeological</td>
<td>• Stage 2 archaeological assessment is required for all previously undisturbed lands affected by construction.</td>
</tr>
<tr>
<td></td>
<td>• If any archaeological and/or historical resources are discovered</td>
</tr>
</tbody>
</table>
Potential Impacts | Mitigation Measures
--- | ---
during the performance of construction work, the performance of the work in the area of the discovery is to halt. The Ministry of Tourism, Culture and Sport (Archaeological Unit) will be notified for an assessment of the discovery. Work in the area of the discovery would not resume until cleared to do so by the Ministry.
Odour Control | • Consideration for odour control technology on air release valves where deemed necessary.

### 8.2 Proposed Construction Monitoring

Contract tender documents will address mitigative measures in an explicit manner to ensure that compliance is maintained. The provision of an experienced field representative to review construction will ensure that the project follows contract specifications and does not unnecessarily impact vegetation, the community or aquatic environment.

### 8.3 Post Construction Monitoring

Following construction, operation of the sanitary interconnection is not expected to result in any negative impacts. This is based on the City’s experience and other municipality experience with operating similar infrastructure.

Post construction monitoring will be required following construction to ensure that any disturbances have been properly restored (e.g., grading, seeding and plantings).

### 8.4 Review Agency Approvals

#### 8.4.1 Ministry of the Environment and Climate Change (MOECC)

The MOECC will require a sanitary sewer application be reviewed by the City for the sanitary forcemains in which a final approval Environmental Compliance Approval (ECA) would be issued by the MOECC. MOECC approvals would also be required for the new pumping stations in the future.

#### 8.4.2 Ministry of Tourism, Culture and Sport (MTCS)
Based on the results of a Stage 1 archaeological assessment a Stage 2 archaeological assessment is recommended for all areas of potentially undisturbed lands within the project construction area limits.

The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in the Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011), including:

- As the study area consists of areas of manicured lawn and woodlot that cannot be ploughed, Stage 2 archaeological assessment must be completed using the standard test pit survey method. Test pit survey must be conducted at 5 m intervals in all areas of potentially undisturbed lands that will be impacted by the project (e.g. manicured lawn, woodlot).

- Poorly drained areas, areas of steep slope, and areas of confirmed previous disturbance (e.g. building footprints, roadways, areas with identifiable underground infrastructure) are to be mapped and photo-documented, but are not recommended for Stage 2 survey as they possess low to no archaeological potential.

8.4.3 Upper Thames River Conservation Authority (UTRCA)

The subject lands contain features regulated by the Conservation Authorities Act Ontario Generic Regulation 97/04, with the implementation of it falling under UTRCA’s local Ontario Regulation 157/06. Any proposed development/site alteration that involves lands within proximity to the Thames River will require review by the UTRCA and will require the submission of an "Application for Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses".

8.4.4 Ministry of Natural Resources and Forestry (MNRF)

Butternut has a S-rank of S3; the community in which an S1, S2 or S3 species is located is considered Significant Wildlife Habitat. If a Butternut tree observed near the proposed forcemain alignment, is assessed as retainable, vegetation removal within that community may require a permit. The tree must be assessed by a Butternut Health Assessor. If a tree is determined to be retainable (category 2), a Notice of Butternut Impact form must be submitted to the MNRF.

8.4.5 Utilities

Utility information and temporary and/or permanent relocation needs should be incorporated into detailed design drawings. Relevant companies have been consulted to confirm location of buried utilities along the preferred route including but not limited to Hydro One, Union Gas, Bell Canada Inc., and Rogers Cable Communications Inc.
9. Summary

The Master Plan covers the process required to ensure that the proposed sewershed optimization meet the requirements of the EAA. The Class EA planning process has not identified any significant environmental concerns that cannot be addressed by incorporating established mitigation measures during construction.

The proposed improvements resolve the problem/opportunity statement identified in this report. A preliminary evaluation of potential impacts has been included in the evaluation, which indicates minor and predictable impacts that can be addressed by recommended mitigate measures as presenting in Section 7. The proposed mitigation measures will be further developed at detailed design and will form commitments that will be adhered to by the City. Appropriate public notification and opportunity for comment was provided and no comments were received that could not be adequately addressed. Subject to receiving Class EA clearance following the 30-day review period, the City will complete the detailed design and permitting-approvals phase and proceed to construction.
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