



**Township of Wellington North**

**Schedule 'B'**

**Municipal Class Environmental Assessment**

**Arthur Water System Supply  
Redundancy and Storage**

**Project File Report**

Revised: August 14, 2026



## TABLE OF CONTENTS

|            |                                                                                                                   |           |
|------------|-------------------------------------------------------------------------------------------------------------------|-----------|
| <b>1.0</b> | <b>INTRODUCTION</b>                                                                                               | <b>8</b>  |
| <b>2.0</b> | <b>CLASS ENVIRONMENTAL ASSESSMENT PROCESS</b>                                                                     | <b>8</b>  |
| 2.1        | ONTARIO ENVIRONMENTAL ASSESSMENT ACT                                                                              | 8         |
| 2.2        | MUNICIPAL CLASS EA PROCESS                                                                                        | 9         |
| 2.3        | SCHEDULE B CLASS EA APPROACH                                                                                      | 13        |
| 2.4        | CONSULTATION                                                                                                      | 13        |
| <b>3.0</b> | <b>PROJECT BACKGROUND</b>                                                                                         | <b>14</b> |
| 3.1        | PROVINCIAL PLANNING STATEMENT, 2024                                                                               | 14        |
| 3.2        | MASTER PLAN STUDY FOR ARTHUR WATER SUPPLY AND SANITARY SEWAGE SYSTEM (JANUARY 2012)                               | 16        |
| 3.3        | ARTHUR WATER AND SANITARY SYSTEMS TECHNICAL STUDY (NOVEMBER 2020)                                                 | 17        |
| 3.4        | EXISTING FACILITIES                                                                                               | 18        |
| 3.4.1      | <i>Watermain Distribution Network</i>                                                                             | 18        |
| 3.4.2      | <i>Water Storage</i>                                                                                              | 19        |
| 3.4.3      | <i>Groundwater Wells</i>                                                                                          | 23        |
| 3.4.4      | <i>Pump Houses</i>                                                                                                | 24        |
| 3.5        | EXISTING SYSTEM CAPACITY                                                                                          | 24        |
| 3.5.1      | <i>Storage Capacity</i>                                                                                           | 24        |
| 3.5.2      | <i>Supply Source Capacity</i>                                                                                     | 24        |
| 3.5.3      | <i>Supply Firm Capacity</i>                                                                                       | 25        |
| 3.6        | ARTHUR WATER SYSTEM RESERVE CAPACITY CALCULATIONS                                                                 | 25        |
| <b>4.0</b> | <b>PHASE 1 – PROBLEM/OPPORTUNITY STATEMENT</b>                                                                    | <b>25</b> |
| <b>5.0</b> | <b>PHASE 2 – ALTERNATIVE SOLUTIONS</b>                                                                            | <b>25</b> |
| 5.1        | ALTERNATIVE 1A – “DO NOTHING”                                                                                     | 26        |
| 5.2        | ALTERNATIVE 1B – LIMIT COMMUNITY GROWTH                                                                           | 26        |
| 5.3        | ALTERNATIVE 1C – REDUCE WATER DEMAND/IMPLEMENT WATER CONSERVATION MEASURES                                        | 26        |
| 5.4        | ALTERNATIVE 2A – INCREASE WATER TAKING FROM EXISTING MUNICIPAL WELLS                                              | 26        |
| 5.5        | ALTERNATIVE 2B – ADDITION OF NEW WELL(S) TO THE EXISTING MUNICIPAL SYSTEM                                         | 27        |
| 5.6        | ALTERNATIVE 3A – CONSTRUCT A NEW WATER STORAGE FACILITY TO SUPPLEMENT EXISTING MUNICIPAL WATER STORAGE FACILITIES | 27        |



|            |                                                                                                                        |           |
|------------|------------------------------------------------------------------------------------------------------------------------|-----------|
| 5.7        | ALTERNATIVE 3B – CONSTRUCT A NEW WATER STORAGE FACILITY AND DECOMMISSION THE EXISTING MULTI-LEG TOWER                  | 27        |
| 5.8        | ALTERNATIVE 3C – CONSTRUCT A NEW WATER STORAGE FACILITY AND DECOMMISSION BOTH OF THE EXISTING WATER STORAGE FACILITIES | 27        |
| <b>6.0</b> | <b>STUDY AREA</b>                                                                                                      | <b>27</b> |
| <b>7.0</b> | <b>PHASE 2 – INVENTORY OF EXISTING CONDITIONS OF STUDY AREA</b>                                                        | <b>27</b> |
| 7.1        | NATURAL ENVIRONMENT                                                                                                    | 28        |
| 7.1.1      | <i>Ecoregion</i>                                                                                                       | 28        |
| 7.1.2      | <i>Regulated and Wooded Areas</i>                                                                                      | 30        |
| 7.1.3      | <i>Species at Risk</i>                                                                                                 | 30        |
| 7.1.4      | <i>Breeding Bird Habitat</i>                                                                                           | 31        |
| 7.1.5      | <i>Physiography and Soils</i>                                                                                          | 31        |
| 7.1.6      | <i>Hydrogeology</i>                                                                                                    | 33        |
| 7.1.7      | <i>Source Water Protection</i>                                                                                         | 33        |
| 7.1.7.1    | <i>Groundwater</i>                                                                                                     | 34        |
| 7.1.7.2    | <i>Surface Water</i>                                                                                                   | 34        |
| 7.1        | ECONOMIC ENVIRONMENT                                                                                                   | 36        |
| 7.1.1      | <i>Existing Development Pattern</i>                                                                                    | 36        |
| 7.1.2      | <i>Growth Projections</i>                                                                                              | 36        |
| 7.1.3      | <i>Township Operation</i>                                                                                              | 38        |
| 7.2        | TECHNICAL ENVIRONMENT                                                                                                  | 39        |
| 7.2.1      | <i>Existing Requirements</i>                                                                                           | 39        |
| 7.2.2      | <i>Projected Requirements</i>                                                                                          | 45        |
| 7.3        | SOCIAL ENVIRONMENT                                                                                                     | 49        |
| 7.4        | CULTURAL HERITAGE ENVIRONMENT                                                                                          | 49        |
| 7.4.1      | <i>Built Heritage Resources and Cultural Heritage Landscapes</i>                                                       | 49        |
| 7.4.2      | <i>Archaeological Resources</i>                                                                                        | 51        |
| <b>8.0</b> | <b>PHASE 2 – SHORTLIST EVALUATION OF ALTERNATIVE SOLUTIONS</b>                                                         | <b>51</b> |
| <b>9.0</b> | <b>EVALUATION OF WATER SUPPLY ALTERNATIVES</b>                                                                         | <b>52</b> |
| 9.1        | ALTERNATIVE 2A - INCREASE WATER TAKING FROM EXISTING WELLS                                                             | 52        |
| 9.2        | ALTERNATIVE 2B - ADDITION OF NEW WELL(S)                                                                               | 54        |
| 9.3        | WELL EXPLORATION AND SHORT-TERM PUMPING TEST                                                                           | 55        |
| 9.3.1      | <i>Test Well TW1-21 Construction and Preliminary Testing</i>                                                           | 56        |
| 9.3.2      | <i>TW1-21 Long-Term Pumping Test</i>                                                                                   | 57        |
| 9.3.2.1    | <i>TW1-21 Testing</i>                                                                                                  | 57        |

|             |                                                                                                                        |           |
|-------------|------------------------------------------------------------------------------------------------------------------------|-----------|
| 9.3.2.2     | <i>Well Monitoring</i>                                                                                                 | 57        |
| 9.3.3       | <i>Conclusions and Recommendations</i>                                                                                 | 61        |
| 9.4         | IDENTIFICATION OF THE WATER SUPPLY PREFERRED SOLUTION                                                                  | 62        |
| <b>10.0</b> | <b>EVALUATION OF WATER STORAGE ALTERNATIVES</b>                                                                        | <b>66</b> |
| 10.1        | ALTERNATIVE 3A – CONSTRUCT A NEW WATER STORAGE FACILITY TO SUPPLEMENT EXISTING STORAGE FACILITIES                      | 69        |
| 10.2        | ALTERNATIVE 3B – CONSTRUCT A NEW WATER STORAGE FACILITY AND DECOMMISSION THE EXISTING MULTI-LEG TOWER                  | 70        |
| 10.3        | ALTERNATIVE 3C – CONSTRUCT A NEW WATER STORAGE FACILITY AND DECOMMISSION BOTH OF THE EXISTING WATER STORAGE FACILITIES | 71        |
| 10.4        | IDENTIFICATION OF THE WATER STORAGE PREFERRED SOLUTION                                                                 | 72        |
| 10.4.1      | <i>Siting of Storage Facility</i>                                                                                      | 74        |
| <b>11.0</b> | <b>CONSULTATION PROGRAM</b>                                                                                            | <b>75</b> |
| 11.1        | GENERAL                                                                                                                | 75        |
| 11.2        | NOTICE OF COMMENCEMENT                                                                                                 | 76        |
| 11.3        | PUBLIC INFORMATION CENTRE                                                                                              | 76        |
| 11.4        | NOTICE OF COMPLETION                                                                                                   | 77        |
| <b>12.0</b> | <b>RECOMMENDED PREFERRED ALTERNATIVES</b>                                                                              | <b>78</b> |
| 12.1        | PROJECT IMPLEMENTATION                                                                                                 | 78        |
| <b>13.0</b> | <b>POTENTIAL IMPACTS</b>                                                                                               | <b>78</b> |
| 13.1        | NATURAL ENVIRONMENT                                                                                                    | 78        |
| 13.2        | ECONOMIC ENVIRONMENT                                                                                                   | 78        |
| 13.2.1      | <i>Capital Costs</i>                                                                                                   | 78        |
| 13.3        | TECHNICAL ENVIRONMENT                                                                                                  | 79        |
| 13.3.1      | <i>Supply</i>                                                                                                          | 79        |
| 13.3.2      | <i>Storage</i>                                                                                                         | 79        |
| 13.3.3      | <i>Distribution Network</i>                                                                                            | 79        |
| 13.4        | SOCIAL ENVIRONMENT                                                                                                     | 80        |
| 13.4.1      | <i>Community</i>                                                                                                       | 80        |
| 13.5        | CULTURAL HERITAGE ENVIRONMENT                                                                                          | 80        |
| 13.5.1      | <i>Built Heritage Resources and Cultural Heritage Landscapes</i>                                                       | 80        |
| 13.5.2      | <i>Archaeological Resources</i>                                                                                        | 80        |

---

|             |                                                   |           |
|-------------|---------------------------------------------------|-----------|
| 13.6        | SOURCE WATER PROTECTION                           | 80        |
| 13.7        | CLIMATE CHANGE                                    | 81        |
|             | <i>13.7.1 Project's Impact on Climate Change</i>  | <i>81</i> |
|             | <i>13.7.2 Impact of Climate Change on Project</i> | <i>82</i> |
| 13.8        | EXCESS SOIL MANAGEMENT                            | 82        |
| <b>14.0</b> | <b>MITIGATING MEASURES</b>                        | <b>82</b> |
| <b>15.0</b> | <b>ANTICIPATED APPROVALS</b>                      | <b>84</b> |
| <b>16.0</b> | <b>ADDITIONAL STUDIES REQUIRED</b>                | <b>84</b> |
| <b>17.0</b> | <b>NEXT STEPS</b>                                 | <b>84</b> |

## **LIST OF FIGURES**

Figure 1- Class EA Planning Process

Figure 2 – Existing Watermain Distribution Network by Size

Figure 3 – Existing Watermain Distribution Network by Material

Figure 4 – Existing Water System Infrastructure Map

Figure 5 – Project Study Area Map

Figure 6 – Regulated and Wooded Areas within the Study Area

Figure 7 – Existing WHPAs for the Existing Arthur Municipal Water System

Figure 8 – Existing Expected Fire Flow Capabilities of the Existing Arthur Municipal Watermain Distribution Network

Figure 9 – Existing Typical System Pressure within the Existing Arthur Municipal Watermain Distribution Network

Figure 10 – TW1-21 Location

## LIST OF TABLES

|                                                                                                                          |    |
|--------------------------------------------------------------------------------------------------------------------------|----|
| Table 1 – Summary of At-Risk Species Potentially Within the Study Area.....                                              | 31 |
| Table 2 – Summary of Population and Household Growth Anticipated for Arthur, per Phase 1 MCR Report.....                 | 37 |
| Table 3 - Summary of Population and Household Growth Anticipated for Arthur, per the Growth Management Action Plan ..... | 38 |
| Table 4 – Summary of the Total Annual Volume of Raw Water Pumped from the Arthur Municipal Wells .....                   | 43 |
| Table 5 – Summary of the Average Day Demand Over the Most Recent 5 Years for the Arthur Water System.....                | 43 |
| Table 6 – Summary of the Maximum Day Demand Over the Most Recent 5 Years for the Arthur Water System.....                | 44 |
| Table 7 – Summary of the Reserve Capacity Calculations for Arthur’s Water System Over the Last 5 Years .....             | 45 |
| Table 8 – Summary of the Projected Water Demands of the Existing and Future Population of Arthur .                       | 46 |
| Table 9 – Summary of Projected Water Storage Requirements of the Existing and Future Population of Arthur .....          | 47 |
| Table 10 – Summary of Expected Pressures within the Watermain Distribution Network for Future Development Areas.....     | 48 |
| Table 11 – Shortlist Evaluation of Alternative Solutions.....                                                            | 51 |
| Table 12: Evaluation of Water Supply Alternatives, Comparative Analysis .....                                            | 63 |
| Table 13: Evaluation of Water Storage Alternatives, Comparative Analysis .....                                           | 72 |
| Table 14 – Evaluation of Alternative 2b to Meet the Demands of the Existing and Future Population....                    | 79 |

---

## LIST OF APPENDICES

|            |                                                                                                                                                                       |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appendix A | Growth Plan (GSP and Curtis Planning, February 2018)                                                                                                                  |
| Appendix B | Municipal Comprehensive Review (Watson & Associates Economists, Ltd, June 16, 2021 and as amended January 31, 2022)                                                   |
| Appendix C | Growth Management Action Plan (Watson & Associates Economists, Ltd, August 16, 2024)                                                                                  |
| Appendix D | Arthur Water and Sanitary Systems Technical Study (Triton, November 2020)                                                                                             |
| Appendix E | Arthur Water System Pressure Testing Report (Triton, August 2024)                                                                                                     |
| Appendix F | Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes – A Checklist for the Non-Specialist                                  |
| Appendix G | Criteria for Evaluating Archaeological Potential – A Checklist for the Non-Specialist                                                                                 |
| Appendix H | Arthur Preliminary Well Exploration Assessment (RJ Burnside, May 6, 2021)                                                                                             |
| Appendix I | Technical Memorandum – Arthur Well Exploration Update 1, TW1-21 Construction and Preliminary Testing (RJ Burnside, January 4, 2022)                                   |
| Appendix J | Hydrogeological Report in Support of Arthur Water Supply Environmental Assessment (RJ Burnside, Rev. 1, November 2022)                                                |
| Appendix K | Notice of Commencement and Related Consultation Records                                                                                                               |
| Appendix L | Public Information Centre and Related Consultation Records                                                                                                            |
| Appendix M | Notice of Completion and Related Consultation Records                                                                                                                 |
| Appendix N | Detailed Cost Estimate for Preferred Alternative                                                                                                                      |
| Appendix O | Memorandum: Preliminary Assessment of Source Protection Implementation Requirements for a Potential New Well Site (Wellington Source Water Protection, June 25, 2024) |

## 1.0 INTRODUCTION

The Township of Wellington North (Township) initiated a Municipal Class Environmental Assessment (Class EA) in July 2023 to evaluate feasible solutions to address the need for water supply redundancy and additional water storage to support the expected population growth in the urban community of Arthur (project). The Class EA process followed the procedures as set out in the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment document, dated 2024 (previous editions published in 2000, 2007, 2011, 2015, and 2023). Triton Engineering Services Limited (Triton) was retained to administer the Class EA on behalf of the Township.

This Class EA Project File Report (herein referred to as Project File or Report) has been prepared to document the Class EA planning and evaluation process followed for this project, and includes the following major components:

- A summary of relevant background information associated with the project and justification for addressing existing conditions.
- An overview of the general project/study area and environmental setting.
- A description of the alternative solutions considered.
- Documentation of the decision-making process used in selection of the preferred alternative.
- A summary of the public and Indigenous consultation process.
- A description of the preferred alternative and next steps.

## 2.0 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

### 2.1 Ontario Environmental Assessment Act

In accordance with the Ontario Environmental Assessment Act (EAA), its purpose *is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation, and wise management in Ontario of the environment* (R.S.O. 1990, c. E. 18, s.2). The EA Act sets out a planning and decision-making process for environmental assessment (EA) projects initiated by the public sector (i.e., provincial ministries and agencies, municipalities, and public bodies) so that all potential environmental effects of the feasible alternative solutions for a project are identified and considered before the preferred alternative solution is implemented. Public consultation is a mandatory component of the process.

There are two types of assessments within the EA Act; Individual EAs and streamlined EAs. Individual EAs require approval from the Ministry of the Environment, Conservation and Parks (MECP), as these large-scale, complex projects have the potential for significant effects on the environment. Routine, smaller-scale projects that are expected to result in predictable and manageable effects on the environment are categorized as streamlined EAs. Streamlined EAs follow a streamlined self-assessment and decision-making process. They do not require formal approval from MECP (i.e., are pre-approved or exempt) unless an elevation request (i.e., Section

16 Order) for preparation of an Individual EA is made or if environmental concerns cannot be resolved through the Class EA process.

Types of Streamlined EA projects include Class EAs by regulation and Class EAs by activity. Class EAs by regulation include electricity projects, waste management projects, and transit projects. There are 11 Class EA categories/activities within Ontario, as follows:

1. Ministry of Northern Development and Mines Under the Mining Act
2. Forest Management on Crown Lands in Ontario
3. GO Transit
4. Minor Transmission Facilities
5. Municipal Infrastructure Projects
6. Provincial Parks and Conservation Reserves
7. Provincial Transportation Facilities
8. Public Works
9. Remedial Flood and Erosion Control Projects
10. Resource Stewardship and Facility Development Projects
11. Waterpower Projects

Proponents must follow the approved class environmental assessment document corresponding to the activity/project being planned. It should be noted that requirements of applicable regulatory agencies must be completed in addition to the Class EA process; however, some overlap may exist.

This Project is categorized as a Municipal Infrastructure Project and follows the streamlined self-assessment and decision-making process as set out in the MEA Class EA document (October 2000, and as amended in 2007, 2011, 2015, 2023 and 2024).

## **2.2 Municipal Class EA Process**

Municipal Class EA (herein referred to as Class EA) projects involve municipal sewage (sanitary and storm), potable water, road, and transit projects that are carried out routinely, follow the same EA planning process, and have a common set of alternatives with recurrent, predictable environmental effects and mitigation measures.

In addition to providing Municipalities with an approved self-assessment process, the Class EA serves as a public statement of the decision-making process under which municipal projects are planned and implemented. The Municipal Class EA process reflects the following five key principles for successful environmental assessment planning under the EAA:

- consultation with affected parties early on and throughout the process such that the planning process is a cooperative venture.
- consideration of a reasonable range of alternatives, both the functionally different “alternatives to” and the “alternative methods” of implementing the solution.



- identification and consideration of the effects of each alternative on all aspects of the environment.
- systematic evaluation of alternatives in terms of their advantages and disadvantages to determine their net environmental effects.
- provision of clear and complete documentation of the planning process followed, to allow “traceability” of decision-making with respect to the project.

The Municipal Class EA categorizes projects according to their potential impact on the environment. This has resulted in the development of the following four Class EA project schedules:

**Exempt – Exempt from the EA Process:** Exempt activities include maintenance, operation, rehabilitation, and other small projects that are limited in scale and have minimal adverse environmental effects. As an exempt project, it may proceed to implementation without following the Class EA planning process; however, the proponent should address any concerns regarding the project, as needed. Consultation/notice of the project is at the proponent’s discretion. The proponent must still obtain any applicable permits, approvals, and authorizations for the project.

**Eligible for Screening to Exempt – Exempt Subject to Screening Process:** Some projects must use a screening process to determine whether the project is eligible for exemption or to proceed under Schedule ‘B’ or ‘C’ Class EA process. Projects eligible for the screening process are identified in the Project Tables (MEA Class EA document, Appendix 1). Proponents of projects eligible for exemption through the screening process must still obtain any applicable permits, approvals and authorizations for the project and should address any concerns regarding the project, as needed. Consultation/notice beyond the requirements of the screening process are at the proponent’s discretion. Projects not eligible for exemption must follow the applicable Schedule ‘B’ or ‘C’ process.

**Schedule ‘B’ - Projects Subject to Phases 1 and 2 of the Class EA Planning Process:** Schedule ‘B’ projects have the potential for some adverse environmental effects. Schedule ‘B’ projects must complete phases 1 and 2 of the Class EA planning process, which includes mandatory contact with Indigenous Communities, directly affected public and relevant review agencies, to ensure that they are aware of the project and that their concerns are acknowledged, considered, and documented. A Project File Report must be prepared and filed for review by the public, Indigenous Communities, and review agencies. Activities under this Schedule include improvements and minor expansions to existing facilities or new small scale projects. A person may request for a higher level of Study through a Section 16 order request to the Minister of the Environment, Conservation and Parks; however, only if it applies to potential adverse impacts to constitutionally protected Aboriginal and treaty rights. The Minister makes the final decision on all comments/concerns/input, if any, as to whether the project requires a higher level of assessment, if it should be approved with conditions, or if it can proceed without conditions.

**Schedule ‘C’ - Project Subject to the Full Class EA Planning Process:** Activities under this Schedule have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. An Environmental Study Report (ESR) must be prepared and filed for review by the public, Indigenous Communities, and

review agencies. Schedule C projects include the construction of new facilities and major expansions to existing facilities. A person may request for a higher level of Study through a Section 16 order request to the Minister of the Environment, Conservation and Parks; however, only if it applies to potential adverse impacts to constitutionally protected Aboriginal and treaty rights. Ultimately, the Minister makes the final decision on all comments/concerns/input, if any, as to whether the project requires a higher level of assessment, if it should be approved with conditions, or if it can proceed without conditions.

The Class EA process includes five main phases, as depicted in Figure 1 and summarized as follows:

**Phase 1 – Problem or Opportunity:** The problem or opportunity statement that is to be addressed by the project is developed. Notification of the project undertaking to Indigenous Communities, public, review agencies and interested parties is optional in this Phase.

**Phase 2 – Alternative Solutions:** Alternatives to address the problem or opportunity are identified and evaluated in the context of potential natural, social, and environmental impacts, resulting in the selection of a preliminary preferred solution. Consultation with the public, review agencies and interested parties is mandatory in Phase 2 to solicit input and comment and consider in confirmation of the selected project schedule and preferred solution. Phase 2 concludes the planning process for Schedule 'B' projects and includes mandatory documentation in a Project File Report to detail the planning process. Schedule 'C' projects continue with Phases 3 and 4 of the planning process. The Project File Report is to be made available for review by Indigenous Communities, public, review agencies and interested parties for at least 30 days. The project may proceed to Phase 5 after concerns are addressed, if any.

**Phase 3 – Alternative Design Concepts for the Preferred Solution:** Alternative design concepts for the implementation of the preferred solution identified in Phase 2 are developed and evaluated, with mitigation measures identified through additional mandatory consultation with Indigenous Communities, public, review agencies, and interested parties.

**Phase 4 – Environmental Study Report:** Phase 4 concludes the planning process for Schedule 'C' projects and includes documentation of the rationale, planning and design process, including the consultation, in an Environmental Study Report, which is to be made available for review by Indigenous Communities, public, review agencies and interested parties for at least 30 days. The project may proceed to Phase 5 after concerns are addressed, if any.

**Phase 5 – Implementation:** The preferred solution, including applicable mitigation measures as identified through the Class EA process, are designed for and proceed to construction, operation, and monitoring.



ARTHUR WATER SYSTEM  
SUPPLY REDUNDANCY AND  
STORAGE CLASS EA

EXHIBIT A.2. MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the MCEA

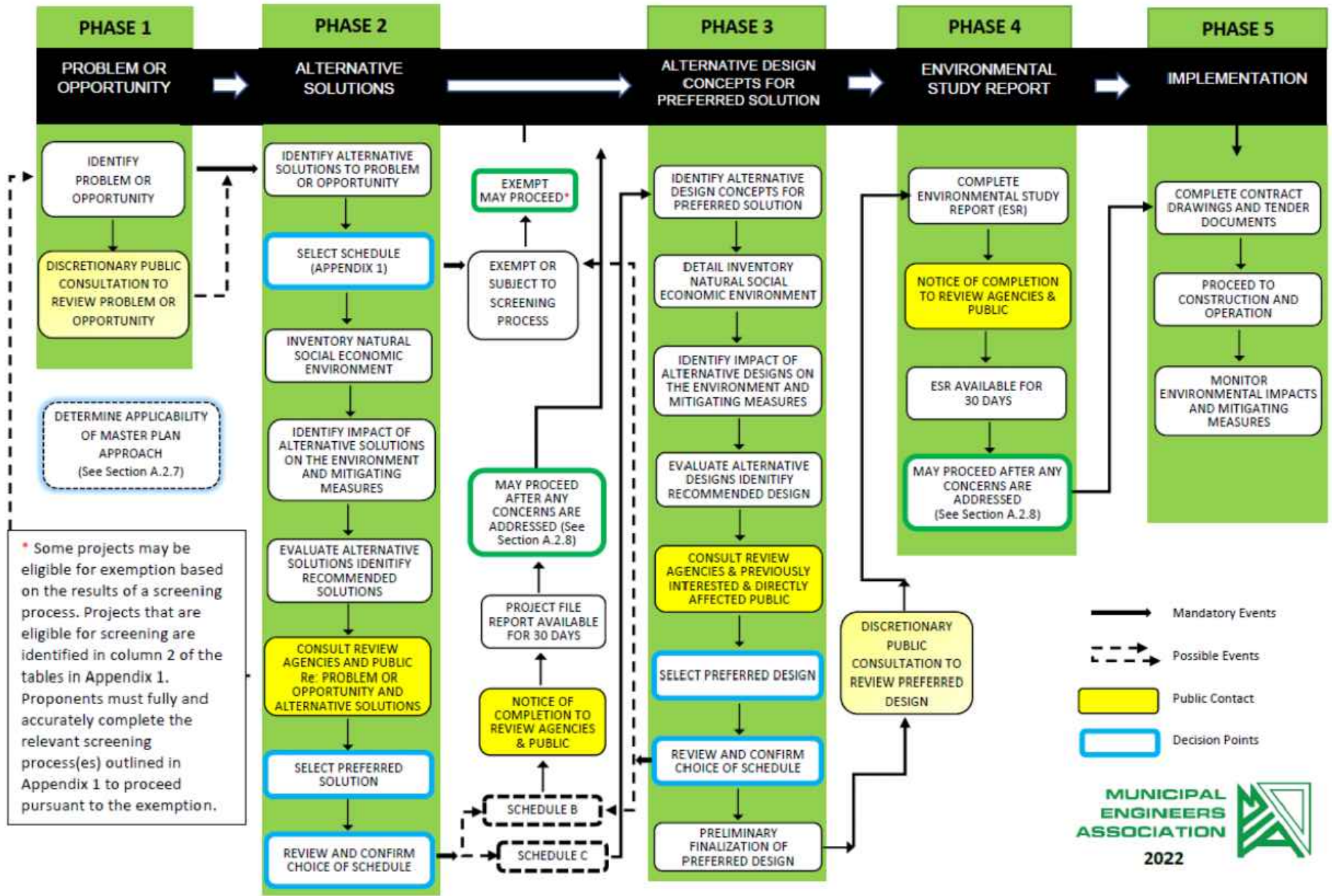


FIGURE 1  
CLASS EA  
PLANNING PROCESS

NOT TO SCALE  
T4003A





## 2.3 Schedule B Class EA Approach

In reviewing Table B: Municipal Water and Wastewater Projects found in Appendix 1 of the 2023 MEA Class EA document, this project is considered to be a Schedule 'B' undertaking. The Schedule 'B' Class EA process requires completion of Phases 1 and 2 of the planning process (refer to Figure 1), which includes identification of the Problem/Opportunity Statement, two mandatory points of contact with Indigenous Communities, public and review agencies, evaluation of a reasonable range of alternative solutions to address the Problem/Opportunity Statement and preparation of a Project File Report for review by Indigenous Community, public and review agencies for a period of at least 30 days.

Following the initial 30 calendar day review period, the project is subject to an additional 30 calendar day review period by MECP to review the project. The MECP will decide if the Minister requires a higher level of assessment on the project or if it should be approved with conditions, or if it can proceed without conditions. Consistent with the *COVID-19 Economic Recovery Act*, passed by the Province on July 21, 2020, a project can only be subject to a higher level of assessment (i.e., Section 16 order of the EAA) if there are concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights.

## 2.4 Consultation

Consultation with approval agencies, Indigenous Communities, interest groups, municipal council, stakeholders, and the public is a key element in responsible environmental decision making. Two-way communication should begin early and throughout the planning process (to meet the minimum mandatory contact points) to ensure consulted parties are provided with opportunities to contribute to the decision-making process and so that proponents are aware of requirements that need to be considered and/or addressed by the project. The Class EA process provides consultation requirements for project category. These requirements are a minimum only and it is up to the proponent to tailor the consultation plan to the project and interested parties.

As per the Code of Practice titled: *Consultation in Ontario's Environmental Assessment Process*, the purpose of consultation is as follows:

- to provide information to the public;
- to consult with Indigenous Communities;
- to identify persons, groups and communities who may be affected by or have an interest in the undertaking;
- to ensure that government agencies and ministries are notified and consulted early in the process;
- to identify concerns that might arise from the undertaking;
- to create an opportunity to develop proponent commitments in response to local input;
- to focus on and address public concerns rather than regulatory procedures and administration;
- to provide appropriate information to the MECP to enable a fair and balanced decision; and,
- to expedite decision making.

Consultation for Schedule 'B' projects must include at least two mandatory contact points. The first mandatory point of contact is near the end of Phase 2, when Indigenous Communities, public, stakeholders, and review agencies are invited to provide comment and input on the problem/opportunity, alternative solutions, and selection of the preferred solution. The second mandatory point of contact is at the completion of Phase 2, to notify Indigenous Communities, public, stakeholders, and review agencies that the planning process has been completed and that the Project File Report is available for review and comment for a period of at least 30 calendar days.

### **3.0 PROJECT BACKGROUND**

#### **3.1 Provincial Planning Statement, 2024**

The Provincial Planning Statement (PPS), effective October 20, 2024 provides a streamlined framework for land use planning in Ontario and replaces the Provincial Policy Statement (2020) and A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2019). The PPS provides direction for key land use issues affecting communities including:

- *Building more housing where it's needed;*
- *Making land available for development;*
- *Creating opportunities for economic development and job creation;*
- *Planning for the appropriate transportation, water, sewer and other infrastructure necessary to accommodate current and future needs;*
- *Protecting the environment and important resources including farmland, water, archaeology, cultural heritage, mineral aggregates and petroleum;*
- *Engaging with indigenous communities to facilitate knowledge-sharing, inform decision-making in land use planning and protect Aboriginal and treaty rights; and*
- *Protecting people, property and community resources by directing development away from natural or human-made hazards, such as flood prone areas.*

Implementation of the provincial policies are through municipalities for local communities (i.e., Wellington County Official Plan and local planning documents).

With respect to water servicing, the PPS provides the following policies, which is applicable to this Class EA:

#### Chapter 3: Infrastructure and Facilities, 3.6 – Sewage, Water and Stormwater

##### *1. Planning for sewage and water services shall:*

- a) accommodate forecasted growth in a timely manner that promotes the efficient use and optimization of existing municipal sewage services and municipal water services and existing private communal sewage services and private communal water services;*

*b) ensure that these services are provided in a manner that:*

- 1. can be sustained by the water resources upon which such services rely;*
- 2. is feasible and financially viable over their life cycle;*
- 3. protects human health and safety, and the natural environment, including the quality and quantity of water; and*
- 4. aligns with comprehensive municipal planning for these services, where applicable.*

*c) promote water and energy conservation and efficiency;*

*d) integrate servicing and land use considerations at all stages of the planning process;*

*e) consider opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply; and*

*f) be in accordance with the servicing options outlined through policies 3.6.2, 3.6.3, 3.6.4 and 3.6.5.*

*2. Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. For clarity, municipal sewage services and municipal water services include both centralized servicing systems and decentralized servicing systems.*

*3. Where municipal sewage services and municipal water services are not available, planned or feasible, private communal sewage services and private communal water services are the preferred form of servicing for multi-unit/lot development to support protection of the environment and minimize potential risks to human health and safety.*

*4. Where municipal sewage services and municipal water services or private communal sewage services and private communal water services are not available, planned or feasible, individual onsite sewage services and individual on-site water services may be used provided that site conditions are suitable for the long-term provision of such services with no negative impacts. At the time of the official plan review or update, planning authorities should assess the long-term impacts of individual on-site sewage services and individual on-site water services on environmental health and the financial viability or feasibility of other forms of servicing set out in policies 3.6.2 and 3.6.3.*

*5. Partial services shall only be permitted in the following circumstances:*

*a) where they are necessary to address failed individual on-site sewage services and individual on-site water services in existing development;*

*b) within settlement areas, to allow for infilling and minor rounding out of existing development on partial services provided that site conditions are suitable for the long-term provision of such services with no negative impacts; or*

*c) within rural settlement areas where new development will be serviced by individual on-site water services in combination with municipal sewage services or private communal sewage services.*

*6. In rural areas, where partial services have been provided to address failed services in accordance with policy 3.6.5.a), infilling on existing lots of record may be permitted where this would represent a logical and financially viable connection to the existing partial service and provided that site conditions are suitable for the long-term provision of such services with no negative impacts.*

*7. Planning authorities may allow lot creation where there is confirmation of sufficient reserve sewage system capacity and reserve water system capacity. 19*

### **3.2 Master Plan Study for Arthur Water Supply and Sanitary Sewage System (January 2012)**

Arthur is a growing urban community within the Township of Wellington North that is serviced by municipal water, sanitary and stormwater systems. In 2011, the Township initiated a technical review of the water and sanitary infrastructure within the community, which was completed by Triton on behalf of the Township, in accordance with the Class EA Master Plan process. The intention of the review was to formulate a long-term servicing strategy to maintain the existing level of municipal service for future development within Arthur. The results of the technical review were documented in a report by Triton, entitled Township of Wellington North Class Environmental Assessment Master Plan Study for Water Supply and Sanitary Sewage System (Master Plan), Community of Arthur, dated January 2012 (Revision 2) and included conclusions and recommendations (based on 2012 existing conditions and projected growth information) regarding the Arthur water system, as follows: Conclusions:

- Source capacity sufficient to meet the estimated water demands of the 2031 growth scenario.
- Additional storage capacity is required to meet the needs of the 2031 growth scenario.
- Existing water storage facilities are aging and are limited in servicing outlying areas.
- Water distribution system pressures and fire flow capabilities sufficient to meet the needs of the 2031 growth scenario.
- Watermains are in good condition, although some mains are approaching their end of service life.
- Distribution network is well looped with few dead-ends.

#### **Recommendations:**

- Complete annual Water Supply Reserve Capacity Calculations (RCC) to monitor usage and future needs.
- Be proactive in securing future water sources, given that establishment can be a lengthy, arduous process.

- Consider construction of a new elevated tower with more storage to replace an existing tower.
- Replace watermain that are approaching end of service life as part of road reconstruction projects.
- Future developments (i.e., requiring watermain extensions) should be designed to eliminate dead ends and ensure adequate circulation.
- Review the Master Plan every five years to determine the need for a detailed formal review and/or update.

### **3.3 Arthur Water and Sanitary Systems Technical Study (November 2020)**

Since the 2012 Master Plan, the Township has completed Water RCC on an annual basis, replaced aging watermain as part of reconstruction projects and ensured designs of new developments eliminate dead ends, as reasonably feasible, and ensure adequate circulation. In 2020, on behalf of the Township, Triton updated the computer simulation models of the municipal water and sanitary systems in Arthur, (which were created in 2011 for the Master Plan) based on current (2020) existing conditions to evaluate the adequacy of the systems to meet the needs of the existing and projected future population to calendar year 2045. The results of the technical update were documented in a report by Triton, entitled Water and Sanitary Systems Technical Study – Arthur (Technical Study) dated November 2020 (Revision 1) and included conclusions and recommendations regarding the Arthur water system, as follows:

#### **Conclusions:**

- Source capacity is sufficient to meet the estimated water demands of the 2045 growth scenario.
- Given that the firm capacity of the water system is obtained from three sources, two of which are in the same well field, a failure of any of these wells would significantly impact the ability of the water system to meet current and future maximum day demand (MDD).
- Additional water storage is required to service projected population within 5 to 15 years.
- Existing water storage facilities are aging and are limited in servicing outlying areas.
- Water distribution system pressures and fire flow capabilities sufficient to meet the needs of the 2045 growth scenario; however, potential future development areas to the north of the existing urban area will benefit from having a water tower with a higher operating range to increase system pressures and fire flows.
- Watermains are in good condition, although some mains are approaching their end of service life.

#### **Recommendations:**

- Determine the available water RCC on an annual basis and consider the possibility of failure of one of the current supply wells.
- Proactively identify and secure future water sources through a well exploration program.
- Add additional storage to the system within 5 to 15 years.



- Consider construction of a new elevated tower at a higher operating level and with more storage to replace an existing tower.
- Replace watermain trunks that are approaching end of service life as part of road reconstruction projects.
- Extend watermain trunks to service the future expansion of the industrial area.

### **3.4 Existing Facilities**

The Township owns, operates and maintains the Arthur drinking water system, which operates under the Safe Drinking Water Act, 2002 and its applicable regulations.

The Arthur water system is a single pressure zone watermain distribution network that is pressurized by two elevated water storage tanks. Water is supplied to the system from three deep overburden (groundwater) wells and two pumphouses. The system provides fire protection to the entire service area and currently provides service to its permanent population of approximately 3,195 and 1,229 residences and 111 Industrial/Commercial/Institutional (ICI) properties, according to Township records (2023).

Operation of the system is in accordance with its Municipal Drinking Water License (MDWL, 113-101), Drinking Water Works Permit (DWWP, 113-201) and Permit to Take Water (PTTW). The MDWL provides authorization for the operation of the system, the DWWP describes the scope of the system and authority to establish and make changes to the system, and the PTTW describes the approved rate of water taking for the system.

Operation of the system is controlled by a Supervisory Control and Data Acquisition (SCADA) system. The system is a demand/storage system. Generally, well pumps are called on and turned off based on water levels in the storage towers. These levels are set by the operators based on storage requirements, volume turnover needs and well pumping constraints. The SCADA system also provides real-time monitoring and record keeping.

The ICI water customers in Arthur are fully metered, meaning the volume of water used is measured and charges/billing include a base charge and a metered rate for the volume of water that was consumed. Residential water customers in Arthur are on a flat rate system, meaning they are charged/billed a flat rate on a monthly or annual basis, regardless of the amount of water they consume.

#### **3.4.1 Watermain Distribution Network**

The distribution network currently services all existing developed areas within Arthur's urban boundary. The network includes approximately 21 km of watermain ranging in size from 50 mm to 600 mm, with 1,340 service connections. The distribution network trunk consists of 250 mm and 300 mm diameter watermain, which runs from Wells 8A/8B along Jones Baseline, Highway 6, George Street and Smith Street, past the Freud Tower to Wells Street and along Wells Street to Well 7B.

Type of watermain used to construct the distribution network has varied over the years and includes cast iron, ductile iron and PVC. Any recent upgrades or extensions have been PVC. Figures 2 and 3 present the existing watermain distribution network by size and material, respectively.

### **3.4.2 Water Storage**

Storage for the Arthur Drinking Water System is provided by two elevated water storage facilities, identified as the Charles Street (Multi-Leg) Tower and the Freud (Spheroid) Tower. The locations of these storage facilities are presented on Figure 4. Details for these tanks are summarized as follows:

#### **Charles Street (Multi-Leg) Tower:**

- Located near the intersection of Charles Street East and Isabella Street, in the southeast part of the system (195 Isabella St E)
- Multi-legged steel tank
- Commissioned in 1932
- Storage volume is 227 m<sup>3</sup>
- Operation range: 494.2 m to 499.6 m

#### **Freud (Spheroid) Tower:**

- Located on Smith Street between Preston Street and Wells Street in the northwest part of the system (460 Smith Street)
- All steel spheroid tank
- Commissioned in 1970
- Storage volume is 1,137 m<sup>3</sup>
- Operation range: 494.0 m to 499.2 m

The existing total storage volume of the system is 1,364 m<sup>3</sup>. Based on discussions with Township staff, the existing storage facilities have been recently inspected by Landmark Municipal Services (Calendar Year 2024 and 2025 for the spheroid and multi-leg towers, respectively). The Clean, Inspection and Report (CIR) for the July 2024 cleaning and inspection of the Spheroid Tower recommended full removal and replacement of the exterior paint when it has been deemed unacceptable from a cosmetic standpoint, and complete removal and replacement of the interior lining as the existing interior liner is expected to reach the end of its useful life within the next 2 to 4 year period.



TOWNSHIP OF WELLINGTON NORTH



ARTHUR WATER SYSTEM  
SUPPLY REDUNDANCY AND  
STORAGE CLASS EA



WATERMAIN SIZING:

- ≤ 100mm
- 150mm
- 200mm
- 250mm
- 300mm

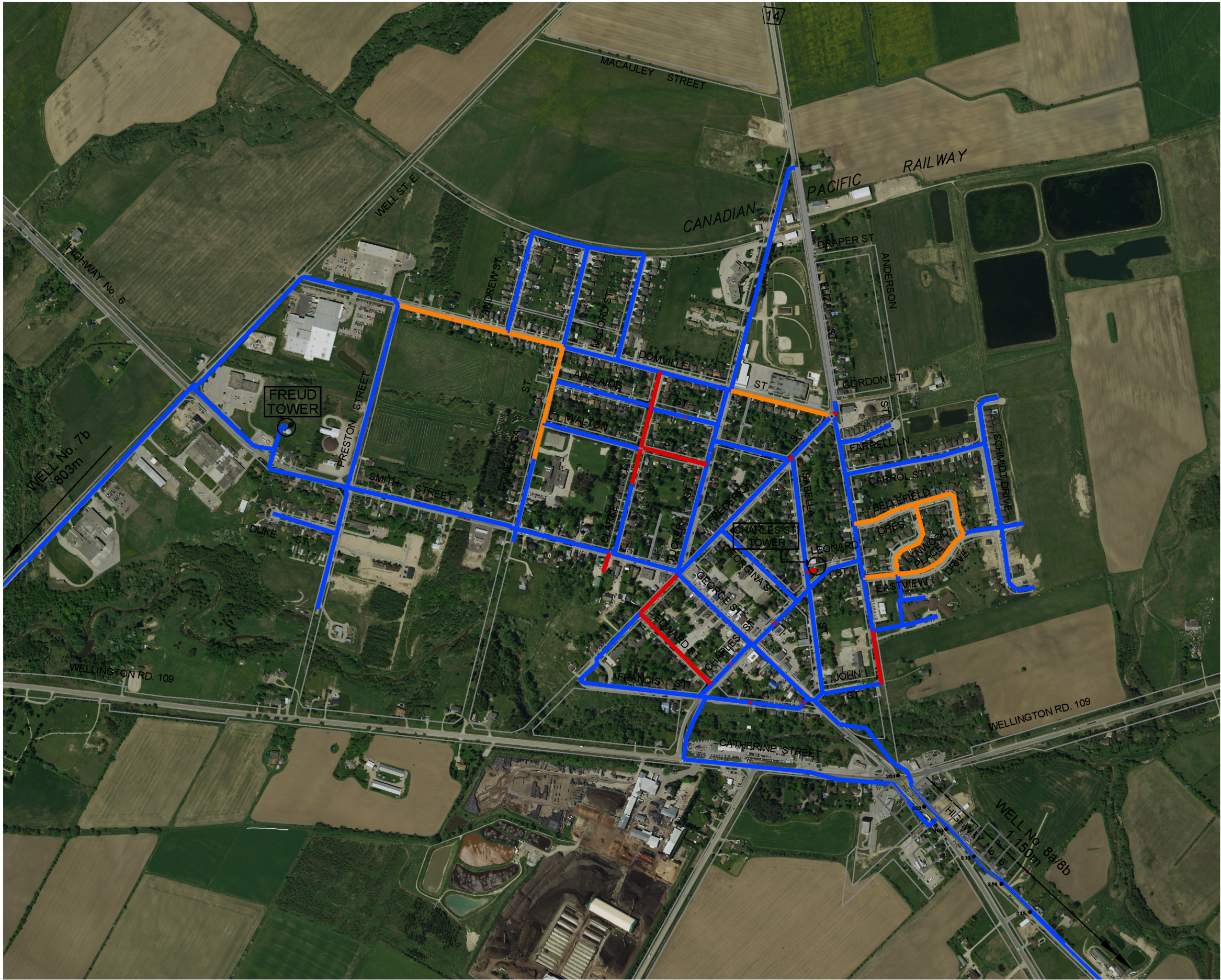
FIGURE 2  
EXISTING WATERMAIN  
DISTRIBUTION NETWORK  
BY SIZE

SCALE 1:10,000  
T4003A





r:\wellington north - twsp of\4003a - arthur water system class ea\cad and survey\6. figures\4003a-fig-02 - 03 figures 2 and 3.dwg - 2025-05-16 - mwolfer



**TOWNSHIP OF  
WELLINGTON NORTH**



**ARTHUR WATER SYSTEM  
SUPPLY REDUNDANCY AND  
STORAGE CLASS EA**



WATERMAIN MATERIAL

-  PVC
-  CAST IRON
-  DUCTILE IRON
-  THIN WALL PVC

FIGURE 3

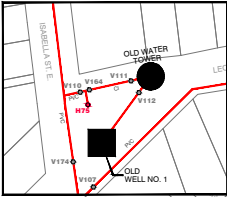
**EXISTING WATERMAIN  
DISTRIBUTION NETWORK  
BY MATERIAL**

SCALE 1:10,000  
T4003A

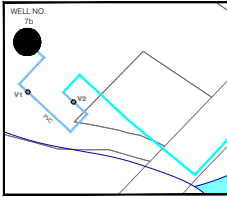




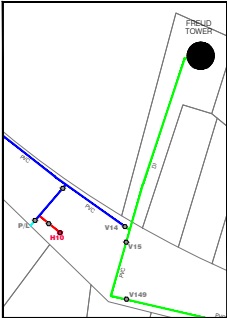
# INSET-1



# INSET-2



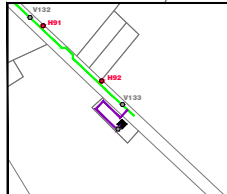
# INSET-3



# INSET-4



# INSET-5



NOTES:  
This is a schematic representation of the water distribution system. While this drawing and its detail views are shown to a scale, symbols and sanitary sewers are not plotted to scale. This mapping should be used for general purposes only.  
Valves indicated as "CLOSED" are to remain closed under normal system operation.



- Legend**
- P/L Property Line Valve
  - V140 Watermain Valve
  - TW Tracer Wire Box
  - H102 Hydrant
  - PH3 Private Hydrant
  - Well/Pump House
  - Water Tower
  - Waterbody
  - Parcels
  - Area not assumed by the Municipality
- Watermain (mm dia.)**
- 38
  - 50
  - 100
  - 150
  - 200
  - 250
  - 300
  - 500
  - 600
- Watermain Material**
- Cast Iron
  - Ductile Iron
  - Polyvinyl Chloride
  - High Density Polyethylene
  - Thin Walled Polyvinyl Chloride
  - Black Poly

FIGURE 4  
EXISTING WATER SYSTEM INFRASTRUCTURE MAP



The CIR for the June 2025 cleaning and inspection of the Multi-Leg Tower noted many areas of corrosion and de-lamination on structural members and recommended consideration of replacement given the age of the facility, signs of structural deterioration and coating failure. As noted in the inspection report, the industry recognized lifecycle for a multi-legged water storage facility is between 80 and 100 years. The CIR further indicates that the capital cost to repair/refurbish and maintain the existing facility will be more expensive than to replace with a new storage facility. Therefore, the Charles Street (Multi-Leg) Tower has reached the end of its useful service life and should be decommissioned. The Freud/Spheroid Tower is expected to reach the end of its service life in Calendar Year 2050.

A computer simulation model of the Arthur water system was developed using WaterCAD V8i software as part of the Master Plan Study for the Arthur Water Supply and Sanitary Sewage Systems (2012) and subsequent Technical Study Updates (2020). Based on existing conditions in the computer simulation model, the normal pressure throughout the existing distribution network ranges from approximately 40 psi to 80 psi.

### **3.4.3 Groundwater Wells**

The three overburden wells supplying water to the Arthur Drinking Water are named Well No. 7B, 8A and 8B. The locations of these wells are presented on Figure 4. Details for these wells are summarized as follows:

#### **Well No. 7B:**

- Located at 109 Wells Street West near the Conestogo River.
- Commissioned in 1998.
- 45.9 m deep drilled.
- 250 mm diameter.
- Well pump is a submersible type complete with a 30kW (40 hp) motor which discharges directly to the distribution system (via Pumphouse #7).
- Rated capacity is 22.7 L/s (1,961 m<sup>3</sup>/day).

#### **Well No. 8A/8B:**

- Located on Part of Lots 20 and 21, Concession A, approximately 1.15 km south of County Road 109 and 235 m east of Highway 6.
- Commissioned in 2005.
- Depth of wells are 61.9 m and 62.2 m for 8A and 8B, respectively.
- Well pumps are submersible type complete with a 30 kW (40hp) motor which discharges directly to the distribution system (via Pumphouse #8).
- Rated capacities are 26.1 L/s (2,255 m<sup>3</sup>/day) each; however, the PTTW allows for the operator to pump either Well 8A or Well 8B, but not both wells concurrently. Therefore, total production from this facility is limited to 2,255 m<sup>3</sup>/day.
- Standby power provided by diesel generator.



### 3.4.4 Pump Houses

The locations of the pumphouses are presented on Figure 4. A summary of the details for each pumphouse is as follows:

#### **Pumphouse #7**

- Houses Well No. 7B.
- Disinfection using sodium hypochlorite. Contact time is provided by oversized discharge main.
- Iron sequestering treatment is provided.
- Pre-contact time (process) FCR analyzer and post-contact time (legislative) continuous FCR analyzer. The post-contact time chlorination analyzer takes water for sampling at the end of the contact main.
- Equipped with a remote notification security system.

#### **Pumphouse #8**

- Houses Wells 8A/8B.
- Disinfection using sodium hypochlorite. Contact time is provided by oversized discharge main.
- Manganese sequestering treatment is provided.
- Pre-contact time (process) FCR analyzer and post-contact time (legislative) continuous FCR analyzer. The post-contact time chlorination analyzer takes water for sampling at the end of the contact main.
- Equipped with a remote notification security system.

## 3.5 Existing System Capacity

### 3.5.1 Storage Capacity

The existing treated water storage for the Arthur municipal water system is 1,364 m<sup>3</sup>, considering the combined storage capacity of the spheroid and multi-leg towers. Treated water storage volume requirement is determined in accordance with MECP guidelines and considers fire, equalization and emergency water storage. Given that the Charles Street (multi-leg) Tower has reached the end of its service life, its storage volume should be excluded from the water storage calculations. Therefore, the total system storage volume available for the Arthur municipal water system is 1,137m<sup>3</sup>, which is equal to the storage volume of the Spheroid Tower.

### 3.5.2 Supply Source Capacity

The available water supply capacity of the Arthur municipal water system is 4,216 m<sup>3</sup>/day. The system capacity represents the cumulative sum of all the wells rated capacities (1,961 m<sup>3</sup>/day Well 7B and 2,255 m<sup>3</sup>/day each Well 8A and Well 8B), which is based on the limiting condition (i.e., production limit) of the capacity of the well's respective PTTW, DWWP or pumping equipment.

### 3.5.3 Supply Firm Capacity

The firm capacity of a water system is defined as the (source) capacity of the system with the largest pump or source out of service. This ensures sufficient redundancy in the system supply and treatment in case of an equipment failure. The largest source of water in the Arthur water system is Well 8A or Well 8B, each with a rated capacity of 2,255 m<sup>3</sup>/day; however, failure of these wells is unlikely given that it is a dual system and has standby power. Failure of Well 7 is more likely than failure of Wells 8A/8B, therefore the firm capacity of the system is 2,255 m<sup>3</sup>/day (since Wells 8A and 8B cannot be pumped concurrently).

## 3.6 Arthur Water System Reserve Capacity Calculations

Consistent with the recommendations of the Master Plan and the Technical Study, RCC for the Arthur water system have been completed on an annual basis to monitor usage of the existing population and needs of the projected future population. The recommendations are consistent with the Master Plan and Technical Study in terms of the need for redundancy within the supply system and additional storage. Refer to Sections 7.3.1.4 – *Historical Reserve Capacity* and 7.3.2.1 – *Projected Requirements, Demands* of this Report.

## 4.0 Phase 1 – Problem/Opportunity Statement

Based on the conclusions and recommendations in the Master Plan, Technical Study and annual water RCC, and given that efforts (i.e., planning, technical, financial, etc.) associated with establishing new water sources and adding storage to a water system can be a lengthy and arduous process, the Township initiated this Schedule 'B' Class EA, to address the following Problem/Opportunity Statement:

*The existing Arthur water system requires water supply redundancy and additional water storage to support expected population growth.*

## 5.0 Phase 2 – Alternative Solutions

Phase 2 of the Class EA process requires identification and assessment of a reasonable range of feasible alternatives to address the Problem/Opportunity Statement, which is generally categorized as an *expansion of an existing water system*. Consistent with the MEA Class EA document, “the feasibility of the alternative solutions will depend, in part, on the nature and location of the water system, the nature and location of the problem(s), the comparative cost of the alternative solutions, the pressures for growth, and on the municipality’s capacity to finance the extension of services.”

Therefore, the alternative solutions considered for this Project are as follows:

Baseline/General Alternatives:

- Alternative 1a – “Do Nothing”
- Alternative 1b – Limit Community Growth
- Alternative 1c – Reduce Water Demand/Implement Water Conservation Measures

#### Water Supply Alternatives:

- Alternative 2a – Increase Water Taking From Existing Municipal Wells
- Alternative 2b – Addition of New Well(s) to the Existing Municipal System

#### Water Storage Alternatives

- Alternative 3a – Construct a New Water Storage Facility to Supplement Existing Municipal Water Storage Facilities
- Alternative 3b – Construct a New Water Storage Facility and Decommission One of the Existing Water Storage Facilities
- Alternative 3c – Construct a New Water Storage Facility and Decommission Both of the Existing Water Storage Facilities

### **5.1 Alternative 1a – “Do Nothing”**

The “Do Nothing” Alternative is considered for all Municipal Class EA projects. It means that no changes would be made to address the Problem/Opportunity statement; regardless of whether the existing population continued to grow. Typically, the “Do Nothing” alternative is only implemented when the costs (financial and environmental) of all other alternatives significantly outweigh the benefits. The “Do Nothing” alternative can be recommended at any time during the design process.

### **5.2 Alternative 1b – Limit Community Growth**

Limiting community growth means that the size of the existing population would be maintained, or population growth would be limited to what the existing municipal water system could sustain (i.e., continue to provide the existing level of service to Arthur’s urban population). This alternative does not include improvements or changes to increase water supply redundancy and water storage capacity.

### **5.3 Alternative 1c – Reduce Water Demand/Implement Water Conservation Measures**

This alternative includes the reduction of water demand through conservation, efficiency and demand management and does not include improvements or changes to increase water supply redundancy and water storage capacity. By reducing water demand, the timeline that the existing water supply and water storage capacity of the Arthur water system would be insufficient to service the future population would be extended further into the future. This alternative does not ensure that Arthur water system would be able to services the projected future population of Arthur.

### **5.4 Alternative 2a – Increase Water Taking From Existing Municipal Wells**

If possible, this alternative considers increasing the permitted water taking from the existing municipal well(s) to provide supply redundancy for the future population.



## **5.5 Alternative 2b – Addition of New Well(s) to the Existing Municipal System**

For this alternative, a new municipal well(s) would be added to the existing system to increase supply capacity to achieve the desired long-term Firm Capacity to service the projected future population growth. In addition to satisfying the capacity requirements, the new well(s) would also need to meet water quality requirements.

## **5.6 Alternative 3a – Construct a New Water Storage Facility to Supplement Existing Municipal Water Storage Facilities**

To meet the projected water storage needs of the existing and future population, additional water storage capacity would be supplied by the construction of a new water storage facility, to supplement the existing municipal water storage facilities.

## **5.7 Alternative 3b – Construct a New Water Storage Facility and Decommission the Existing Multi-Leg Tower**

To meet the projected water storage needs of the existing and future population, additional water storage capacity would be supplied by the construction of a new water storage facility, to supplement the capacity of the existing Spheroid Tower. This alternative includes decommissioning of the Charles St multi-leg storage facility.

## **5.8 Alternative 3c – Construct a New Water Storage Facility and Decommission Both of the Existing Water Storage Facilities**

This alternative considers the construction of a new water storage facility to meet the water storage capacity needs of the existing and future projected population growth, including decommissioning both existing water storage facilities. The location of the new water storage facility could be sited at a new or existing location.

## **6.0 Study Area**

The Study Area, shown on Figure 5, includes approximately 460 ha of land, bounded by the urban area limits of Arthur, located within the Township of Wellington North, in Wellington County.

## **7.0 Phase 2 – Inventory of Existing Conditions of Study Area**

The analysis and evaluation of the alternatives is based on impacts to environmental features of the Project Study Area. Before the alternatives can be evaluated, background/existing environmental conditions are defined to determine the magnitude of potential effects (positive or negative) to these features.

The Class EA divides the environment into five categories, with each category divided into its own components that may be impacted through implementation of the alternative solutions in consideration. These categories are as follows:

- Natural Environment
  - Natural heritage policies
  - Surface water
  - Groundwater
  - Vegetation
  - Wildlife, aquatic resources
  - Physiography and soils
- Cultural Environment
  - Archaeological resources and areas of archaeological potential
  - Built heritage resources and cultural heritage landscapes
- Social Environment
  - Existing community
- Economic Environment
  - Existing development pattern
  - Growth projections
- Technical/Built Environment
  - Existing facilities
  - Existing System capacity
  - Projected System capacity requirements

A physical description and general inventory of the natural, technical, and social/cultural environments of the Study Area was completed to identify any environmental factors that could influence selection of the preferred alternative solution.

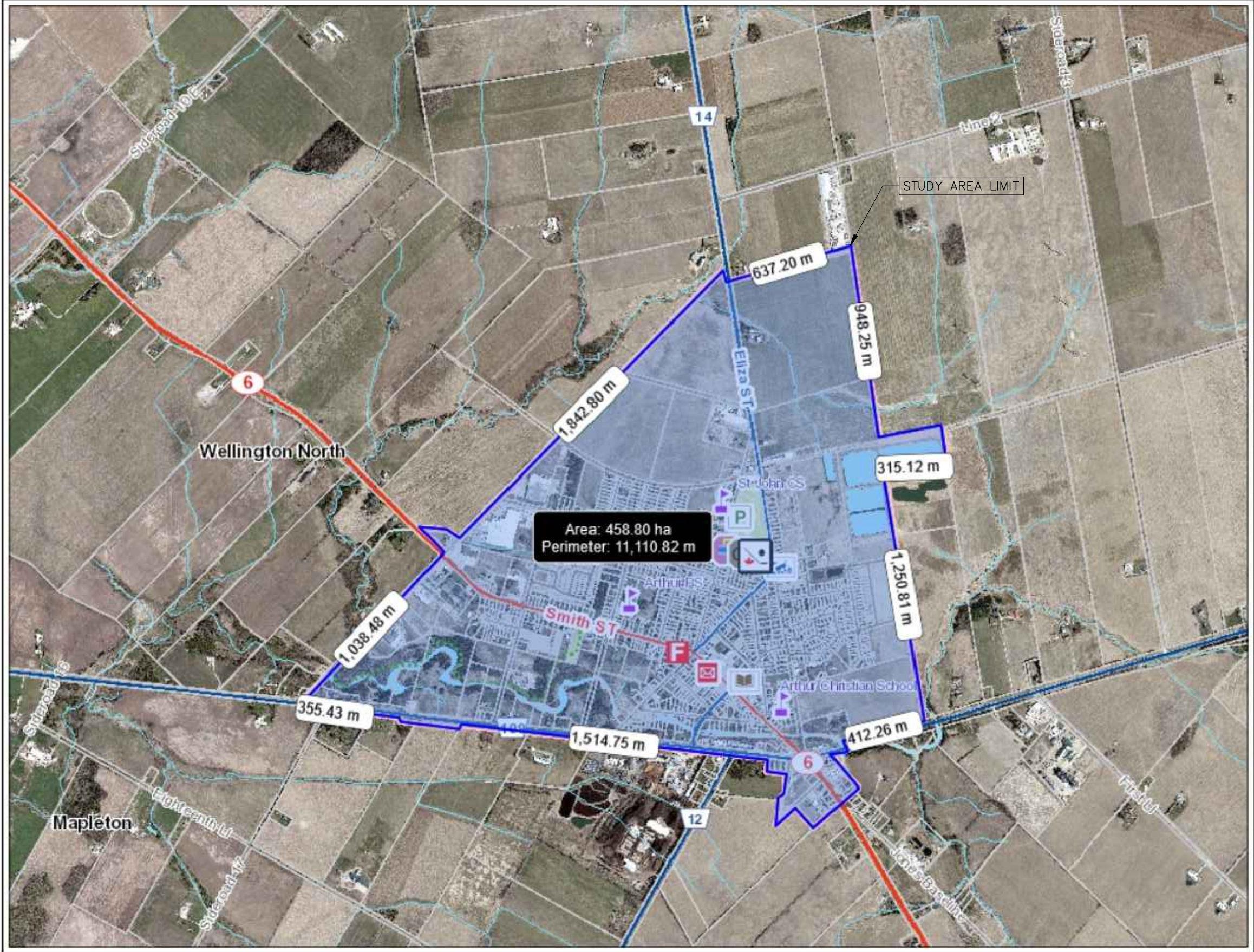
## **7.1 Natural Environment**

### **7.1.1 Ecoregion**

Based on the Natural Heritage Information Centre (NHIC) mapping (available through the NDMNRF website), the Study Area is located within ecoregion 6E (Lake Simcoe-Rideau), which is in the Mixedwood Plains ecozone. Ecoregion 6E covers 6.4% of Ontario, extending from Lake Huron to the Ottawa River and is the second most densely populated ecoregion in Ontario. The climate within Ecoregion 6E is mild and moist, with mean annual precipitation in the range of 759 mm to 1,087 mm (<https://www.ontario.ca/page/ecosystems-ontario-part-1-ecozones-and-ecoregions>).



r:\wellington north -- twsp of\14003a -- arthur water system class ea\cod and survey\6. figures\14003a-fig-05 figure 5.dwg -- 2025-05-16 -- mwolfer



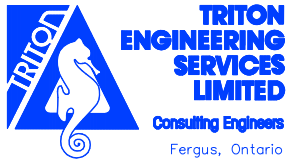
**TOWNSHIP OF  
WELLINGTON NORTH**



**ARTHUR WATER SYSTEM  
SUPPLY REDUNDANCY AND  
STORAGE CLASS EA**

FIGURE 5  
**PROJECT  
STUDY AREA MAP**

NOT TO SCALE  
T4003A





With regard to geology and substrates, the underlying bedrock is Paleozoic dolomite and limestone overlain by ice-laid materials. Majority (57%) of the landcover in Ecoregion 6E is cropland, 30% is forest cover and 4% is water. Located within the Great Lakes Watershed, ecoregion 6E is well drained, with significant volumes of groundwater located within three major overburden aquifers (Kitchener, Alliston, and Oak Ridges) and three large bedrock aquifers (Detroit River, Guelph-Amabel, and Nepean).

Vegetation within the ecoregion is moderately diverse. Within hardwood forests, sugar maple, American beech, white ash and eastern hemlock are the dominant species. Within the lowlands, rich floodplain forests are comprised mostly of green ash, silver maple, red maple eastern white sider, yellow birch, balsam fir and black ash trees. Occurring along the northern edge and eastern portion of the ecoregion, peatlands are dominated with black spruce and tamarack.

Characteristic fauna are as follows: mammal species including white-tailed deer, northern raccoon, striped skunk and woodchuck; bird species including wood duck, great blue heron, wilson's snipe, field sparrow, grasshopper sparrow, eastern meadowlark, hairy woodpecker, wood thrush, scarlet tanager and rose-breasted grosbeak; reptile and amphibian species including American bullfrog, northern leopard frog, spring peeper, red-spotted newt, snapping turtle, eastern gartersnake and common watersnake; and fish species including white sucker, smallmouth bass, walleye, northern pike, yellow perch, rainbow darter, emerald shiner and pearl dace.

### **7.1.2 Regulated and Wooded Areas**

The Study Area is located within the Grand River Watershed under the jurisdiction of the Grand River Conservation Authority (GRCA). The GRCA mapping database was consulted as part of the desktop investigation to collect background information on the significant environmental features within the Study Area. Majority of the Study Area is comprised of a "built-up" landscape. Other landscape features include regulated areas and wooded areas. Regulated areas within the Study Area include floodplain, slope erosion, slope valley and regulated watercourse. Wooded areas, identified by the Ontario Ministry of Natural Development, Mines, Natural Resources and Forestry (NDMNRF) are also present within the Study Area. Based on GRCA mapping, there is no Area of Natural and Scientific Interest (ANSI) identified within the Study Area. The regulated areas, wooded areas, and "built-up" landscape within the Study Area are presented on Figure 6.

GRCA's policies are regulated under *Ontario Regulation (O.Reg.) 150/06: Grand River Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*, under the *Conservation Authorities Act, R.S.O. 1990, C.27*. Any work proposed within the GRCA regulated limits requires approval from GRCA prior to implementation.

### **7.1.3 Species at Risk**

NHIC mapping was used to identify the presence of any Species at Risk in Ontario (SARO) within the Study Area. Four provincial SAR under the ESA and two other species considered rare in the province were identified within or proximate to (within 1km) the Study Area.

NDMNRF and NHIC both use range maps to protect the exact location of an identified species. Therefore, the SAR identified through the desktop investigation can only be considered as potentially present within the Study Area. Field observations have not been completed to determine whether any of the identified species are present within the Study Area.

A summary of the NHIC data is provided in Table 1.

*Table 1 – Summary of At-Risk Species Potentially Within the Study Area*

| <b>Species Scientific name</b>   | <b>Common Name</b>     | <b>Species Type</b> | <b>SARO Status</b> |
|----------------------------------|------------------------|---------------------|--------------------|
| <i>Spatula discors</i>           | Blue-winged Teal       | Bird                | Not Listed         |
| <i>Dolichonyx oryzivorus</i>     | Bobolink               | Bird                | Threatened         |
| <i>Sturnella magna</i>           | Eastern Meadowlark     | Bird                | Threatened         |
| <i>Contopus virens</i>           | Eastern Wood-pewee     | Bird                | Special Concern    |
| <i>Chrysemys picta marginata</i> | Midland Painted Turtle | Reptile             | Special Concern    |
| <i>Bartramia longicauda</i>      | Upland Sandpiper       | Bird                | Not Listed         |

#### **7.1.4 Breeding Bird Habitat**

The online Atlas of Breeding Birds of Ontario was consulted to identify the potential presence of breeding birds within the Study Area. The Study Area is encompassed within geographic survey and area entitled Square 17TNJ35 (Region 47). A total of 80 bird species were identified as having breeding evidence. With respect to breeding status, 25 species were confirmed, 32 species were categorized as possible, and 23 species were categorized as probable. Of the confirmed species, one species (northern pintail) is considered provincially rare, and three (killdeer, cliff swallow, bobolink) are considered species of interest. Field observations have not been completed to determine whether breeding birds and/or breeding bird habitat are present within the Study Area.

#### **7.1.5 Physiography and Soils**

GRCA online mapping was consulted to obtain surficial and Paleozoic geology information for the Study Area. The GRCA mapping tool uses NDMNRF data to define physiography and soils characteristics of the Site. The entire Study Area is situated within the Salina Formation, which is thin-bedded, argillaceous dolostone and shale, with beds and nodules of gypsum and thick salt beds in the deep subsurface. Surface soils in most of the Study Area consist of clayey silt to silt till, which is primarily diamicton material that was deposited during the Wisconsinian age. This material has low permeability. Generally, within the regulated area of the Conestoga River, the surface soil





Grand River Conservation Authority  
Date: Apr 10, 2024

### Regulated and Wooded Areas within the Study Area

- Legend
- Regulation Limit (GRCA)
  - Floodplain (GRCA)
    - Engineered
    - Estimated
    - Approximate
  - Floodplain - Special Policy Area (GRCA)
  - Slope Erosion (GRCA)
    - Steep
    - Oversteep
    - Toe
  - Slope Valley (GRCA)
    - Steep
    - Oversteep
  - Regulated Watercourse (GRCA)
  - Regulated Waterbody (GRCA)
  - Wetland (GRCA)
  - Lake Erie Flood (GRCA)
  - Lake Erie Shoreline Reach (GRCA)
  - Lake Erie Dynamic Beach (GRCA)
  - Lake Erie Erosion (GRCA)
  - ANSI (ON)
  - Wooded Area (MNR)

Copyright Grand River Conservation Authority, 2024.

Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user. The source for each data layer is shown in parentheses in the map legend. See Sources and Citations for details.

Scale 1:18,353  
NAD83 UTM zone 17 (EPSG:26517)



## TOWNSHIP OF WELLINGTON NORTH



### ARTHUR WATER SYSTEM SUPPLY REDUNDANCY AND STORAGE CLASS EA

FIGURE 6

### REGULATED AND WOODED AREAS WITHIN THE STUDY AREA

NOT TO SCALE  
T4003A





is described as silt, sand and gravel, which is primarily sand material that was deposited during the Hudson age. This material has variable permeability.

The physiography of the Study Area is described as Till Plains (Drumlinized), encompassed mainly within the Stratford Till Plain Region and the rest within the Dundalk till Plain Region.

### **7.1.6 Hydrogeology**

Within the Study Area, the hydrogeology is Paleozoic aged carbonate and shale bedrock (100 to 120 m) overlain by approximately 50 to 75 m of glacial derived overburden (Lower Sediments). The Lower Sediments that are directly above the bedrock are the source for the existing high capacity wells; however, high iron (Well 7B) and manganese (Wells 8A and 8B) concentrations are also typical, due to the mineral compositions of the sediments. The layer of lower sediments tends to thin out in the north and east of the Study Area.

The deep bedrock within the Study area is characterized by low hydraulic conductivity due to the massive unfractured carbonate bedrock; however, south of the Study Area, the deep bedrock is characterized by a higher hydraulic conductivity due to the presence of reef bedrock structures and interconnected fractures that result in micro karst bedrock groundwater flow paths.

The rural residences on the properties surrounding the Arthur serviced area obtain their water supplies from private domestic wells. The majority of the existing individual domestic wells in the area surrounding the study area obtain their water supplies from the lower sediments or bedrock.

### **7.1.7 Source Water Protection**

Source water protection implementation requirements are a combination of Source Protection Plan policies and the *Clean Water Act* and its associated regulations. A review of the MECP Source Protection Information Atlas identified that the Study Area is located within the Grand River Source Protection Area of the Lake Erie Source Protection Region and is therefore subject to the approved Grand River Source Protection Plan, Chapter 7 - County of Wellington Source Protection Plan, dated February 9, 2022.

Municipal wells are required to have wellhead protection areas. This requirement is pursuant to the *Safe Drinking Water Act* and *Clean Water Act*. Four WHPAs are specified, with one being a proximity zone and the others are time related capture zones, as follows:

Zone A = 100 m radius from wellhead

Zone B = 2-year time of travel (TOT) capture zone

Zone C = 5-year TOT capture zone

Zone D = 25-year time of travel capture zone.

Other WHPAs may apply if a well is designated as groundwater under the direct influence of surface water. Hydrogeological modelling is required to delineate the WHPAs and vulnerability scoring, which indicates how sensitive the water source is to contamination. Vulnerability is numerically scored between 2 and 10, with 10 being the most vulnerable.

In addition to WHPAs, there are three other vulnerable areas around municipal wells and surface water intakes that are defined in source protection plans, under the Clean Water Act, including the Intake Protection Zone (IPZ), Significant Groundwater Recharge Area (SGRA) and Highly Vulnerable Aquifer (HVA).

IPZ is the area surrounding a surface water (river and stream) intake and are specified in three zones, based on a proximity zone and vulnerability score, and are determined by wind, water pumping rates. SGRA contribute to the maintenance of capacity in water supply aquifers and are areas with porous soils with higher than average infiltration rates and are hydraulically connected to groundwater supply wells. HVA are aquifers with thin or permeable overlying soil layers and can be easily contaminated.

The Grand River Source Protection Plan, Chapter 7 - County of Wellington Source Protection Plan, dated February 9, 2022 identifies location and nature of threats (including potential threats) to the Arthur water system groundwater sources and provides a delineation of vulnerable areas and an overview of water quality and quantity.

Consistent with the MECP Source Protection Information Atlas, and as illustrated on Figure 7, portions of the Study Area are located within Zones A, B, C and D of the existing GRCA Wellhead Protection Area for the existing municipal wells (7B, 8A/8B).

#### 7.1.7.1 Groundwater

Arthur relies on groundwater for its water supply. The municipal water system and majority of private residential wells within (abandoned) and surrounding Arthur obtain water from the groundwater supply.

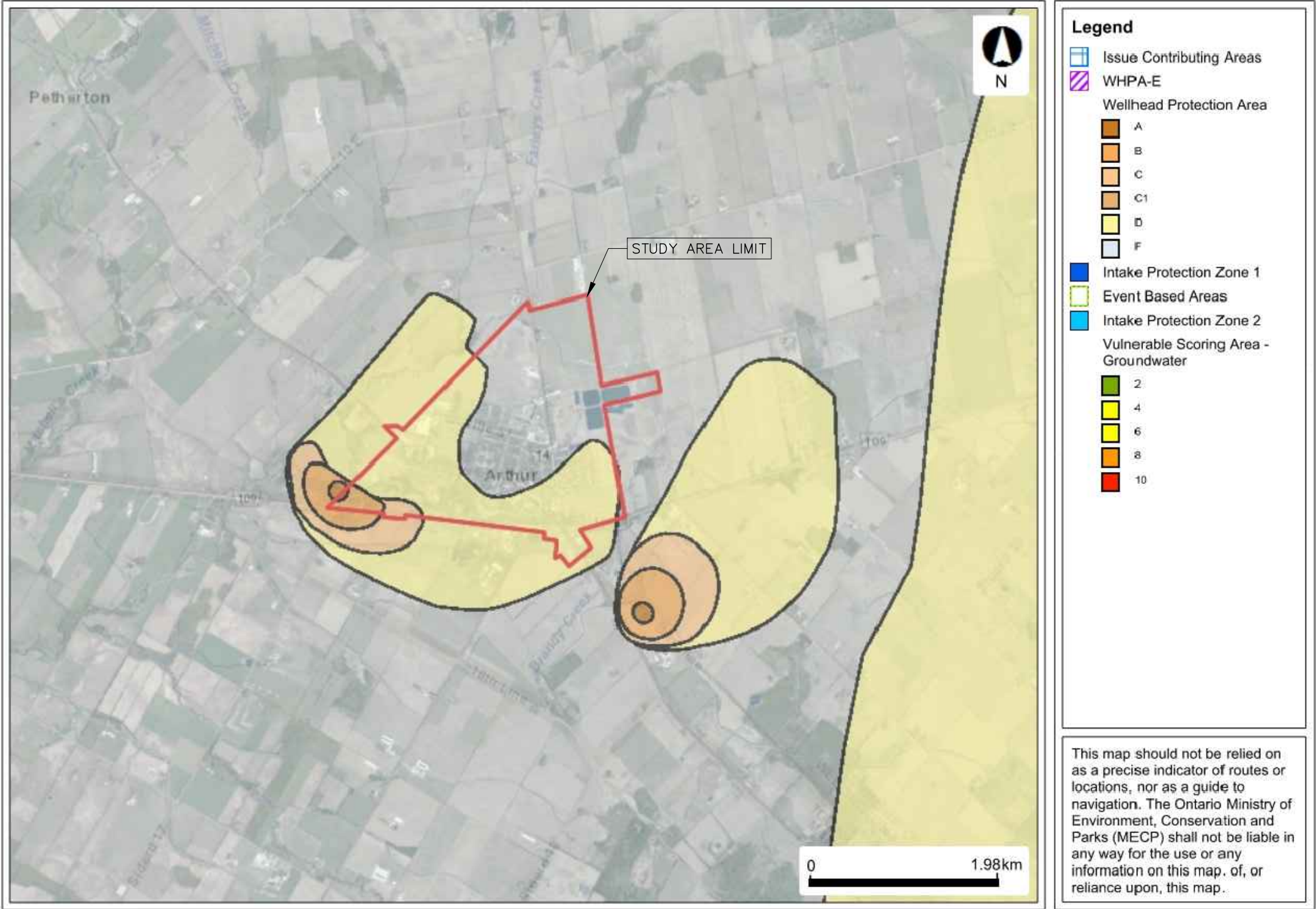
Groundwater usage within Arthur includes municipal drinking water and industrial and commercial water taking. Most of the water takers require a Permit to Take Water (PTTW) from MECP due to the volume of water taken per day.

#### 7.1.7.2 Surface Water

The Conestoga River generally flows east to west along the south boundary of the Study Area. An unnamed stream, which is a tributary of Farleys Creek also flows east to west within the Study Area from west of Conestogo St N to beyond Wells St, where it bends and flows south into Farleys Creek, which ultimately discharges to the Conestoga River in the southeast corner of the Study Area.

r:\wellington north - twsp of\4003a - arthur water system class ea\cod and survey\6. figures\4003a-fig-07 figure 7.dwg - 2025-05-16 - mwolfer

# Wellhead Protection Areas for the Existing Municipal Wells (7B, 8A/8B)



TOWNSHIP OF WELLINGTON NORTH



ARTHUR WATER SYSTEM  
SUPPLY REDUNDANCY AND  
STORAGE CLASS EA

FIGURE 7

EXISTING WHPAS FOR THE  
EXISTING ARTHUR MUNICIPAL  
WATER SYSTEM

NOT TO SCALE  
T4003A



© King's Printer for Ontario and its licensors, 2024

May Not be Reproduced without Permission.  
THIS IS NOT A PLAN OF SURVEY.

Map Created: 4/10/2024  
Map Center: 43.83511 N, -80.53645 W

