Volume I – Water and Wastewater Master Plan Update

Water and Wastewater Master Plan Update

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Municipality of South Huron

GMBP Project: 521054

Table of Contents

APPENDICES

1 INTRODUCTION AND BACKGROUND

1.1 Municipality of South Huron Background

The Municipality of South Huron (Municipality) is located in southwest Ontario, along the southern border of Huron County, approximately 45 km north of the City of London. The Municipality consists of predominantly agricultural land and includes the town of Exeter and the Greater Grand Bend area, the small rural communities of Centralia, Crediton, Dashwood, Huron Park, and Kirkton, plus the hamlets of Corbett, Elimville, Greenway, Mount Carmel, Winchelsea and Woodham. The Municipality of South Huron is a single tier municipality, which owns and is responsible for the planning, construction, and management of municipal water and wastewater infrastructure.

The Municipality owns and operates storage facilities, pumping stations, and trunk and distribution watermains within its water system. The Municipality's water is supplied by the Lake Huron Primary Water Supply System (LHPWSS) Water Treatment Plant (WTP) that draws water from Lake Huron and is operated by the Ontario Clean Water Agency (OCWA). The Municipality receives its treated water from the LHPWSS WTP at various supply points throughout the water system.

The Municipality owns and operates its wastewater system, which includes wastewater treatment, pumping stations, and collection and trunk sewers. The Municipality's wastewater from the villages of Crediton, Huron Park and Centralia as well as the town of Exeter is collected and conveyed to the Exeter Wastewater Treatment Facility (WWTF), that treats the Municipality's wastewater before discharging to the Ausable River.

The Grand Bend wastewater system operates independently of the Exeter wastewater system. The Municipality owns and operates pumping stations, and collection and trunk sewers in and around Grand Bend. The wastewater is conveyed to the Grand Bend WWTF, that is jointly owned and administered by Lambton Shores and operated by Jacobs Engineering Group.

Readily available and accessible public infrastructure is essential to the viability of existing and growing communities. Infrastructure planning, land use planning, and infrastructure investment require close integration to ensure efficient, safe, and economically achievable solutions to provide the required water and wastewater infrastructure.

To balance the needs of growth with the protection and preservation of natural, environmental, and heritage resources, the Municipality of South Huron initiated the 2023 Master Plan Update (MPU) for water and wastewater under the Municipal Engineers Association (MEA) Master Plan Class Environmental Assessment process.

1.2 Master Plan Update

The Master Plan Update comprehensively documents the development of the preferred water and wastewater servicing strategies for the Municipality of South Huron to meet the servicing needs of existing users and future development.

The Master Plan Update evaluates the ability of existing and planned water and wastewater infrastructure within the Municipality of South Huron to service the Municipality's existing population, service the forecasted growth, and evaluate/develop recommended servicing strategies efficiently and effectively.

The 2023 Master Plan Update is a critical component of the Municipality's planning for growth and will provide the framework for the management, expansion and funding of the water and wastewater systems for the Municipality.

1.3 Master Plan Update Objectives

The key objectives of the Master Plan Update are as follows:

- Review potential residential and employment areas and determine the impacts on servicing needs for the Municipality's water and wastewater infrastructure;
- Review and integrate the water and wastewater system renewal and replacement needs;
- Evaluate the ability of existing and planned water and wastewater infrastructure to efficiently and effectively service the Municipality's existing users and potential growth;
- Undertake a comprehensive review and analysis for the water and wastewater servicing requirements;
- Address key servicing considerations as part of the development and evaluation of servicing strategies including:
    - Level of Service to existing users and anticipated growth
    - Operational flexibility and security of supply
    - Mitigation of impacts to natural, social, and economic environments
    - Opportunity to meet policy, policy statements, regulations and technical criteria
    - Opportunity to optimize existing infrastructure and servicing strategies
    - Ensuring the strategies are cost effective
- Consider and develop sustainable servicing solutions;
- Utilize recently completed and on-going projects to update infrastructure status, capacity and cost estimates;
- Utilize the newly developed water and wastewater hydraulic models for the analysis of servicing alternatives;
- Establish a complete and implementable water and wastewater capital program;

- Extensive consultation with the public and stakeholders; and
- Complete the Master Plan in accordance with the MEA Class EA process for Master Plans.

1.4 Master Plan Update Documentation Layout

The Master Plan Update Report, including all supporting volumes, is the documentation placed on public record for the prescribed review period. This documentation, in its entirety, describes all required phases of the planning process and incorporates the procedure considered essential for the compliance with the **Environmental Assessment Act**.

The MPU Report is organized into three volumes as described below.

Volume I – Water and Wastewater Master Plan Update

Volume I provides a brief overview of the Master Plan Update. It details the problem statement, purpose of the study, significant planning, environmental and technical considerations, master planning process, population and employment growth forecasts, existing environmental and servicing conditions, evaluation methodology, and future considerations.

This volume will also detail all relevant documentation of the public consultation process including notices, comments and responses, and distribution information. Presentation material from the Public Information Centre (PIC) held during this process is included. Other presentation material and discussion information from workshops held during this process is included. Other discussion information with relevant agencies, approval bodies and other stakeholders are also included within the appendices:

- Appendix A – Study Stakeholder List
- Appendix B – Study Commencement
- Appendix C – Public Information Centre
- Appendix D – Comments Received
- Appendix E – Study Completion

Volume II – Water Master Plan

Volume II consists of the principal document summarizing the study objectives, approach, methodologies, technical analyses, evaluation, and selection of the preferred water servicing strategy. This volume outlines the water policies, design criteria and Level of Service needed to be achieved by the water network. In addition, **Volume II** identifies the existing water network and describes the hydraulic modelling tool used for the analysis. Further **Volume II** outlines the detailed evaluation and decision-making process as well as the preferred servicing strategy and associated capital program and implementation plan.

A significant amount of technical background information has been compiled, which is critical to the development of the Water Master Plan Update. This information is included as appendices in **Volume II**. The technical appendices contain relevant project, implementation, and technical analysis information including:

- Appendix A – Water System Schematic
- Appendix B – Water Condition Assessments
- Appendix C – Growth Demand
- Appendix D – Evaluation Tables
- Appendix E – Capital Program Project Sheets

Volume III – Wastewater Master Plan

Volume III consists of the principal document summarizing the study objectives, approach, methodologies, technical analyses, evaluation, and selection of the preferred wastewater servicing strategy. This volume outlines the wastewater policies, design criteria and Level of Service needed to be achieved by the wastewater network. In addition, **Volume III** identifies the existing wastewater network and describes the hydraulic modelling tool used for the analysis. Further in **Volume III** is the detailed evaluation and decision-making as well as the preferred servicing strategy and associated capital program and implementation plan.

A significant amount of technical background information has been compiled, which is critical to the development of the Wastewater Master Plan Update. This information is included in appendices in **Volume III**.

The technical appendices contain relevant project, implementation, and technical analysis information including:

- Appendix A – F-5-1 Effluent Design Objectives
- Appendix B – Wastewater Condition Assessments
- Appendix C – Wastewater System Schematic
- Appendix D – Growth Flows
- Appendix E – Evaluation Tables
- Appendix F – Capital Program Project Sheets

2 MASTER PLANNING PROCESS

A Master Plan is typically subject to approval by the municipality but does not normally require approval under the Environmental Assessment Act (EAA); however, any specific project within a Master Plan must fulfill the Class Environmental Assessment (EA) requirements. At a minimum, Master Plans address Phases 1 and 2 of the Class EA process.

2.1 Class Environmental Assessment Process

Ontario's EAA was passed in 1975 and was proclaimed in 1976.The EAA requires proponents to examine and document the environmental effects that could result from major projects or activities and their alternatives. Municipal undertakings became subject to the EAA in 1981.

The EAA's comprehensive definition of the environment is:

- Air, land or water;
- Plant and animal life, including human life;
- The social, economic 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 human activities; and,
- Any part of a combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

The purpose of the EAA is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management of the environment in Ontario (RSO1990, c.18, s.2). It is the objective of EAA proponents to ensure that decisions result from a rational, objective, transparent, replicable, and impartial planning process.

As set out in Section 6.1(2) of the EAA, an EA document must include the following:

- A description of the purpose of the undertaking;
- A description of and a statement of the rationale for,
    - The undertaking;
    - The alternative methods of carrying out the undertaking; and,
    - Alternatives to the undertaking.

The EA document must also include a description of:

- The environment that will be affected or that might reasonably be expected to be affected, directly or indirectly, by the undertaking or alternatives to the undertaking;
- The effects that will be caused or that might reasonably be expected to be caused to the environment by the undertaking or alternatives to the undertaking;
- The actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment by the undertaking or alternatives to the undertaking;
- An evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of carrying out the undertaking and the alternatives to the undertaking (RSO1990, c.18, s.2); and,
- A description of any consultation about the undertaking by the proponent and the results of the consultation.

2.2 Principles of Environmental Planning

The EAA sets a framework for a systematic, rational and replicable environmental planning process that is based on five key principles, as follows:

- Consultation with affected parties. Consultation with the public and government review agencies is an integral part of the planning process. Consultation allows the proponent to identify and address concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.
- Consideration of a reasonable range of alternatives. Alternatives include functionally different solutions, “alternatives to” the proposed undertaking and “alternative methods” of implementing the preferred solution. The “Do Nothing” alternative must also be considered.
- Identification and consideration of the effects of each alternative on all aspects of the environment. This includes the natural, social, cultural, technical, and economic environments.
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects. The evaluation shall increase in the level of detail as the study moves from the evaluation of “alternatives to” to the evaluation of “alternative methods”.
- Provision of clean and complete documentation of the planning process followed, to allow “traceability” of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

2.3 Class Environmental Assessment

"Class" Environmental Assessments (Class EAs) were approved by the Minister of the Environment in 1987 for municipal projects having predictable and mitigable impacts. The Municipal Class EA process was revised and updated in 1993, 2000, 2007, 2011, 2015, and 2023. The Class EA approach streamlines the planning and approvals process for municipal projects that are:

- Recurring;
- Similar in nature;
- Usually limited in scale;
- Predictable in the range of environmental impacts; and,
- Responsive to mitigation.

The Municipal Class Environmental Assessment, prepared by the Municipal Engineers Association (MEA) (October 2000, as amended in 2007, 2011, 2015, and 2023), outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater, stormwater management and road projects. The process includes five phases:

- Phase 1: Identification of the Problem or Opportunity;
- Phase 2: Identification and Evaluation of Alternative Solutions to determine a Preferred Solution while taking input from the public and other stakeholders into consideration;
- Phase 3: Examination of Alternative Methods of implementation of the Preferred Solution based on the existing conditions and anticipated environmental effects, while taking input from the public and other stakeholders into consideration;
- Phase 4: Documentation of the Class EA process in the form of an Environmental Study Report (ESR) for public review; and,
- Phase 5: Implementation and Monitoring.

Projects subject to the Class EA process are classified into the following four "schedules" depending on the degree of the expected impacts.

Exempt Projects, most of which were formerly classified as Schedule A and A+ projects, include various municipal maintenance, operational activities, rehabilitation works, minor reconstruction or replacement of existing facilities, and new facilities that are limited in scale and have minimal adverse effects on the environment. These projects are exempt from the requirements of the Environmental Assessment Act.

Eligible for Screening to Exempt projects may be eligible for exemption based on the results of a screening process. Proponents may choose to complete the applicable screening process to determine whether the project is eligible for exemption from the Act or proceed with the applicable Schedule B or C process. Projects that are eligible for screening are identified in the MCEA document. Proponents must fully and accurately complete the relevant screening process(es) outlined in the MCEA to proceed pursuant to the exemption.

Schedule B projects require a screening of alternatives for their environmental impacts and Phases 1 and 2 of the planning process must be completed. The proponent is required to consult with the affected public and relevant review agencies. A Project File must be prepared and made available for review. Provided that no significant impacts are identified and no requests for a Part II Order to a Schedule C or Individual Environmental Assessment are received, Schedule B projects are approved and may proceed directly to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities or smaller new projects.

Schedule C projects must satisfy all five phases of the Class EA process. These projects have the potential for greater environmental impacts. Phase 3 involves the assessment of alternative methods of carrying out the project, as well as public consultation on the preferred conceptual design. Phase 4 normally includes the preparation of an Environmental Study Report (ESR) that is filed for public review. Provided no significant impacts are identified and no requests for Part II Order or "bump-up" to an Individual Environmental Assessment are received, Schedule C projects are then approved and may proceed directly to implementation. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.

Figure 1 illustrates the Municipal Class EA planning and design process with the phases required for each schedule.

PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Problem or Opportunity	Alternative Solutions	Alternative Design Concepts for Preferred Solution	Environmental Study Report (ESR)	Implementation
Identify Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Identify Alternative Solutions to Problem or Opportunity	Complete Environmental Study Report (ESR)	Complete Contract Drawings and Tender Documents
Discretionary Public Consultation to Review Problem or Opportunity	Inventory Natural, Social, Economic Environment	Detail Inventory Natural, Social, Economic Environment	Environmental Study Report (ESR) Placed on Public Record	Proceed to Construction and Operation
Determine Applicability of Master Plan Approach (See Section A.2.7 within the Municipal Class Environmental Assessment Manual)	Identify Impact of Alternative Solutions on the Environment, and Mitigating Measures	Identify Impact of Alternative Designs on Environment, and Mitigating Measures	Notice of Completion to Review Agencies and Public	Monitor for Environmental Provisions and Commitments
	Evaluate Alternative Solutions: Identify Recommended Solutions	Evaluate Alternative Designs: Identify Recommended Solutions	Copy of Notice of Completion to MOE-EA Branch	
	Consult Review Agencies and Public. RE: Problem or Opportunity and Alternative Solutions	Consult Review Agencies and Previously Interested and Directly Affected Public.	Opportunity to Request Minister Within 30 Days of Notification to Request and Order*	
	Select Preferred Solution	Select Preferred Design		
		Preliminary Finalization of Preferred Design		

Figure 1: Municipal Class EA Planning and Design Process

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2.4 Master Planning Process

Municipalities recognize the benefits of comprehensive, long-range planning exercises that examine problems and solutions for an overall system of municipal services. The Municipal Class EA for water and wastewater projects recognizes the importance of Master Plans as the basis for sound environmental planning. The Class EA defines Master Plans as:

"Long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system(s) or group of related projects in order to outline a framework for planning for subsequent projects and/or developments."

Master Plans have distinguishing features that set them apart from project specific studies. These features include the following:

- Master Plans are broad in scope and focus on the analysis of a system for the purpose of outlining a framework for the provision of future works and developments.
- Specific projects recommended in a Master Plan are part of a larger management system and are distributed geographically throughout the study area. The implementation of specific projects may occur over an extended time frame.

In accordance with the MEA Class EA document, a Master Plan must at least satisfy the requirements of Phases 1 and 2 of the Class EA process and incorporate the five key principles of environmental planning. The Master Plan must document public and agency consultation at each phase of the process and a reasonable range of alternative solutions must be identified and systematically evaluated.

The approach for the Master Plan is to confirm existing planned projects and where applicable, evaluate and develop any new components. This approach would also be scrutinized through a public and agency consultation process and be fully documented.

There are generally four approaches to undertaking Master Plans under the Class EA process as follows:

- **Approach 1**: Under this approach, the Master Plan document is completed through a conceptual and strategic level study where detailed investigations would be required at the project-specific level for individual Schedule B and C projects or developer led requirements identified though the Master Plan.
- **Approach 2**: This approach allows specific Schedule B projects identified in the Master Plan to move forward to implementation. The Master Plan provides evaluation and documentation to support identified Schedule B Class EA requirements with applicable review agency commitments prior to the respective implementation. The Master Plan document also identifies Schedule B or C projects that will proceed with separate studies to fully meet the Class EA requirements and allow for greater detail in the evaluation of alternatives and design concepts. Schedule C projects will continue to Phase 3 and 4 of the Class EA process with an Environmental Study Report filed for public review.
- **Approach 3**: This approach involves a comprehensive assessment to allow for Schedule B and C projects identified in the Master Plan to move forward to implementation. The Master Plan completes Phases 1 to 4 of the Class EA process, necessary for Schedule B (Phase 1 and 2 only) and Schedule C (Phases 1 to 4) projects. The master plan document is completed at the conclusion of Phase 4 of the Class EA process.
- **Integration with the Planning Act**: Under this approach, the Master Plan is completed and integrated with the Planning Act. This approach is necessary in studies where context and justifications are necessary on a broad scale. For example, a Master Plan completed alongside long-term planning studies (i.e. Official Plan) where the recommendations are dependent and integrated. The Master Plan document will satisfy the early stages of Phases 1 and 2 for Schedule B projects and Phases 3 and 4 for Schedule C projects.

This study follows Approach 1 of the approved Master Planning Class EA process.

2.5 Public Consultation

Public and agency consultation are integral to the Class EA planning process. The public consultation process is essential for informing and obtaining input from potentially interested and affected parties during the study process.

Objectives of Phase 1 of the MEA Municipal Class EA process with respect to public consultation are as follows:

- Present clear and concise information to stakeholders at key stages of the study process;
- Solicit community, regulatory and Municipal staff input;
- Meet Municipal Class EA consultation requirements;
- To fulfill the consultation requirements of the MEA Municipal Class EA document:
    - Build on past communication protocols and consultation plans from previous Class EA and municipal planning initiatives, to ensure consistency and continuity.
    - Meet public and agency notification and consultation requirements for Phases 1 and 2 of the MEA Municipal Class EA; and
    - Complete additional tasks to enhance the proposed consultation program and overall Class EA process.

The complete public and agency consultation process is detailed in **Section 12**.

2.5.1 Section 16 Order Requests

The MCEA process includes an appeal provision – the Minister of the Environment, Conservation and Parks has the authority and discretion to make an Order under Section 16 of the Environmental Assessment Act. A Section 16 Order may require that the proponent of a project going through a Class EA process:

- Submit an application for approval of the project before they proceed. This is generally referred to as an individual EA (s. 16(1) order)
- Meet further conditions in addition to the conditions in the Class EA. This could include conditions for: further study, monitoring and/or consultation (s. 16(3) order)

The Minister can also refer a matter in relation to a section 16(6) Order request to mediation. Before making an Order, the Minister must consider the factors set out in section 16(5) of the Environmental Assessment Act.

If a Section 16 Order request is made, the project proponent cannot proceed with the project until the Minister makes a decision on the request. If the Minister makes a Section 16 Order, the proponent may only proceed with the project if they follow the conditions in the Order.

2.5.1.1 Reasons for Requesting an Order

A concerned party may ask the Minister to make a Section 16(6) Order if:

- They have outstanding concerns that a project going through a Class EA process may have a potential adverse impact on constitutionally protected Aboriginal and treaty rights.
- They believe that an Order may prevent, mitigate, or remedy this impact.

A Section 16(6) Order request cannot be made to simply delay or stop the planning and implementation of a project that is going through the MCEA process. Prior to making a Section 16(6) Order request, the concerned party should first try to resolve any concerns directly with the project proponent, in this case, the Municipality of South Huron.

2.5.1.2 Timing for an Order Request

During the 30-day public comment period, anyone can review the documentation, submit any comments or concerns to the proponent, and request a Section 16(6) Order.

To request a Section 16 Order for a project, on the grounds that an Order may prevent, mitigate, or remedy potential adverse impacts on constitutionally protected, Aboriginal and treaty rights, a concerned party must make the request before the public comment period is complete.

3 RELEVANT STUDIES AND BACKGROUND INFORMATION

The following completed studies have been reviewed and considered throughout the Master Planning process and selection of preferred servicing strategies.

3.1 2018 Municipality of South Huron Water and Wastewater Master Plan

The 2018 Municipality of South Huron Water and Wastewater Master Plan determined preferred water and wastewater servicing strategies over 20 years to 2036. The water and wastewater capital programs are detailed in **Tables 1** to **4**, which details incomplete and completed projects to date. It can be noted that incomplete projects were carried over into the Master Plan Update's capital program.

Table 1: Exeter 2018 Master Plan Water Capital Projects

Item	Project	Status
E-01	Replace length of watermain on William Street between Anne Street and Huron Street	Complete
E-02	Replace watermain along John Street between Main Street and Albert Street	Complete
E-03	Replace watermain along James Street between Andrew Street and Main Street	Complete
E-04	Replace watermain on Simcoe Street between Andrew Street and Main Street	Complete
E-05	Replace watermain easement between Huron Street and McTaggart Line	Complete
E-06	Replace watermain on Huron Street between Edward Street and East town limit (680 m)	Complete
E-07	Replace aging controls at the Exeter Water Tower with a new control system	Complete
E-08	Develop a water meter replacement program to replace aging water meters.	Complete
E-09	Determine reason for frequent UV alarms and clogging of filters. When development occurs on the east side of Exeter, a new pressure zone could be created to feed the areas with low chlorine residual issues, potentially eliminating the need for the POE UV units.	Complete
E-10	Replace watermain on Main Street between Main Street and Huron Street and MacNaughton Drive (1400 m)	Not Complete
E-11	Replace watermain on Victoria Street between Main Street and the Arena (235 m)	Not Complete
E-12	Replace watermain on William Street Between Nelson Street and Church Street (270 m)	Complete
E-13	Replace watermain on William Street between Anne Street and Sanders Street (300 m)	Complete

Item	Project	Status
E-14	Replace watermain on Thomas Street between Marlborough Street and Carling Street (210 m)	Not Complete
E-15	Replace watermain on Church Street between William Street and Main Street (120 m)	Not Complete
E-16	Replace watermain on Mill Street between Market Street and William Street	Not Complete
E-17	Replace watermain on Sherwood Crescent (600 m)	Complete
E-18	Retrofit a mechanical mixing system for more frequent turnover within the Exeter Water Tower to prevent freezing during winter months	Complete
E-19	Recoat the interior of the Exeter Water Tower	Complete
E-20	Replace watermain on Gidley Street between William and Carling Streets	Not Complete
E-21	Replace watermain on Waterloo street between London Road South and the GEXR railway tracks.	Complete
E-22	Replace watermain on Kingscourt Crescent from Pryde Street to the dead end (280 m)	Not Complete
E-23	Replace broken valve at Gidley Street and Main Street	Not Complete
E-24	Replace watermain connected to the hydrant near Public Works building at 40526 Huron Street	Complete
E-25	Replace watermain connected to the hydrant on Carling Street between Huron Street and Waterloo Street (4" main)	Not Complete
E-26	Replace watermain on Thames Street East	Not Complete
E-27	Replace watermain connected to the hydrant on Eastern Avenue (replacement to occur when area is developed)	Complete
E-28	Install anode banks at strategic locations along Main Street to provide cathodic protection	Not Complete
E-29	Evaluate ladder at Exeter Water Tower to ensure that it meets current safety standards and undertake upgrades or replacement if necessary	Not Complete

Table 2: Stephen 2018 Master Plan Water Capital Projects

Item	Project	Status
S-01	Frequent watermain breaks in the Oakwood Area - replace / repair watermains as required	Not Complete
S-02	Replace Shipka Line watermain (South Road to north of Kirkton Road)	Complete
S-03	Cut and cap the twinned section of Crediton Road.	Complete
S-04	Replace Dashwood Road watermain (Highway 21 to Shipka Line)	Complete
S-05	Replace Dashwood Road watermain (Shipka Line to Bronson Line)	Complete
S-06	Disconnect feed from rear yard watermain along Gore Road and connect water services to Gore Road watermain in the Turnbull Subdivision.	Complete
S-07	Potential to coordinate with the Municipality of Bluewater and LHPWSS to reduce pressures coming from the WTP to the Lakeshore Area	Complete
S-08	Replace Shipka Line watermain (Dashwood Road to Kirkton Road)	Complete
S-09	Develop a water meter replacement program to replace aging water meters.	Complete
S-10	Replace Dashwood Road watermain (Bronson Line to Babylon Line)	Complete
S-11	Replace Dashwood Road watermain (Ausable Line to Airport Line)	Complete
S-12	Replace Blackbush Line watermain (Crediton Road to Dashwood Road)	Complete
S-13	Replace Mollard Line watermain (Grand Bend Line and South Road)	Not Complete
S-14	Replace Parr Line watermain (north and south of Crediton)	Complete
S-15	Replace Bronson Line watermain (Crediton Road to Huron Street)	Not Complete
S-16	Replace Grand Bend Line watermain (POG to Greenway Road)	Not Complete
S-17	Install anode banks and corrosion monitoring coupons at strategic locations along Highway 21	Not Complete
S-18	Cut and cap the interconnect at Shipka Line and Mount Carmel Drive	Complete
S-19	Cut and cap the interconnect at Victoria Drive and Mount Carmel Drive	Complete
S-20	Decommission the abandoned reservoir in Huron Park	Complete
S-21	Upgrade to a 250 mm diameter watermain on Grand Bend Line between B-Line and the POG property upon development commitment	Not Complete
S-22	Replace Highway 21 watermain with a smaller diameter watermain	Not Complete
S-23	Install watermain between Ausable Line and Babylon Line on Dashwood Road to provide looping and install a PRV to maintain pressure	Removed
S-24	Huron Park Water Tower Re-chlorination system upgrade	Complete
S-25	SCADA Master Plan and associated upgrades	Not Complete

Table 3: Exeter 2018 Master Plan Wastewater Capital Projects

Item	Project	Status
E-01	Undertake investigations to determine where inflow and infiltration exists within the sanitary collection system and identify locations where concrete pipes exist, as it is suspected that this type of pipe may result in a significant amount of inflow and infiltration	Not Complete
E-02	Stantec will undertake the preliminary design for upgrades to the William Street Pumping Station as part of this Master Plan	Complete
E-03	Replace sewer main along James Street between Main Street and Albert Street	Complete
E-04	Replace sewer main on Sherwood Crescent (600 m)	Complete
E-05	Replace sewer main on Huron Street between Edward Street and East town limit (680 m)	Complete
E-06	Replace piping and diffusers for the aeration system	Complete
E-08	Perform an assessment of the sand filters to evaluate performance and level of effectiveness, including evaluation of alternative filter technology. Rehabilitate or replace the sand filters as necessary.	Complete
E-09	Review the installation of tertiary filtration and UV disinfection to improve effluent quality discharge, eliminate winter discharge restrictions; allow year-round discharge and increase capacity	Complete
E-10	Replace sewer main on Kingscourt Crescent from Pryde Street to the dead end (280 m)	Not Complete
E-11	Replace sewer main on Church Street between William Street and Main Street (120 m)	Not Complete
E-12	Replace sewer main on Victoria Street East between Main Street and the Arena (235 m)	Complete
E-13	Replace sewer main on William Street Between Nelson Street and Church Street (270 m)	Not Complete
E-14	Replace sewer main on William Street between Anne Street and Sanders Street (300 m)	Complete
E-15	Replace sewer main on Thomas Street between Marlborough Street and Carling Street (210 m)	Complete
E-16	Determine location and condition of aging maintenance hole structures and those constructed of brick and implement a long term replacement or rehabilitation program	Removed
E-17	Locate an access point to the sewer main located in between Main Street and William Street and perform a camera inspection to determine the cause of backups	Complete
E-18	Undertake study to determine source and reduction of fish population in lagoons	Removed
E-19	Evaluate the condition of the pumps, controls, instrumentation, and generator at the Snider Street Pumping Station	Complete
E-20	Develop multiyear plan for sludge removal and disposal at Exeter Sewage Lagoons.	Not Complete

Item	Project	Status
E-21	Replace sewer main on Church Street between William Street and Carling Street (120 m)	Not Complete
E-22	Review existing sanitary design sheets and determine what capacity is remaining within the sanitary sewer network. Evaluate options which will allow development to occur without impacting the conveyance of sanitary flows	Complete
E-23	Replace sewer main on Waterloo street between London Road South and the GEXR railway tracks	Removed
E-24	Determine the remaining lifespan of the pumping station so that future upgrades will be sized accordingly in order to accommodate new growth	Not Complete

Table 4: Stephen 2018 Master Plan Wastewater Capital Projects

Item	Project	Status
S-01	Upgrade to a 350 mm diameter forcemain on Mollard Line	Complete
S-02	Replace existing bypass flow meter at the Huron Park PS	Not Complete
S-03	Create a record of existing septic systems in the Grand Bend Service Area, date of last inspection and condition rating for each based on the Ontario Ministry of Municipal Affairs and Housing Septic System Re-inspection program. Determine where and if it is possible to sample a nearby watercourse that would be affected by failing septic systems. Determine trigger point for when to implement mandatory hook up to a municipal sanitary collection system (when constructed).	Not Complete
S-04	Rehabilitate Huron Park forcemain in vicinity of pumping station to prevent further breaks	Not Complete
S-05	Phase 1 of the Trunk Gravity Sewer on the West Side of Highway 21. This project would include the construction of a trunk sewer from PS2, along Municipal Drive, to Ontario Street (Highway 21), and along Ontario Street to Indian Road. The project will commence upon committed development of the area.	Complete
S-06	Undertake condition assessment of E-one pump stations, repair or replace as required.	Not Complete
S-07	Huron Park PS study to review wet well, pump, and forcemain condition and capacity. Upgrade or replace the PS.	Complete
S-08	Replacement of aging sanitary sewers in easements on private property in Huron Park Industrial Area (by developer).	Not Complete
S-09	The option will be available for Grand Cove Estates to abandon the Grand Cove Estates sanitary pumping station and connect via gravity to the new trunk sewer on Highway 21 at Indian Rd. (Phase 1) when completed. Construction trigger points include confirmed development and/or request from the Municipality of Bluewater.	Complete
S-10	Disconnect the temporary connection for Oakwood Links Condominiums from the Lambton Shores sewage collection system and connect it to the new Phase 1 trunk sewer on Highway 21 at Indian Road. This project will commence upon completion of the Phase 1 trunk sewer.	Complete

3.2 Relevant Historic Reports

A review of relevant reports was completed for additional project context and information pertinent to the confirmation of design parameters, including:

- Grand Bend Area Sewage Collection System Class Environmental Assessment (Gamsby and Mannerow Limiter, 2012)
- Dark Horse Estate Winery Sanitary Pumping Station and Forcemain Revised Design Brief (GM BluePlan, 2015)
- Exeter Wastewater Treatment Plant Upgrades – Tertiary Filtration and Disinfection (GM BluePlan, 2017)
- 2020 Development Charges Background Study (Watson & Associates, 2020)
- The Asset Management Plan for the Municipality of South Huron (The Public Sector Digest Inc., 2021)
- South Huron Wastewater Collection System and Exeter Wastewater Treatment Facility – 2021 Annual Report to Council
- MacNaughton BPS Upgrades – Reservoir Condition Assessment Summary (GM BluePlan, 2022)
- Huron Park Sewage Pumping Station Design Brief (GM BluePlan, 2022)

4 PROBLEM AND OPPORTUNITY STATEMENT

Through the Municipal Class EA process, Phase 1 requires the identification of a problem or opportunity statement that guides the development and evaluation of alternative strategies to address the deficiencies identified in the water and wastewater systems.

The MPU has been initiated to:

- Review and integrate the servicing needs to support existing system needs and support the buildout of the settlement area boundary; including allowances for future expansion of the existing settlement area boundaries;
- Review planning forecasts and determine the impacts on servicing needs for the Municipality's water and wastewater infrastructure;
- Re-evaluate growth needs and water supply and wastewater treatment capacities;
- Develop water and wastewater servicing solutions that include flexibility in servicing strategy and understanding of servicing impacts and costs; and,
- Update the long-term financial planning that includes a capital forecast to service existing and support growth and can be used as basis for development charges, water and wastewater utility rate updates, and the Drinking Water Quality Management Standard.

4.1 Master Plan Update Vision and Problem and Opportunity Statement

Through the Municipal Class EA process, Phase 1 requires the identification of the problem and opportunity statement that guides the process of establishing preferred strategies to address the deficiencies observed in the water and wastewater systems. The following vision statement is a driver for the MPU where problems and opportunities are clearly identified through the desire to provide an adequate level of service to users and improve system performance under both current and future conditions.

The Problem and Opportunity Statement is as follows:

Supporting a Strong and Growing Municipality

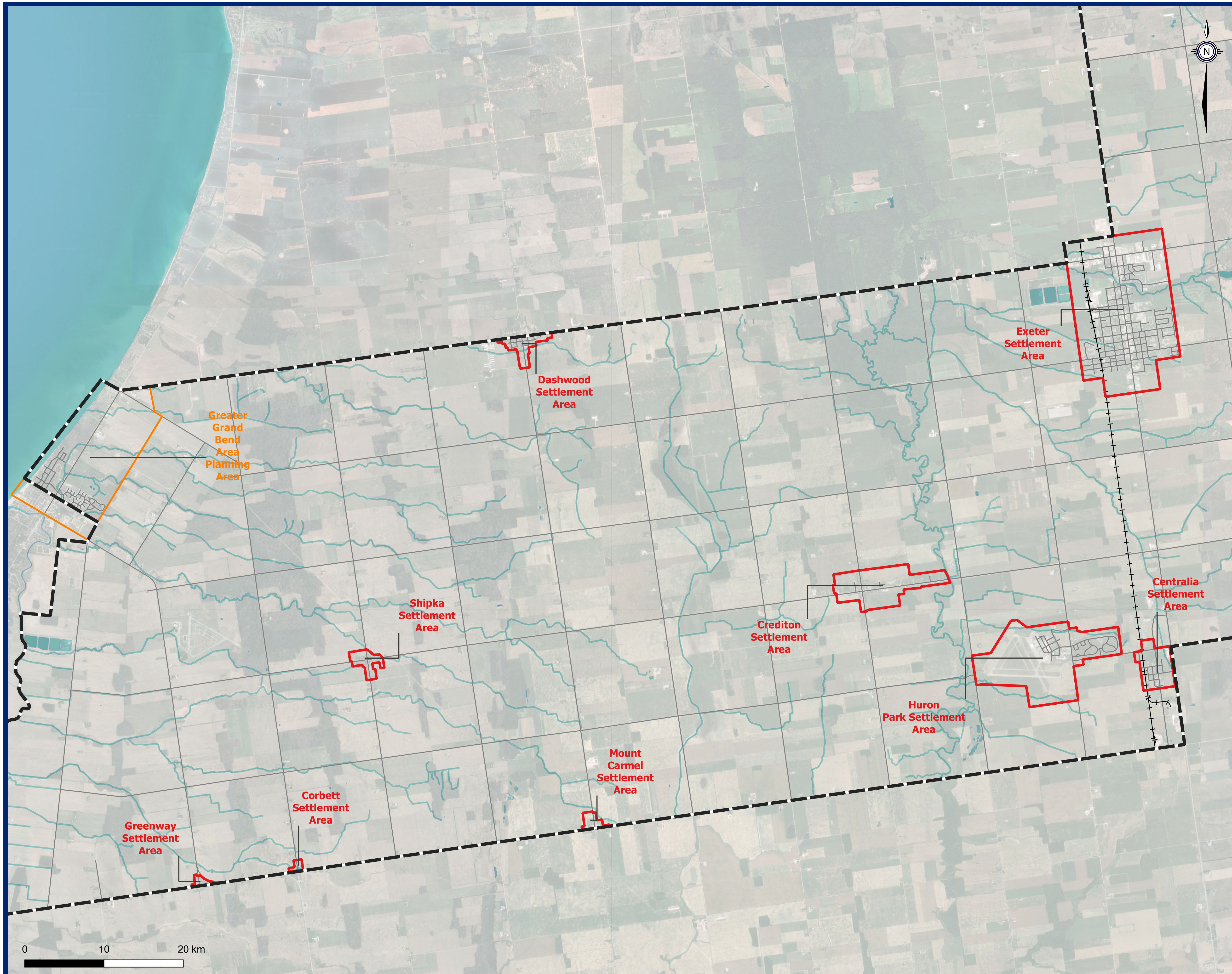
"To establish a preferred servicing plan for the Municipality's water and wastewater systems that, meets current needs, supports growth and expansion of the Municipality's settlement area boundary, maintains or improves service levels, considers priority areas of climate change, infrastructure optimization and renewal, and system resiliency."

5 STUDY AREA

The Municipality of South Huron is located in southwest Ontario, within the southern border of Huron County, approximately 45 km north of the City of London, as shown in **Figure 2**. The Municipality consists of predominantly agricultural land and includes towns and small rural communities. This MPU focuses on the town of Exeter and the Greater Grand Bend Area, the small rural communities of Dashwood, Crediton, Centralia, and Huron Park, plus the hamlets of Greenway, Corbett, and Mount Carmel. The Municipality of South Huron is a single tier municipality, which owns and is responsible for the planning, construction, and management of municipal water and wastewater infrastructure.

The Municipality has a total area of 423.4 km^2, with a 2021 Statistics Canada population of 10,063 people. The study area covers the water and wastewater systems within the limits of the Municipality. The water and wastewater study areas, including limits of existing infrastructure, are shown in **Figures 3** and **4**.

The Municipality of South Huron Water and Wastewater Masterplan

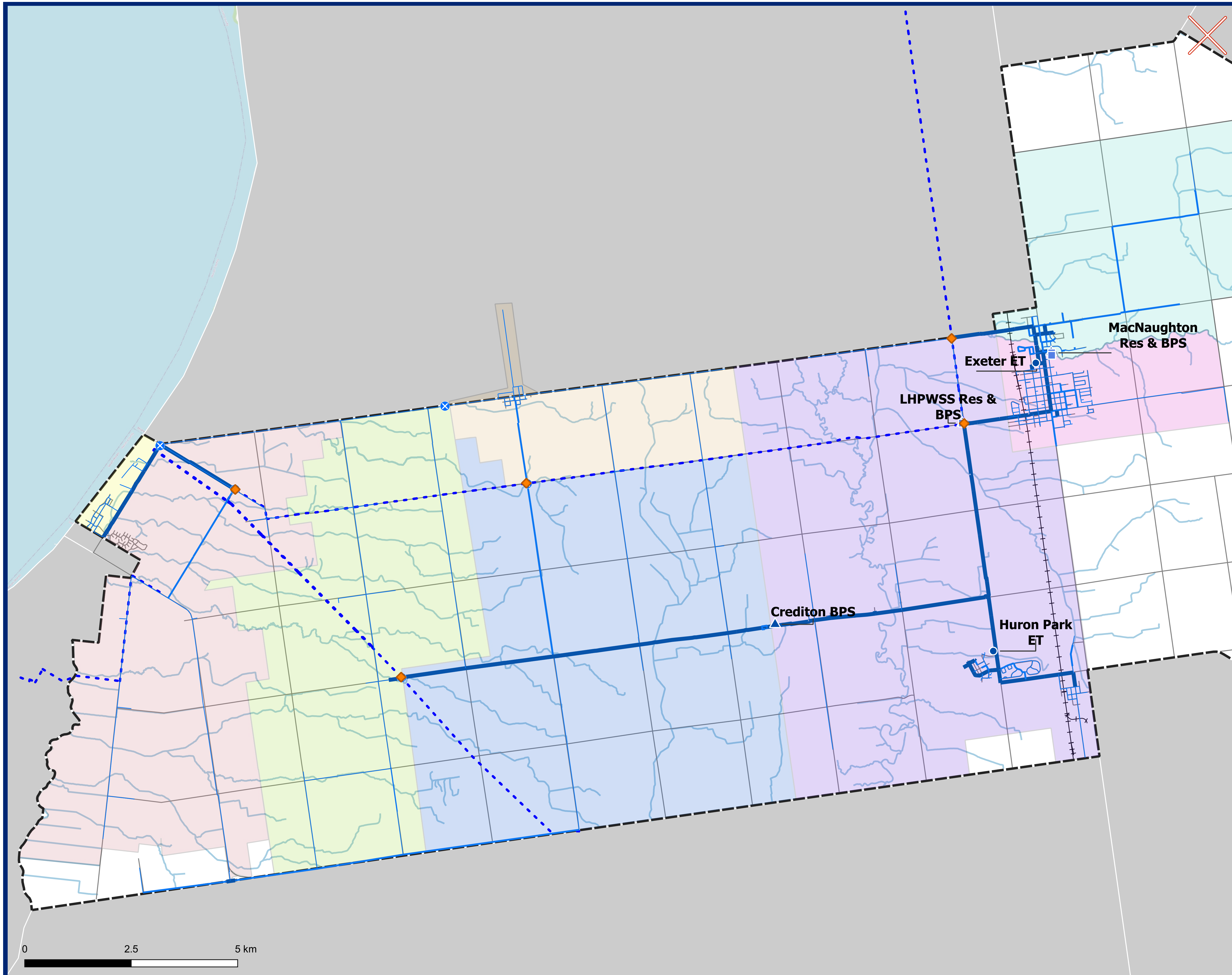


South Huron Boundary
Settlement Area
Greater Grand Bend Area
Watercourses
Waterbody

Figure 2

Municipality of South Huron

January, 2025
521054-G-001
Projection EPSG:26917



MUNICIPALITY OF SOUTH HURON 2001

The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure

- Elevated Tank
- Pumping Station
- Reservoir
- PRV
- Supply Connection Points
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Mains (LWHPSS)

Pressure Zones

- Dashwood Zone
- Huron Park Zone
- Exeter North
- Shipka Zone
- Exeter South
- West Crediton Zone
- West Zone
- Lower West Zone

General Features

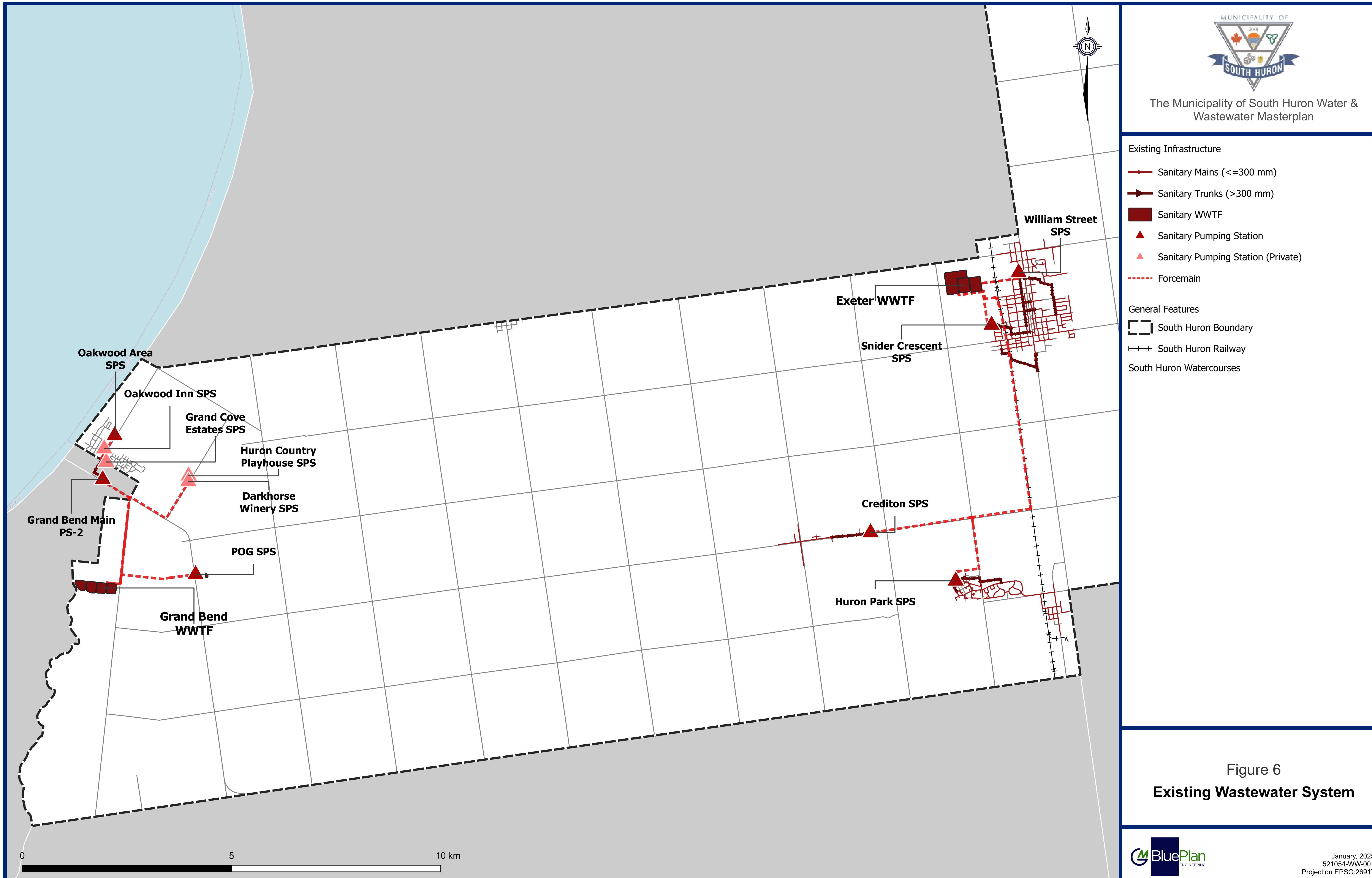
- South Huron Boundary
- South Huron Rail
- South Huron Watercourses

Figure 3

Existing Water System

GM BluePlan ENGINEERING

May, 2024
521054-W-001
Projection EPSG:26917



MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water & Wastewater Masterplan

Figure 6
Existing Wastewater System

GM BluePlan ENGINEERING

January, 2025
521054-WW-001
Projection EPSG:26917

6 PLANNING CONTEXT

6.1 Provincial and Federal Legislation and Policy Context

The Provincial Policy Statement sets the policy foundation for land use planning and development in Ontario. The Provincial Policy Statement provides guidance and support for appropriate land use planning and development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment.

The Provincial Policy Statement applies to land use planning decisions made under the Planning Act by provincial ministers, municipal councils, local boards and planning boards, among other approval authorities. All municipal decisions affecting planning matters shall be consistent with the policies outlined in the Provincial Policy Statement.

The Provincial Policy Statement contains policies relevant to water and wastewater infrastructure planning included, but not limited to:

- Requirement that infrastructure be provided in a coordinated, efficient and cost-effective manner with considerations to climate change.
- Planning for infrastructure should be financially viable over their lifecycle and available to meet current and projected needs.
- Optimization of the use of existing infrastructure and public service facilities before developing new infrastructure.

More specifically, the Provincial Policy Statement recommends that water and wastewater services should:

- Direct and accommodate expected growth in a manner that promotes the efficient use and optimization of existing municipal water and wastewater services.
- Ensure that these systems are provided in a manner that:
    - Can be sustained by the water resources upon which such services rely;
    - Is feasible, financially viable and complies with all regulatory requirements; and
    - Protects human health and the natural environment.
- Promote water conservation and water-use efficiency.
- Integrate servicing and land use considerations at all stages of the planning process.

6.1.1 Planning Reform Act

The Planning Act establishes the rules for land use planning in Ontario. It describes how land uses may be controlled in communities. Changes to the planning system were introduced in 2006 by the Planning and Conservation Land Statute Law Amendment Act. Key changes are as follows:

- Municipalities must now update their official plan every ten years or ever five years after an update done through an amendment to the plan, followed by an update of the accompanying zoning by-law within three years after the new official plan is in effect;
- There are more opportunities for public input before local decisions are made;
- Municipalities have enhanced ability to plan for a range and mix of housing types and densities; and,
- Municipalities have additional ability to have the final say on whether designated employment lands can be changed to other uses.

6.1.2 Bill 13, Sustainable Water and Wastewater Systems Improvement and Maintenance Act, 2010

This Bill enacts the Sustainable Water and Wastewater Systems Improvement and Maintenance Act, 2010 and repeals the Sustainable Water and Sewage Systems Act, 2002. The Bill had it first reading on March 23rd, 2010. Key points of the Bill are as follows:

- Sets out the purposes of the Act, which include ensuring that public ownership of water services and wastewater services is maintained;
- Establishes the Ontario Water Board as an agent of the Crown and sets out the Board’s objectives, powers and duties which relate to the regulation of water services and wastewater services;
- Sets out the responsibilities of municipalities or groups of municipalities that are designated as regulated entities by regulation; and,
- Regulated entities must prepare business plans for the provision of water services or wastewater services. The plan must contain, among other things, an assessment of the full cost of providing water services or wastewater services to the public and a description of how the regulated entity intends to pay this full cost.

6.1.3 Water Opportunities and Conservation Act

The Ontario Government passed the Water Opportunities and Conservation Act in 2010. The purposes of the Act are as follows:

- To foster innovative water, wastewater, and stormwater technologies, services and practices;
- To create opportunities for economic development and clean-technology jobs in Ontario; and,
- To conserve and sustain water resources for present and future generations.

To further the purposes of the Act, the Minister of the Environment, Conservation, and Parks may establish aspirational targets in respect of the conservation of water and other matters.

The Act requires certain municipalities, persons and entities to prepare, approve and submit to the Minister of the Environment, Conservation, and Parks municipal water sustainability plans for municipal water services, municipal wastewater services and municipal storm water services under their jurisdiction. The Minister may establish performance indicators and targets for these services. The Act also authorizes the making of regulations requiring public agencies to prepare water conservation plans, achieve water conservation targets, and consider technologies, services and practices that promote the efficient use of water and reduce negative impacts on Ontario’s water resources.

6.1.4 Safe Drinking Water Act

The Safe Drinking Water Act was adopted in 2002. The Act provides for the protection of human health and the prevention of drinking water hazards through the control and regulation of drinking water systems and drinking water testing. Key features of the Act include the following:

- Legally binding standards for contaminants in drinking water;
- Requirement to use licensed laboratories for drinking water testing;
- Requirement to report any results that do not meet the standards to the Ministry of the Environment, Conservation, and Parks and the local Medical Officer of Health and to undertake corrective action;
- All operators of municipal drinking water systems must be trained and certified;
- Establishment of a licensing regime for drinking water systems; and,
- Inspections and enforcement to determine compliance with the Act.

6.1.5 Clean Water Act

The Clean Water Act was adopted in 2006 with the objective to protect existing and future sources of drinking water including rivers, lakes, and underground aquifers. The Act requires the following:

- That local communities assess existing and potential threats to their water, and that they set out and implement the actions needed to reduce or eliminate these threats;
- Empowers communities to take action to prevent threats from becoming significant;
- Public participation on every local source protection plan – the planning process for source protection is open to anyone in the community; and,
- That all plans and actions be based on sound science.

6.1.5.1 Source Water Protection

Under the Clean Water Act, O. Reg. 287/07, on-site sewage systems and sewage works may be considered a threat to drinking water. These activities may be deemed significant under certain conditions. The applicable source protection plan policies have been considered throughout this MPU.

Source Water Protection (SWP) Plans were prepared for the 19 watershed-based Source Protection Regions (SPR) across Ontario to protect existing and future sources and to identify areas of significant drinking water threats. The Municipality of South Huron falls within the Ausable Bayfield Maitland Valley Source Protection Region.

The Source Water Protection Plans identify vulnerable areas that have been delineated under the Clean Water Act including Wellhead Protection Areas (WHPA), Intake Protection Zones (IPZ), Highly Vulnerable Aquifers (HVA), Significant Groundwater Recharge Areas (SGRA), and Vulnerable Scoring Areas for Groundwater and Surface Water (VSA) as well as water quantity vulnerable areas. According to the Source Protection Plan;

- WHPAs are areas on the land around a municipal well, the size of which is determined by how quickly water travels underground to the well, measured in years.
- IPZs are the areas on the water and land surrounding a municipal surface water intake.
- SGRAs are areas characterized by porous soils that allow the water to seep easily into the ground and flor to an aquifer.
- HVAs are aquifers that can be easily changed or affected by contamination from both human activities and natural processes as a result of (a) its intrinsic susceptibility, as a function of the thickness and permeability of overlaying layers, or (b) by preferential pathways to the aquifer.

As the Municipality's water supply is from Lake Huron, it is located within an IPZ.

6.1.6 CCME Strategic Vision for Water

In 2009, the Canadian Council of Ministers of the Environment (CCME) provided a framework for future actions and activities related to water through the development of a vision and action plan, such that Canadians have access to clean, safe and sufficient water to meet their needs in ways that also maintain the integrity of ecosystems. The goals and rationale developed as part of the vision includes the following:

Goal 1: Aquatic ecosystems are protected on a sustainable watershed basis.

- Rationale: Enhance understanding and application of Integrated Water Resource Management to improve ecosystem health.

Goal 2: The conservation and wise use of water is promoted.

- Rationale: Improve understanding of the full value of water to achieve behavioral change.

Goal 3: Water quality and water quantity management is improved, benefitting human and ecosystem health.

- Rationale: Promote nationally consistent approaches to water quality and quantity monitoring, guidelines and multi-jurisdictional public reporting. Encourage research and networks to enhance knowledge and understanding of ground and surface waters.

Goal 4: Climate change impacts are reduced through adaptive strategies.

- Rationale: Enhance water quality and quantity monitoring networks to support water and adaptation needs.

Goal 5: Knowledge about Canada's water is developed and shared.

- Rationale: Help to spearhead value added information on water quality and quantity by supporting jurisdictional reporting efforts to Canadians in a systematic and consistent fashion.

6.1.7 Canada-Wide Strategy for the Management of Municipal Wastewater Effluent

This 2009 Strategy was developed by the CCME and it requires that all facilities achieve minimum National Performance Standards and develop and manage site-specific Effluent Discharge Objectives. The Strategy requires that overflow frequencies for sanitary sewers not increase due to development or redevelopment. The same applies for combined sewers, unless occurring as part of an approved combined sewer overflow management plan. Neither should occur during dry weather, except during spring thaw and emergencies. Source control of pollutants is recommended, and monitoring and reporting on effluent quality required. The 2014 Progress Report outlined the progress made by signatory federal, provincial and territorial jurisdictions on the commitments made in the 2009 Strategy.

6.1.8 CCME Wastewater Systems Effluent Regulations

The proposed CCME Wastewater System Effluent Regulations were published in March 2010, with the final Regulations published on June 29, 2012 and was amended January 2015. These Regulations are the primary instrument that Environment Canada is using to implement the CCME Canada-wide Strategy for the Management of Municipal Wastewater Effluent.

The proposed Regulations apply to any wastewater system that has a capacity to deposit a daily volume of effluent of 100 m^3 or more from its final discharge point. The effluent from the applicable wastewater systems would be compared against “national effluent quality standards”, which are as follows:

- Average carbonaceous biochemical oxygen demand (cBOD) due to the quantity of BOD matter in the effluent of less than or equal to 25 mg/L;
- Average concentration of suspended solids in the effluent of less than or equal to 25 mg/L;
- Average concentration of total residual chlorine in the effluent of less than or equal to 0.02 mg/L; and,
- Maximum concentration of un-ionized ammonia in the effluent of less than 1.25 mg/L, expressed as nitrogen, at 15°C ± 1°C.

6.1.9 Canadian Environmental Protection Act – Inorganic Chloramines and Chlorinated Wastewater Effluents in Municipal Wastewater Effluent

The Canadian Environmental Protection Act (CEPA) required the elimination of toxic chlorine residuals from municipal wastewater effluent. All owners and operators of wastewater systems with daily volumes greater than 5,000 m^3 of effluent were required to lower their total residual chlorine (TRC) levels to less than 0.02 mg/L or lower by December 15, 2009.

6.1.10 Ministry of the Environment, Conservation, and Parks Procedure F-5-1

Procedure F-5-1 outlines the treatment requirements for municipal and private sewage treatment works discharging to surface waters. Effluent requirements are established on a case-by-case basis considering the characteristics of the receiving water body. All sewage treatment works shall provide secondary treatment or equivalent as the "normal" level of treatment, unless individual receiving water assessment studies indicate the need for higher levels of treatment. Existing works not complying with the guideline are required to upgrade as soon as possible. The Procedure stipulates effluent design objectives for biological oxygen demand (BOD), suspended solids, total phosphorus and ammonia and provides guidelines for BOD and suspended solids. It is the responsibility of the Municipality to ensure sewage treatment works are designed according to the guidelines and should be able to meet the objectives on an average annual basis and not exceed the guidelines.

6.1.11 Species at Risk Act (SARA)

At a federal level, species at risk designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment, species are added to the federal List of Wildlife Species at Risk (Government of Canada 2002). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the Species at Risk Act (SARA). On private or provincially-owned lands, only aquatic species listed as endangered, threatened or extirpated and migratory birds are protected under SARA, unless ordered by the Governor in Council.

6.1.12 Endangered Species Act (ESA)

Species at risk designation for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of Natural Resources and Forestry, species are added to the provincial Endangered Species Act (ESA), which came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as endangered or threatened in the various schedules to the Act. The ESA also provides habitat protection to all species listed as threatened or endangered. As of June 30, 2008, the Species at Risk in Ontario (SARO) List is contained in O. Reg. 230/08.

6.1.13 Fisheries Act

The purpose of the Fisheries Act is to maintain healthy, sustainable and productive Canadian fisheries through the prevention of pollution, and the protection of fish and their habitat. In 2012, changes were made to the Fisheries Act to enhance Fisheries and Oceans Canada (DFO) ability to manage threats to Canada's commercial, recreational and Aboriginal (CRA) fisheries.

Projects affecting waterbodies supporting Canada's CRA fisheries must comply with the provisions of the Fisheries Act. The proponent is responsible for determining if the project is likely to cause impacts to CRA fish and if these impacts can be avoided or mitigated.

6.2 Conservation Authority Regulation and Policy

The legislative mandate of the Conservation Authority, as set out in Section 20 of the Conservation Authorities Act, is to establish and undertake programs designed to further the conservation, restoration, development and management of natural resources.

Conservation Authorities are local agencies that protect and manage water and other natural resources at the watershed level. These agencies have a number of responsibilities and functions in the land use planning and development process.

The study area falls within the jurisdiction of the Ausable Bayfield Conservation Authority (ABCA).

ABCA is a commenting agency on the development applications under the Planning Act based on regulations approved by their Board of Directors and the province. Conservation Authority has agreements with partnering municipalities to provide technical services regarding matters associated with natural heritage protection, hazardous land management and water resources (e.g., stormwater management).

In addition, Conservation Authorities have the delegated responsibility from the Ministries of Natural Resources and Municipal Affairs and Housing to implement Section 3.1 (Natural Hazards) of the Provincial Policy Statement (2014), consistent with the Provincial one-window planning initiative.

ABCA also administers Regulation 166/06 and Regulation 179/06 respectively, under Section 28 of the Conservation Authorities Act. In general, these regulations prohibit altering a watercourse, wetland or shoreline and prohibit development in areas adjacent to river and stream valleys, hazardous lands and wetlands, without the prior written approval from the Conservation Authority (i.e., issuance of a permit).

6.3 Municipality of South Huron Legislation and Policy

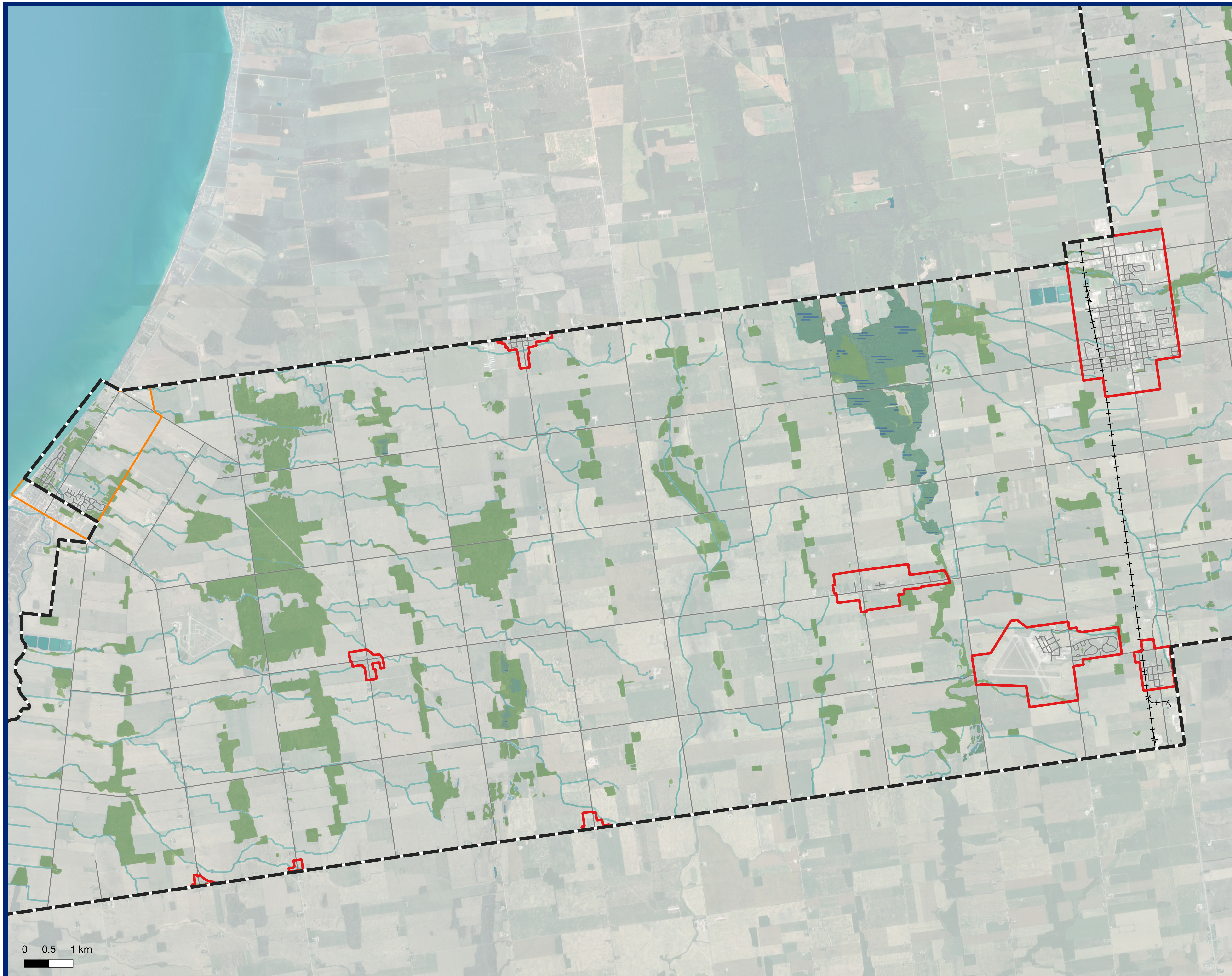
The Municipality of South Huron's Official Plan, consolidated June 2021, establishes the land use policies to guide future development and manage growth and describes the Council's policies on land use. Policies on land use include appropriate location of residential, industrial, commercial, and institutional properties, location of services (i.e., roads, watermains, sewers, parks, and schools), and the order of the Municipality's growth plan.

7 ENVIRONMENT EXISTING CONDITIONS

7.1 Natural Environment Policy Context

The Municipality of South Huron Official Plan includes a set of policies to protect and enhance the natural heritage resources. Within the Municipality, there exists a system of natural areas primarily comprised of wetlands, woodlands, and watercourses. The South Huron natural environment, shown in **Figure 5**, includes the followings:

- Five sub-watersheds of the Ausable-Bayfield Watershed including: Lower Parkhill, Upper Parkhill, South Gullies, Black Creek, and Upper Ausable
- Several shallow and bedrock aquifers
- Two Earth Science Areas of Natural and Scientific Interest (ANSI) (Ontario Ministry of Natural Resources identified areas having provincially or regionally significant representative geological features) including: Dashwood Area Earth Science ANSI and Centralia Area Earth Science ANSI
- One Life Science ANSI (OMNR identified area having provincially or regionally significant representative ecological features) including: Khiva Conservation Forests
- Three locally significant wetlands including: Keller Swamp, O'Brien Swamp, and MacDonald Marsh
- One Conservation Area: Crediton Conservation Area (recreational)
- Approximately 2.5 km of Lake Huron Shoreline
- The South Huron Trail
- Ausable-Bayfield Watershed



MUNICIPALITY OF SOUTH HURON 2001

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Port Blake Planning Area
- South Huron Boundary
- Rail

Natural Heritage

- Watercourses
- Waterbodies
- Wetlands
- Wooded Regions

Figure 5

Natural Environment

BluePlan ENGINEERING

May, 2024
521054-G-001
Projection EPSG:26917

7.1.1 Source Water Protection

The LHPWSS WTP is located at 71155 Bluewater Highway in Grand Bend, within the Municipality of South Huron, and draws water from Lake Huron with OCWA as the accredited operating authority. The LHPWSS supplies the Municipalities of London, Lambton Shores, North Middlesex, South Huron, Bluewater, Lucan-Biddulph, Middlesex Centre, and Strathroy-Caradoc. The WTP has a current rated treatment capacity of 340 MLD (Million Liters per Day) based on the Drinking Water Works Permit.

The water intake structure for the LHPWSS Water Treatment Plant is located approximately 2 km offshore to the west of the study area. The intake is encircled by a primary intake protection zone (IPZ1) with a 1 km radius. The secondary intake protection zone (IPZ2) for the water treatment plant includes portions of the study area, extending over 1 km inland in some areas.

The Ausable Bayfield Maitland Valley Drinking Water Source Protection Committee provided South Huron with a communique to help with understanding the focus of the procedures and requisites used to establish the SGRA, HVA and IPZ. Future water source protection planning may include a broad scope of assessment of threats and therefore the Municipality should remain aware and vigilant of these threats to drinking water when planning development and land uses in the area of the LHPWSS WTP intake zone.

7.2 Cultural Heritage and Archaeology

The Municipality encourages and supports heritage preservation. The Municipality’s atmosphere has a great sense of continuity between the past and the present as defined by its cultural heritage resources, which include: built heritage resources, cultural heritage landscapes, and archaeological resources. The Municipality has established policies to conserve its cultural heritage. For any matters relating to the heritage resources of the municipality, a Municipal Heritage Advisory Committee may be established to ensure the best conservation for the resources.

7.2.1 Built Heritage Resources and Cultural Heritage Landscapes

The Ontario Heritage Act gives municipal council the authority to designate heritage properties that have cultural heritage value or interest based on their historical, contextual, and/or architectural significance in the community. Under the Act, designated heritage properties are protected from demolition and a Heritage Permit is required to make changes to a designated property. There are 5 designated heritage properties in South Huron and an additional 6 properties with high heritage value.

A baseline Cultural Heritage Assessment Report (CHAR) should be completed to determine known and potential cultural heritage resources as they relate to potential infrastructure projects. This may lead to a Heritage Impact Assessment (HIA). The site specific HIA should be conducted prior to water and/or wastewater works on or adjacent (contiguous) to all properties designated under the Ontario Heritage Act and/or subject to a heritage plaque

7.2.2 Archaeology Resources

Before approving land development project regulated by legislation, the Municipality – like all Ontario municipalities – is required to undertake an archaeological assessment of all lands that are part of the project. Assessments are required when the land is known to have an archaeological site on it or has the potential to have archaeological resources.

Public development projects such as watermain or sewer construction require an archaeological assessment under the EAA directly or through a Class EA. In many cases, an EA determines the need for an archaeological assessment, which is completed as part of the overall environmental assessment process. Upon completion, the archaeological assessment must be sent to the Ministry of Heritage, Sport, Tourism, and Culture Industries for review to ensure the terms and conditions of the archaeological assessment were met and that any archaeological sites found were properly conserved.

8 GROWTH PROJECTIONS

This section summarizes the growth scenario considered under the MPU and the rational for the preferred growth scenario utilized to develop the recommended water and wastewater upgrade alternatives.

Due to the general uncertainty in the long-term growth rate within the Municipality of South Huron Settlement Area Boundary (SAB), as well as, the phasing and timing of individual development blocks; the basis of the MPU is to identify the long-term servicing requirement to support the full buildout of the SAB with consideration of potential future SAB expansions where such expansions are reasonably feasible and do not result in excessive infrastructure oversizing and do not negatively impact the operation of existing systems. Further to the SAB buildout, a number of potential rural development areas outside the SAB were also identified and appropriate servicing solutions were also identified.

Growth projections outlined within this MPU are based on best available planning information as provided by the Municipality. It is understood that identified development areas including development status, unit counts, and growth projections may be adjusted. Further, it is understood that this MPU is intended to serve as a guiding document and that the Municipality will review individual applications based on their own merit and may adjust the identified capacity project timing and/or capacity requirements based on development applications received.

8.1 Existing Population

Existing population data was taken from both the 2021 census and 2020 Development Charges Background Study and compared against the total number of addresses at 2.37 people per unit (PPU) which was the average from the 2020 Development Charges Background Study. The existing population of South Huron is detailed in **Table 5**.

Table 5: Municipality of South Huron Existing Population

Description	Development Charges Background Study	Statistics Canada – Municipality of South Huron	South Huron Billing Data
Year	2020	2021	2022
Population	10,303	10,063	9,560
Total Households	4,344	4,339	4,034
PPU	2.37	2.32	2.37[1]
Employment	3,992	-	-
Total Population + Employment	14,295	-	-

[1]Development Charges Background Study, 2020 PPU average

The South Huron billing data is based on the properties serviced by water infrastructure noting that the serviced wastewater population is lower than the serviced water population. Based on the comparison, the calculated population is in line with the population in the Municipality.

8.2 Growth Areas

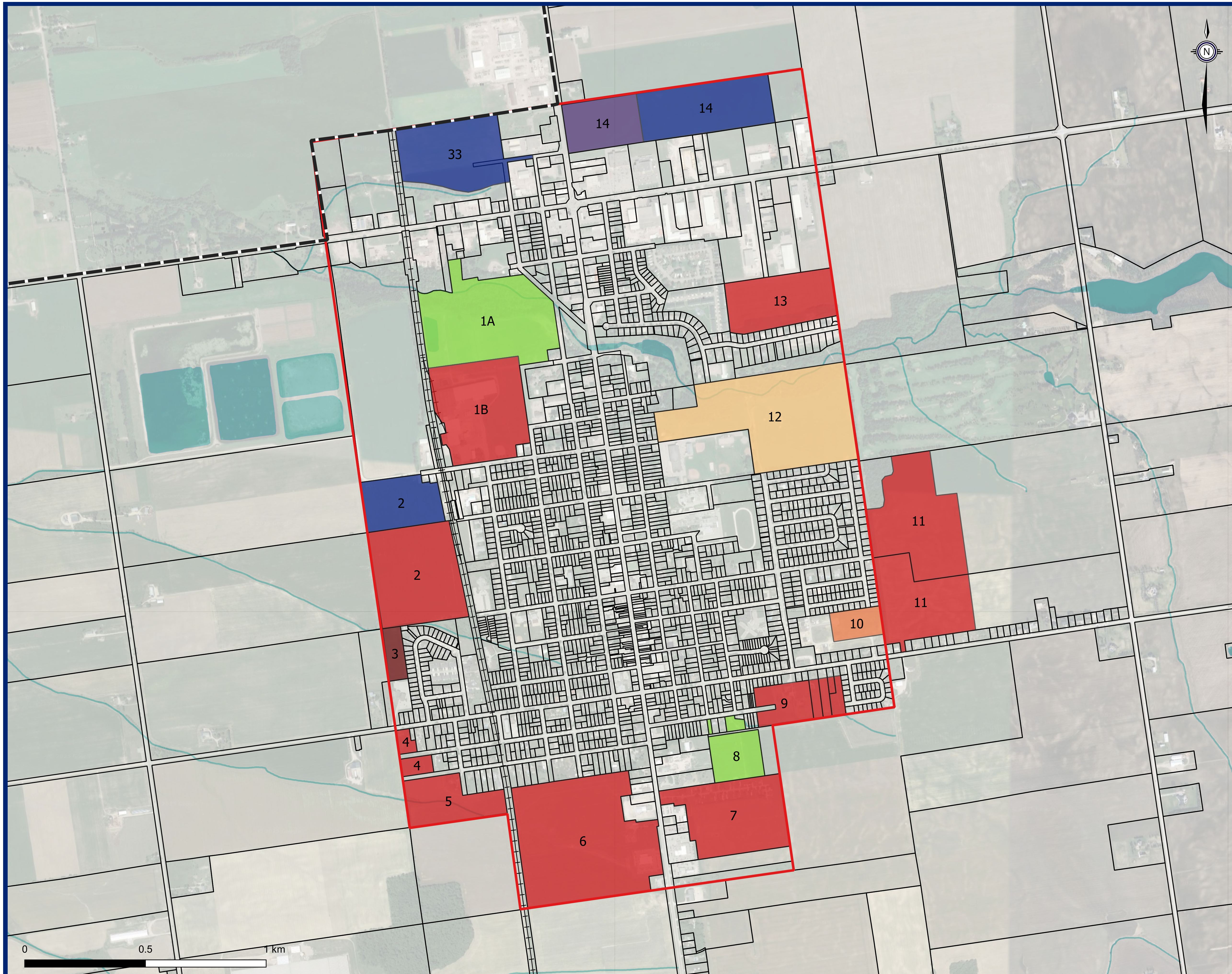
Growth projections were derived using the development and planning information provided by the Municipality. These growth populations were estimated using the design criteria listed below:

- Where the number of development units were known: 2.3 people per unit
- Where the number of development units were unknown: 40 people per hectare

Figures 6 through **9** and **Table 6** highlight the development blocks and their corresponding status and population. Some of the development blocks have corresponding population and employment projections while other blocks are based on the growth projection assumptions.

Table 6: Growth Estimates

#	Status	Name	Town	Type	Area (ha)	Units	Potential Population
1A	Developed	Buckingham Estates	Exeter	Res	18.8	120	276
8	Developed	Southpoint Subdivision	Exeter	Res	1.8	38	87
10	Partially Developed	Stoney Ridge	Exeter	Res	3.7	32	74
1B	Potential Residential Area	HDC Lands	Exeter	Res	11.4	328	754
2	Potential Commercial/ Industrial/ Residential Area	Ondrejicka	Exeter	Res/Emp	13.8	-	552
3	Long Term Care Facility	Southbridge	Exeter	Res	1.7	99	228
4	Potential Residential Area	Willis Way	Exeter	Res	1.6	6	14
5	Potential Residential Area	Shapton	Exeter	Res	2.2	38	87
6	Potential Residential Area	McBride	Exeter	Res	26.5	-	1,060
7	Potential Residential Area	Hamather	Exeter	Res	12.1	120	276
9	Potential Residential Area	Pooley	Exeter	Res	5.8	100	230
11	Potential Residential Area	Hamather/McBride	Exeter (Outside SAB)	Res	19.0	178	409
12	Draft Plan Approved	Windermere Subdivision	Exeter	Res	23.6	160	368
13	Potential Residential Area	Rasenberg	Exeter	Res	9.4	163	375
14	Potential Residential Area	CVD Subdivision	Exeter	Res/Emp	17.5	238	916
33	Potential Commercial/ Industrial Area	Exeter Produce	Exeter	Emp	11.9	-	475
17B	Pre-Servicing Agreement	Sol Haven Phase I	Grand Bend	Res	12.2	182	490
15	Potential Residential Area	South of Pollock Farms	Grand Bend (Outside SAB)	Res	10.7	127	292
16	Potential Residential Area	Turnbull Lands	Grand Bend (Outside SAB)	Res	41.1	456	1,049
17A	Potential Residential Area	Sol Haven Phase II	Grand Bend	Res	40.4	241	501
18	Potential Residential Area	Zone 2 Future Development	Grand Bend	Res	164.9	1,088	2,502
19	Potential Residential Area	Grand Cove Estates Phase 5	Grand Bend	Res	4.0	34	78
28	Potential Commercial/ Industrial Area	Bendtech	Grand Bend (Outside SAB)	Emp	21.2	-	850
31	Potential Commercial Area	Watson	Grand Bend	Emp	3.5	-	141
35	Potential Residential Area	Hotson	Grand Bend	Res	8.4	-	336
36	Potential Commercial Area	Grand Bend Proposed Commercial	Grand Bend (Outside SAB)	Emp	11.1	-	444
20	Potential Residential Area	Crediton Village Centre	Crediton	Res	33.6	337	775
21	Potential Residential Area	Morrisey	Crediton	Res	1.3	8	18
22	Potential Residential Area	Stephan	Crediton	Res	7.4	-	298
23	Potential Residential Area	Huron Park Proposed 1	Huron Park	Res	4.1	48	110
24	Potential Residential Area	Huron Park Proposed 2	Huron Park	Res	9.5	98	225
29	Potential Residential Area	Huron Park Proposed 3	Huron Park	Res	1.3	-	51
30	Potential Residential Area	Huron Park Proposed 4	Huron Park	Res	1.5	-	58
25	Potential Residential Area	Pavkeje Subdivision	Centralia	Res	3.4	13	30
26	Potential Residential Area	Hodgins	Centralia	Res	4.8	-	194
27	Potential Residential Area	Centralia Proposed 1	Centralia	Res	2.0	-	81
34	Potential Industrial Area	Centralia Proposed 2	Centralia	Emp	5.1	-	204
37	Potential Industrial Area	Centralia Proposed 3	Centralia (Outside SAB)	Emp	6.1	-	244
				Centralia	**21.5**	**13**	**753**
				Exeter	**180.7**	**1,620**	**6,181**
				Grand Bend	**317.5**	**2,128**	**6,737**
				Crediton	**42.3**	**345**	**1,091**
				Huron Park	**16.3**	**146**	**445**
				Total	**578.4**	**4,252**	**15,208**



MUNICIPALITY OF SOUTH HURON 2001

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 6

Exeter Proposed Growth

GM BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

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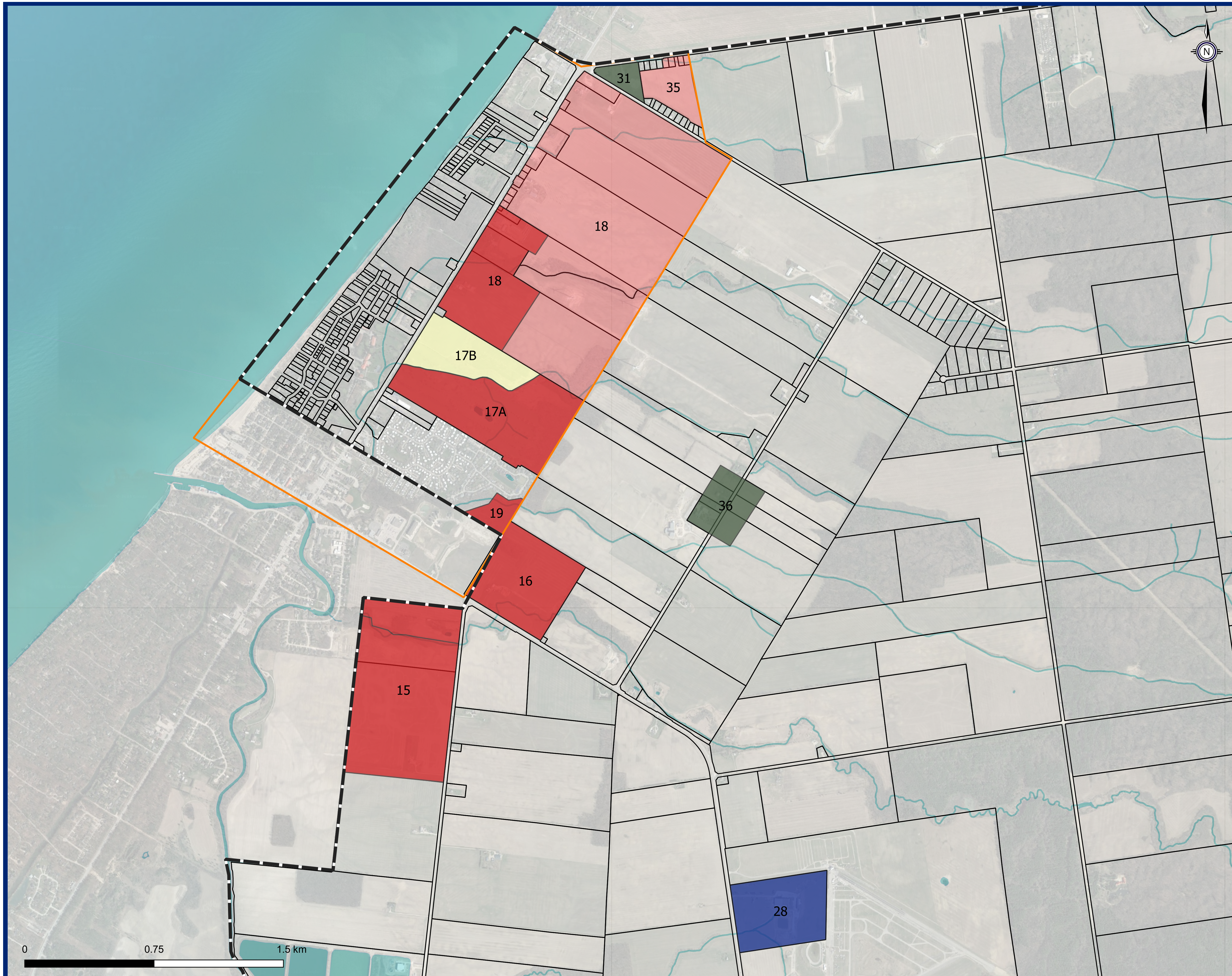

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Port Blake Planning Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 7

Grand Bend Proposed Growth

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

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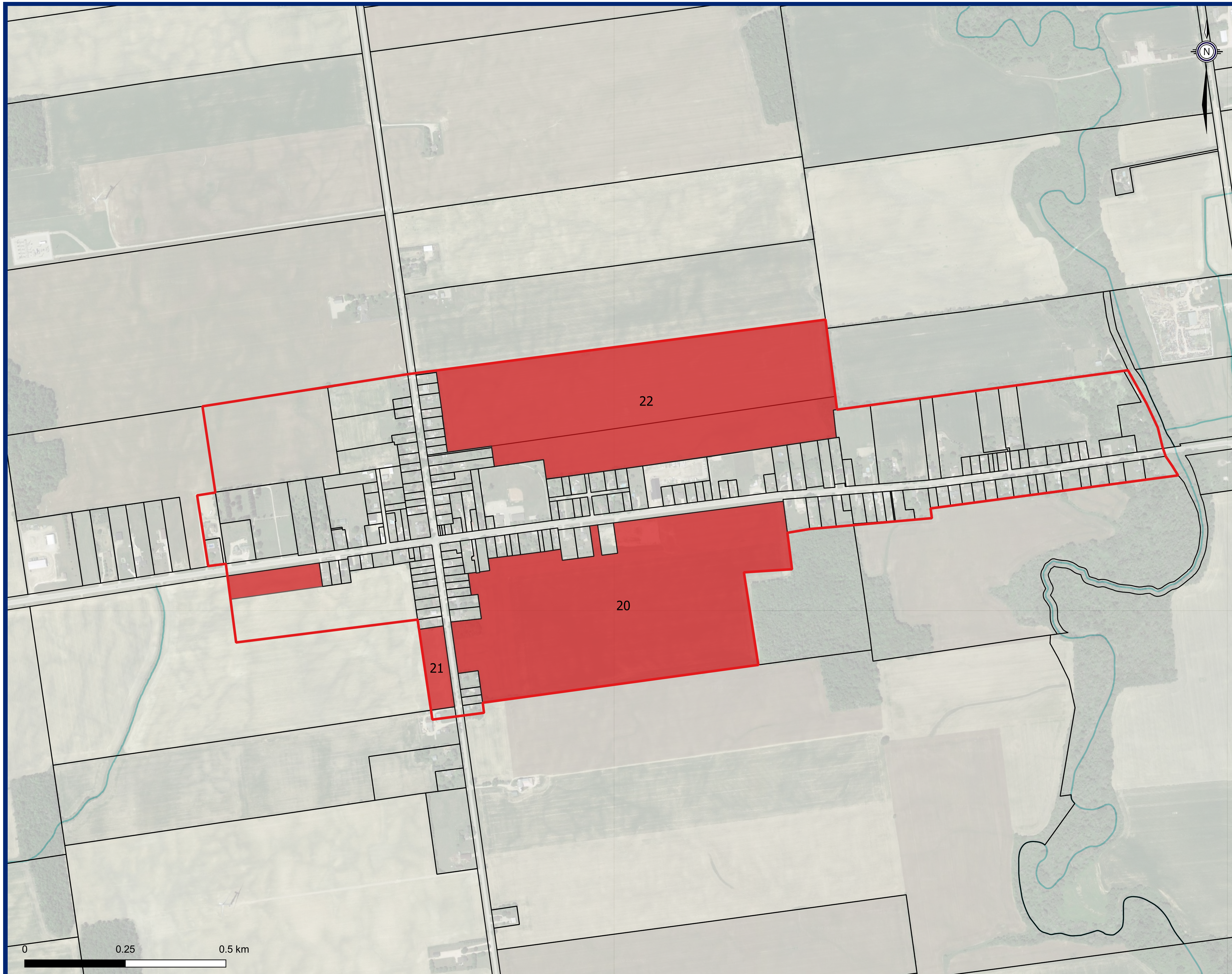


The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

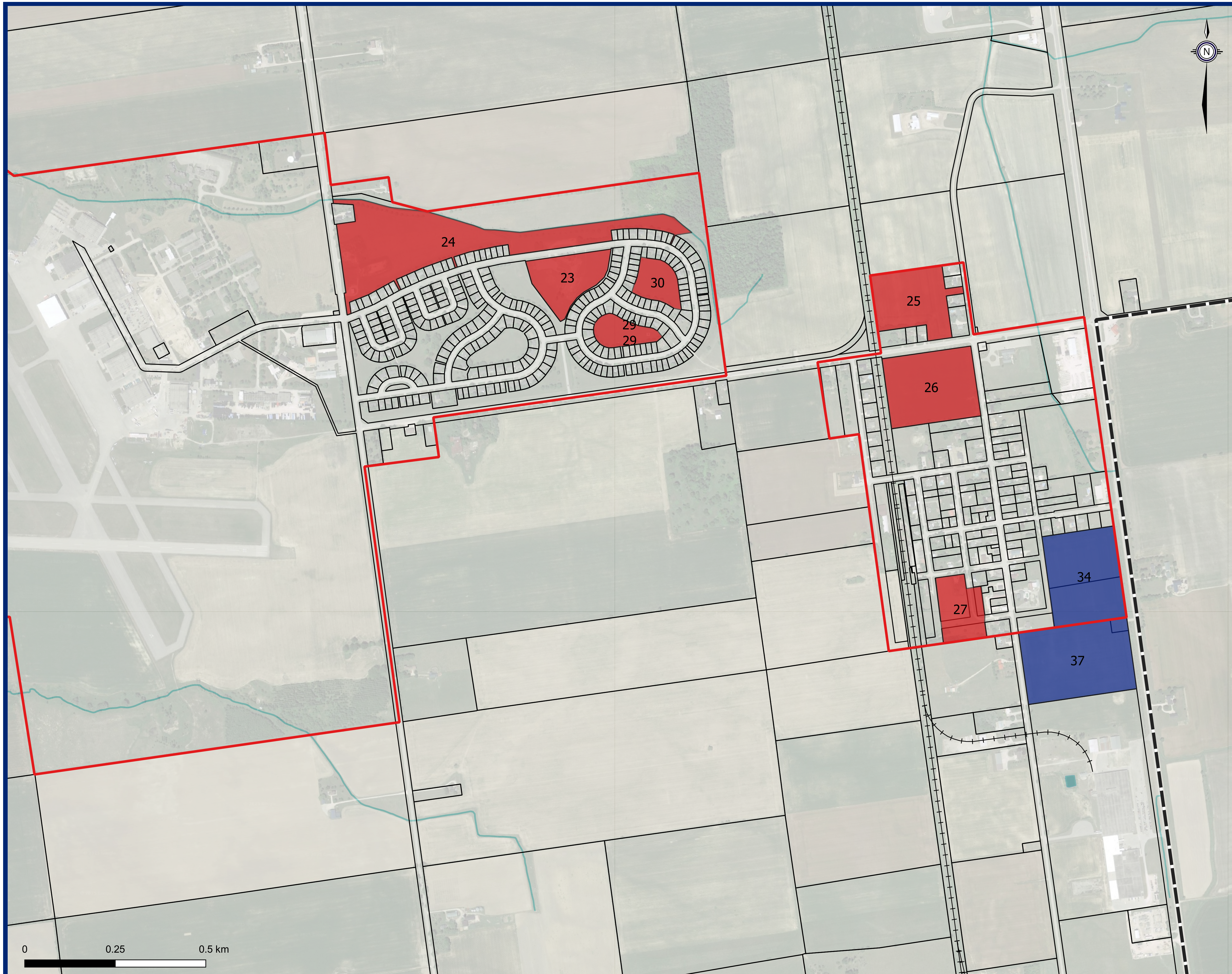
- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 8

Crediton Proposed Growth

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917



MUNICIPALITY OF SOUTH HURON 2001

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 9

Huron Park / Centralia Proposed Growth

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

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8.3 Post Period Considerations

The servicing analysis focuses on servicing the proposed development, mostly within the existing SAB; however, in the development of the recommended servicing strategy and infrastructure sizing, consideration for the buildout of the expansion of the Municipality's SAB was considered assuming similar population and employment densities. Where applicable, identification of future facility expansion needs and/or strategic upsizing of linear infrastructure was identified and incorporated into the final recommended servicing plan.

8.3.1 Exeter

In the future, the SAB may be expanded to capture lands east to Morrison Line, south to Kirkton Road, west to Airport Line and north of Thames Road. This expansion will be reviewed under the Municipality's new Official Plan which will determine if and to what extent to which the SAB is to be expanded. The proposed land use designations for the expansion areas will also be determined at that time. The possibility of these additional lands was considered when reviewing the Municipality's existing infrastructure as well as new infrastructure and upgrades.

8.3.2 Grand Bend

The Grand Bend SAB includes the properties along the east side of Highway #21, currently designated as Agricultural Lands. As these lands are within the Planning Area and have potential for development in the future, they have been included in the strategic sizing of linear infrastructure within the Grand Bend system.

The draft Official Plan Update includes future development lands in the Grand Bend settlement area (SAB) east of Mollard Line and north of County Road #81. These lands have also been assessed when reviewing the recommended servicing strategy and infrastructure sizing.

Future development lands are included in the draft Official Plan Update on Mollard Line south of County Road #81. These lands will develop concurrently with adjacent land-locked lands in Lambton Shores and servicing will be stand alone systems and integrated with the Lambton Shores development.

There are also lands outside of the Planning Area, such as surrounding the Darkhorse Winery and Huron County Playhouse, as well as the Bendtech property. These lands have also been assessed when reviewing the recommended servicing strategy and infrastructure sizing.

9 DESIGN CRITERIA AND HYDRAULIC PERFORMANCE CRITERIA

A guiding principle of design criteria is to ensure that the demand and flows projections are adequately predicted with an appropriate factor of safety and risk management. This overall principle also ensures that infrastructure has sufficient capacity to meet the growing needs of the Municipality and does not impede the approved/planned growth.

The design criteria were reviewed as part of this MPU to ensure that they are accurate and will support sizing and timing of future infrastructure.

9.1 Water Design Criteria and Hydraulic Performance Criteria

The development of water design criteria utilized historical billing data in combination with MECP Design Standards and Guidelines. Level of Service and water policies were discussed and established at the outset of the project. The development of hydraulic performance criteria used the water model to establish system capacity. **Volume II** outlines the background information used to form the water design and Level of Service criteria presented in **Table 7**.

Table 7: Water Level of Service Criteria

<table>
<tr><th colspan="2">Description</th><th colspan="2">Criteria</th></tr>
<tr><td>System Performance Targets</td><td>Pressure</td><td colspan="2">40 – 100 psi</td></tr>
<tr><td rowspan="6">Fire Flow</td><td rowspan="5">Flow Target</td><th>Landuse</th><th>Flow (L/s)</th></tr>
<tr><td>Dead-End / Rural Residential</td><td>50</td></tr>
<tr><td>Single / Semi Family</td><td>50</td></tr>
<tr><td>Townhouse / Multi Family</td><td>125</td></tr>
<tr><td>Institutional, Commercial, and Industrial (ICI) Properties</td><td>150</td></tr>
<tr><td>Fire Storage</td><td colspan="2">MECP guideline</td></tr>
<tr><td rowspan="3">Facility Capacity</td><td>Facility Triggers</td><td colspan="2">80% Planning and Design
90% Construction</td></tr>
<tr><td>Storage</td><td colspan="2">MECP Methodology (A+B+C)
A = Fire Storage
B = Equalization Storage (25% of MDD)
C = Emergency Storage (25% of A+B)</td></tr>
<tr><td>Pumping</td><td colspan="2">Firm capacity = Largest pump out of service
Pump capacity sized to provide:
• MDD where sufficient elevated storage is available; or,
• Greater of PH) or MDD+FF where no/ insufficient elevated storage is available; further, fire flow needs are based on the highest land-use based fire flow target within the pressure zone.</td></tr>
</table>

9.2 Wastewater Design Criteria and Hydraulic Performance

The development of water design criteria utilized historical flow data in combination with MECP Design Standards and Guidelines. Level of Service and wastewater policies were discussed and established at the outset of the project. The development of hydraulic performance criteria determined historic conditions and growth flows to establish system capacity. **Volume III** outlines the background information used to form the water design and Level of Service criteria presented in **Table 8**.

Table 8: Wastewater Level of Service Criteria

<table>
<tr><th colspan="2">Description</th><th>Criteria</th></tr>
<tr><td rowspan="2">Facility Capacity</td><td>Facility Triggers</td><td>80% Planning and Design
90% Construction</td></tr>
<tr><td>Pumping</td><td>Firm capacity =
• Largest pump out of service (pump capacity); and,
• Largest forcemain out of service (when multiple forcemains are present)
Sanitary Pumping Station (SPS) to convey peak 10-year flows</td></tr>
<tr><td rowspan="3">System Performance</td><td>Peak Wet Weather Design Flows</td><td>10-Year Design Storm</td></tr>
<tr><td>Existing Infrastructure</td><td>Hydraulic Grade Line Target 2.1 meters below ground level or depth/Diameter (d/D) ≤1.0</td></tr>
<tr><td>New/Upgraded Infrastructure</td><td>depth/Diameter of pipe (d/D) ≤ 0.7</td></tr>
<tr><td colspan="2">Extraneous Flow Program</td><td>Requirement of the flow monitoring of new developments to ensure development is achieving design flows.</td></tr>
</table>

10 EVALUATION METHODOLOGY

The development and evaluation of alternatives, with the ultimate goal of determining the recommended servicing strategy, generally follows the approach outlined below for each infrastructure group:

1. Define opportunities and constraints within the study area, by evaluating existing and future system performance and facility needs, such that high-level servicing concepts are developed. These high-level servicing concepts address key system deficiencies and servicing considerations to best satisfy the previously defined principles, policies, and levels of service. The appropriateness and feasibility of these servicing concepts will be assessed through consultation with the Municipality staff and a high-level evaluation to determine which servicing concepts will be carried forward.
2. Determine the servicing alternatives, through the refinement of the high-level servicing concepts, which fully detail necessary projects, impacts, and costing. These servicing alternatives will undergo detailed evaluation using criteria and process defined in the following sections. The intent of the detailed evaluation is to objectively assess and compare each alternative such that the recommended strategy exhibits the most positive benefits while minimizing its negative impacts.

The following sections detail the process and criteria which will be used to evaluate both the high-level concepts and the detailed alternatives. This is applicable for water and wastewater infrastructure.

10.1 Evaluation Process

The evaluation process, undertaken for the development and selection of a preferred servicing strategy, is outlined in **Figure 10**.

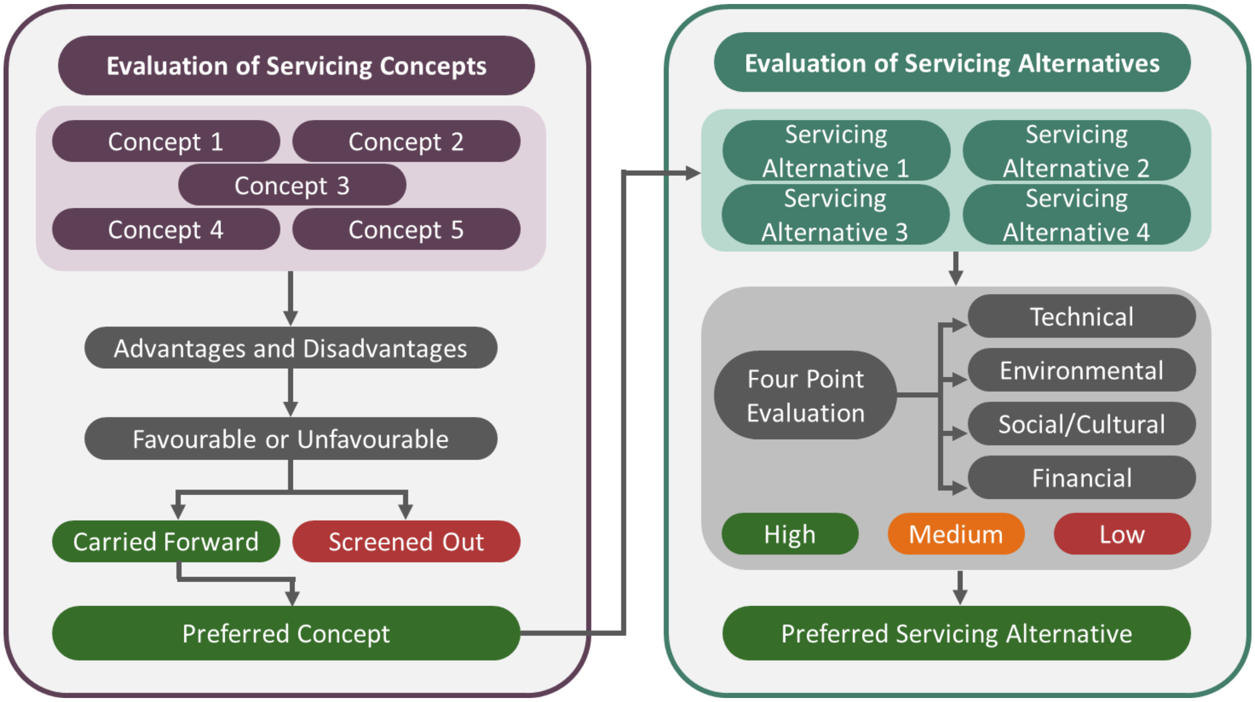


Figure 10: Evaluation Methodology Flow Diagram

10.1.1 Evaluation of Servicing Concepts

The first step in determining the preferred servicing strategy is to determine the feasibility of the high-level servicing concepts. The overall advantages and disadvantages of these concepts will define which concepts are “favourable” vs. “unfavourable” to subsequently screen out concepts which are deemed unfavourable. The favourable concepts will be carried forward and further refined into servicing alternatives and undergo a more stringent evaluation. Further, it should be noted that all servicing concepts were presented to Municipality staff to confirm the further refinement and evaluation.

10.1.2 Evaluation of Servicing Alternatives

The second step in determining the preferred servicing solution is to evaluate the detailed servicing alternatives. This process uses the reasoned argument approach to provide a clear and thorough rationale of trade-offs among each alternative based on the anticipated impacts caused by the evaluation criteria. The basis of this approach is to qualitatively evaluate the relative advantages, disadvantages, and impacts of each alternative against the established criteria.

Further to the qualitative evaluation, the following criteria score will be assigned to each criteria for each servicing alternative:

- “High” concepts generate beneficial impacts and/or has no substantial technical challenges; these are depicted in green within the evaluation tables.
- “Medium” concepts present a mix of positive and negative elements with some impacts; these are depicted in yellow within the evaluation tables.
- “Low” concepts present negative impacts and/or presents significant technical challenges; these are depicted in red within the evaluation tables.

This process is intended to highlight the preferred alternative through the evaluation of technical, environmental, social/cultural, and financial categories.

10.2 Evaluation Criteria

The evaluation matrices, which outline both the qualitative reasoning and score for each servicing alternative, will be used in selecting the preferred servicing strategy. The servicing alternatives will be subject to a four-point evaluation which includes technical, environmental, social/cultural, and financial impacts categories. The detailed criteria within each category are outlined in **Table 9**.

Table 9: Evaluation Categories and Criteria

Category	Criteria	Description
Technical Impacts	Meets existing and future servicing needs	To assess the alternative's ability to satisfy the project problem and opportunity statements and to achieve the desired system technical level of service objectives. This includes capacity to meet existing level of service and capacity to support future growth.
	Provides a reliable service	To assess the overall system configuration's ability to: support flexibility in system operations, provide system redundancy, minimize the risk related to single element failure, perform under power outage, and adapt to the potential impacts of climate change. Includes the feasibility, maintenance, and flexibility of the alternative's implementation (i.e. length of linear needs associated operation and maintenance, additional pumping due to hydraulic conditions, or regular maintenance requirements).
	Minimizes and manages construction risk	To assess the alternative's constructability including scope of infrastructure upgrades including maximizing existing infrastructure, environmental significance, time required to complete construction, and impact on existing utilities. This also includes assessing the timing and technical suitability of project implementation with the aim of improving the overall flexibility in project phasing and reducing the number of critically dependent components.
	Supports phased expansion of the system	To assess whether the proposed servicing strategy minimizes the total system upgrades, maximizing the capacity/use of existing facilities, and provides flexibility in servicing of growth areas.
	Operational Complexity	To assess whether the proposed servicing strategy will result in a system which is difficult to operate and maintain.
	Resiliency to climate change	To assess the alternative's resiliency to maintain the desired system level of service objectives due to climate changes impacts. This includes assessment of system resiliency and/or the facility and network vulnerability to climate related failures such as flooding.
Environmental Impacts	Protects environment features	To assess, monitor and ensure the preservation and protection of aquatic resources and other natural features. This includes minimizing any impact to wetlands (Locally or Provincially Significant, identified by Conservation Authority and Province), wildlife habitat, or valley lands, which may be identified by Conservation Authorities, Municipalities, or Province.
	Protects wildlife and species at risk	To assess any potential species at risk. The implementation should maintain the function of habitat for locally significant wildlife, including endangered or threatened species.
	Minimizes climate change impacts	Uses technology and practices, where applicable, to minimize climate change impacts and reduce greenhouse gas contributions. This includes consideration during the construction process, day to day operations, and future maintenance requirements.
Social and Cultural Impacts	Protects resident quality of life	To assess the proposed alternative's ability to maintain or improve upon the existing level of service. Further, to assess any impacts to existing residents due to the long-term operation of any new/modified linear infrastructure and/or facilities including aesthetic impacts.
	Manages and minimizes construction impacts	To assess any impact to existing built up areas (residents, businesses) due to construction activities, including creating noise/dust/vibrations, traffic and traffic flow, limiting access to properties (temporary), or other. This also includes identifying needs to alter timing and scope of the construction practices to minimize impacts.
	Protects cultural heritage and archeological features	To assess impacts to a structure, property or district which has been previously identified to be of cultural heritage or archeological value or interest. Impacts may be deemed as temporary (i.e. site access) or permanent (i.e. altering the existing conditions).
Financial Impacts	Capital and life-cycle costs	To minimize the capital and lifecycle costs of the new/upgraded infrastructure and maximizes use of existing infrastructure. Outlines costs required for phasing of growth.

11 PROJECT COTSING

The cost estimation approach used for the MPU, uses a classification system to categorize different cost estimate classes. These classes represent different phases of planning and design, and subsequently different methods of cost estimation and levels of accuracy. This framework complements the generic approach developed by the Association of Advancement in Cost Estimating (AACE) International and has similarities to the Government of Canada (GOC) approach. For the purposes of the MPU it is expected that all the cost estimates will follow a Class 4 estimate; however, it is important to establish the level of accuracy that can be expected and as the project matures through planning to design, how the higher-class estimates refine the costs. Each of the key components is described below, including:

- Cost Estimate Classes
- Project Complexity
- Area Condition
- Estimate Accuracy Range
- Construction and Project Contingency
- Construction Provisional and Allowance
- Additional Costs

The unit costs and all the above components are contained in MPU Capital Program spreadsheets which also include standard project details sheets. The spreadsheets are the working tool that brings all the cost components together to create a project cost estimate and are included in **Volume II** and **Volume III** for each program.

11.1 Unit Rates

Suggested unit rates are based on supplier material costs, tender analysis, and historic project costs from multiple municipalities across southern Ontario. In this recommended approach the unit rates are the starting point or base for a cost estimate. Many other factors and criteria are applied to the unit rates. As such, caution is advised when comparing recommended unit rates in isolation with those used for previous studies. Only full and complete costs estimates should be compared.

A number of special cases for estimating unit rates for linear infrastructure costs which include:

- Where linear infrastructure upgrades align with road reconstruction projects, unit rates only include for the linear infrastructure and include 50% of the costs associated with road reconstruction
- Along rural roads within Stephen, linear infrastructure costing reflects a lower, “rural” unit rate

11.2 Cost Estimate Classes

Table 10 provides a description of the proposed estimate classes and their end usage or deliverables.

Table 10: Cost Estimation Classes

Estimate Class	Estimate Class Description	End Usage / Major Deliverables
Class 4	Planning Cost Estimate	Infrastructure Planning/Master Planning. Justification for project planning funding. Minimum information requirements.
Class 3	Concept Design Cost Estimate	Basis for budgeting and approvals.
Class 2	Preliminary Design Cost Estimate	Used for project cost control during design; initial detailed estimate.
Class 1	Detailed Design Cost Estimate	Final cost review in preparation for construction; tender ready.

11.3 Project Complexity

Table 11 provides a general definition of project complexity.

Table 11: Project Complexity Descriptions

Project Complexity	Complexity Description
High Complexity	Projects with high cost, broad scope of work, multiple alternatives/alignments, etc.
Low Complexity	Projects with low cost, defined scope of work, few if any alternatives

11.4 Area Condition

Area Condition provides an allowance for the increased cost of constructing in built-up areas, applied to the base construction cost. **Table 12** provides a general definition and the construction uplift cost percentage of the area condition.

Table 12: Area Condition Descriptions

Construction Environment	Environment Description	Construction Cost Uplift %
Rural	Greenfield construction with no environmental constraints	0%
Suburban	Developed built up environment	20%
Urban	Heavily developed built up environment – downtown area	30%

11.5 Estimated Accuracy Range

The accuracy range is defined by the cost estimate class and the project complexity. **Figure 11** shows how the estimate varies based on the two input criteria. The accuracy percentage applies to the total base cost plus all allowances and contingencies.

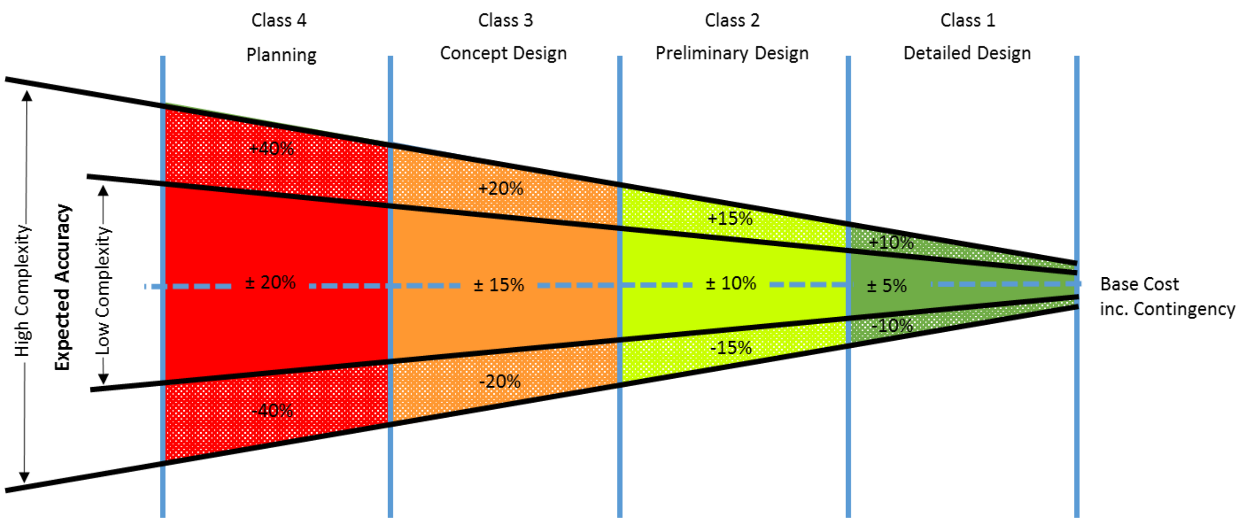


Figure 11: Cost Estimate Accuracy Range

An accuracy range is an acknowledgment that even with a formal cost estimation framework, and appropriate contingencies, actual costs may still vary because of 'unknown unknowns', such as changes in the economy or new future innovative technologies. These unknowns can just as easily result in a lower final cost as a higher one, even with the application of an appropriate contingency. A recent example is the value of the Canadian dollar. In 2013, the Canadian dollar was at par with the American dollar, and in 2018 it was $0.77. If an American supplier is being used for the project, a final cost in 2020 will significantly vary from that estimated in 2013. This variance should not be associated with the contingency amount.

The accuracy range is not an additional contingency and should not be used for budgeting or funding purposes but rather be a representation of the level of confidence or vulnerability associated with a cost estimate (base + contingency). The concept of an accuracy range is that after the inclusion of an appropriate contingency, it is just as likely that the final cost will be below the estimate as above and it is therefore expected that the long-term aggregate of cost estimates (base + contingency), within each class, will balance out.

The accuracy range for each class is comprised of a high and low value to provide flexibility with respect to the project complexity and corresponding levels of cost estimating confidence.

In summary, as the class and project details increase (left to right in **Figure 11**), or as the project complexity decreases (top to bottom in **Figure 11**), the cost estimate is less vulnerable to 'unknown unknowns' and therefore the extent of the accuracy range will be narrower.

11.5.2 Construction and Project Contingency

There is a certain amount of risk and uncertainty associated with each class of cost estimation. The associated risk and uncertainty are minimized with the addition of a contingency. Contingencies are an allowance for risks that are known or anticipated at early stages of the project definition, i.e. they represent probable events that are 'known unknowns' and experience has shown are likely to occur. They cannot be attributed to specific items in the base estimate but need to be considered in addition to the base cost. It should be noted that a project contingency does not cover changes in scope, which are dealt with on their own and should be defined in the project management plan.

Two types of contingency are recommended for use; construction contingency and project contingency.

11.5.3 Construction Contingency

Construction contingency is a percentage contingency amount applied to the base construction costs. It accounts for any additional construction costs not included in the unit rates, valves, and crossings. It includes Mobilization/Demobilization, connections, inspection, hydrants, signage, traffic management, bonding, and insurance. Construction contingency changes with project complexity, as follows:

- Low Complexity Construction Contingency: 10%
- High Complexity Construction Contingency: 20%

11.5.4 Project Contingency

Project contingency is a percentage applied to the entire project cost inclusive of all soft costs and fees. It accounts for any additional cost associated to any part of the project including soft cost such as consultant engineering and design, geotechnical and property costs. As such the project contingency changes with project complexity as well as project estimate class, as shown in **Figure 12**.

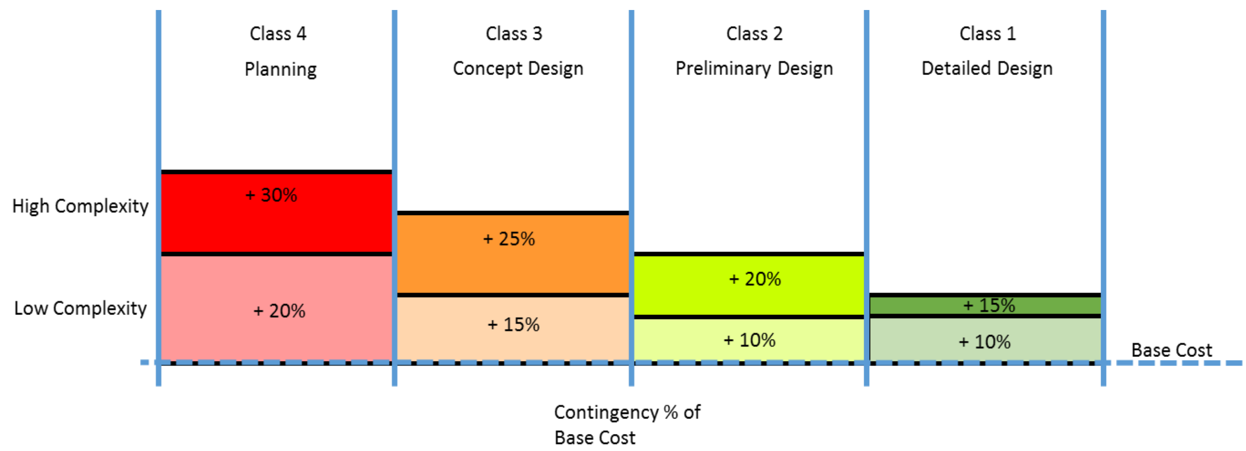


Figure 12: Cost Estimate Contingency Amounts

11.6 Construction Provisional and Allowance

It is recommended that a provisional amount be applied to the base construction costs in the event of increased construction labour and/or material costs. Provisional Project Costs remain separate from the primary project cost but must be included for budgeting purposes. Regardless of estimate class or project complexity it is recommended that 10% of the base construction cost is applied as a Provisional Allowance.

11.7 Additional Costs

Additional Costs capture all soft costs associated with the project. If available, actual quoted costs should be used. In the absence of actual costs, percentage amounts, applied to the base construction costs, are recommended. Such costs are related to project complexity and total project cost, as such percentages vary accordingly. **Table 13** shows the percentages to be applied for high and low complexity and different value projects.

Table 13: Additional Cost Components

Cost Component		High Complexity	Low Complexity
Geotechnical / Hydrogeological / Materials		2% of construction cost	0.5% of construction cost
Property Requirements (including property acquisition)		2% of construction cost	1% of construction cost
Consultant Engineering/Design	Total Construction Cost <$10M	15% of construction cost	
	Total Construction Cost $10M to $50M	12% of construction cost	
	Total Construction Cost >$50M	10% of construction cost	
In House Labour/ Engineering/ Wages/CA	Total Construction Cost <$10M	8% of construction cost	
	Total Construction Cost $10M to $50M	6% of construction cost	
	Total Construction Cost >$50M	4% of construction cost	
Non-refundable HST		1.76% of Total costs	

12 PUBLIC CONSULTATION

The Public Consultation section provides a compilation of all the relevant documentation related to the public, stakeholder and agency consultation. This section also provides the background support for satisfying the Public Consultation for the Class EA Process.

12.1 Communication and Consultation Summary

Public consultation is an integral component of the Class EA process, enabling the Municipality to inform the public about the study while eliciting input from potentially interested and affected parties during the study process.

The primary goals of the public consultation process are to:

- Present clear and concise information to stakeholders at key stages of the study process;
- Solicit community, regulatory and Municipality staff input;
- Undertake comprehensive consultation to complete the duty to consult with Aboriginal people in Ontario;
- Consider stakeholder comments when evaluating alternative solutions and in recommending the technical feasible solution; and,
- Comply with Municipal Class EA consultation requirements.

At the outset of the public consultation process, the Municipality of South Huron developed a Communication and Consultation Plan tailored to this study. The primary objective of the plan was to encourage two-way communication with the community, regulatory agencies and Municipality staff. More specifically, the plan was designed to:

- Build on past communication protocols and consultation plans from previous Class EAs and municipal planning initiatives - to ensure consistency and continuity;
- Ensure the general public, local councillors, stakeholders, external agencies (including federal, provincial and regional), Indigenous Peoples, and special interest groups had an opportunity to participate in the study process;
- Ensure that relevant information was provided to interested and affected stakeholders early and often throughout the planning process; and,
- Make contact with external agencies to obtain legislative or regulatory approvals, and to collect pertinent technical information.

In order to comply with the Municipal Class EA process, the Municipality hosted a PIC to elicit input on the study process and the preliminary preferred servicing solution and infrastructure projects.

12.2 Contact List

A list of stakeholders, review agencies and other interested parties was developed at the outset of the study to invite participation in the planning process. The contact list was updated throughout the study as more individuals became aware of the study or provided feedback. The stakeholder list is provided in **Appendix A**.

12.3 Notice of Commencement

The Notice of Commencement was published and distributed on October 11, 2023, provided in **Appendix B**. The notice was made public by the following means:

- Mailed/ e-mailed to the stakeholders listed in the contact list;
- Posted on the Municipality's website; and,
- Advertised in the Exeter Lakeshore Times Advance, a weekly newspaper on October 11 and October 18, 2023.

12.4 Public Information Centre

The study's PIC was intended to elicit input on the Class EA process, servicing constraints and opportunities, alternative concepts and strategies to address the servicing challenges and opportunities, and the technically feasible solution. The study included one PIC.

The Notice of Commencement was published and distributed on April 3, 2024. The notice was made public by the following means:

- Mailed/ e-mailed to the stakeholders listed in the contact list;
- Posted on the Municipality's website; and,
- Advertised in the Exeter Lakeshore Times Advance, a weekly newspaper on April 3 and April 10, 2024.

The PIC was held during Phase 2 of the Class EA study process to present the systems opportunities and constraints, present preliminary preferred servicing strategies and received public input. The PIC 1 was held at the location and date provided in **Table 14**.

Table 14: Public Information Centre Details

Date	Location
April 16, 2024 6:00 p.m. to 8:00 p.m.	South Huron Recreation Centre 94 Victoria Street East, Exeter

Details on the attendance, comments received, and display panels presented during the PIC are provided in **Appendix C**.

12.5 Aboriginal and First Nations Consultation

Following the Notice of Commencement, the MECP provided GM BluePlan with a list of Aboriginal and First Nation's communities who may potentially be affected by the Municipality's Master Plan. The identified communities include:

- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island)
- Caldwell First Nation
- Chippewas of Kettle and Stony Point
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames

These communities were added to the project contact list and received all project notices throughout the project's timeline.

12.6 Comments Received

Through the public consultation process, comments were received from stakeholders. These comments were filed and addressed accordingly. **Table 15** provides a summary of comments received during this study. **Appendix D** provides the detailed list of comments received throughout the study.

Table 15: Consultation Comments Summary

Date	Stakeholder Organization	Comment	Response/Action
10/13/2023	County of Huron	Received request to change the contact in our stakeholder list.	Updated stakeholder list.
10/19/2023	Lake Huron & Elgin Area Primary Water Supply Systems	Received request to update the contacts in our stakeholder list.	Updated stakeholder list.
10/19/2023	Oakwood Park Association	Received request to update the contacts in our stakeholder list to the current president of the association.	Updated stakeholder list and resent Notice of Commencement.
10/20/2023	Resident	Received request to resend the Notice of Commencement and update the stakeholder list.	Updated stakeholder list and resent Notice of Commencement.
10/20/2023	Whitewave Consulting	Received request to resend the Notice of Commencement and update the stakeholder list.	Updated stakeholder list and resent Notice of Commencement.
10/23/2023	County of Huron	Received request to update the contacts in our stakeholder list.	Updated stakeholder list.
11/6/2023	Resident	Received questions related to what triggered the study as Stantec completed a study in 2018 and requested information on the status of several Class EAs completed in 2012.	The Project Team provided response noting it's standard practice for municipalities to regularly review their strategic plans. GMBP also provided information on how long Municipal Class EAs are valid for and whether they might require an addendum or updates.

Date	Stakeholder Organization	Comment	Response/Action
11/28/2023	Hydro One Networks	A letter was provided confirming Hydro One has existing high voltage transmission facilities within the study area. Hydro One requested to continue to receive project information so they can advise on potential impacts.	No action required.
12/5/2023	Chippewas of the Thames First Nation	Received letter via email providing a response to project information provided with the Notice of Commencement. COTTFN noted the project has been identified as moderate concern but have no current comments but would like to continue to inform of any project updates using NationsConnect.	No action required.
1/8/2024	Upper Thames River Conservation Authority	Received letter via email acknowledging receipt of the Notice of Study Commencement and noting the request to review and provide comments on any upcoming draft documents and proposed alternatives. UTRCA also provided comments relating to regulations around completing works within conservation lands, availability of digital mapping outlining approximate boundaries of natural hazard features and Drinking Water Source Protection Areas, and the opportunity to assess Source Protection Plans and review requirements during the Master Plan.	No action required.

Date	Stakeholder Organization	Comment	Response/Action
4/2/2024	Lake Huron Primary Water Supply System	Received email requesting a contact change.	Updated stakeholder list.
4/3/2024	County of Huron	Received email requesting to be added to the stakeholder list.	Updated stakeholder list.
4/12/2024	Municipality of Lambton Shores	Received request to change the contact in our stakeholder list.	Updated stakeholder list.
4/12/2024	Municipality of Lambton Shores	Received request to add to stakeholder list.	Updated stakeholder list.
4/24/2024	Hydro One Networks	Received a letter indicating there is existing high voltage transmission facilities within the study area and that Hydro One is requesting to be consulted throughout the project.	No action required.
4/25/2024	Infrastructure Ontario	Received request to update stakeholder list and send all circulation to this contact.	Updated stakeholder list.
4/26/2024	Three Fire Groups (on behalf of Chippewas of Kettle and Stony Point First Nation)	Received email noting the contact is now overseeing consultation for the Chippewas of Kettle and Stony Point First Nation. The email acknowledged receipt of the Notice of PIC and shared contact information.	Updated stakeholder list. The Project team provided a response indicating the contact information has been updated and future we future project correspondence will continue to be provided.

12.7 Notice of Completion

The Notice of Completion was published and distributed in 2025 to notify the public that this Project File Report was being placed on the public record for the required 30-day review period. The notice was made public by the following means:

- Mailed/ e-mailed to the stakeholders listed in the contact list,
- Posted on the Municipality's website; and
- Advertised in the Exeter Lakeshore Times Advance, a weekly newspaper on DATE.

A copy of the notice is provided in **Appendix E**. During the review period, the MCEA entitles interested persons, Indigenous Peoples, or government agencies who have significant concerns which cannot be resolved to request the MECP to issue a Section 16 Order under the EA Act.

If there are concerns regarding the study, a request may be made to the MECP for an order requiring a higher level of study (i.e., requiring a Schedule C Class EA or Individual/ Environmental Assessment), or that conditions be imposed (e.g., require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name for the Ministry.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy those potential adverse impacts, and any information in support of the statements in the request. This will ensure that the Ministry is able to efficiently begin reviewing the request.

Requests should be sent by email or in writing to:

Minister of the Environment, Conservation and Parks
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5

EABDirector@ontario.ca

APPENDIX A:
STUDY STAKEHOLDER LIST

Stakeholder Name	Organization	Category (Utilities, Provincial, Ministry, etc.)	Internal/ External	Title/ Role	Address Line 1	Address Line 2	City / Province	Postal Code	Contact Email	Contact Phone Number
INDIGENOUS COMMUNITIES										
Chief Christopher Plain	Aamjiwnaang First Nation	Indigenous Communities	External	Chief	978 Tashmoo Avenue		Sarnia, ON	N7T 7H5	chief.plain@aamjiwnaang.ca	519-336-8410
Cathleen O'brien	Aamjiwnaang First Nation	Indigenous Communities	External	Environment Coordinator	978 Tashmoo Avenue	Annex Building	Sarnia, ON	N7T 7H5		519-336-8410 ext. 245
Harrison Plain	Aamjiwnaang First Nation	Indigenous Communities	External	Band Manager	978 Tashmoo Avenue	Aamjiwnaang Administration Office	Sarnia, ON	N7T 7H5		519-336-8410 ext. 288
Geoff Stonefish	Association of Iroquois and Allied Indians	Indigenous Communities	External	Office Manager	387 Princess Avenue		London, ON	N6B 2A7	gstonefish@aiai.on.ca	519.434.2761
	Bkejwanong Territory (Walpole Island)	Indigenous Communities	External	Consultation Manager	117 Tahgahoning Road, RR3		Wallaceburg, ON	N8A 4K9		
Julie Le	Caldwell First Nation	Indigenous Communities	External	Executive Assistant/Communications Officer	14 Orange Street		Leamington, ON	N8H 1P5	ea@caldwellfirstnation.ca	519-322-1766
Jessica Wakefield	Three Fires Group (on behalf on Kettle & Stony Point First Nation)	Indigenous Communities	External	Executive Director, Major Projects and IBAs	A-9119 W Ipperwash Rd		Kettle & Stony Point	N0N 1J1	jessica.wakefield@threefires.com	
Shadia Ali	Chippewas of the Thames First Nation	Indigenous Communities	External	Communications Officer	320 Chippewa Road		Muncey, ON	N0L 1Y0	comms@cottfn.com	519-289-5555 ext. 242
Chief Justin Logan	Delaware Nation	Indigenous Communities	External	Chief	14760 School House Line, RR3		Thamesville, ON	N0P 2K0	justin.logan@delawarenation.on.ca	519-692-3936
Derrick Pont	Metis Nation of Ontario	Indigenous Communities	External		3250 Schmon Parkway	Unit 1A	Thorold, ON	L2V 4Y6	niagarametiscouncil@gmail.com	905-682-3487
	Metis Nation of Ontario	Indigenous Communities	External						consultations@metisnation.org	
Abby LaForme	Mississaugas of the Credit First Nation	Indigenous Communities	External	Acting Consultation Coordinator	2634 6th Line Road	P.O. Box 714, Suite 600	Ohsweken , ON	N0A 1M0	abby.LaForme@mncfn.ca	
	Mississaugas of the Credit First Nation	Indigenous Communities	External						DOCA.Admin@mncfn.ca	
Chief Mark Peters	Munsee-Delaware Nation	Indigenous Communities	External	Chief	289 Jubilee Rd, RR1		Muncey, ON	N0L 1Y0	chief.peters@munsee.ca	519-289-5396 ext. 226
	Munsee-Delaware Nation	Indigenous Communities	External	Reception	290 Jubilee Rd, RR1		Muncey, ON	N0L 1Y1	reception@munsee.ca	519-289-5396
Chief Todd Cornelius	Oneida Nation of the Thames	Indigenous Communities	External	Chief	2212 Elm Avenue		Southwold, ON	N0L 2G0	todd.cornelius@oneida.on.ca	519-318-4605
Dawn LaForme	Six Nations of the Grand River	Indigenous Communities	External	Secretary	2498 Chiefswood Road	P.O. Box 5000	Ohsweken , ON	N0A 1M0	dlaforme@sixnations.ca	
Peter Graham	Six Nations of the Grand River	Indigenous Communities	External	Consultation Supervisor	2498 Chiefswood Road	P.O. Box 5000	Ohsweken , ON	N0A 1M0	lrcs@sixnations.ca	
FEDERAL AGENCIES										
Derrick Beach	Canadian Section, International Niagara Board of Control	Federal	External	Secretary	867 Lakeshore Road		Burlington, ON	L7S 1A1	derrick.beach@canada.ca	
Anjala Puvananathan	Impact Assessment Agency of Canada	Federal	External	Regional Director, Ontario Regional Office	55 York Street	Suite 600	Toronto, ON	M5J 1R7	anjala.puvananathan@iaac-aeic.gc.ca	416-952-1576
	Department of Fisheries and Oceans Canada	Federal	External	Regional Director, Ecosystems Management	867 Lakeshore Road		Burlington, ON	L7S 1A1		
Rob Clavering	Department of Environment and Climate Change Canada	Federal	External	Manager, Environmental Assessment Ontario Section	4905 Dufferin Street		Downsview, ON	M3H 5T4	robert.clavering@ec.gc.ca	416-458-9670
Shannon Doyle	Department of Indigenous Services Canada	Federal	External	Regional Manager, Lands Operations	655 Bay Street		Toronto, ON	M5G 2K4		416-973-7451
	Department of Indigenous Services Canada	Federal	External	Senior Environmental Advisor	655 Bay Street	7th Floor	Toronto, ON	M5G 2K4		
	Department of Indigenous Services Canada	Federal	External	Environmental Assessment Coordinator	655 Bay Street	7th Floor	Toronto, ON	M4T 1M2		
	Federal Economic Development Agency for Southern Ontario	Federal	External	Manager of Program Delivery, Infrastructure Operations	151 Yonge Street	3rd floor	Toronto, ON	M5C 2W7		
Alex Sirianni	Federal Economic Development Agency for Southern Ontario	Federal	External	Program Policy Advisor	151 Yonge Street	3rd floor	Toronto, ON	M5C 2W7	alex.sirianni@FedDevOntario.gc.ca	
Kitty Ma	Health Canada	Federal	External	Ontario Regional Manager	180 Queen Street West		Toronto, ON	M5V 3L7	kitty.ma@hc-sc.gc.ca	647-829-8295
PROVINCIAL AGENCIES										
	Ministry of the Environment, Conservation and Parks	Provincial	External	Project Information Form - Online Submission	South West Region				eanotification.swregion@ontario.ca	
Joanna Craig	Infrastructure Ontario	Provincial	External	Planner	1 Dundas Street West	Suite 2000	Toronto, ON	M5G 1Z3	noticereview@infrastructureontario.ca	647-965-6703
	Ministry of Agriculture, Food and Rural Affairs	Provincial	External	OMAFRA Notices	1 Stone Road West		Guelph, ON	N1G 4Y2	omafra.eanotices@ontario.ca	
Ken Mott	Ministry of Agriculture, Food and Rural Affairs	Provincial	External	Rural Planner (A), Land Use Policy & Stewardship, Food Safety and Environmental Policy Branch	1 Stone Road West		Guelph, ON	N1G 4Y2	ken.mott@ontario.ca	613-290-9112
George McCaw	Ministry of Agriculture, Food and Rural Affairs	Provincial	External	Director, Environmental Management Branch	1 Stone Road W		Guelph, ON	N1G 4Y2		
Erin Thompson	Ministry of Economic Development , Job Creation and Trade	Provincial	External	Manager, Corporate Policy Coordination Unit	56 Wellesley Street West	11th Floor	Toronto, ON	M5S 2S3	erin.thompson@ontario.ca	437-770-1241
Nathan Hammill	Ministry of Economic Development , Job Creation and Trade	Provincial	External	Team Lead, Corporate Policy Coordination Unit	56 Wellesley Street West	11th Floor	Toronto, ON	M5S 2S3	nathan.hammill@ontario.ca	437-882-0990
	Ministry of Indigenous Affairs	Provincial	External		160 Bloor Street East	9th Floor	Toronto, ON	M7A 2E6		
	Ministry of Indigenous Affairs	Provincial	External		160 Bloor Street East	9th Floor	Toronto, ON	M7A 2E6		
Erick Boyd	Ministry of Municipal Affairs and Housing	Provincial	External	Manager, Community Planning and Development	659 Exeter Road	2nd Floor	London, ON	N6E 1L3	erick.boyd@ontario.ca	226-688-9058
Tracey Burton	Ministry of Mines	Provincial	External	Manager (A), Strategic Support Unit	Willet Green Miller Centre, 2nd Fl	933 Ramsey Lake Road	Sudbury, ON	P3E 6B5	tracey.burton@ontario.ca	705-918-1609
Melanie Johnson	Ministry of Mines	Provincial	External	Senior Strategic Initiatives Lead, Strategic Support Unit	Willet Green Miller Centre, 2nd Fl	933 Ramsey Lake Road	Sudbury, ON	P3E 6B5	melanie.johnson@ontario.ca	705-698-5041
	Ministry of Natural Resources and Forestry	Provincial	External	Southern Region	300 Water Street, Box 3000	4th Floor, South Tower	Peterborough, ON	K9J 3C7	SR.Planning@ontario.ca	
Fuad Abdi	Ministry of the Solicitor General	Provincial	External	Director (A), Facilities and Capital Planning Branch	George Drew Bldg, 13th Floor	25 Grosvenor Street	Toronto, ON	M7A 1Y6	fuad.abdi@ontario.ca	416-884-5632
Cheryl Davis	Ministry of Transportation	Provincial	External	Manager (A), Environmental Policy Office	Garden City Tower, 2nd Floor	301 St. Paul Street	St. Catharines, ON	L2R 7R4	cheryl.davis@ontario.ca	416-573-8548
Michael Nadeau	Ministry of Transportation	Provincial	External	Manager, Engineering Program Delivery West, Design & Engineering Branch	659 Exeter Road	2nd Floor	London, ON	N6E 1L3	michael.nadeau@ontario.ca	226-688-4799
CONSERVATION AUTHORITIES										
Geoffrey Cade	Ausable Bayfield Conservation	Conservation Authority	External	Water and Planning Manager	71108 Morrison Line, R. R. # 3		Exeter, Ontario	N0M 1S5	gcade@abca.ca	519.235.2610 ext. 222
Daniel King	Ausable Bayfield Conservation	Conservation Authority	External	Regulations Coordinator and Provincial Offences Officer	71108 Morrison Line, R. R. # 3		Exeter, Ontario	N0M 1S5	dking@abca.ca	519.235.2610 ext. 224
Andrew Bicknell	Ausable Bayfield Conservation	Conservation Authority	External	Permitting and Regulations	71108 Morrison Line, R. R. # 3		Exeter, Ontario	N0M 1S5	abicknell@abca.ca	519.235.2610 ext. 243
Davin Heinbuck	Ausable Bayfield Conservation	Conservation Authority	External	Water Resources Coordinator	71108 Morrison Line, R. R. # 3		Exeter, Ontario	N0M 1S5	dheinbuck@abca.ca	519.235.2610 ext. 237
Cristen Watt	Ausable Bayfield Conservation	Conservation Authority	External	Water Quality Technician	71108 Morrison Line, R. R. # 3			N0M 1S5	cwatt@abca.ca	519.235.2610 ext. 257
Tracy Annet	Upper Thames River Conservation Authority	Conservation Authority	External	General Manager/Secretary-Tresurer	1424 Clarke Road		London, Ontario	N5V 5B9	annettt@thamesriver.on.ca	519.451.2800 ext. 253
Brad Glasman	Upper Thames River Conservation Authority	Conservation Authority	External	Manager, Integrated Watershed Management	1425 Clarke Road		London, Ontario	N5V 5B10	glasmanb@thamesriver.on.ca	519.451.2800 ext. 251
Chris Tasker	Upper Thames River Conservation Authority	Conservation Authority	External	Manager, Water and Information Management	1426 Clarke Road		London, Ontario	N5V 5B11	taskerc@thamesriver.on.ca	519.451.2800 ext.238
Jenna Allain	Upper Thames River Conservation Authority	Conservation Authority	External	Manager, Environmental Planning & Regulations	1427 Clarke Road		London, Ontario	N5V 5B12	allainj@thamesriver.on.ca	519.451.2800 ext. 223
	Upper Thames River Conservation Authority	Conservation Authority	External	General Information	1428 Clarke Road		London, Ontario	N5V 5B13	infoline@thamesriver.on.ca	519.451.2800
RAIL & TRANSIT										
Steve Lund	Huron County Highway Department	Rail/Transit	External	County Engineer and Director of Operations	1 Courthouse Square		Goderich, Ontario	N7A 1M2	slund@huroncounty.ca	
Imran Khalid	Huron County Highway Department	Rail/Transit	External		1 Courthouse Square		Goderich, Ontario	N7A 1M2	ikhalid@huroncounty.ca	
Matthew Boucher	Goderich-Exeter Railway Company Ltd.	Utilities	External	General Manager	101 Shakespeare Street	Unit 2	Stratford, ON	N5A 3W5	matthew.boucher@gwrr.com	519-274-1382
UTILITIES										
	Hydro One Networks	Utilities	External						secondarylanduse@hydroone.com	
Cyrus Elmpak-Mackie	Hydro One Networks	Utilities	External		483 Bay Street, 15th Floor		Toronto	M5G 2P5	mackie@hydroone.com	416-345-1265
Robert Manco	Bell Canada	Utilities	External						robert.manco@bell.ca	
Craig Stratychuk	Bell Canada	Utilities (Hospital Contact)	External						craig.stratychuk@bell.ca	
	Eastlink	Utilities	External		P.O. Box 8660, Station "A"		Halifax, NS	B3K 5M3		
Goran Borovickic	Festival Hydro (Village of Dashwood)	Utilities	External		187 Erie St		Stratford, ON	N5A 2M6	gborovickic@festivalhydro.com	
Jake Van Ryn	Enbridge Gas	Utilities	External		200 425-1st St SW		Calgary, AB	T2P 3L8	jake.vanryn@enbridge.com	
LOCAL MUNICIPAL REPRESENTATIVES										
George Finch	Municipality of South Huron	Municipal	External	Mayor	322 Main Street South	PO Box 759	Exeter, Ontario	N0M 1S6	gfinch@southhuron.ca; gfinch@cabletv.on.ca	226-377-8886
Jim Dietrich	Municipality of South Huron	Municipal	External	Deputy Mayor	322 Main Street South	PO Box 759	Exeter, Ontario	N0M 1S6	jdietrich@southhuron.ca	519-237-3225
Milt Dietrich	Municipality of South Huron	Municipal	External	Ward 1	322 Main Street South	PO Box 760	Exeter, Ontario	N0M 1S7	mdietrich@southhuron.ca	
Marissa Vaughan	Municipality of South Huron	Municipal	External	Ward 1	322 Main Street South	PO Box 759	Exeter, Ontario	N0M 1S6	mvaughan@southhuron.ca	519-282-2702
Aaron Neeb	Municipality of South Huron	Municipal	External	Ward 2	322 Main Street South	PO Box 759	Exeter, Ontario	N0M 1S6	aneeb@southhuron.ca; aaron.neeb@gmail.c	519-520-7023
Ted Oke	Municipality of South Huron	Municipal	External	Ward 3	322 Main Street South	PO Box 759	Exeter, Ontario	N0M 1S6	toke@southhuron.ca	519-229-8249
LOCAL CONTACTS										
Nancy Rothwell	Avon-Maitland District School Board	Municipal	External	Chair of the Board					nancy.rothwell@ed.amdsb.ca	519-502-7250
Celina McIntosh	Huron County Planning Department	Municipal	External	Planner	57 Napier Street, 2nd Floor		Goderich, Ontario	N7A 1W2	cmcintosh@huroncounty.ca	
Mary Helen Van Loon	Huron-Perth Catholic School Board	Municipal	External	Chair of the Board					mhvanloon@huronperthcatholic.ca	519-275-1710
John Van Heck	St. Clair Catholic District School Board	Municipal	External	Chair of the Board						(519) 350-0025
Jeremy Becker	South Huron Fire Department	Municipal	External	Fire Chief					firechief@southhuron.ca	519-235-1981; 519-615-2544
Dr. Miriam Klassen	Huron County Health Unit	Municipal	External		1 Courthouse Square		Goderich, Ontario	N7A 1M2	huronadmin@huroncounty.ca	519.524.8394
Marcy McKillop	Lake Huron Primary Water Supply System	Utilities	External	Environmental Services Engineer, Regional Water Supply	235 North Centre Road	Suite 200	London, ON	N5X 4E7	mmckillop@huronelginwater.ca	519-930-3505 ext. 4976
Ryan Armstrong	Lake Huron Primary Water Supply System	Utilities	External		235 North Centre Road	Suite 200	London, ON	N5X 4E7	rarmstrong@huronelginwater.ca	
	Lake Huron Primary Water Supply System	Utilities	External	Submissions					submissions@huronelginwater.ca	
Angela Lawrence	Hay Communications	Utilities	External	General Manager	72863 Blind Line	PO Box 99	Zurich, ON	N0M 2T0	a.lawrence@hay.net	519-235-3369
Bill Legge	Kingsmere Syndicate (Kingsmere South)	Local	External	Vice President					bill.legge@hotmail.com	519-390-0445
Jason Brown	Kingsmere North Cottages	Local	External		165 Thames Rd E				jbrown@northlanderindustries.com; jasonjbrownca@gmail.com	519-870-8442
J.E. Fordyce	Maple Grove Syndicate Ltd.	Local	External						jfordyce75@rogers.com	
Dave Ross	Oakwood Park Association	Local	External	President					president@oakwoodparkassociation.com	

Stakeholder Name	Organization	Category (Utilities, Provincial, Ministry, etc.)	Internal/ External	Title/ Role	Address Line 1	Address Line 2	City / Province	Postal Code	Contact Email	Contact Phone Number
Mark Hughes	Oakwood Park Association	Local	External						hughes.lion@gmail.com	
Marc Trudell	Oakwood Park Association	Local	External						m.trudell@rogers.com	
Bob Schram	Oakwood Park Association	Local	External						bschram@sterling.ca	
Janet Kurasz	Oakwood Park Association	Local	External						janetk519@gmail.com	
Jennifer White	White Wave Consulting	Local	External						jen@whitewaveconsulting.com	
Tim Hamather	Huron Motor Products Limited	Local	External	Dealer Principal	70704 London Road		Exeter, Ontario	N0M 1S1	timh@hmpexeter.com	519-235-0363 x223
[redacted]	Local Resident	Local	External						[redacted]	[redacted]
Nick Verhoeven	Municipality of Lambton Shores	Local	External	Director of Public Works	9577 Port Franks Road		Thedford, ON	N0M 2N0	nverhoeven@lambtonshores.ca	519-243-1400 ext. 8213
[redacted]	Local Resident	Local	External		[redacted]		Municipality of South Huron		[redacted]	
[redacted]	Local Resident	Local	External		[redacted]		Exeter, Ontario		[redacted]	
[redacted]	Local Resident	Local	External		[redacted]		Exeter, Ontario			
[redacted]	Local Resident	Local	External				Crediton, ON		[redacted]	

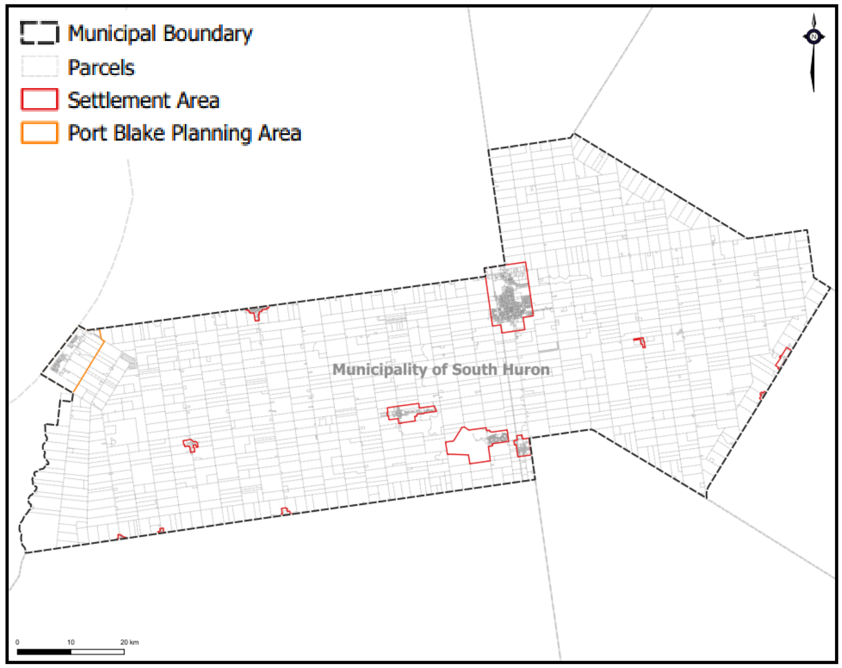
APPENDIX B:
STUDY COMMENCEMENT

Notice of Study Commencement

Water and Wastewater Master Plan
October 2023

What is this Study All About?

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update. This Update will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality. This is a critical component in the integrated planning process and will provide the framework and vision for the water and wastewater servicing needs for the Municipality of South Huron.



How is this Study Being Undertaken?

The Water and Wastewater Master Plan Update will be completed in accordance with the requirements of the Municipal Engineers Association (MEA) Class Environmental Assessment (EA) process for Master Planning. The study is being undertaken based on Phases 1 and 2 of the Class EA processes for Master Plans.

How can I Participate in this Study?

The Municipality invites Agencies, interested stakeholders and residents to participate in this planning process and learn more about the Water and Wastewater Master Plan by:

- Attending a Public Information Centre (PIC) during the study that will discuss the need for improvements to the Municipality's water and wastewater infrastructure, anticipated to be scheduled in late 2023 or early 2024.
- Contacting the Project Managers to further discuss the project.

Notice of the Public Information Centre will be posted on the Municipality Website, in local newspapers and mailed to the project stakeholder list, including those asking to be placed on the project mailing list.

This notice is also available on the Municipality's website where future project updates will also be posted. If you wish to submit comments or would like to be added to the project mailing list, please contact:

Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron
322 Main St S, Exeter, ON N0M 1S3
Phone: 519-235-0310
Email: dgiberson@southhuron.ca

Julien Bell, P.Eng.
Consultant Project Manager
GM BluePlan Engineering Limited
330 Trillium Drive, Unit D, Kitchener, ON N2E 3J2
Phone: 519-748-1440
Email: Julien.bell@gmblueplan.ca

With the exception of personal information, all comments will become part of the public record of the study. The study is being conducted according to the requirements of the Municipal Class Environmental Assessment, which is a planning process approved under Ontario's Environmental Assessment Act. Questions regarding the collection of information should be referred to the Clerk at the Municipality of South Huron.

Public Notices

MUNICIPALITY OF SOUTH HURON 2001

Notice of Study Commencement

Water and Wastewater Master Plan

October 2023

What is this Study All About?

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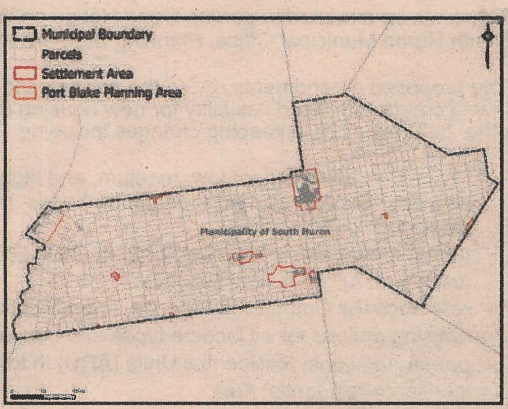

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Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron
322 Main St S, Exeter, ON N0M 1S3
Phone: 519-235-0310
Email: dgiberson@southhuron.ca

Julien Bell, P. Eng.
Consultant Project Manager
GM BluePlan Engineering Limited
330 Trillium Drive, Unit D, Kitchener, ON N2E 3J2
Phone: 519-748-1440
Email: Julien.bell@gmblueplan.ca

With the exception of personal information, all comments will become part of the public record of the study. The study is being conducted according to the requirements of the Municipal Class Environmental Assessment, which is a planning process approved under Ontario's Environmental Assessment Act. Questions regarding the collection of information should be referred to the Clerk at the Municipality of South Huron.

Public Notices

MUNICIPALITY OF SOUTH HURON

Municipality of South Huron

Notice of Vacancy – Councillor Ward 2

Take Notice that a vacancy exists on the Municipality of South Huron Council for Ward 2 Councillor. Council has determined that it wishes to fill this vacancy by appointment through a **Call for Nominees** in accordance with the "Filling Council Vacancy" procedures.

The term of this position is from the date of Oath of Office for the balance of the term of Council being November 14, 2026.

A candidate for municipal office must be a qualified municipal elector as set out in the *Municipal Elections Act, 1996.* Qualified electors must be:

- 18 years of age or older;
- a Canadian citizen;
- a resident of the Municipality of South Huron, or an owner or tenant of land in the Municipality or the spouse of such an owner or tenant; and
- not prohibited from voting under any other Act or disqualified from holding municipal office.

Qualified Persons interested in being appointed must complete a Council Vacancy Application Package (Nomination Form, Declaration of Qualification, Consent to Release Personal Information) and submit in person with the Clerk's Office. **Applications will be accepted by the Clerk's Office during regular business hours from Thursday, October 5, 2023 until Friday, October 27 at 2:00 p.m., at 322 Main Street South, Exeter, ON N0M 1S6.**

Candidate(s) may also submit, to the Clerk, a personal statement of qualification for consideration of Council. Personal statements will be typewritten in a 12 point font on letter size (8 ½" x 11") paper, shall not exceed two (2) pages in length, and will include the Candidate's name and address. Statements that do not meet these requirements shall not be included in any Council meeting agenda, or provided to Council by the Clerk.

Certified registered candidates will be afforded the opportunity to address Council for a period of not more than five (5) minutes and will be asked questions by Council in an open Public Meeting to be held on Wednesday, November 8, 2023 at 6:00 p.m. in Council Chambers at Town Hall.

Important dates:

Application deadline	Friday, October 27, 2023 (before 2:00p.m.)
Withdrawal of Application	Friday, October 27, 2023 (before 2:00p.m.)
Certification by Acting Clerk	Monday, October 30, 2023 (before 4:00p.m.)
Special Council Meeting	Wednesday, November 8, 2023 (6:00p.m.)

For more information please visit www.southhuron.ca. or contact the Acting Clerk.

Dated this 5th day of October, 2023

Alex Wolfe, Acting Clerk
Municipality of South Huron
322 Main Street South, Exeter
ON N0M 1S6
519-235-0310 x224
clerk@southhuron.ca

CLASSIFIEDS

Drivers

KENPAL FARM PRODUCTS INC

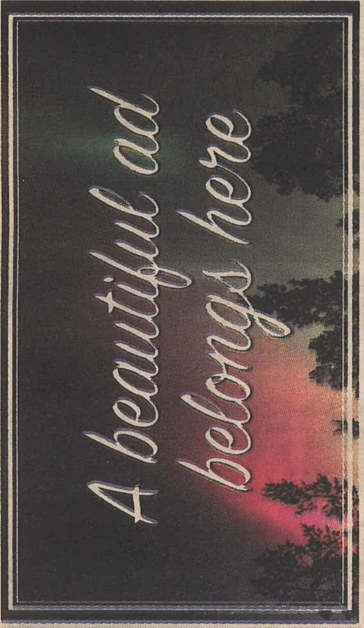
AZ OR DZ TRUCK DRIVER

Kenpal Farm Products Inc., in Centralia, has full time position available for AZ or DZ Truck Driver. **This position requires personnel with a valid DZ licence.**

Candidate must have a clean driver's abstract and 3 years truck driving experience. We offer competitive wages and a benefit plan

If you are interested in joining our growing business please submit your resume to: **shipping@kenpal.on.ca** or via fax at **519-228-7125.**

Please note that only those applicants selected for an interview will be contacted.



Wanted

!!! WANTED !!!
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Year Round! Pick-up available!
416-889-9365 Peter
NO MIN QTY OR NO MAX!!

Events

START CURLING!
Curling season is here!
New members welcome
Open House SUN., OCT.29,2023
Chicken dinner by Pineridge
$25/person
ADVANCE TICKETS ONLY
4:30-6:30
Exeter Curling Club
205 Riverside Dr.
Exeter, ON
TICKETS:
Dave 519-630-3443
Steve 519-476-8019
exetercurlingclub.ca

Firewood

SCREENED
Hardwood slabs
16" cut $30 face cord, 10 cord deliveries or pickup in Auburn.
huronfirewood.com
Call 519-524-3493

SHOP the Classifieds!

Celebrating

Add your message to the Celebrating guestbook of classifieds.lakeshoreadvance.com and share with Facebook and Twitter!

Graduations

Exeter Lakeshore **Times-Advance**

See all the ***Graduations*** at **lakeshoreadvance.com/exetergrads** and use the guestbook to share thoughts with family and friends.

To place your graduation go to: **lakeshoreadvance.com/classifieds**
>Place your Ad
>Graduations

Public Notices

MUNICIPALITY OF SOUTH HURON 2001

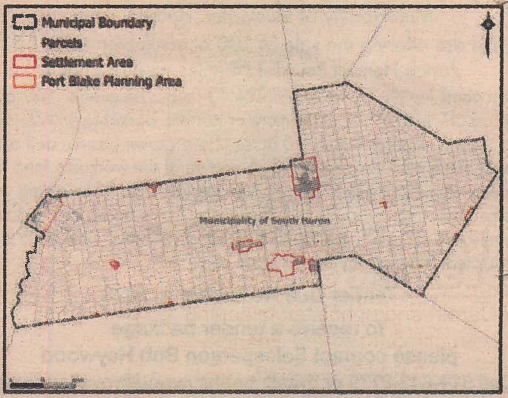
Notice of Study Commencement

Water and Wastewater Master Plan

October 2023

What is this Study All About?

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update. This Update will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality. This is a critical component in the integrated planning process and will provide the framework and vision for the water and wastewater servicing needs for the Municipality of South Huron.



How is this Study Being Undertaken?

The Water and Wastewater Master Plan Update will be completed in accordance with the requirements of the Municipal Engineers Association (MEA) Class Environmental Assessment (EA) process for Master Planning. The study is being undertaken based on Phases 1 and 2 of the Class EA processes for Master Plans.

How can I Participate in this Study?

The Municipality invites Agencies, interested stakeholders and residents to participate in this planning process and learn more about the Water and Wastewater Master Plan by:

- Attending a Public Information Centre (PIC) during the study that will discuss the need for improvements to the Municipality's water and wastewater infrastructure, anticipated to be scheduled in late 2023 or early 2024.
- Contacting the Project Managers to further discuss the project.

Notice of the Public Information Centre will be posted on the Municipality Website, in local newspapers and mailed to the project stakeholder list, including those asking to be placed on the project mailing list.

This notice is also available on the Municipality's website where future project updates will also be posted. If you wish to submit comments or would like to be added to the project mailing list, please contact:

Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron
322 Main St S, Exeter, ON N0M 1S3
Phone: 519-235-0310
Email: dgiberson@southhuron.ca

Julien Bell, P. Eng.
Consultant Project Manager
GM BluePlan Engineering Limited
330 Trillium Drive, Unit D, Kitchener, ON N2E 3J2
Phone: 519-748-1440
Email: Julien.bell@gmblueplan.ca

With the exception of personal information, all comments will become part of the public record of the study. The study is being conducted according to the requirements of the Municipal Class Environmental Assessment, which is a planning process approved under Ontario's Environmental Assessment Act. Questions regarding the collection of information should be referred to the Clerk at the Municipality of South Huron.

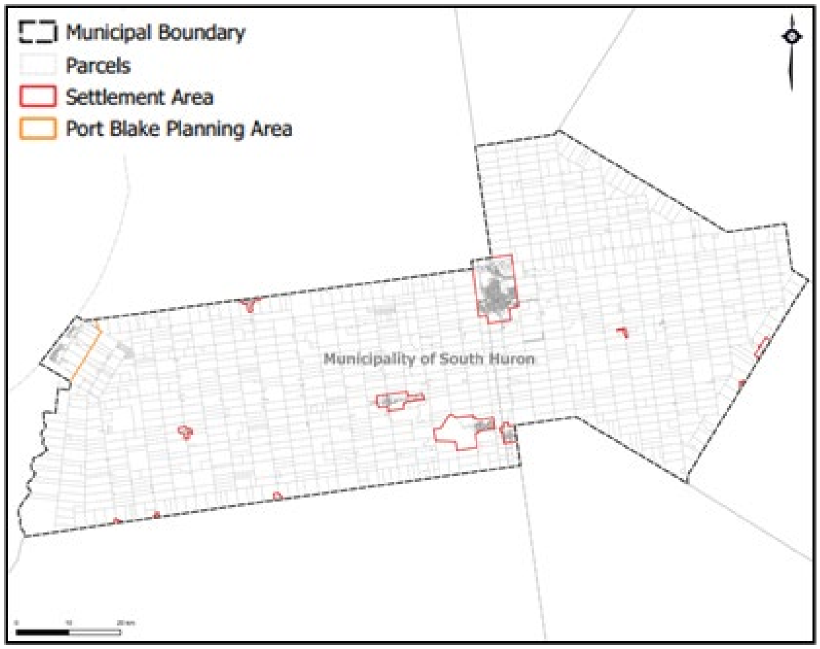
APPENDIX C:
PUBLIC INFORMATION CENTRE

Notice of Public Information Centre

Municipal Class Environmental Assessment for the
Water and Wastewater Master Plan

The Study

The Municipality of South Huron is undertaking a Water and Wastewater Master Plan Update. This study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Engineers Association Municipal Class Environmental Assessment process for Master Planning. The Master Plan is following Approach #1.



This Master Plan Update will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality. This is a critical component in the integrated planning process and will provide the framework and vision for the water and wastewater servicing needs for the Municipality of South Huron. The Master Plan Update will form the basis for future, more detailed investigations for projects that are subject to the Environmental Assessment Act.

We want to hear from you!

Public consultation is a key component of this study. The Municipality invites residents, agencies, and interested parties to participate in this planning process and learn more through attendance at a Public Information Centre (PIC). The PIC has been arranged to provide details about the study, the process used to decide possible solutions and the preferred servicing strategies, as well as allowing the public the opportunity to share comments and concerns. Members of the project team will be available at the PIC to answer questions and discuss the study progress to date.

Date and Time: April 16, 2024, 6:00 p.m. to 8:00 p.m.

Location: South Huron Recreation Centre
94 Victoria Street East, Exeter

For more information or to submit comments, please reach out to a member of the project team listed below.

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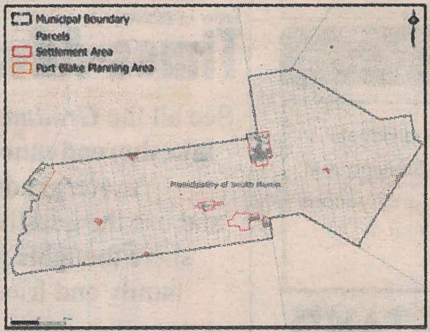
MUNICIPALITY OF SOUTH HURON

Notice of Public Information Centre
Municipal Class Environmental Assessment for the Water and Wastewater Master Plan

The Study



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CLASSIFIEDS

CLASSIFIEDS.LAKESHOREADVANCE.COM
PHONE: 1-888-786-7821
FAX: 1-866-757-0227
CLASSIFIEDADS@POSTMEDIA.COM

Events

A "Labour of Love" Quilt Show

Exeter United Church-42 James St. Exeter
Celebrating 25 years of the Electric Quilter
Featuring Award Winning Quilts from
Diane Carson & Anne Beaudoin
April 18th 10:00 am-4:00 pm
April 19th 10:00 am-7:00 pm
April 20th 10:00 am-4:00 pm
Admission: $10.00 cash
Tea Room-Vendors-Demos
Quilts & Vintage Sewing Machines For Sale
Proceeds to Exeter United Church
Call 519-235-0860
exeterunitedchurch@gmail.com
http://www.exeterunitedchurch.com

Classic Country Tribute Fest

May 4, at 2 pm, featuring Mike Pollard, Crystal Gage, and Annette Haas Tributing George Jones, Dolly Parton and Loretta Lynn. Brodhagen Community Centre. Tickets $25, available online www.ashleygiles.ca
519-719-0433

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519-719-0433

Condos & Apartments

Exeter

Quiet senior building 2 bedroom 2 bath + den in Exeter. New flooring, renovated bathrooms and kitchen. All appliances included. $2,000.00 + Utilities
Call: 519-238-6459
Email: faeheywood@hotmail.com

Condos & Apartments

KEXETER
1 BEDROOM
APARTMENT
$1050/mo plus hydro (Heat & Water Incl)
Package deal: Internet & Satellite
Call Beverly
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Firewood

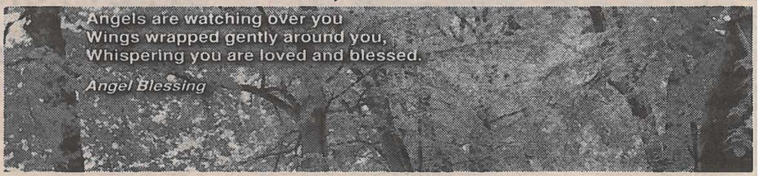
SCREENED
Hardwood slabs
16" cut $30 face cord, 10 cord deliveries or pickup in Auburn.
huronfirewood.com
Call 519-524-3493

Obituaries

HICKEY, Catharine May (Lisso)
1968 - 2024

It is with a heavy heart that we share the news of the passing of Catharine May (Lisso) Hickey on Sunday, March 24, 2024 of Lucan, at the age of 55. Cathy has peacefully joined her dear parents, Bob (2011), and Ella (Krouse - 1997) Lisso, who hailed from Greensville, Ontario. Cathy found immense joy in her role as a loving mother to Patrick and Chantel Hickey (and her future son-in-law Jacob Oudekerk), as well as being the cherished Nina to her two precious grandchildren, Weston and Madison. The loss of their FaceTime sessions with Nina, especially Weston, who adored watching Paw Patrol with her, leaves a profound void in their lives. Our hearts ache as we remember Cathy's compassionate spirit, demonstrated through her regular visits to check on her mother-in-law, Beverly and (Pius 2014) Hickey during her strolls. Cathy will always be fondly remembered by her partner of the past decade, Phil Godwin, Phil's children; Justin, and Lucas, and her ex-husband Joe Hickey & (Sonya Clipperton), with whom she shared a journey since 1988. Cathy's departure leaves a deep void in the lives of her close cousins John & Sharon Furlong, Dave & Jane Furlong, Karen (Furlong) & Brian Egoff, and especially her Aunt Eleanor & the late Jack Furlong (2012). She will be greatly missed by numerous aunts, uncles, cousins, nieces, and nephews. Special mention goes to her dear friends Shelly & Murray Reid, who provided crucial support to Cathy throughout her challenging battle with breast cancer since 2018. Cathy's walking companions Liz and Kelly, also offered unwavering support. Cathy's resilience and strength throughout her battle, much like Rocky in his boxing matches, are a testament to her character. For 25 years, Cathy dedicated herself to TD Canada Trust, starting in Hamilton and concluding her career at the Grand Bend branch. Her absence will be deeply felt by many clients, colleagues, and friends alike. You will forever remain in our hearts, Cathy. Until we meet again, we love you dearly. The family extends sincere gratitude to the staff at Victoria Hospital in London, Ontario, for their compassionate care during Cathy's final weeks. The family wishes to express a special thank you to all the staff at Jessica's House Hospice for ensuring Cathy's comfort during her stay. Additionally, heartfelt appreciation to Don and Marcia Oudekerk for caring for their grandchildren while Chantel spent time with her mom. A service honoring Cathy will be held at Haskett Funeral Home, 456 Main Street South, EXETER on Saturday, April 6, 2024 at 12 noon, with a celebration of her life to follow, everyone welcome. Cremation has taken place. In lieu of flowers, donations to Jessica's House Hospice (Exeter, Ontario) or Breast Cancer Canada will be gratefully acknowledged by Cathy's family. Online condolences can be shared at www.haskettfh.com.

HASKETT FUNERAL HOMES LTD
www.haskettfh.com

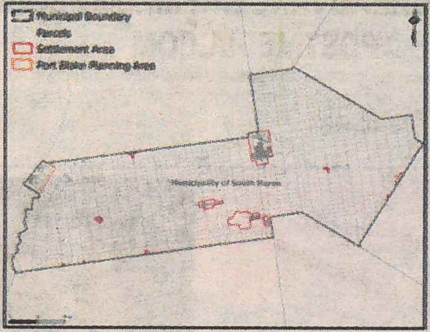


MUNICIPALITY OF SOUTH HURON

Notice of Public Information Centre

Municipal Class Environmental Assessment for the Water and Wastewater Master Plan

The Study



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Date and Time: April 16, 2024, 6:00 p.m. to 8:00 p.m.

Location: South Huron Recreation Centre
94 Victoria Street East, Exeter

For more information or to submit comments, please reach out to a member of the project team listed below.

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This Notice is issued 2024/03/25

Acreages, Lots & Land

ROYAL LEPAGE HEARTLAND REALTY **Bob Heywood 519-643-6779** **EXCLUSIVE SALES REPRESENTATIVE**

TWO FARMS FOR SALE BY TENDER

We have been favoured to offer two parcels of valuable cropland. Neither parcel has any buildings. Parcels to be sold separately.

Parcel 1 - Located just east of the Hamlet of Elimville (southside), on the paved Kirkton Road. Known legally as PT LT 10, CON 7 former Usborne TWP, AS IN R309398 save & except PART 1, PLAN 22R-5147, Municipality of South Huron. Comprising of 63.9 acres (Geo W) Zoning AG-2. Good soil. 58 acres more or less workable. An open ditch that extends east to west for the length of the property. Taxes $3008. (2023). Pin # 41262-0103

Parcel 2 - Located just south of the Hamlet of Elimville on the gravelled Elimville Line (west side). Known legally as N ½ LT 8, CON 6, former Usborne TWP, Municipality of South Huron. Comprising of 50 acres (Geo W) Zoning AG-1. Approx. 42 acres workable with the balance woodlot and open ditch cutting across the property from north to south. Taxes $2126. (2023). Pin #41262-0007

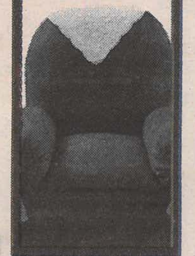
Tenders due Tuesday, April 23, 2024 by 1 PM. Closing date May 14, 2024.

To receive a Tender package please contact
Exclusive Salesperson: Bob Heywood at
Cell 519-643-6779 or Email: bobheywood@royallepage.ca
Royal LePage Heartland Realty, Brokerage
417 Main St. S. PO Box 1054 Exeter, ON N0M 1S7
Office: 519-235-4949

Firewood

SCREENED Hardwood slabs
16" cut $30 face cord, 10 cord deliveries or pickup in Auburn.
huronfirewood.com
Call 519-524-3493

SELL YOUR STUFF HERE!



Graduations

Exeter Lakeshore **Times-Advance**

See all the *Graduations* at **lakeshoreadvance.com /exetergrads** and use the guestbook to share thoughts with family and friends.

To place your graduation go to:
lakeshoreadvance.com /classifieds
>Place your Ad
>Graduations

Celebrating

Add your message to the Celebrations guestbook at **classifieds.lakeshoreadvance.com** and share with Facebook and Twitter!

Birthdays

Come & Celebrate with

Fern Dougall

90th Birthday

When: Saturday April 20, 2024

Where: Ironwood Golf Course at 70969 Morrison Line

Arrive: 2:00-4:00

No Gifts please only donations for the Food Bank

Let us in on your BIG NEWS...

- ***Birth • Engagement***
- ***Wedding***
- ***Graduation***
- ***Retirement***

South Huron Water and Wastewater Master Plan
Public Information Centre No. 1
April 16, 2024

SIGN-IN SHEET

Name (Organization if applicable)	Physical Address (and mailing address if different)	Email Address	Would you like to be added to the contact list? (✓/X)
[redacted]	[redacted]	[redacted]	✓
[redacted]	[redacted]	[redacted]	✓
[redacted]	[redacted]	[redacted]	✓
[redacted]	[redacted]	[redacted]	✓
[redacted]	[redacted]	[redacted]	✓
[redacted]	[redacted]	[redacted]	✓

Page 1 of ___

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South Huron Water and Wastewater Master Plan
Public Information Centre No. 1
April 16, 2024

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Name (Organization if applicable)	Physical Address (and mailing address if different)	Email Address	Would you like to be added to the contact list? (✓/X)
[redacted]	[redacted]	[redacted]	✓
Jim Dietrich	Deputy Mayor		
[redacted]	Crediton	[redacted]	✓

Page 2 of ___

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South Huron Water and Wastewater Master Plan

Public Information Centre

April 16th, 2024 – 6:00 p.m. to 8:00 p.m.
South Huron Recreation Centre
94 Victoria Street East, Exeter ON

Public Information Centre (PIC)

Public Information Centre (PIC) Objectives

- **Present the Master Plan objectives and recommendations.**
- **Present the environmental assessment process.**
- **Present technical background relevant to the development of servicing recommendations.**
- **Receive feedback on the study process, and recommendations.**

Key Dates

- Notice of Study Commencement – Oct 2, 2023
- **PIC – April 16, 2024**
- Notice of Completion – May 2024

PIC Materials are available on the project website: https://www.southhuron.ca/en/government/south-huron-water-and-wastewater-master-plan-update.aspx

Stay Engaged!

- ✓ Please sign in and take a comment sheet.
- ✓ Have a look at the project information on display and chat with the Project Team.
- ✓ Provide your feedback regarding the information presented.

What is Driving the South Huron Water and Wastewater Master Plan?

Responsible Management	Planning for Buildout	Capital Program Development	Long-Term Financial Planning
• Essential to Revisit Needs Periodically • Support Other Needs (Capital Program, Utility Rates, Development Charges, Etc.) • Long-Term Plan for a Water Distribution System is a Regulatory Requirement (DWQMS) to Own/ Operate a Drinking Water System	• Support Responsible Development • Supply and Treatment Capacity • Flexibility in Servicing Strategy	• Coordination and Consolidation of Renewal and Growth Needs • Long-Term Visioning of System Needs	• Understanding of Servicing Impacts and Costs • Capital Forecast to Service Existing and Support Future Growth

South Huron Master Plan Water and Wastewater Objectives

- Review and integrate the servicing needs to support existing system needs and support the buildout of the settlement area boundary; including allowances for future expansion of the existing settlement area boundaries;
- Review planning forecasts and determine the impacts on servicing needs for the Municipality's water and wastewater infrastructure;
- Re-evaluate growth needs and water supply and wastewater treatment capacities;
- Develop water and wastewater servicing solutions that include flexibility in servicing strategy and understanding of servicing impacts and costs; and,
- Update the long-term financial planning that includes a capital forecast to service existing and support growth and can be used as basis for development charges and water, wastewater utility rate updates, and DWQMS.

Municipal Class Environmental Assessment Process

The South Huron Water and Wastewater Master Servicing Plan involves the completion of Phases 1 and 2 of the MEA Municipal Class EA process.

Environmental Assessment Process

Problem and Opportunity

- What makes up the water and wastewater systems?
- How does it work?
- How well is it working?
- What do we need?
- Project problem and opportunity statement

Identify Alternative Solutions

- How can we meet our needs?
- What are the different options?
- What does each option look like?

Evaluate Alternative Solutions

- How well does each option meet our needs?
- How much does each option cost?
- What impact does each option have on:
  - System performance?
  - Natural Environment?
  - Social/ Cultural?
  - Financial?

Select Preferred Solutions

- What is the best option and why?
- How do we move forward with the best option?

The study follows the Master Plan process as outlined in Section A.2.7 of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (Oct 2000, as amended in 2007, 2011 and 2015).

Planning for Growth

Growth Uncertainty

- Location of growth – What infrastructure is needed?
- Rate of growth – When is infrastructure needed?
- Servicing outside existing Settlement Area Boundaries

Draft Plans and Concepts

- Where available approved draft plans or Developer's concept plans were used to project growth

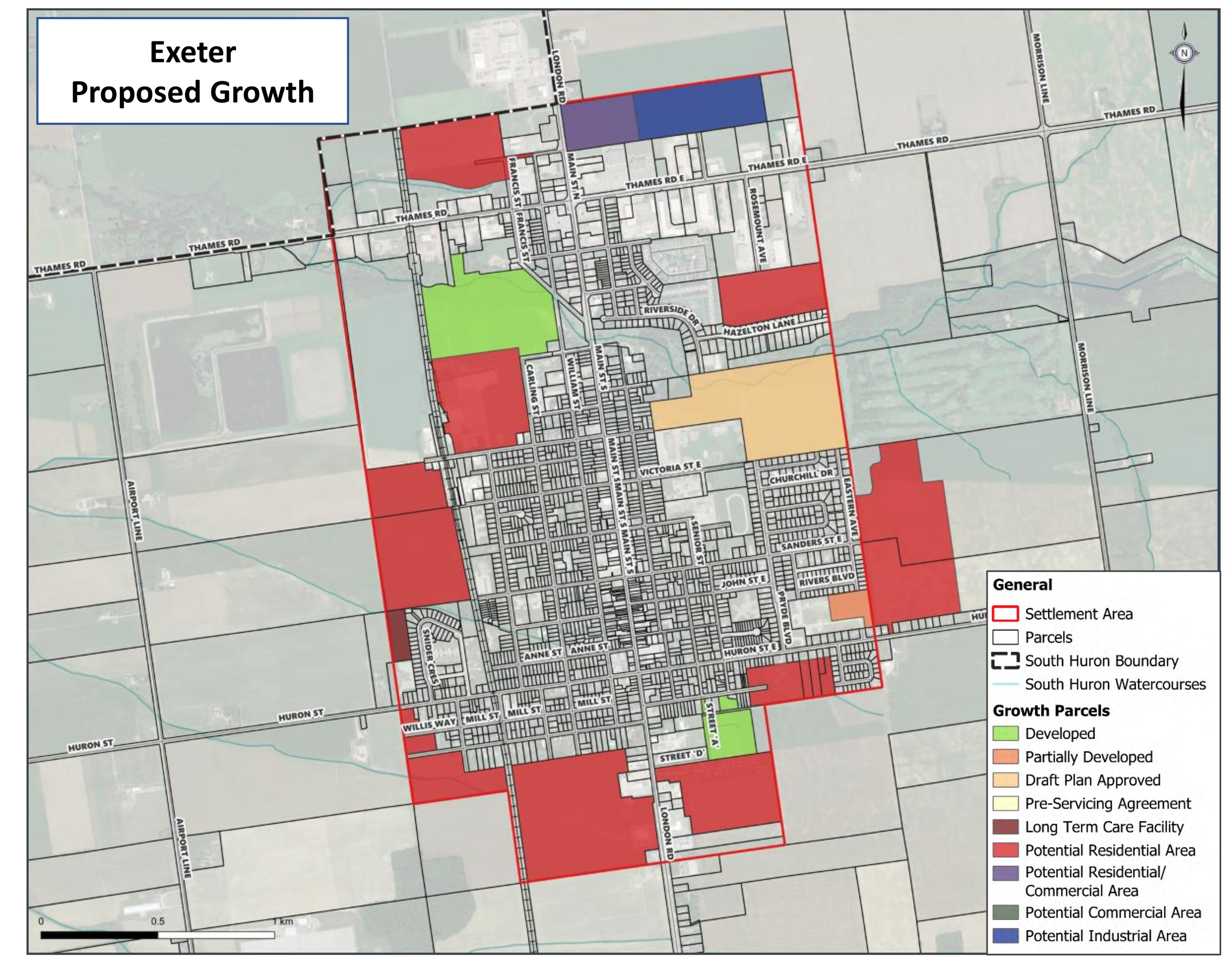
Remaining Development Lands

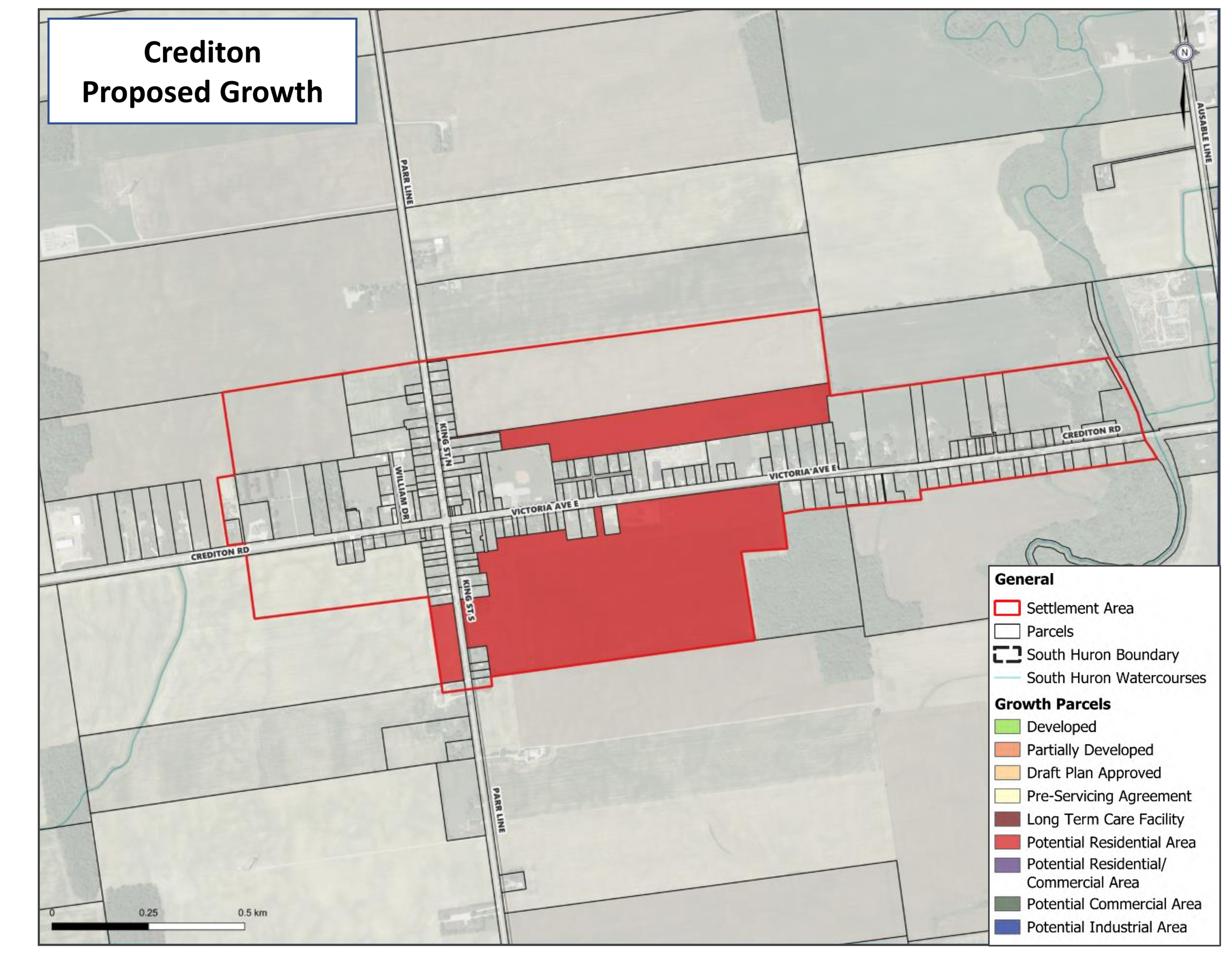
- For potential development lands, growth has been projected based on:
  - Where development units were known: 2.3 people per unit
  - Where units were unknown: 40 people per hectare

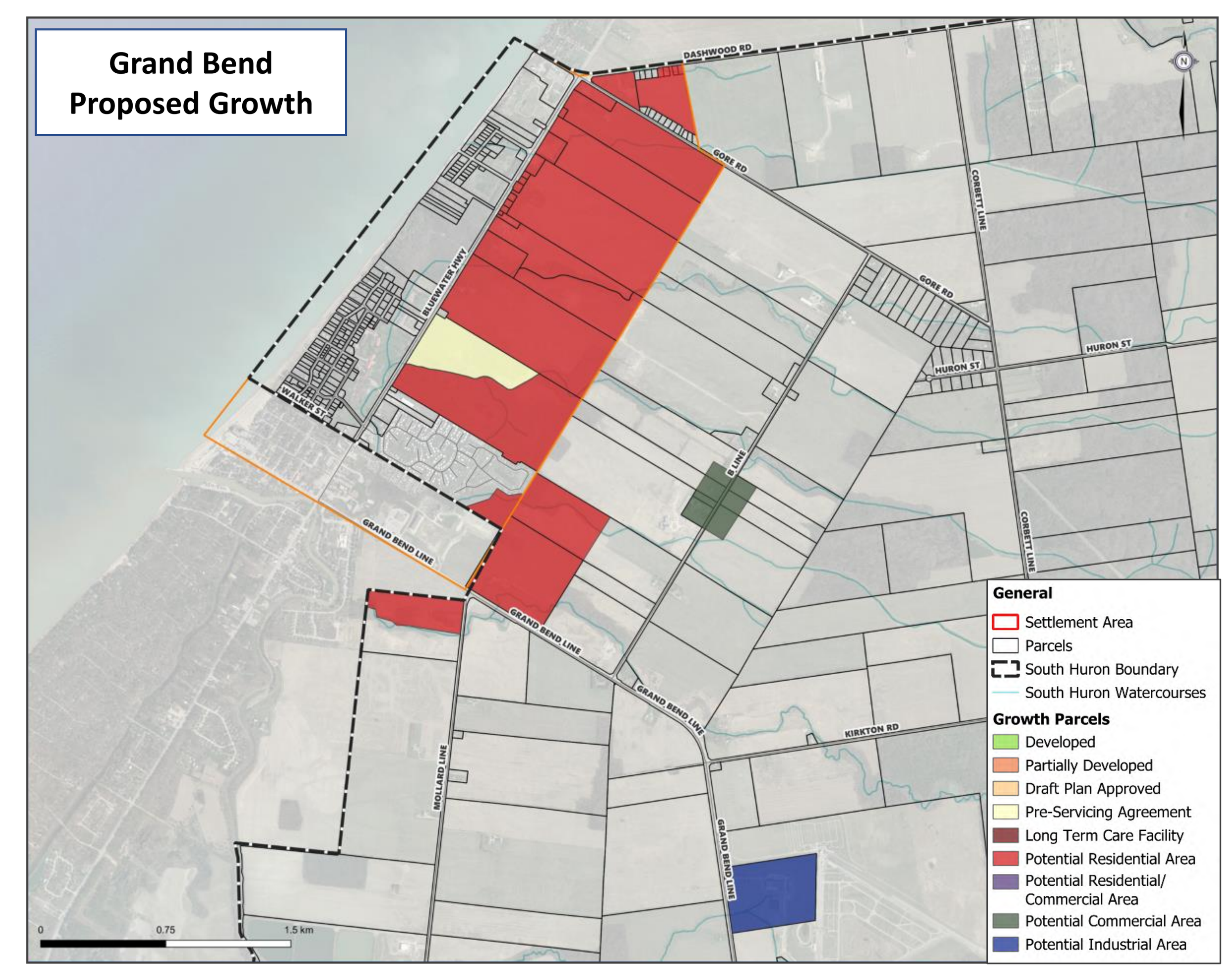
South Huron Master Servicing Plan Focuses on Buildout Potential

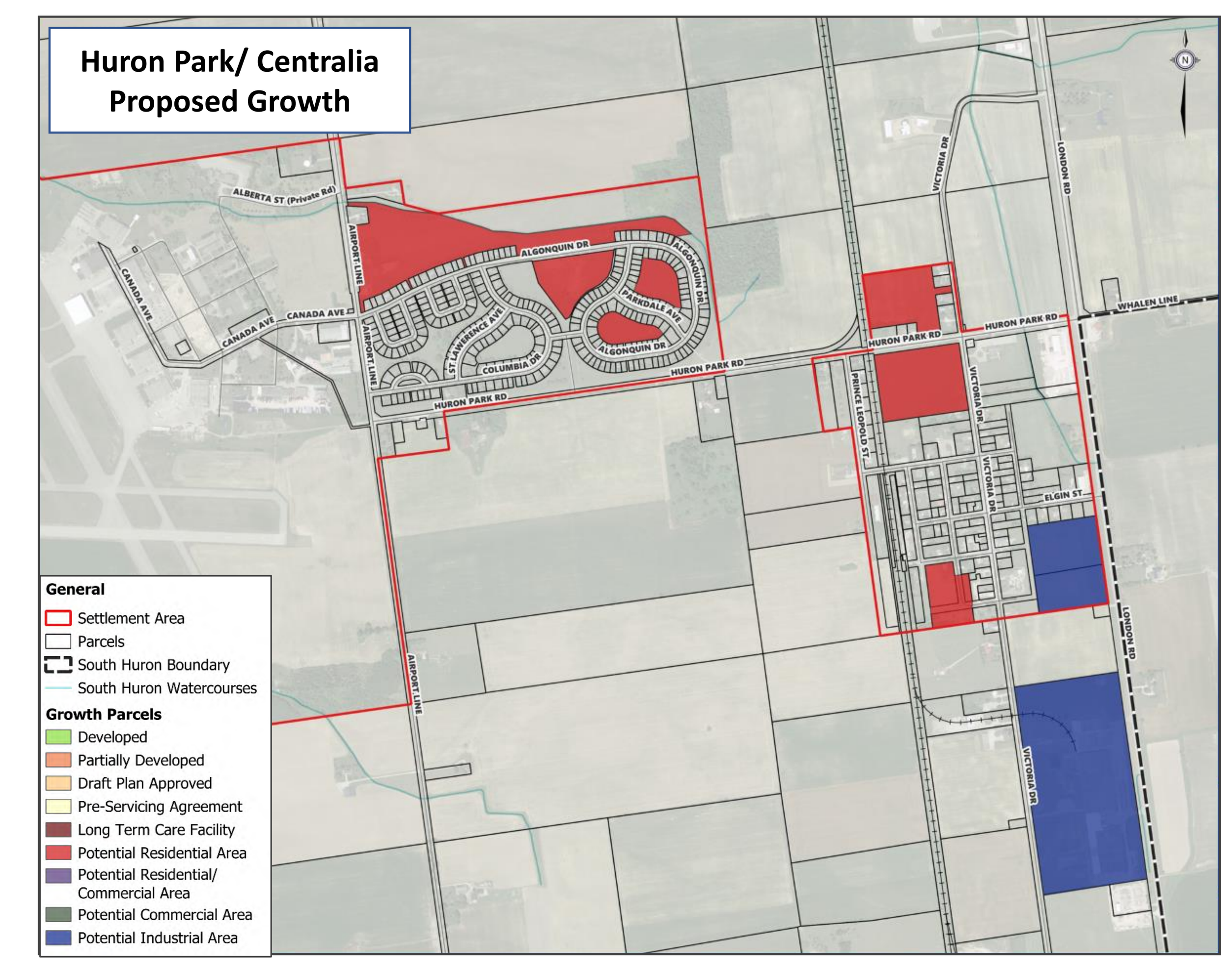
- Clarity in long-term needs
- Flexibility to respond to changes
- Helps to guide and manage growth

Location	Area (ha)	Units	Potential Population
Centralia	33.6	13	1,236
Exeter	180.7	1,620	6,181
Grand Bend	317.5	2,105	6,684
Crediton	42.3	345	1,091
Huron Park	16.3	146	445
Total	**590.5**	**4,229**	**15,639**









Evaluation Methodology

Criteria Scoring and Selection

For each individual project, the evaluation of each criteria will be completed using the following ranking approach:

- "High" Solution generates beneficial impacts and/or has no substantial technical challenges
- "Medium" Solution to a mix of positive and negative elements with some impacts
- "Low" Solution presents permanent negative impacts and/or presents significant technical challenges

Selection will be guided by the **Reasoned Argument Approach**

- Clear and thorough rationale of the tradeoffs among the various criteria
- Highlights the reasons why one alternative is the best alternative

Environmental Factors

- Protects environmental features.
- Protects wildlife and species-at-risk.
- Minimizes climate change impacts.

Financial Viability

- Capital and life-cycle costs.
- Operation and maintenance costs.

Technical Factors

- Meets existing and future servicing needs.
- Supports phased expansion of the system.
- Provides a reliable service.
- Minimizes and manages construction risk.
- Aligns with approval and permitting process.
- Ability to adapt to climate change.

Social and Cultural Factors

- Protects resident quality of life.
- Manages and minimizes construction impacts.
- Protects cultural heritage features.
- Protects archaeological features.

Existing Water System

Supply

- Water supply originates from Lake Huron and is treated at the Lake Huron Primary Water Supply System (LHPWSS). The LHPWSS delivers water to five connection points in the Municipality's water system which typically divide the pressure zones

Pressure Zones

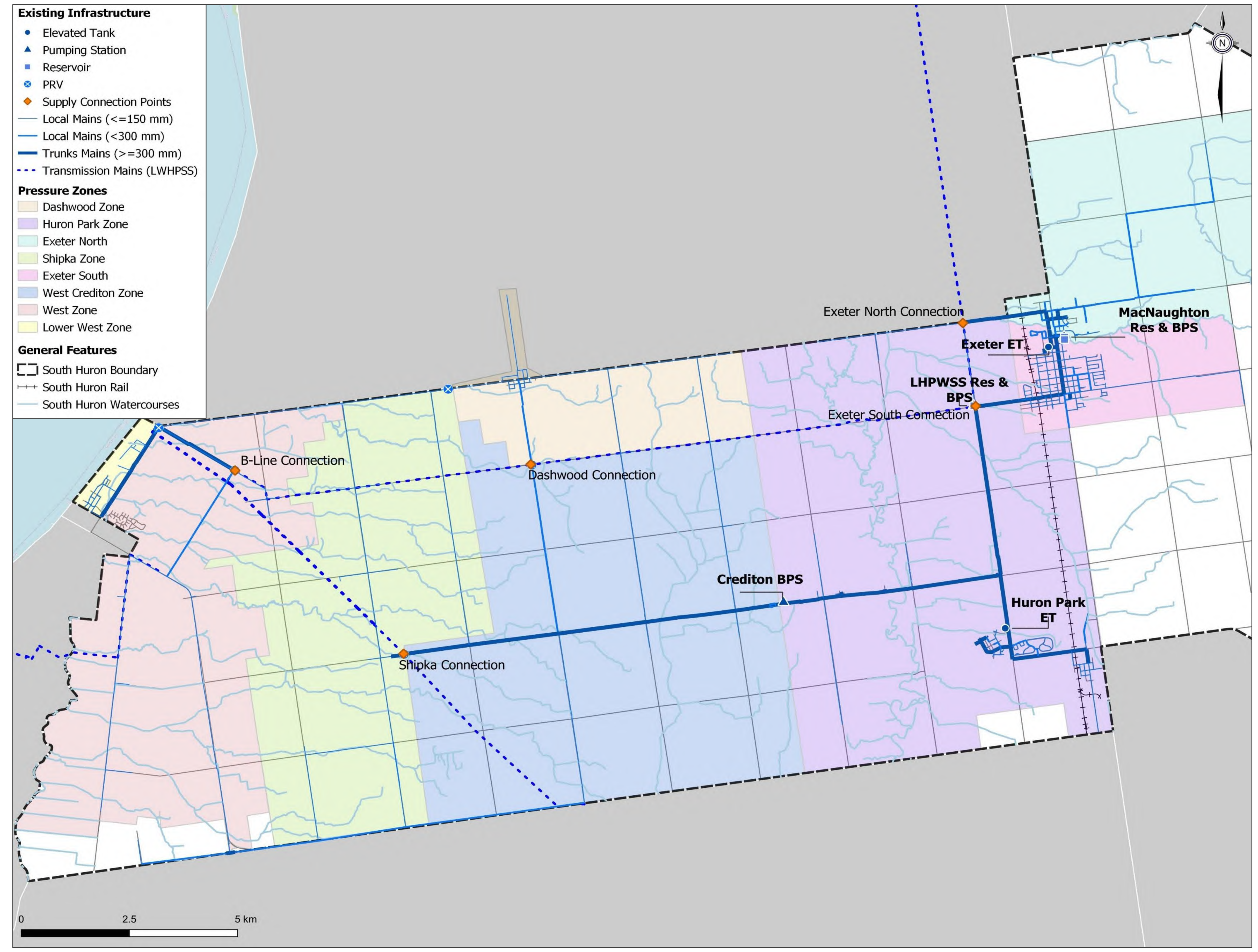
- Eight (8) Pressure Zones
- Boundaries typically consist of closed valves and pipes, and pressure reducing valves to decrease the pressure to the acceptance range of level of service

Storage

- Two (2) Elevated Tanks (ET); Huron Park ET, Exeter ET, and one (1) Reservoir (Res); MacNaughton Res operated by the Municipality
- One (1) Reservoir; Airport Line and Huron Street Res owned and operated by the LHPWSS

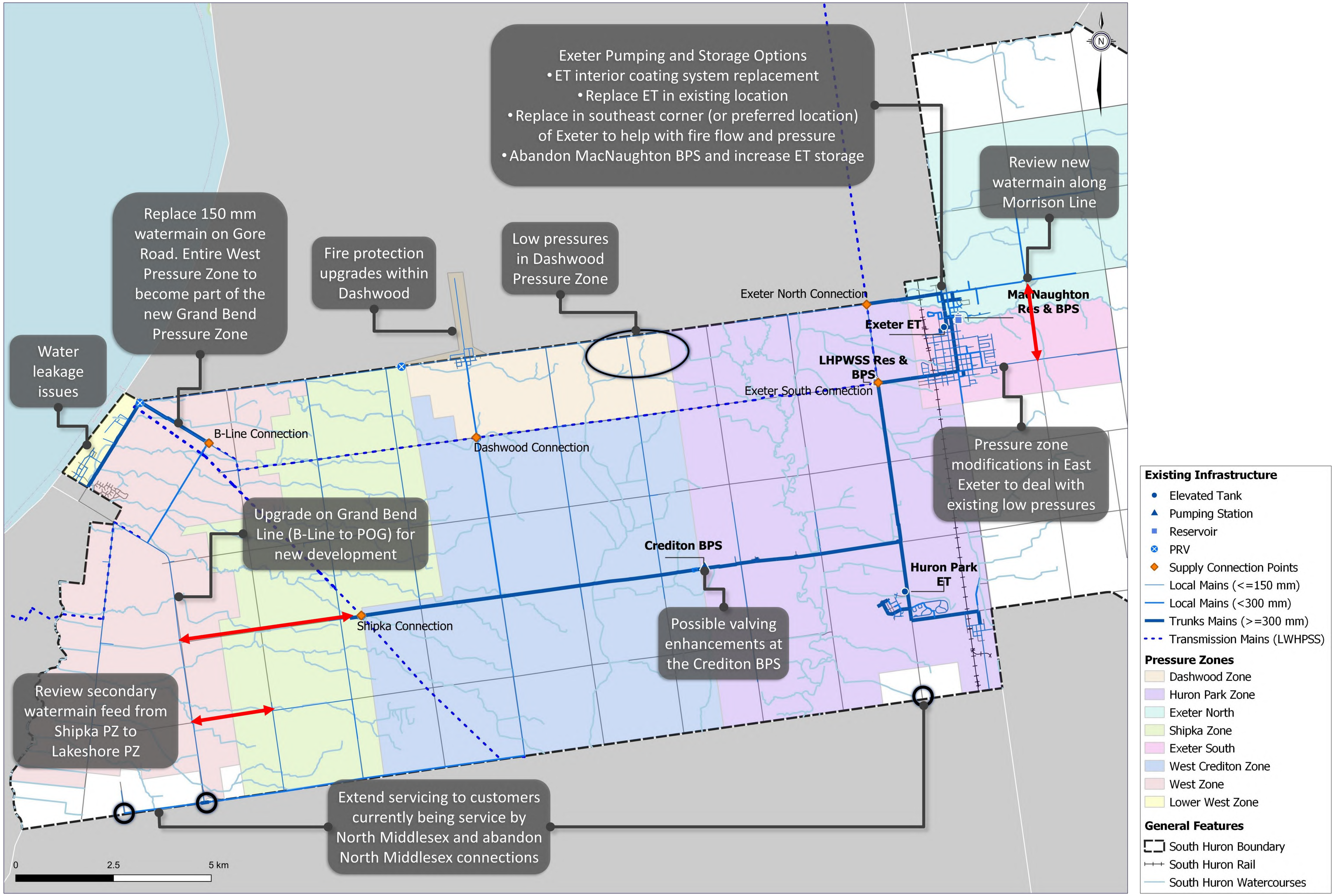
Pumping

- Two (2) Booster Pumping Station (BPS); Crediton BPS and MacNaughton BPS



South Huron Existing Demands	
Pressure Zone	**Average Day Demand (L/s)**
Lower West & West	12.6
Shipka	1.7
Dashwood	4.0
West Crediton	0.9
Huron Park	5.5
Exeter South	11.3
Exeter North	8.9
Total	**44.9**

Water System Opportunities and Constraints

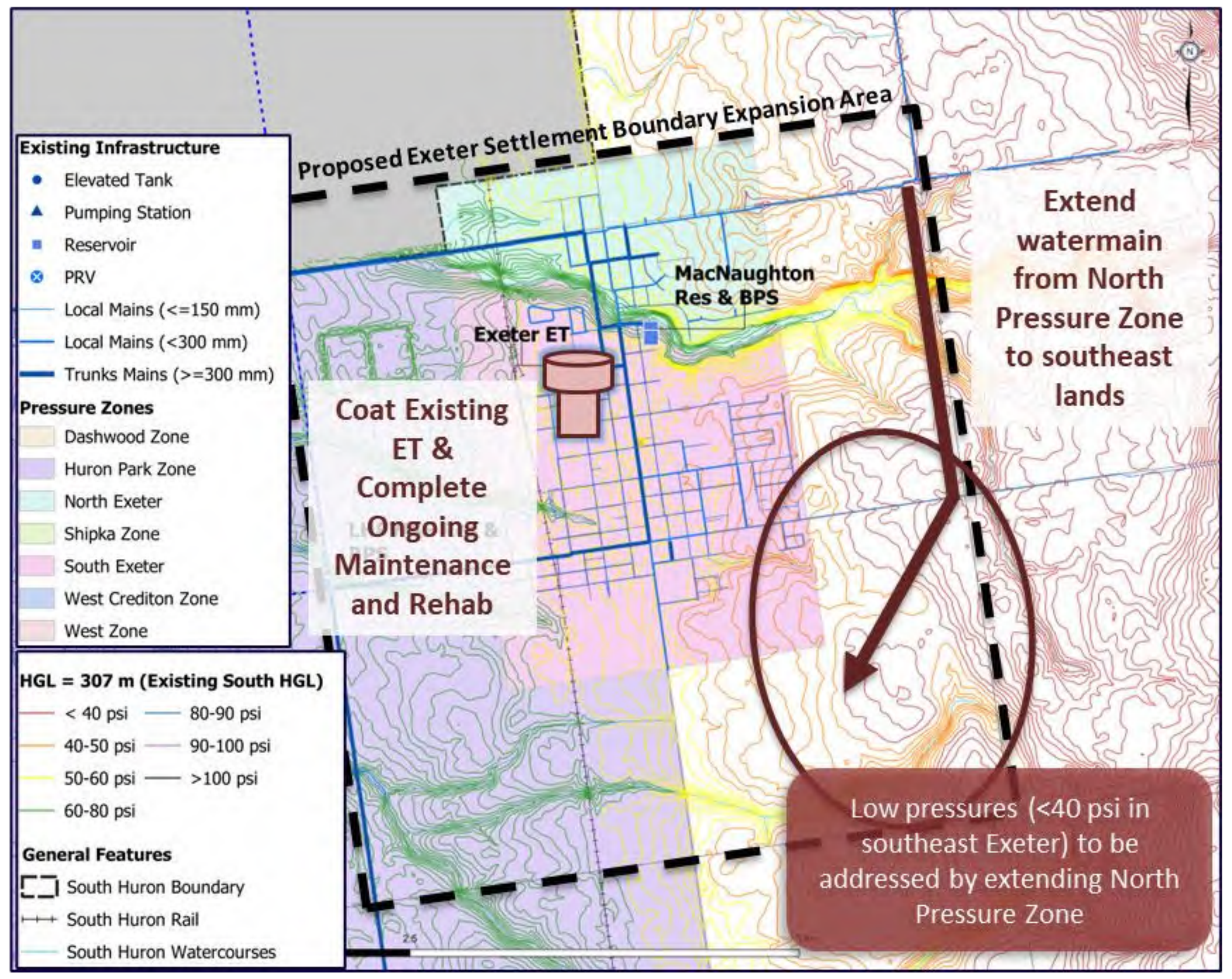


Water Servicing – Exeter Pressure Zones

Alternative 1: Maintain Two Pressure Zones

Advantages:
- Existing storage within Exeter is sufficient to service existing and proposed growth; utilizes existing storage capacity
- No significant construction challenges
- Operate Exeter ET in parallel with Huron Park ET
- Maximizes use of existing pumping and storage facilities

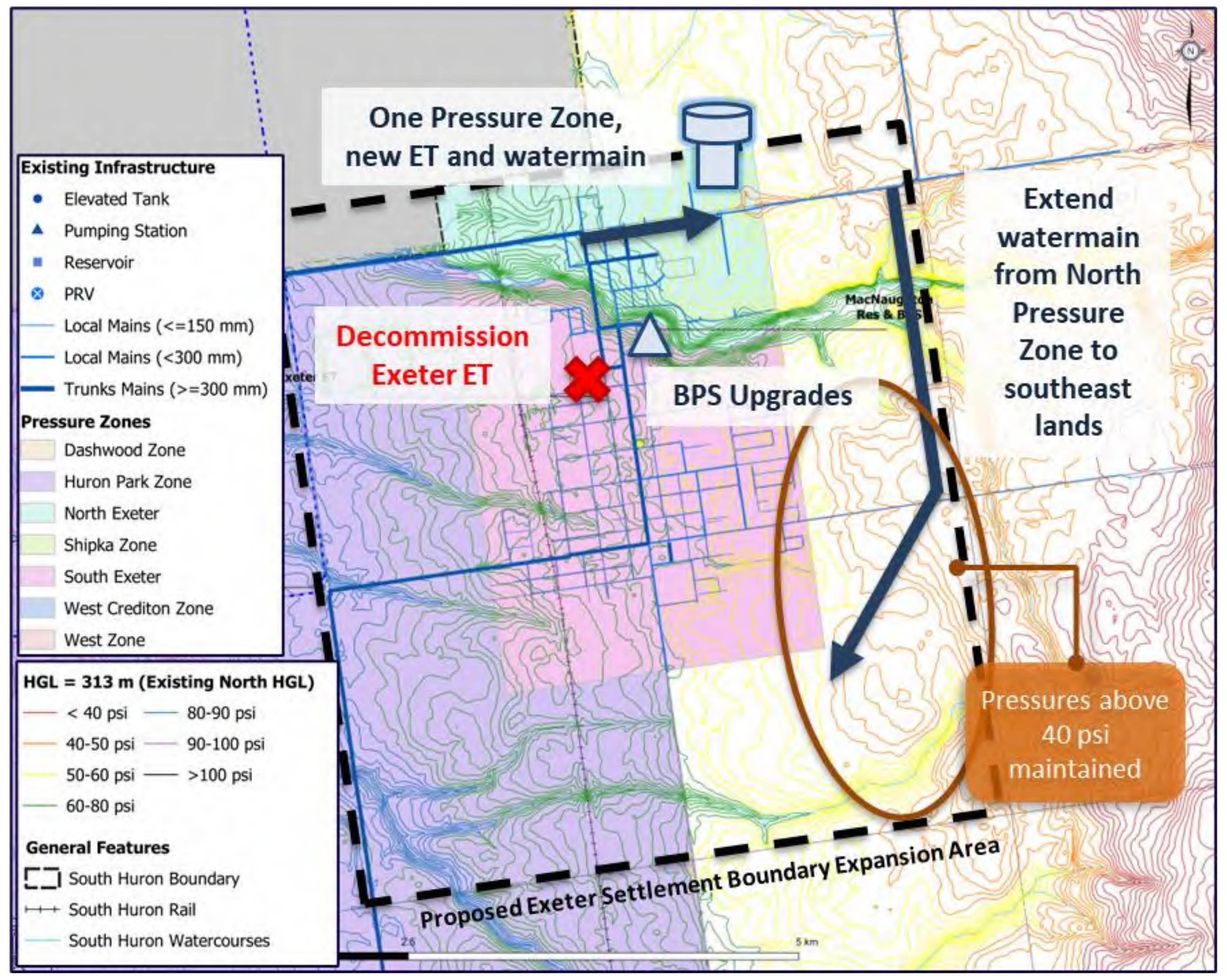
Disadvantages:
- Existing Exeter ET will require ongoing upgrades including recoating the interior which will be cost prohibitive
- No operational improvements or additional system flexibility
- Low pressures in southeast Exeter due to existing topography
- Dependence on longer conveyance for growth in southeast Exeter
- Additional O&M to operate two pressure zones and maintain reliability of existing Exeter ET



Alternative 2: Operate Exeter as One Pressure Zone at a Higher HGL

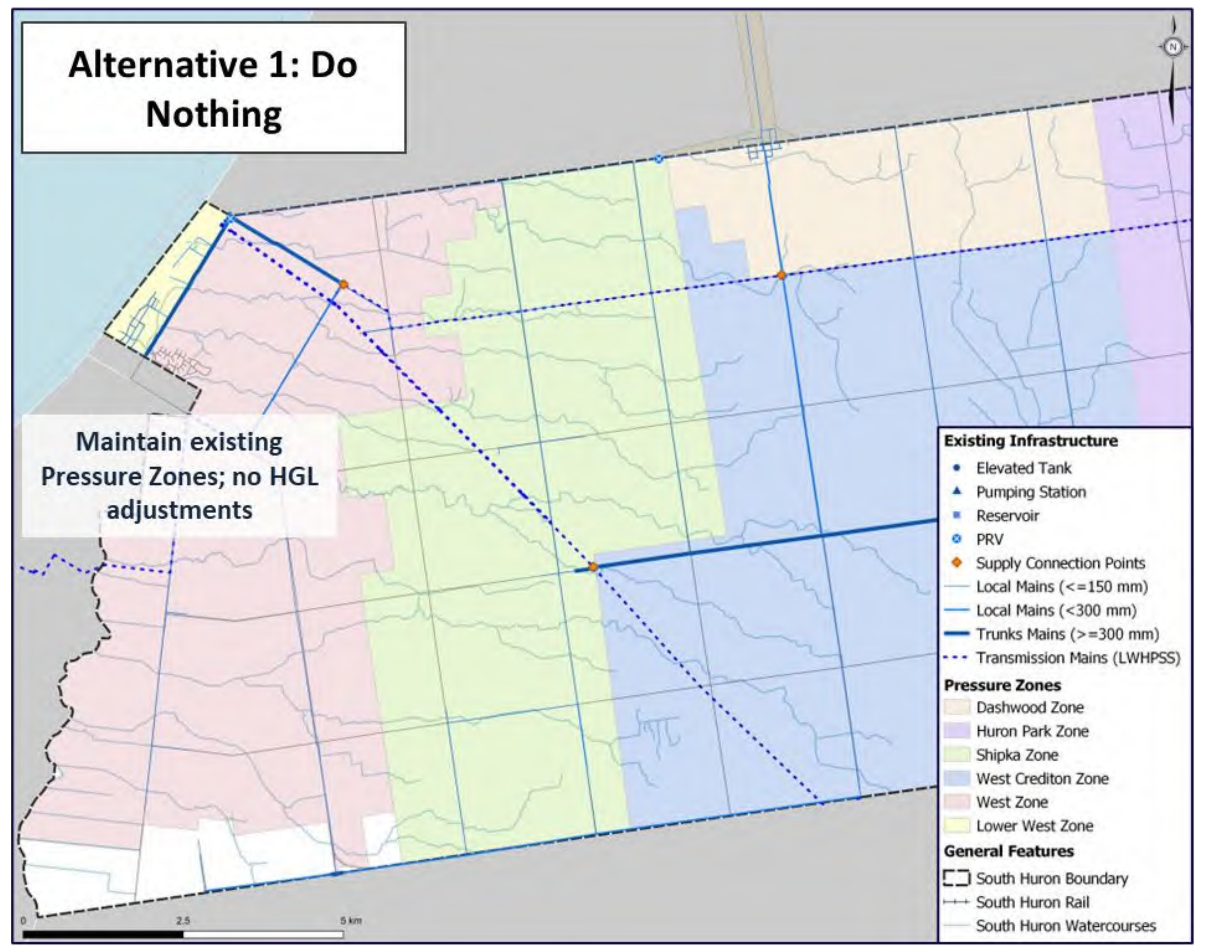
Advantages:
- Pressures can be optimized
- Location of new ET can be optimized to reduce infrastructure required Provides greater hydraulic benefit and system looping
- Reduced O&M costs due to new ET

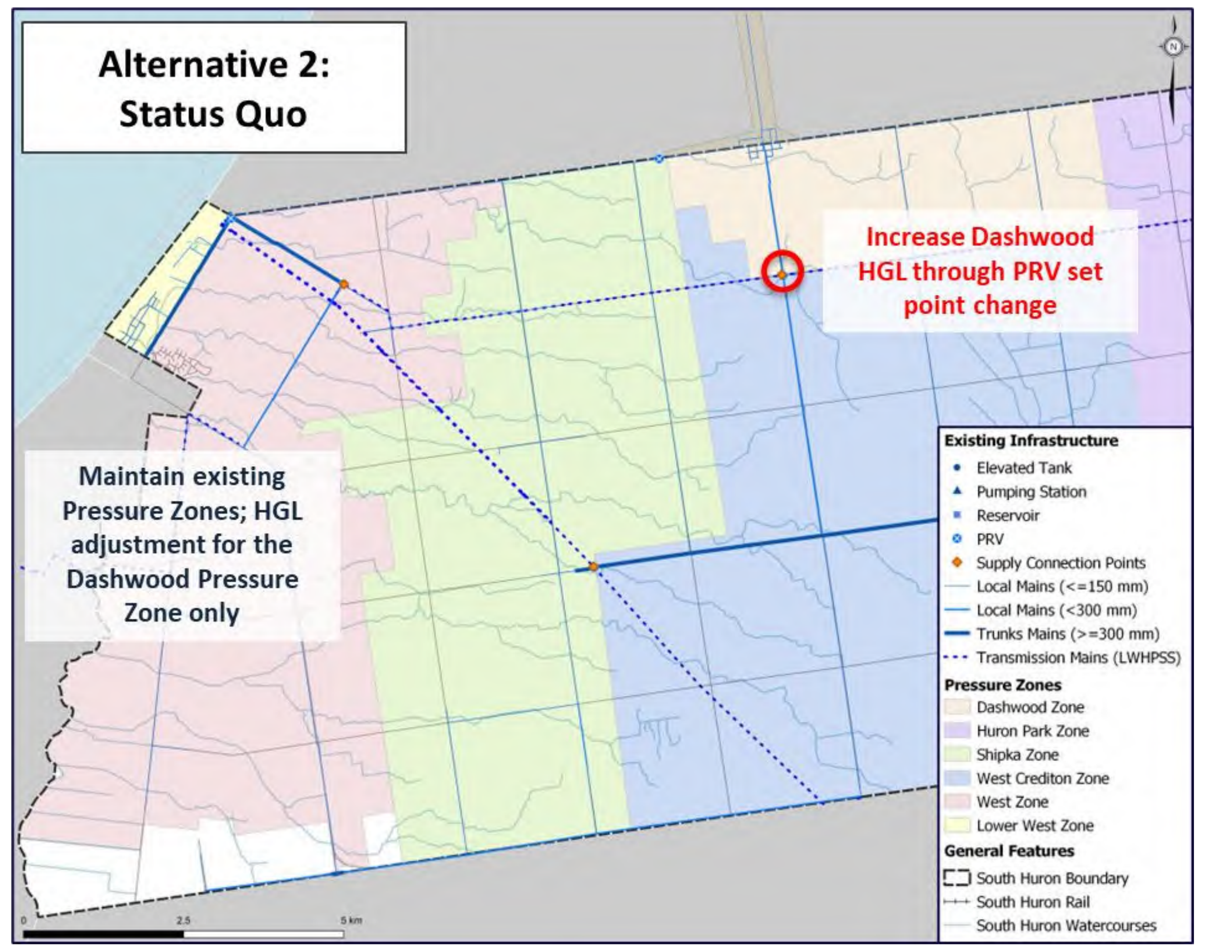
Disadvantages:
- Land acquisition could result in potential delays for new ET
- ET will be oversized until growth lands are constructed
- Construction of storage facilities (especially highly visible elevated tanks) are historically opposed by area residents and businesses
- Increase in HGL for the new ET may require minor upgrades at the MacNaughton BPS and can no longer operate the Exeter ET in parallel with the Huron Park ET

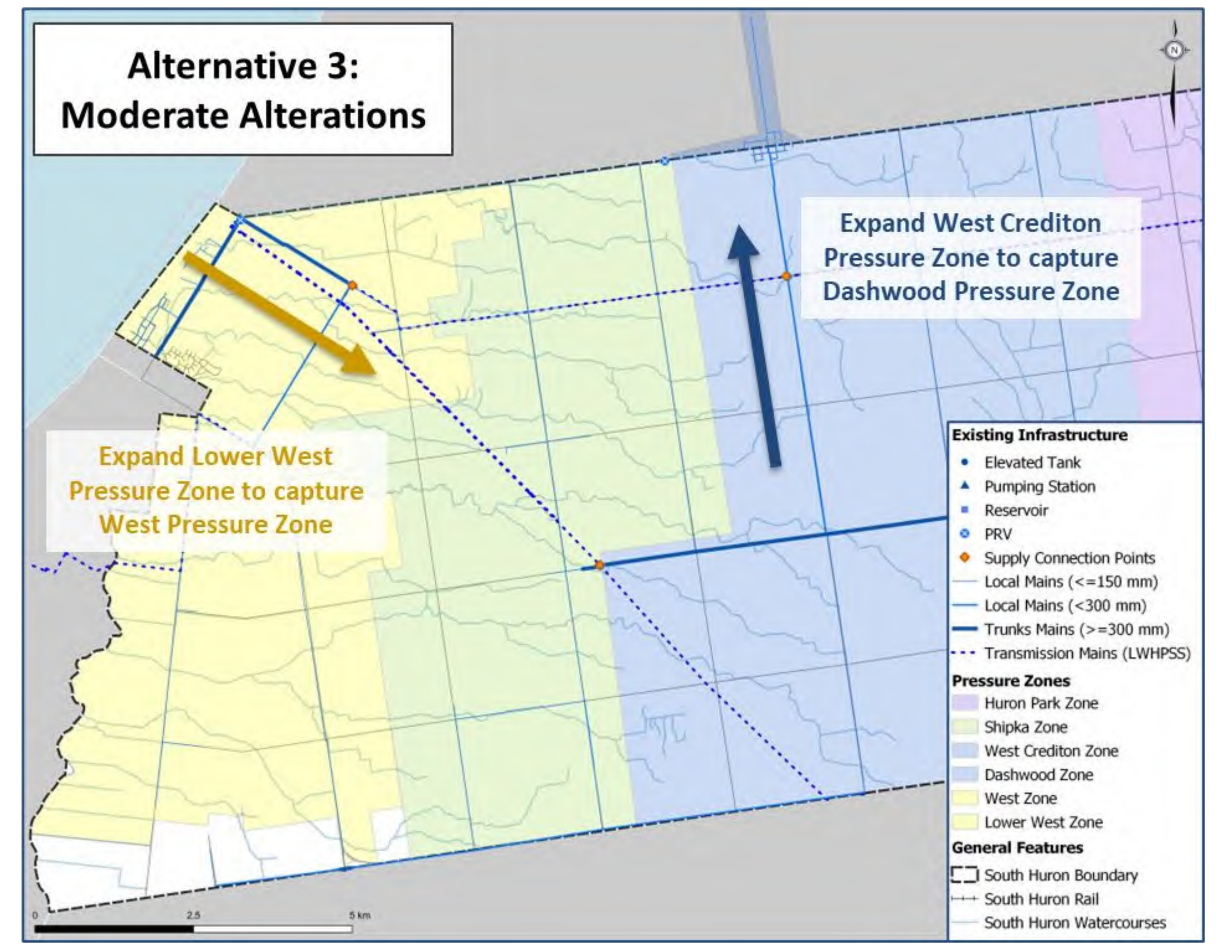


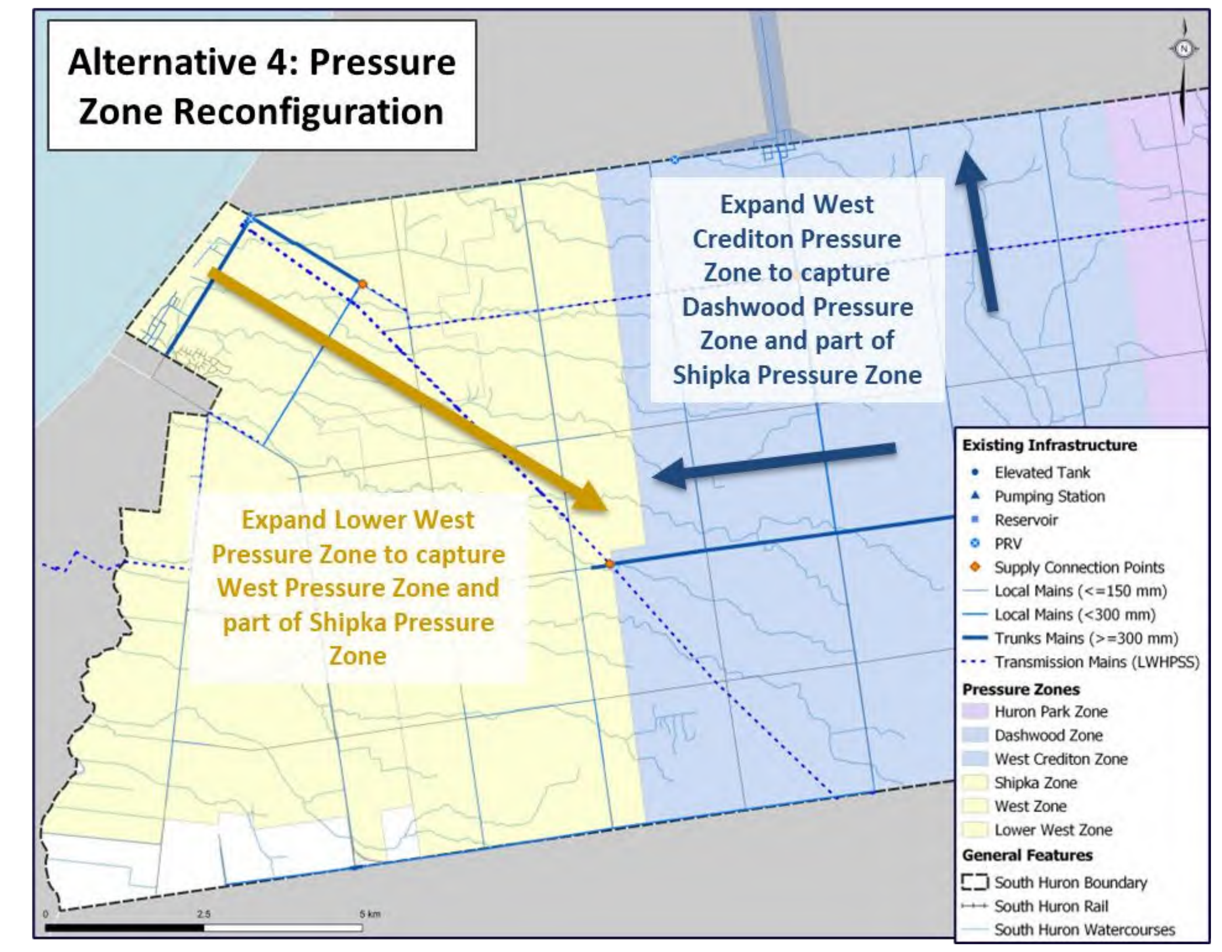
Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Maintain Two Pressure Zones	Med	High	High	Low	**Not Recommended:** No improvements to system under existing or growth conditions
Alternative 2: Operate Exeter as One Pressure Zone	High	High	Med	Med	**Recommended:** Hydraulically, more beneficial and allows for future accommodation of growth lands

Water Servicing – Stephen Pressure Zones









Alternative 1: Do Nothing

Advantages:
- No new infrastructure
- Optimized system pressures with multiple pressure zones

Disadvantages:
- Level of service not met for all areas; low pressures eastern extent of Dashwood Pressure Zone
- No operational improvements

Alternative 2: Status Quo

Advantages:
- Minimal system operation updates
- Improvements for existing low-pressure areas in eastern Dashwood Pressure Zone

Disadvantages:
- Pressures at both ends of the Level of Service criteria within Dashwood; high pressure at western extent and low pressure at eastern extent

Alternative 3: Moderate Alterations

Advantages:
- Minimal to moderate system operation updates required
- Lower number of pressure zones to operate; operational improvements
- Some improved pressures for eastern Dashwood Pressure Zone

Disadvantages:
- Level of service still not met for eastern Dashwood Pressure Zone

Alternative 4: Pressure Zone Reconfiguration

Advantages:
- Lowest number of pressure zones to operate
- Some improved pressures for eastern Dashwood Pressure Zone

Disadvantages:
- Low and high pressures observed at new pressure zone boundaries due to large elevation change over pressure zone

Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Do Nothing	Med	Med	Low	High	Not Recommended: Does not improve system pressures
Alternative 2: Status Quo	High	Med	Med	Med	Not Recommended: Improves Level of Service in Dashwood Pressure Zone; however, also increases risk of watermain breaks and issues from high pressures
Alternative 3: Moderate Alterations	High	High	Med	Med	**Recommended:** Moderate improvements to Level of Service and highest improvement for system operations
Alternative 4: Pressure Zone Reconfiguration	High	High	Low	Med	Not Recommended: Highest system risk for watermain breaks due to high pressures needed to achieve Level of Service across entire Pressure Zone

Water Servicing – LHPWSS Shut Down Resiliency

Alternative 1: Backfeed from Huron Park ET

Advantages:
- No major infrastructure required or substantial changes to existing operations

Disadvantages:
- System only has 34 hours under existing Average Day Demand without maintaining fire storage (excluding Huron Park Pressure Zone)
- Heavily reliant on conveyance watermains

Alternative 2: Install a New ET in Stephen Pressure Zone

Advantages:
- ET location can be optimized to reduce infrastructure requirements
- Reduces risk by providing redundancy and increasing operational flexibility

Disadvantages:
- Potential negative public perception with new ET
- EA and land acquisition required

Alternative 3A: Backfeed from Airport Reservoir: No Additional Storage

Advantages:
- Utilize existing storage facilities
- System has 89 hours under existing Average Day Demand without maintaining fire storage
- Upgrades and piping localized to existing site

Disadvantages:
- Dependent on pumps at Airport Reservoir
- Higher energy usage
- High importance on watermain conveyance, specifically Airport Line watermain

Alternative 3B: Backfeed from Airport Reservoir: Twin Airport Reservoir

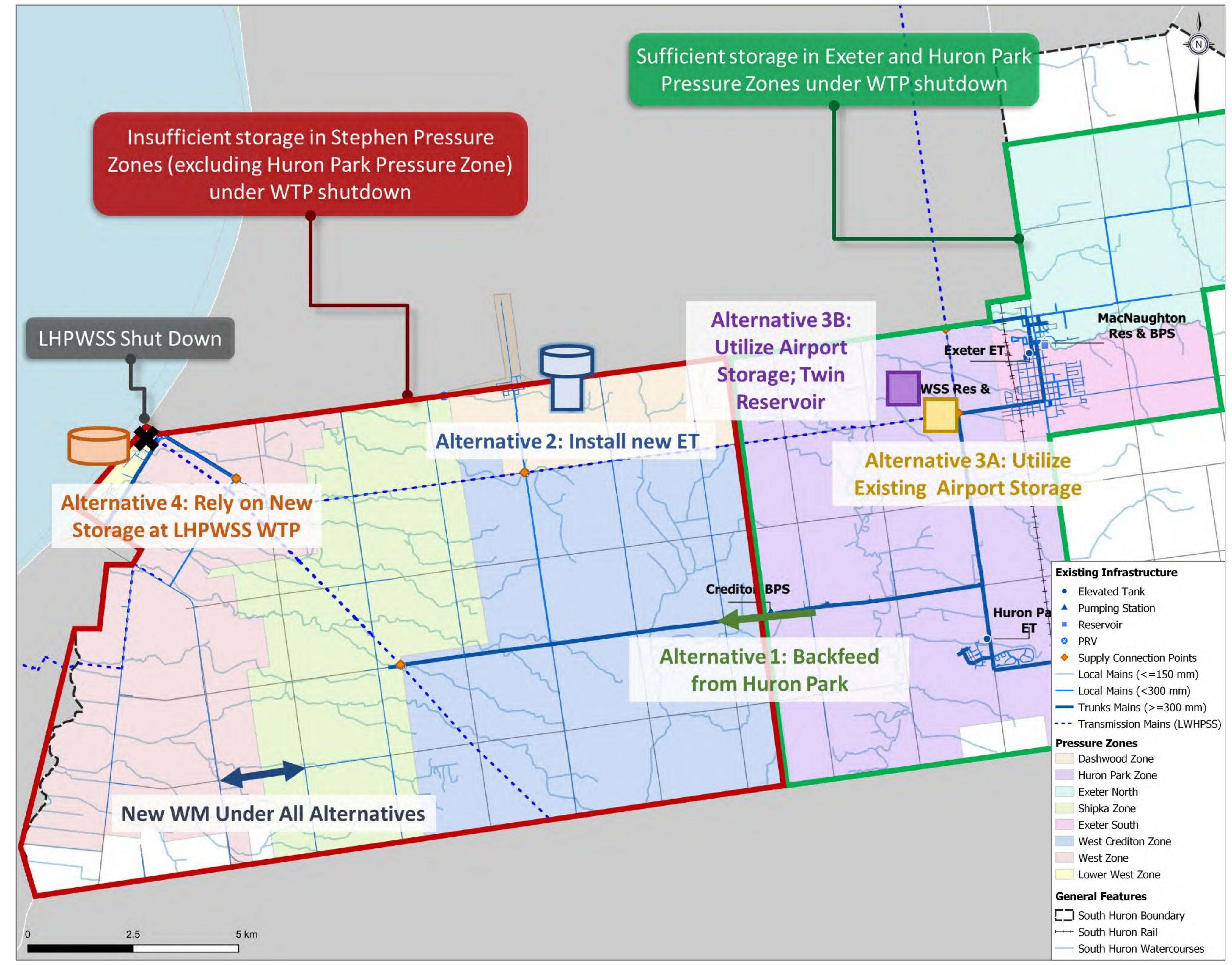
Advantages:
- Space is available for twinning
- Increased redundancy with additional 63 hours of storage compared to Alternative 3A

Disadvantages:
- Higher costs to twin reservoir
- Dependent on pumps at Airport Reservoir
- High importance on watermain conveyance, specifically Airport Line watermain

Alternative 4: Rely on New Storage at the LHPWSS WTP

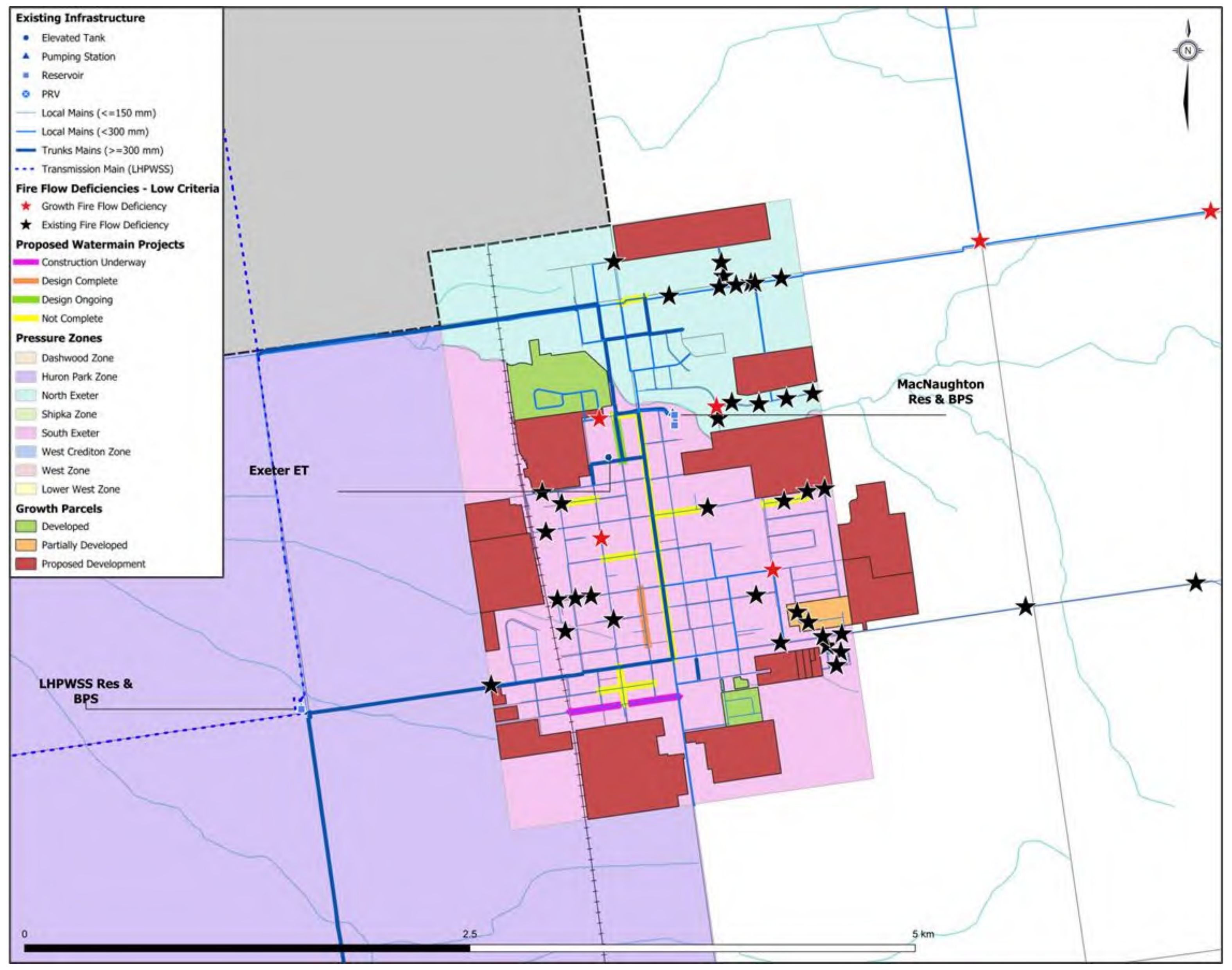
Advantages:
- No municipal infrastructure required
- No substantial changes to current operations

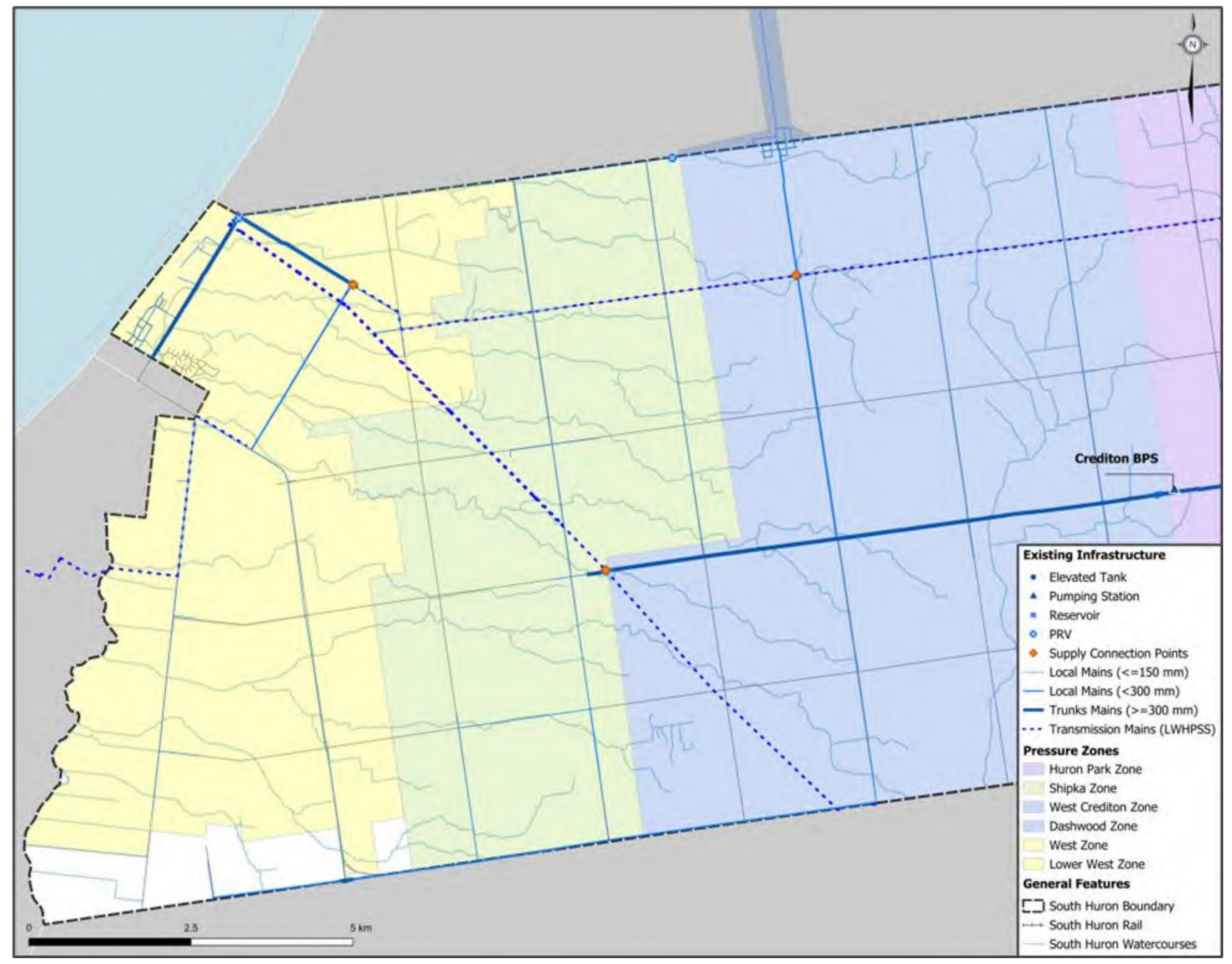
Disadvantages:
- Increased communications and partnership with LHPWSS
- Will not work under high-lift pump shutdown, unless additional backup pumps are installed

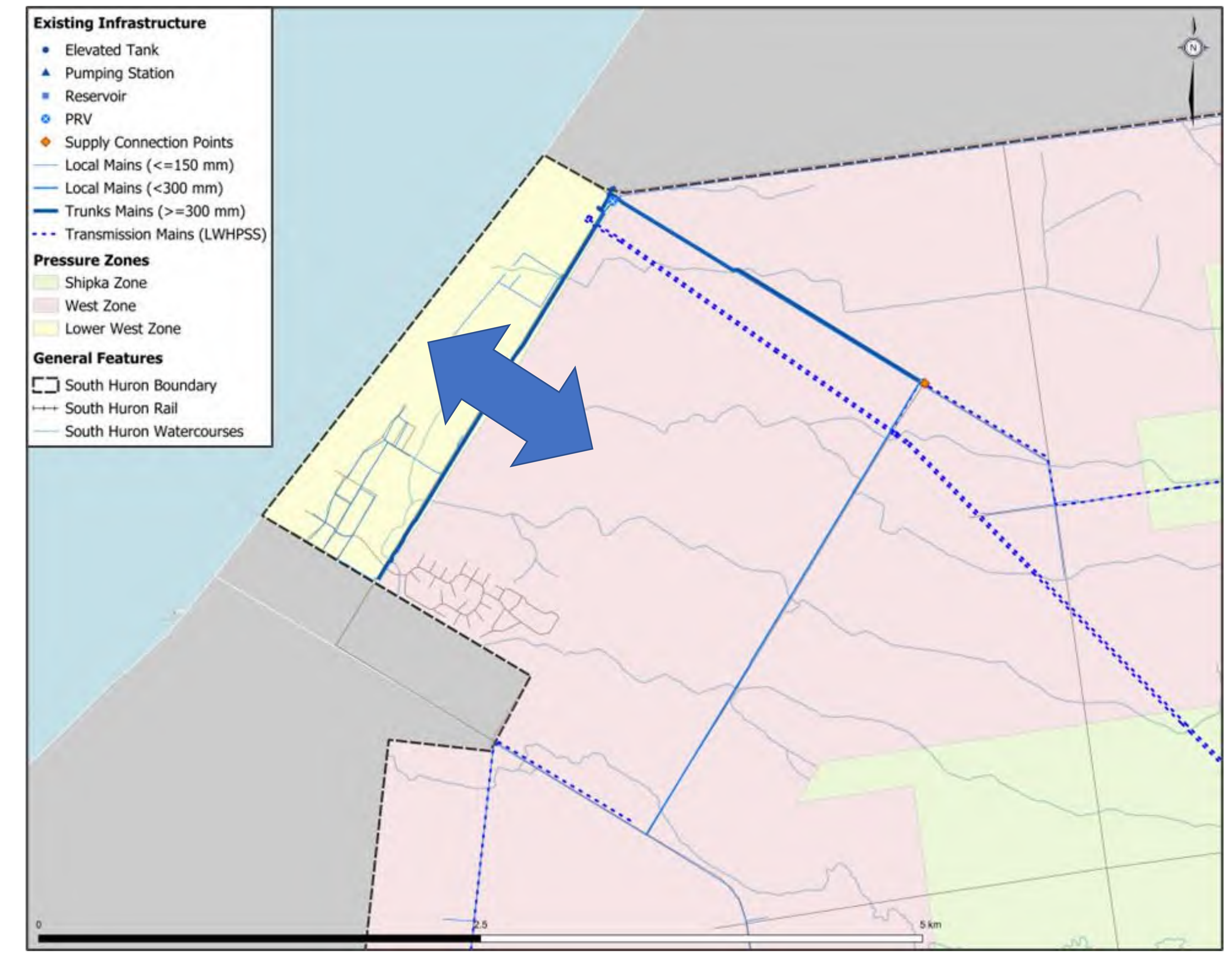


Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Backfeed from Huron Park ET	Low	High	Med	High	Not Recommended: Does not provide highest system resiliency with existing infrastructure
Alternative 2: Install a New ET in Stephen Pressure Zone	High	Med	Low	Low	Not Recommended: High costs and oversized storage infrastructure
Alternative 3A: Backfeed from Airport Reservoir: No Additional Storage	High	Med	High	High	**Recommended:** Provides greatest redundancy while utilizing existing infrastructure
Alternative 3B: Backfeed from Airport Reservoir: Twin Airport Res	Med	Med	High	Low	Not Recommended: High costs and oversized storage infrastructure
Alternative 4: Rely on New Storage at the LHPWSS WTP	Low	High	Med	High	Not Recommended: Not a reliable solution; dependent on extent of LHPWSS shutdown

Water Servicing – Localized Upgrades







Local Watermain Needs

- Local watermains connect to the strengthened trunk watermain network
- Adjustments to the Municipality's local watermain network, to improve local fire flows, are typically needed along dead ends, along cast iron watermains, or for higher fire flow criteria areas
- The replacement process to improve these fire flows is:
  - Creating loops through proposed development where feasible
  - Replacement of watermain at the same time as planned road reconstruction
  - Replacement of aging or small diameter watermains

Non-Revenue Water (NRW) Program

- There are areas within the Stephen water system that have been identified as having significant water leakage issues.
- To reduce the NRW, it is recommended that the Municipality implement a targeted Non-Revenue Water Reduction Program including the following:
  - Leak detection program for watermains
  - Watermain replacement program
  - Improved tracking of unbilled authorized users and development of demand reduction strategies:
    - Boundary Water Meter Program
    - Improved monitoring and enforcement of new construction water uses

Lower West and West Pressure Zone Merging

- High water pressure in the West Pressure Zone due to the high pressures currently used to supply the Municipality of Bluewater from the LHPWSS.
- Installing a new separate feed to Bluewater will reduce water pressure within South Huron and also reduce costs associated with potential water loss due to these high pressures
- Will have a pressure reducing valve (PRV) in the water meter and Bluewater will have their own meter

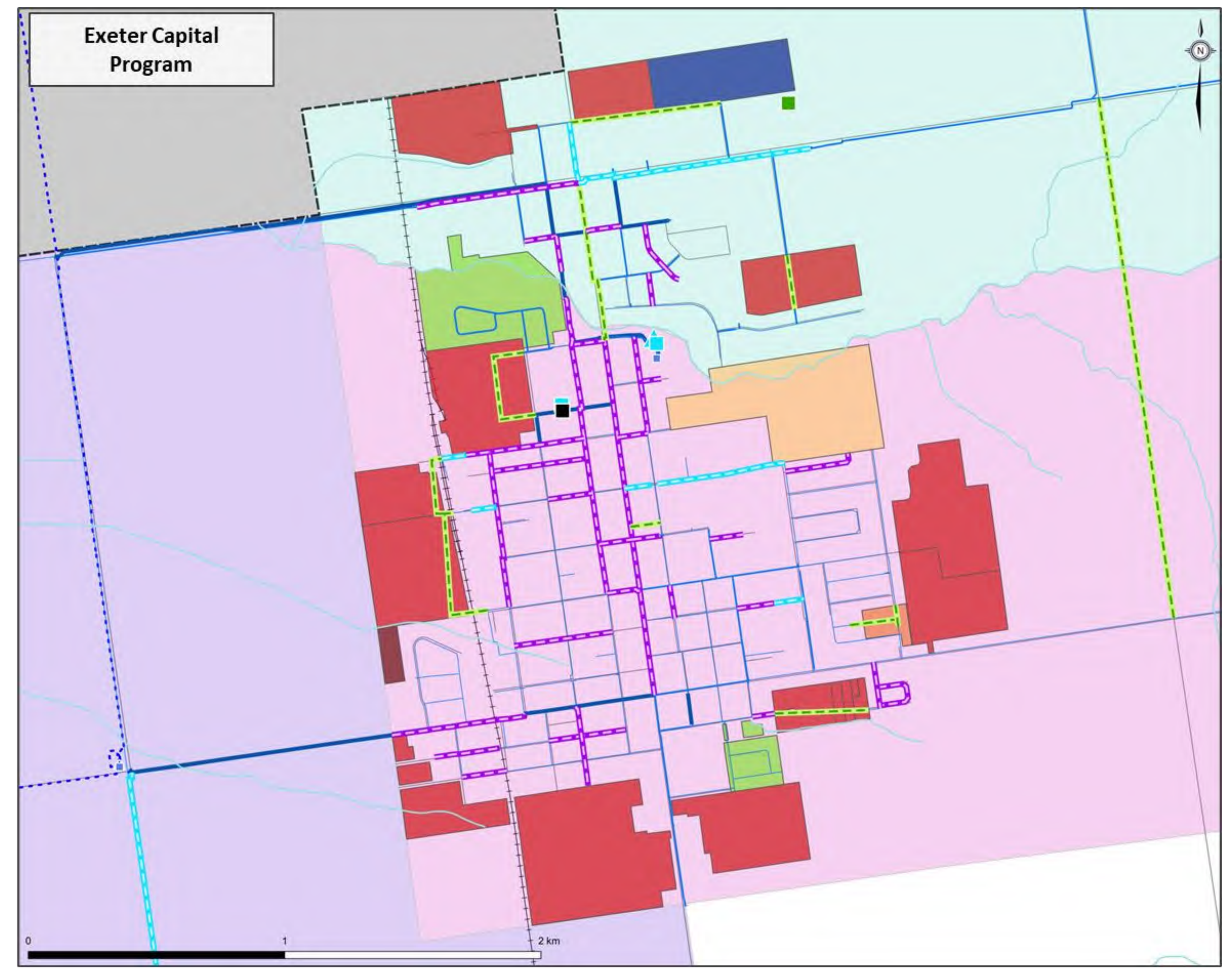
Water Servicing – Capital Program

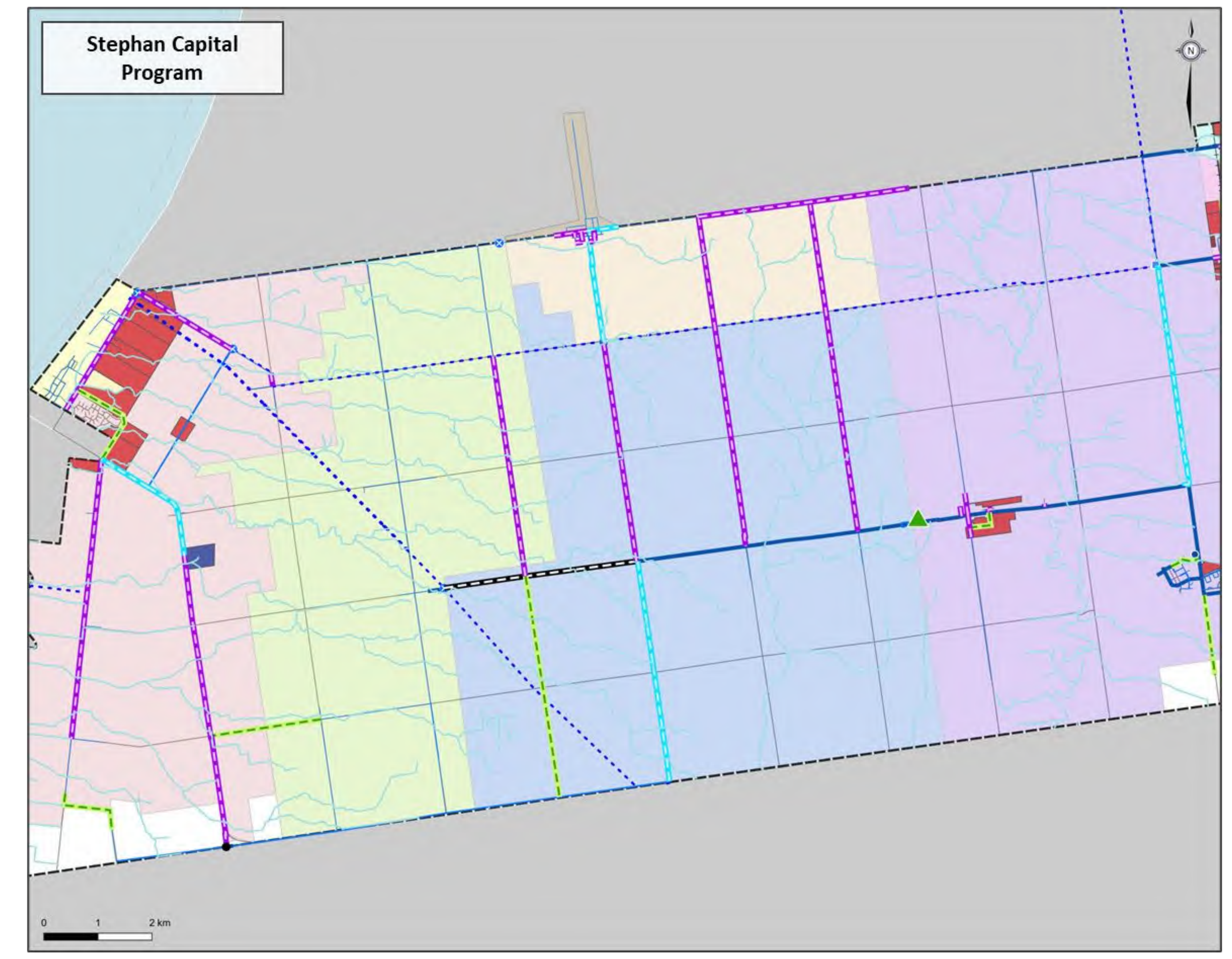
Preferred Water Capital Program - Exeter

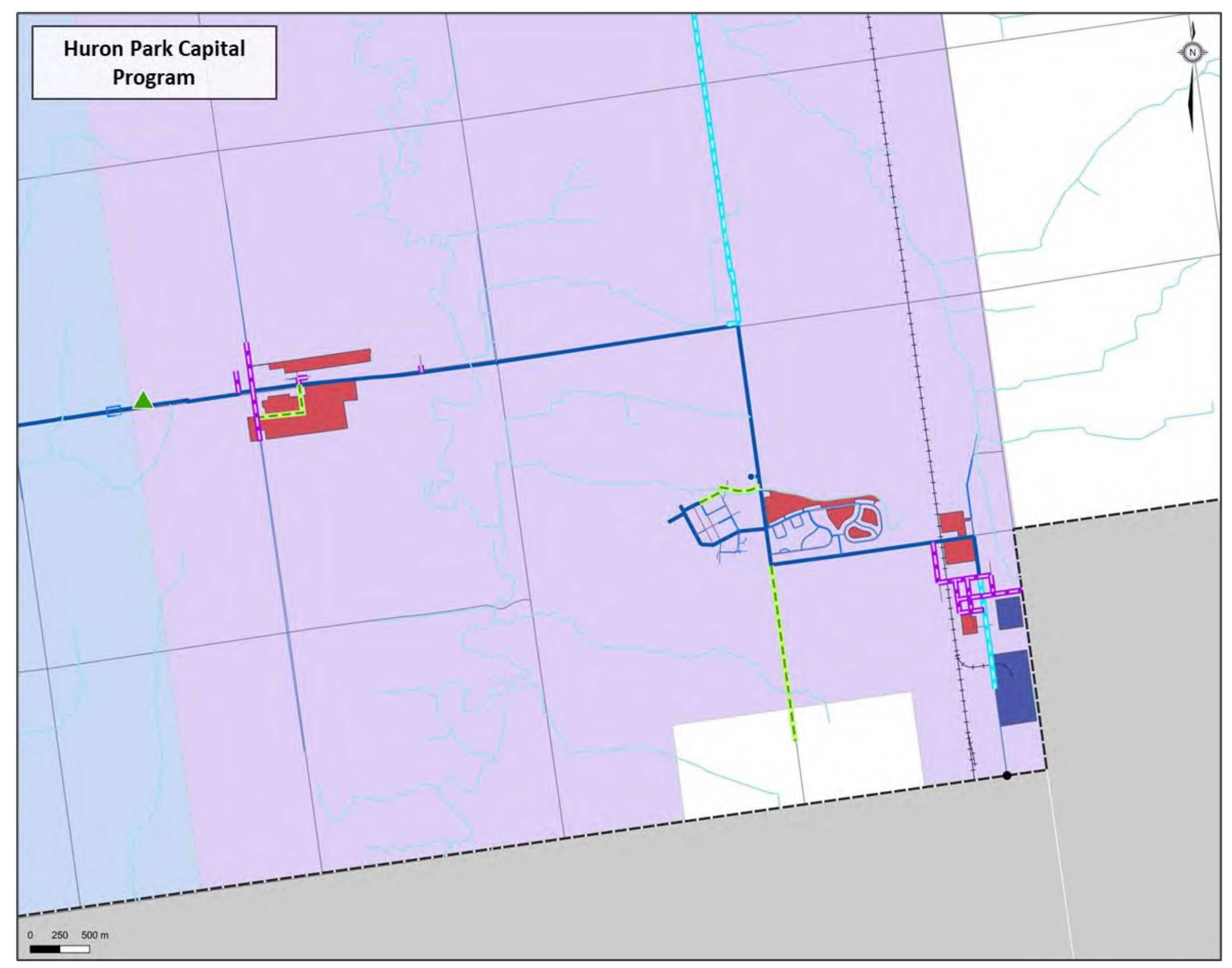
- Align growth strategy and watermain looping with the ongoing road reconstruction projects to improve fire flows for existing and growth demand
- Install a new ET in North Exeter and operating Exeter as one Pressure Zone at a higher HGL
- New trunk watermain along Morrison Line from North Exeter to southeast Exeter for additional system flexibility and looping and improved pressures

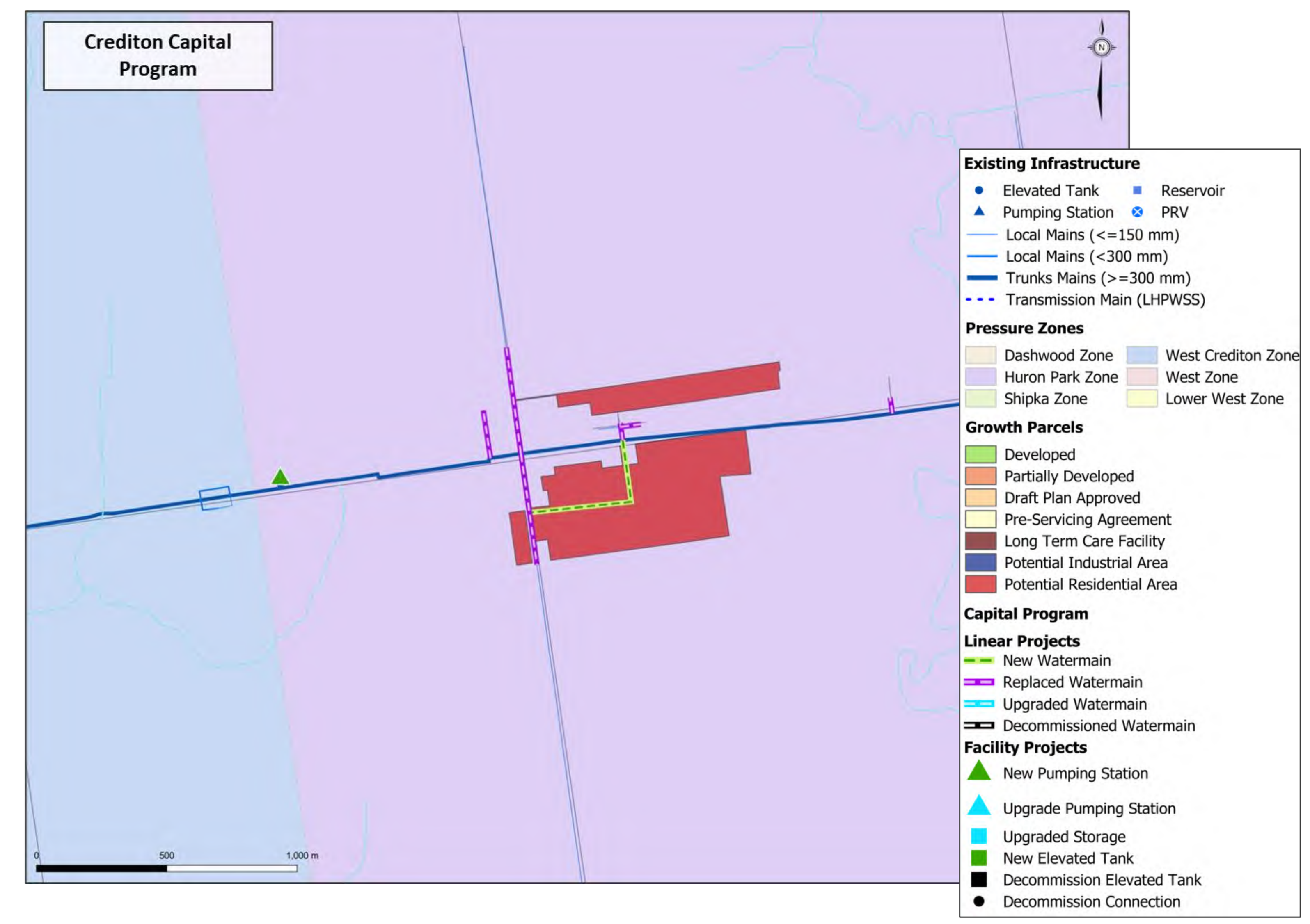
Preferred Water Capital Program - Stephen

- Stephen includes Stephen, Huron Park, and Crediton Capital Programs
- Moderate alterations to the existing Stephen Pressure Zones including expanding the Lower West Pressure Zone to capture the West Pressure Zone and expanding the West Crediton Pressure Zone to capture the Dashwood Pressure Zone
- Maximize existing storage infrastructure
- Increase system resiliency and water transfer in the Stephen southwest rural lands by installing a new watermain along South Road between Corbett Line and Grand Bend Line
- Investigation of the Airport Line watermain to determine existing condition and cause for frequent breaks
- Ensure logical watermain looping occurs in line with development pressures to address fire flow deficiencies
- Upsize conveyance watermain to Dashwood to achieve fire flow requirements throughout village
- Extend servicing to customers currently being serviced by North Middlesex and abandon current North Middlesex connections to reduce billing for South Huron customers
- Targeted NRW reduction program including:
  - Implement boundary water metering program of private and semi-private water systems
  - Leak detection program for watermains Water Metering Program in select areas to reduce high NRW currently experienced



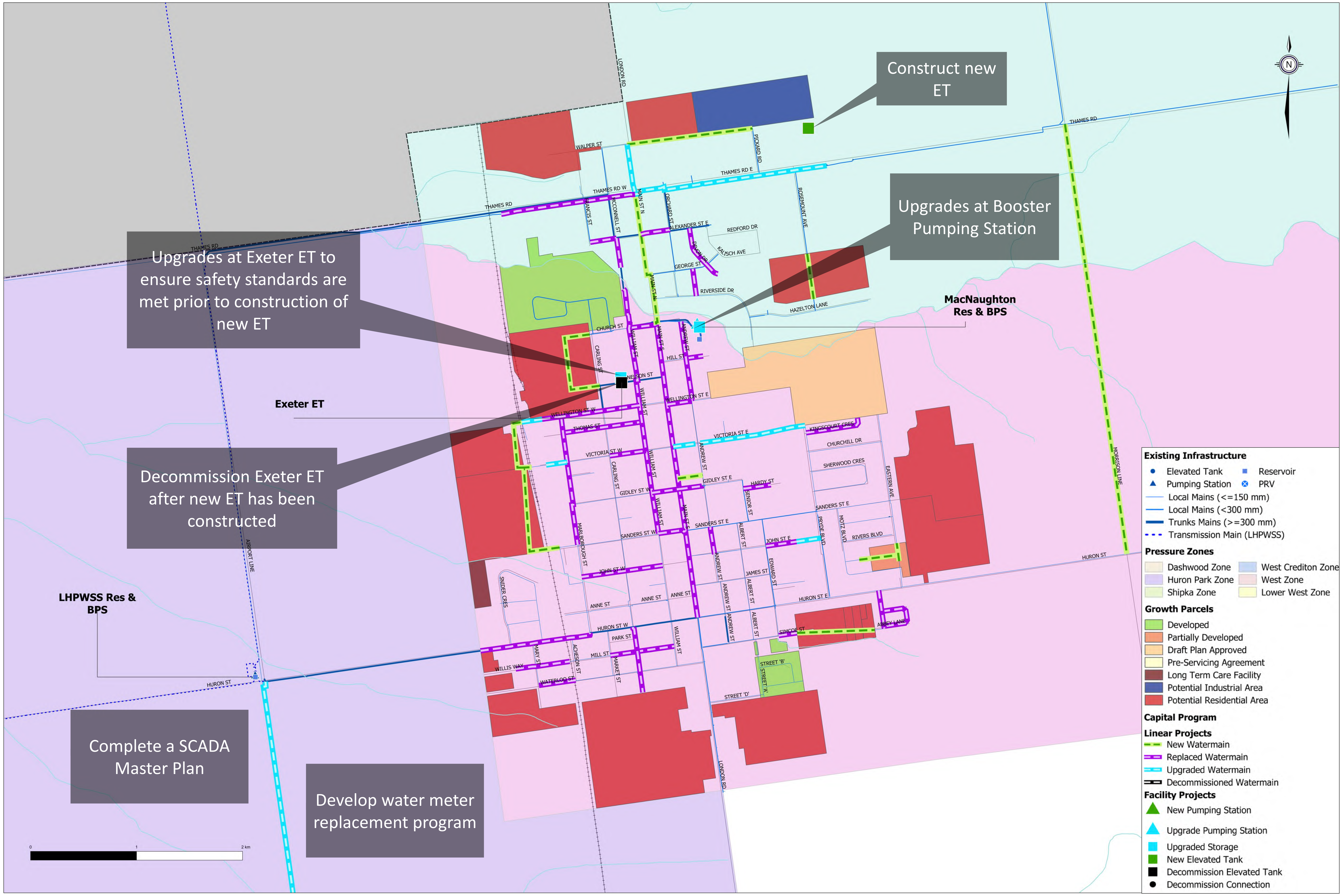






Capital Project	Exeter Project Costs	Stephen Project Costs	Total Project Costs
Linear Projects	$ 42,220,000	$ 105,021,000	$ 147,241,000
Facility Projects	$ 13,981,000	$ 500,000	$ 14,481,000
Studies	$ 560,000	$ 850,000	$ 1,410,000
Total Water Capital Project Costs	**$ 56,761,000**	**$ 106,371,000**	**$ 163,132,000**

Water Servicing – Capital Program (Exeter)



Water Servicing – Capital Program (Stephen)

Water Servicing – Capital Program (Huron Park, Centralia, and Crediton)

Existing Wastewater System

Exeter Wastewater Treatment Facility (WWTF)

- The Exeter WWTF is a sewage lagoon that services the Town of Exeter, and villages of Crediton, Huron Park and Centralia

Exeter Sanitary Pumping Stations (SPS)

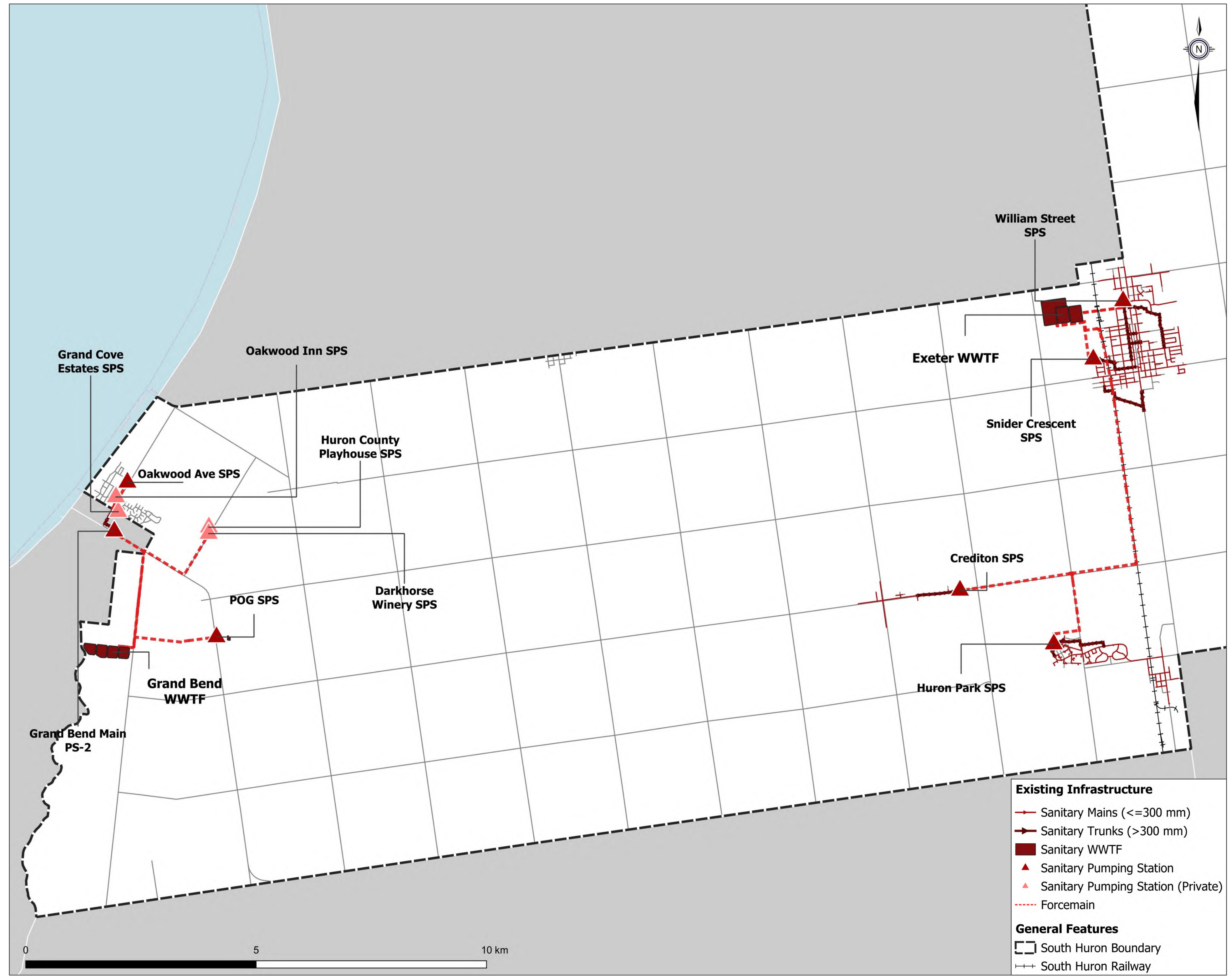
- Four (4) Sanitary Pumping Stations (SPS); William Street SPS and Snider Crescent SPS in Exeter, Crediton SPS and Huron Park SPS that all pump wastewater to the Exeter WWTF

Grand Bend Wastewater Treatment Facility

- The Grand Bend WWTF is a mechanical treatment plant
- Jointly owned and administered by Lambton Shores and operated by Jacobs Engineering Group
- South Huron is allocated 35.7% of the plant capacity

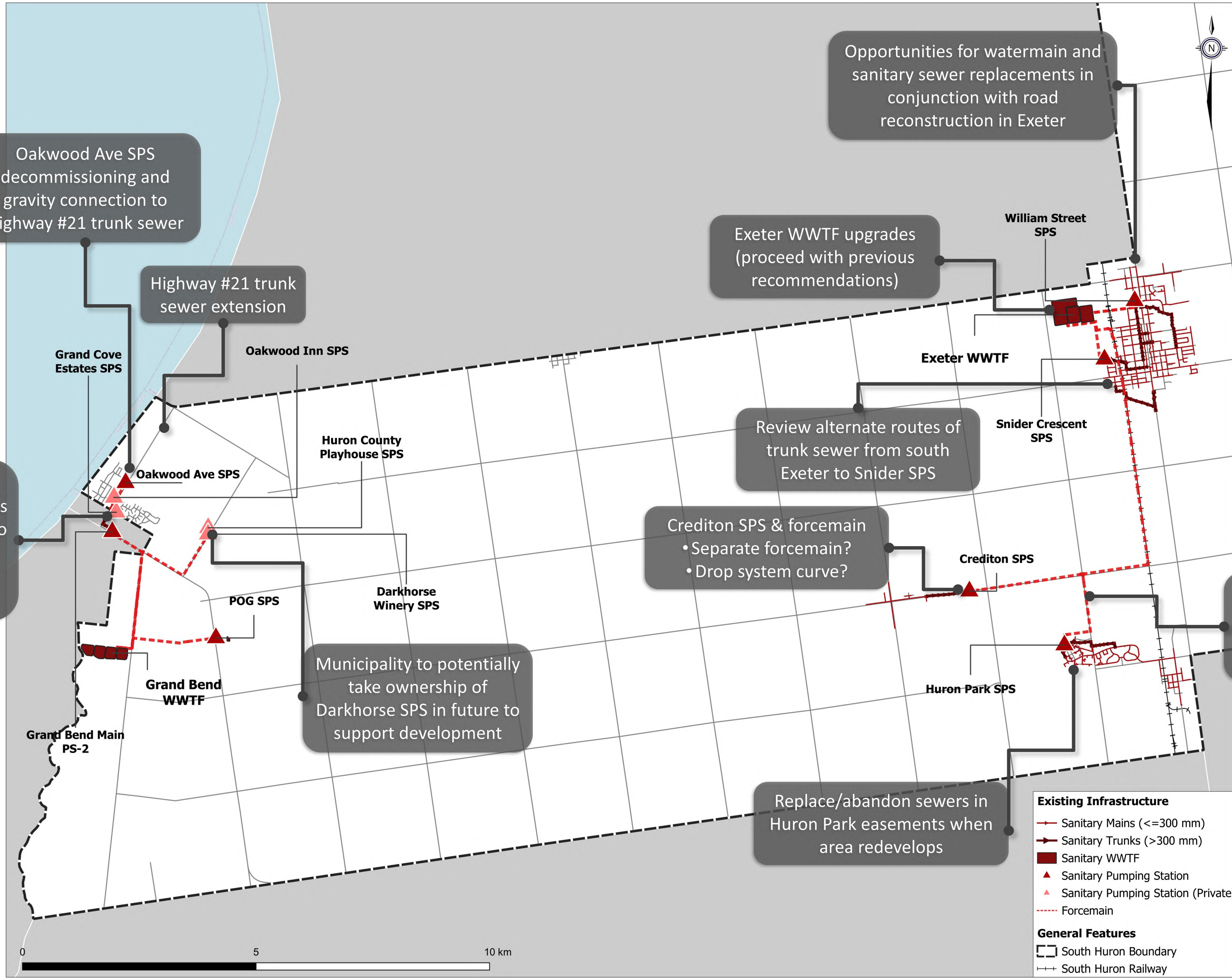
Grand Bend Sanitary Pumping Stations

- Three (3) Municipal owned SPS; Oakwood Area SPS, POG SPS, and Grand Bend Main PS-2
- Grand Bend Main PS-2 is jointly owned with the Municipality of Lambton Shores. South Huron is allocated 50% of station capacity
- Four (4) Privately owned SPS; Oakwood Inn SPS, Darkhorse Winery SPS, Huron County Playhouse SPS and Grand Cove Estates SPS
- All SPS outlet at the Grand Bend WWTF



South Huron Existing Wastewater System Flows		
WWTF	**SPS**	**Average Dry Weather Flow (L/s)**
Exeter	William Street SPS	10.3
	Snider Crescent SPS	6.4
	Crediton SPS	9.1
	Huron Park SPS	3.6
Exeter WWTF Total		**36.8**
Grand Bend	Grand Bend Main PS2	8.6
	POG SPS	No existing data
Grand Bend WWTF Total		**8.6**

Wastewater Opportunities and Constraints



Wastewater Servicing – Exeter Wastewater Treatment Facility

Alternative 1: Do Nothing

Advantages:
- No upgrades required

Disadvantages:
- Does not accommodate all growth flows
- No capacity redundancy to allow for regular maintenance
- Maintenance remains an issue as sand filters have declining performance and are approaching maximum capacity
- Hydraulic capacity will continue to decline
- Effluent quality may deteriorate and result in more MECP exceedances

Alternative 2: Add Ultraviolet Disinfection (UV) Treatment

Advantages:
- Minimal upgrades required
- Interim solution to support existing and growth flows with phased expansion of the plant. Can consider future integration with a mechanical treatment plant
- Summer discharge would be further improved, and winter season discharge could be disinfected

Disadvantages:
- Does not accommodate all growth
- No additional capacity redundancy for regular maintenance
- Constructability issues
- Additional future O&M costs

Alternative 3: Mechanical Filter

Advantages:
- Moderate process upgrades required
- Supports phased expansion of the plant
- Streamlines upgrades with Mechanical Filter supporting future Full Mechanical Plant
- Provides more flexibility for processes to be taken offline for maintenance

Disadvantages:
- More extensive upgrades will be required for existing systems such as pumping station
- Does not provide removal of bacteria within the mechanical system. UV filtration may be required.
- More reliance on lagoon performance
- Additional future O&M costs
- Higher capital costs

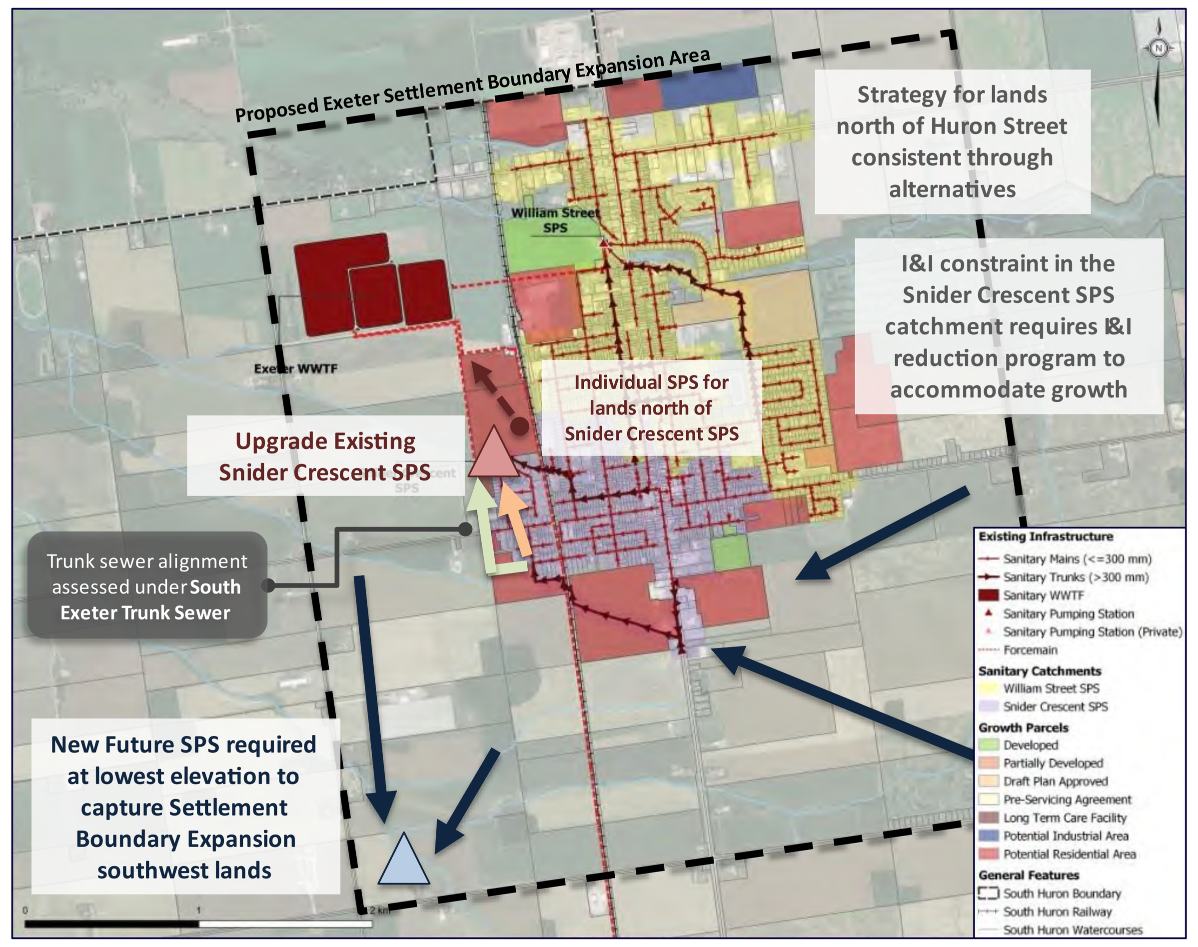
Alternative 4: Full Mechanical Plant

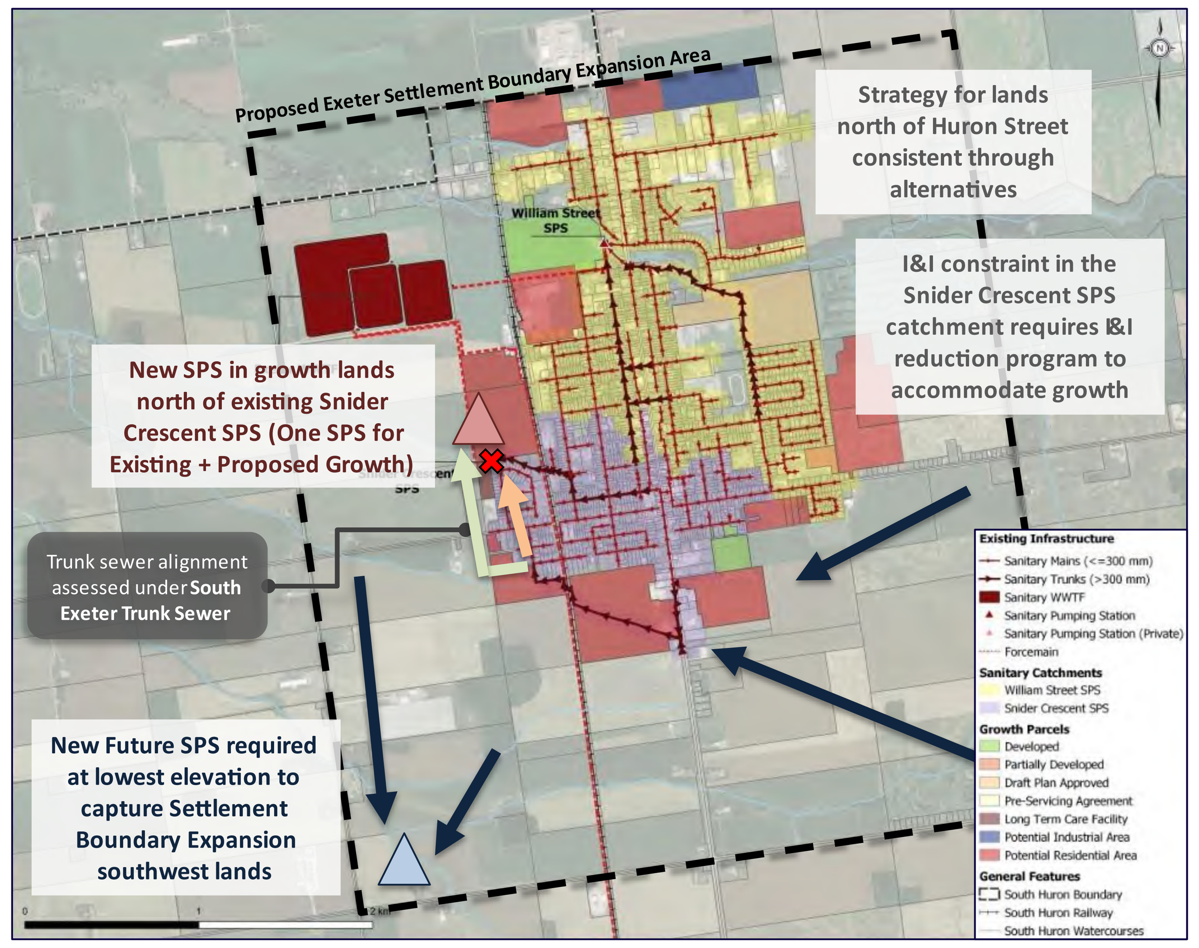
Advantages:
- Provides redundancy for major processes
- Allows growth flexibility
- Phased upgrades including UV Treatment and Mechanical Filter support future new mechanical plant

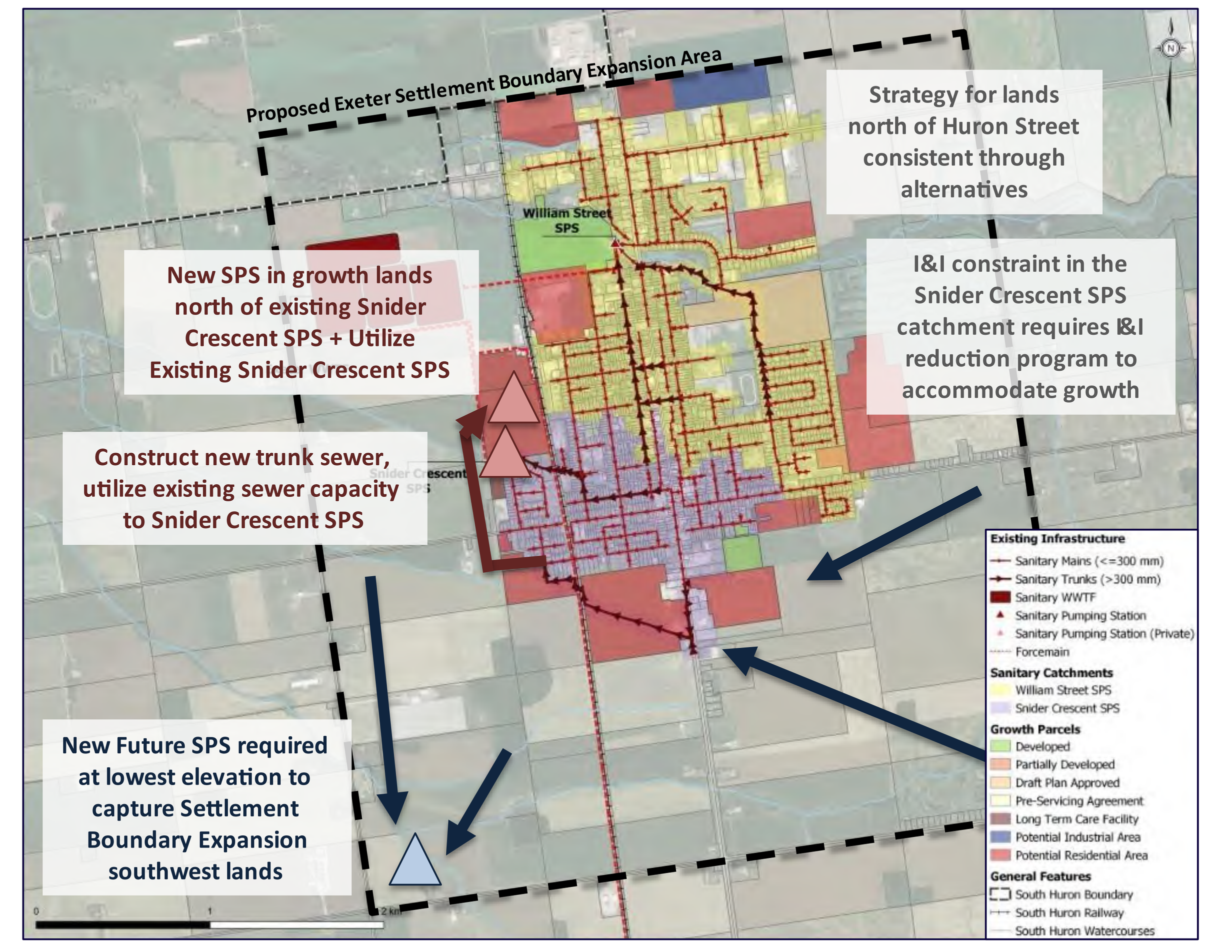
Disadvantages:
- Requires major and costly process upgrades
- System would be oversized for existing flows
- Additional future O&M costs
- Highest capital cost
- EA required

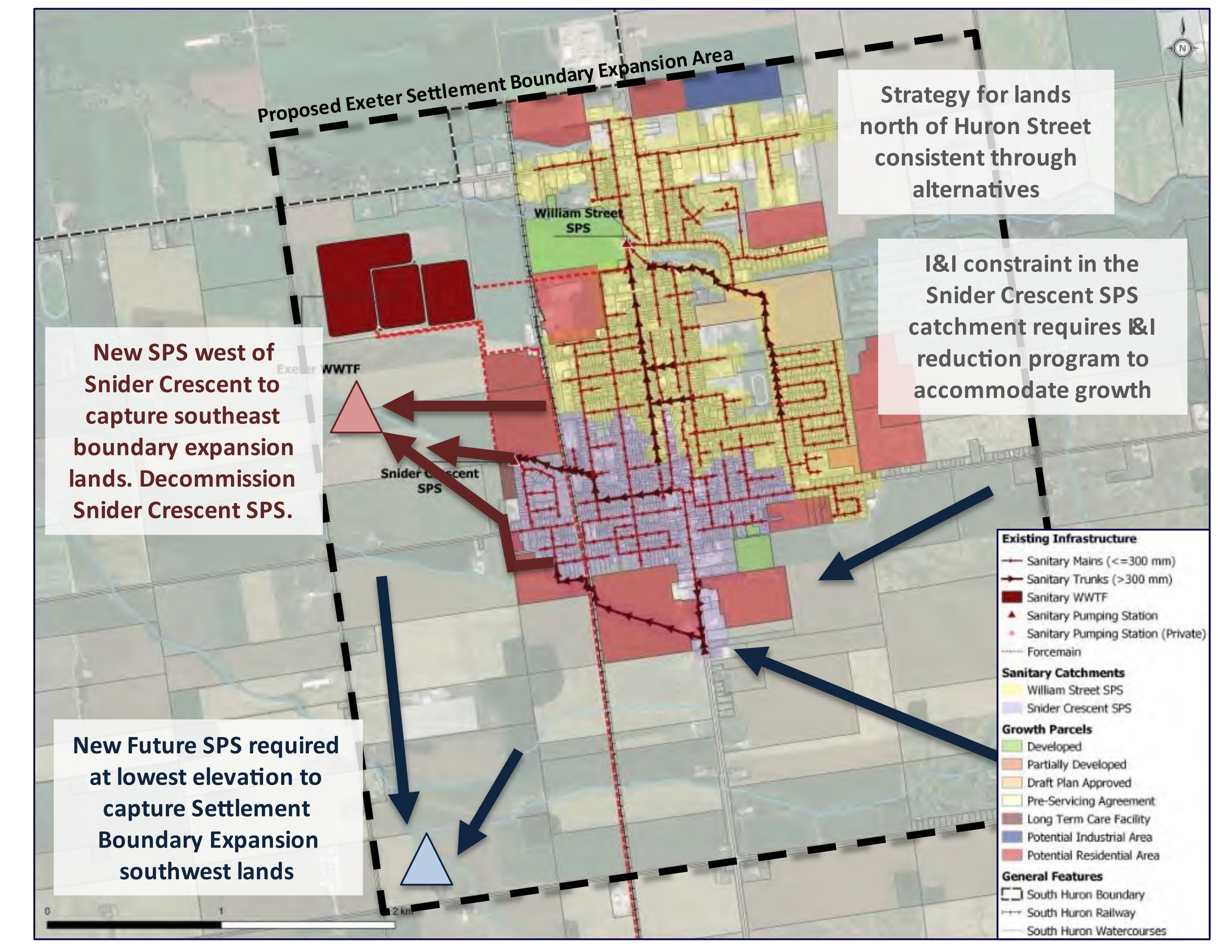
Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Do Nothing	Low	High	High	High	Not Recommended: Existing flows reach capacity and do not accommodate growth flows
Alternative 2: Add Ultraviolet Disinfection (UV) Treatment	Med	High	High	Med	**Recommended (Short-Term)**: Improves existing effluent quality and can be implemented as phased approach as the first step
Alternative 3: Mechanical Filter	Med	High	High	Low	**Recommended (Intermediate Term)**: To be implemented as part of phased approach, following UV treatment.
Alternative 4: Full Mechanical Plant	High	Med	Med	Low	**Recommended (Long-Term)**: Long-term recommendation for the WWTF, as the Municipality works towards transitioning to a fully conventional mechanical treatment plant.

Wastewater Servicing – South Exeter SPS









Alternative 1: Upgrade existing Snider Crescent SPS (One SPS)

Advantages:
- Utilizes existing infrastructure
- Operations and maintenance costs significantly less to operate one SPS

Disadvantages:
- Snider Crescent SPS at capacity with limited to no space for expansion
- Focuses on proposed growth
- Growth north of Snider Crescent SPS will need a separate strategy

Alternative 2: One new SPS north of existing Snider Crescent SPS (One SPS)

Advantages:
- One SPS for existing and proposed growth in southeast Exeter
- Operations and maintenance costs significantly less to operate one SPS

Disadvantages:
- Does not utilize Snider Crescent SPS
- Focuses on proposed growth and does not account for potential expansion of boundary lands to the west

Alternative 3: New SPS north of existing Snider Crescent SPS and utilize existing Snider Crescent SPS (Two SPS's)

Advantages:
- All costs related to development; minimizes construction to existing residents
- Utilizes existing infrastructure to capacity
- Allows for phased expansion

Disadvantages:
- Operations and maintenance costs significantly higher to operate two SPS's
- More infrastructure to maintain

Alternative 4: One new SPS northwest of Snider Crescent SPS in Expansion of SAB (One SPS)

Advantages:
- Focuses on servicing expansion of SAB, resulting in the least amount of infrastructure if lands to the west develop
- O&M costs significantly less for one SPS

Disadvantages:
- Location not ideal if growth does not happen
- Longer length of sewer and forcemain required

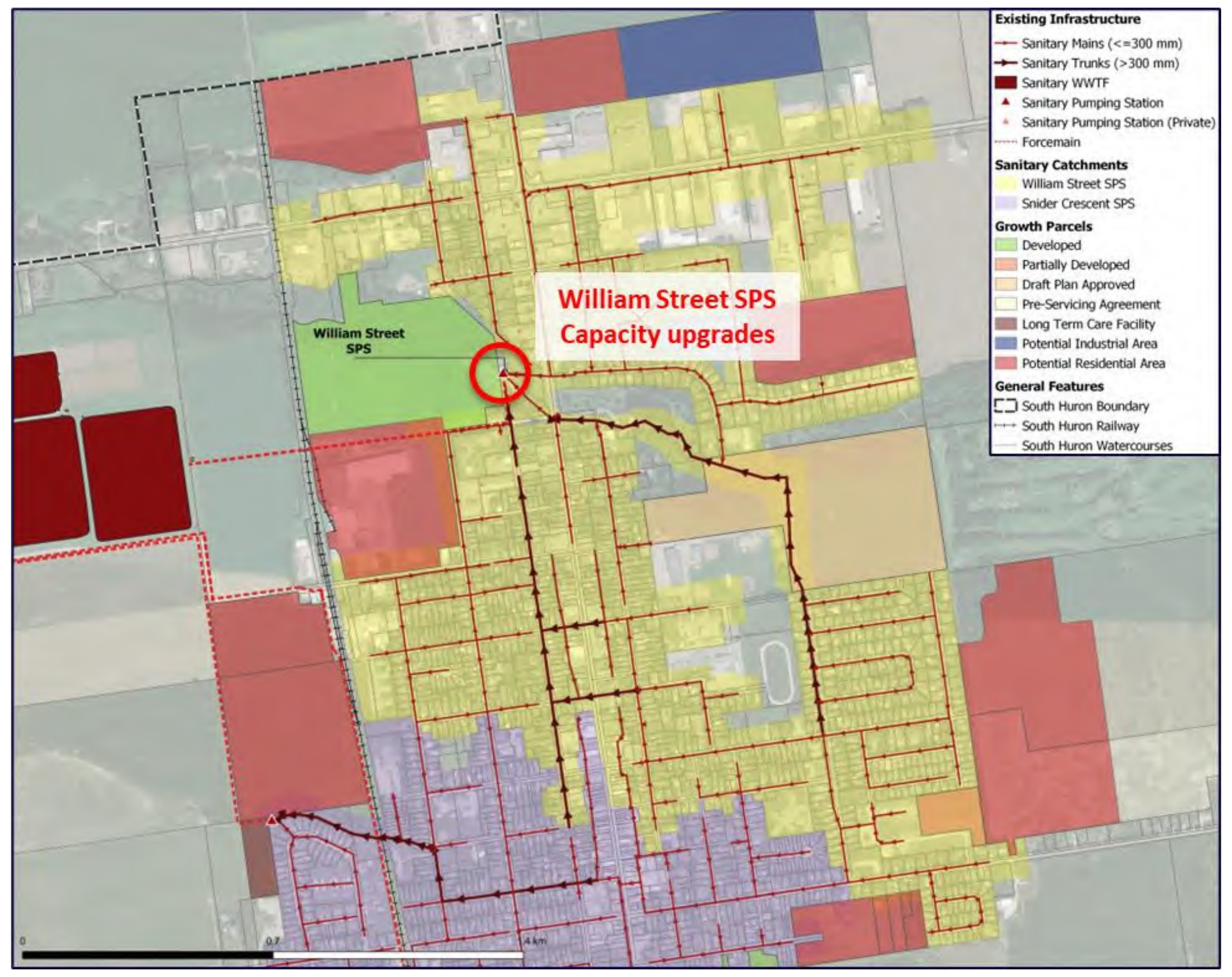
Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Upgrade existing Snider Crescent SPS (One SPS)	High	High	Low	High	Not Recommended: Does not meet needs for planned growth
Alternative 2: One new SPS north of existing Snider Crescent SPS (One SPS)	High	High	Med	High	**Recommended:** Lowers long-term cost for existing and proposed growth
Alternative 3: New SPS north of existing Snider Crescent SPS and utilize existing Snider Crescent SPS (Two SPS's)	Low	High	Low	Low	Not Recommended: High operations and maintenance costs to operate two SPS's
Alternative 4: One new SPS northwest of Snider Crescent SPS in Expansion of SAB Lands (One SPS)	Med	High	Med	High	Not Recommended: Uncertainty in long-term strategy of expansion of SAB lands may result in poor placement of infrastructure

Wastewater Servicing – William Street SPS

Alternative 1: William Street SPS Capacity Upgrades

Advantages:
- Provides immediate growth related capacity
- Reduces risks of overflows to the environment

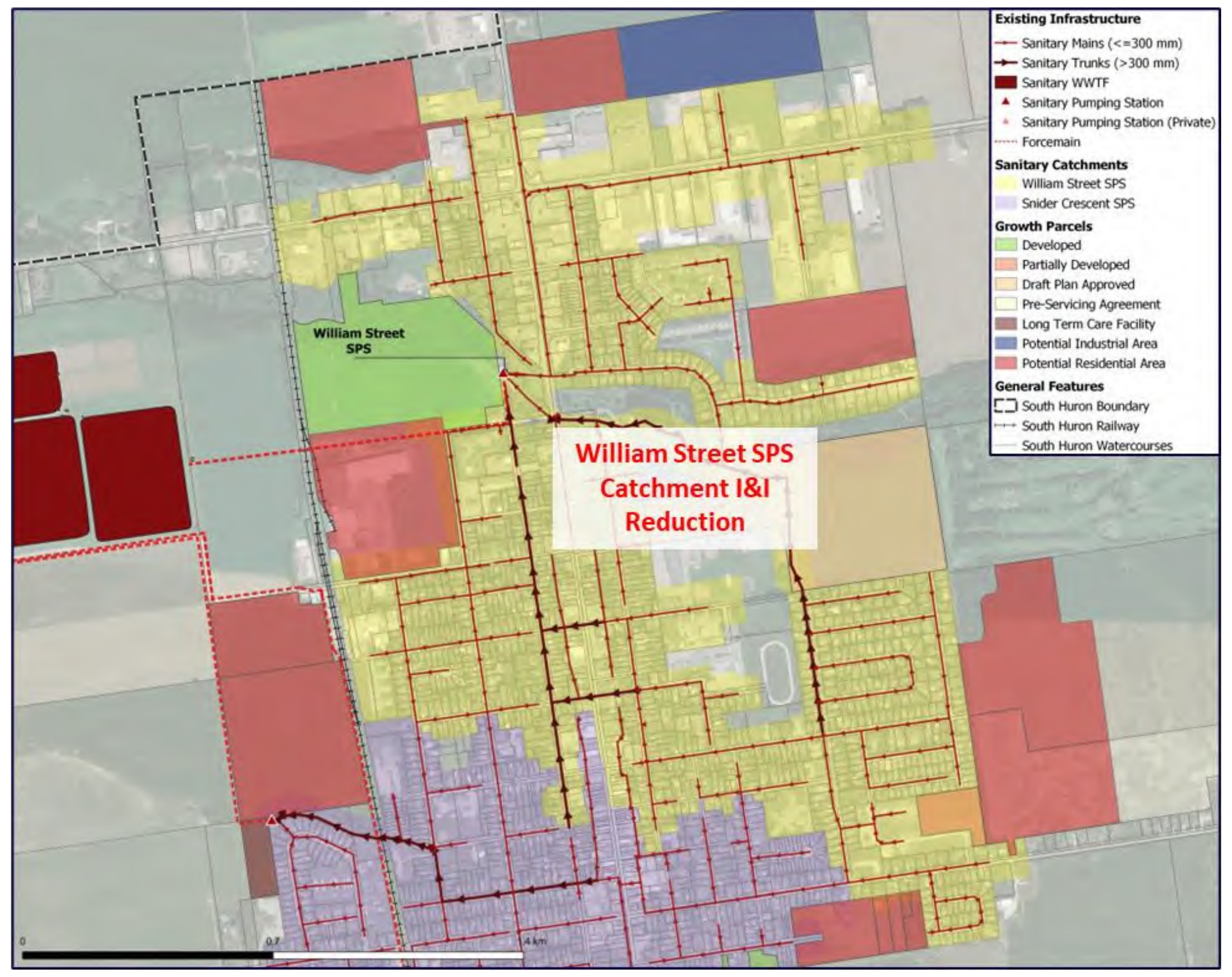
Disadvantages:
- High risk of basement flooding as sewer constraints are not addressed
- Increased pumping and treatment costs for continued wet weather flows
- High O&M costs
- Wet weather flows will continue to increase as sewers deteriorate and existing problem areas remain



Alternative 2: William Street SPS Catchment I&I Reduction

Advantages:
- Reduces pumping and treatment costs
- Least amount of new infrastructure
- Provides resilience to local system and to reduce total system baseflows helping to manage available growth capacity at the WWTF
- Lowest capital and O&M costs
- Reduced risks of overflows to the environment

Disadvantages:
- May be difficult to isolate and repair
- Could be a long time before seeing benefits
- Additional upgrades may be required if I&I reduction efforts are unsuccessful



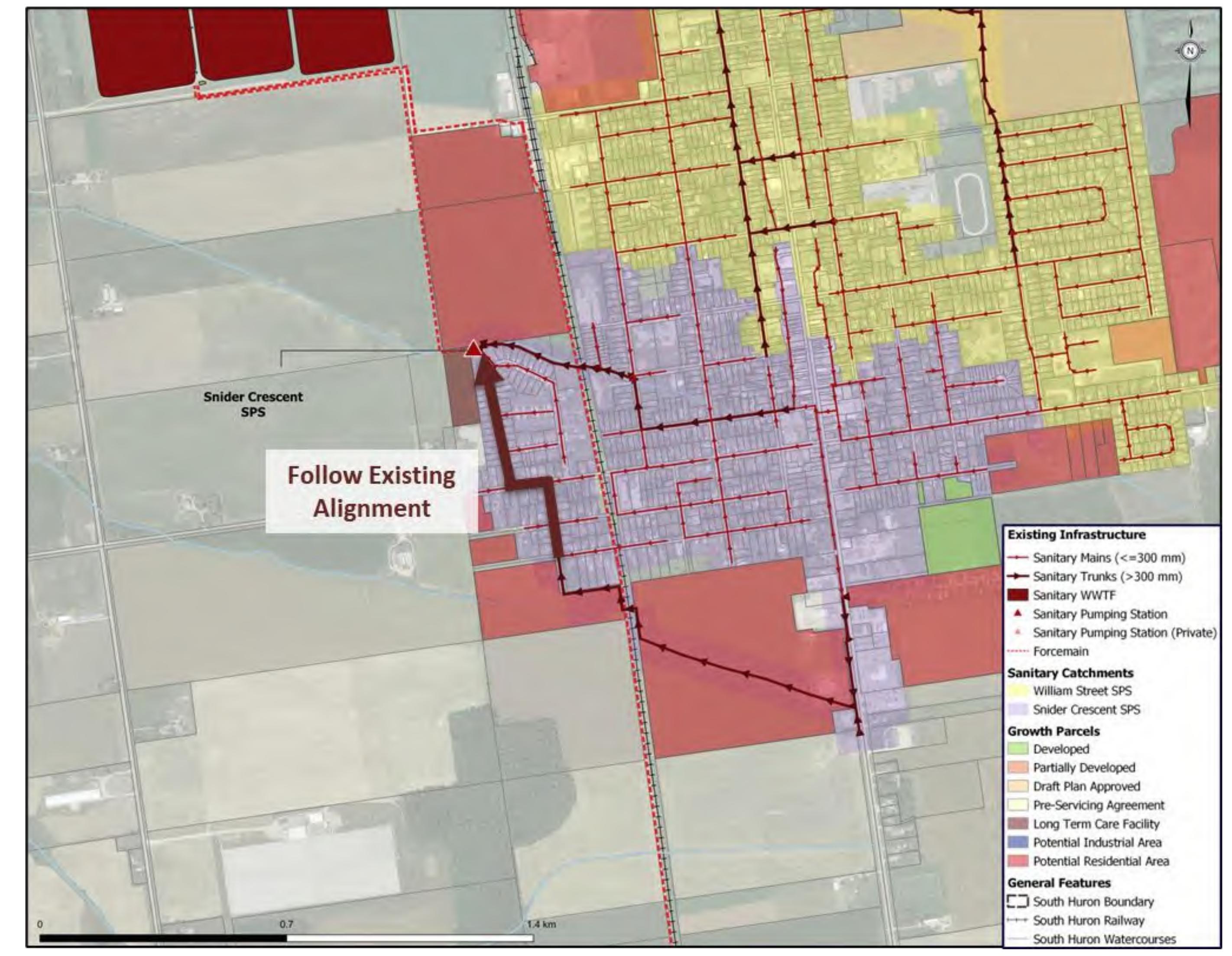
Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: William Street SPS Capacity Upgrades	High	High	Low	Low	Not Recommended: High capital costs and O&M costs by upsizing infrastructure as opposed to reducing existing flows. No resiliency in existing sewers.
Alternative 2: William Street SPS Catchment I&I Reduction	High	High	Med	High	**Recommended:** Provides the greatest overall benefit with some capital costs while reducing wet weather flow. If I&I reduction efforts are unsuccessful, station upgrades at the William Street SPS may be required.

Wastewater Servicing – South Exeter Trunk Sewer

Alternative 1: Upsize Sewer Following Existing Alignment

Advantages:
- Optimize trunk sewer capacity with potential oversizing to support all southeast growth
- No land acquisition required; alignment to follow existing right-of-way
- No EA required
- Utilizes existing trunk sewer upstream of Mary Street at Waterloo Street

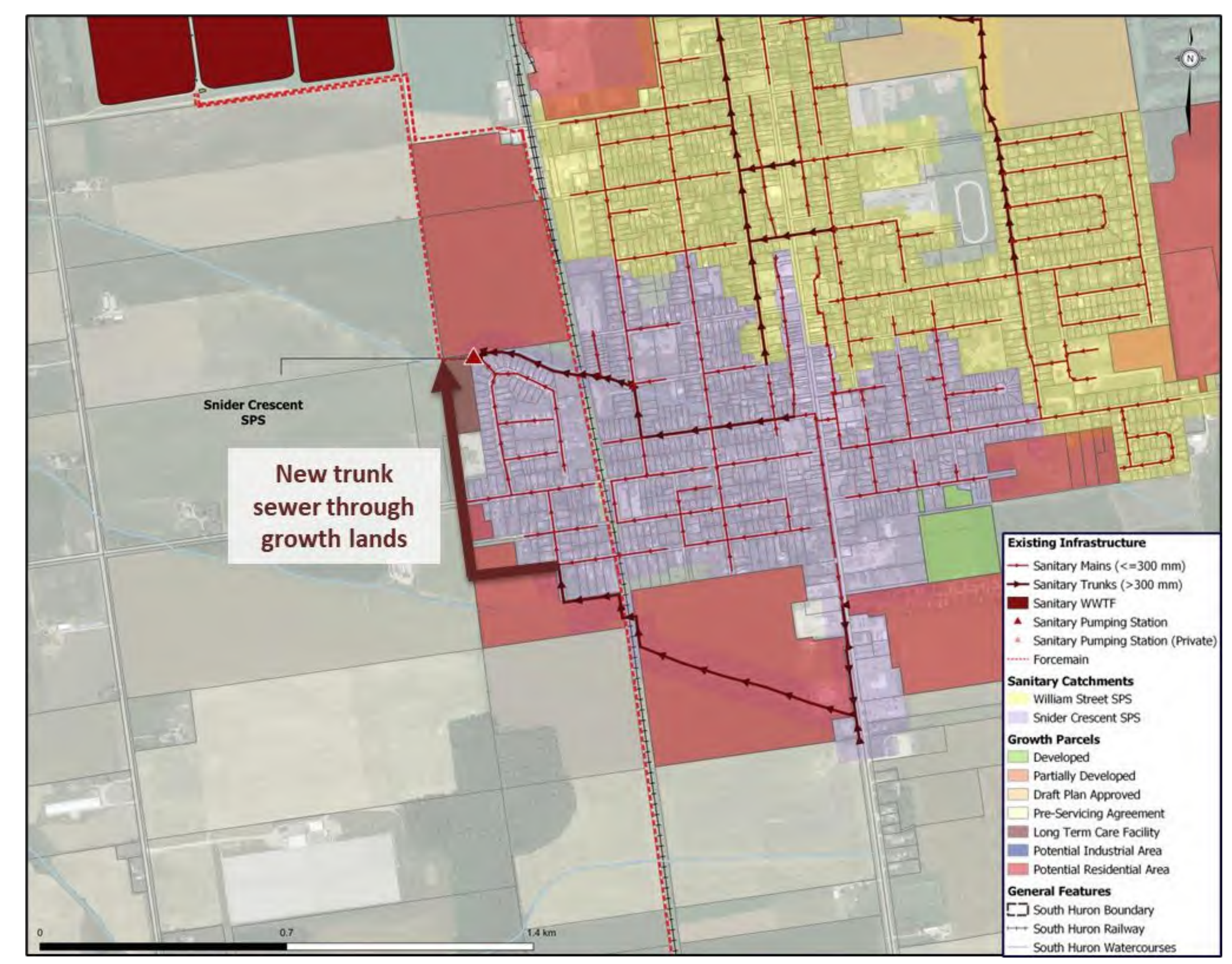
Disadvantages:
- Increased construction impacts to existing residents
- Increased construction complexity in existing road right-of-way



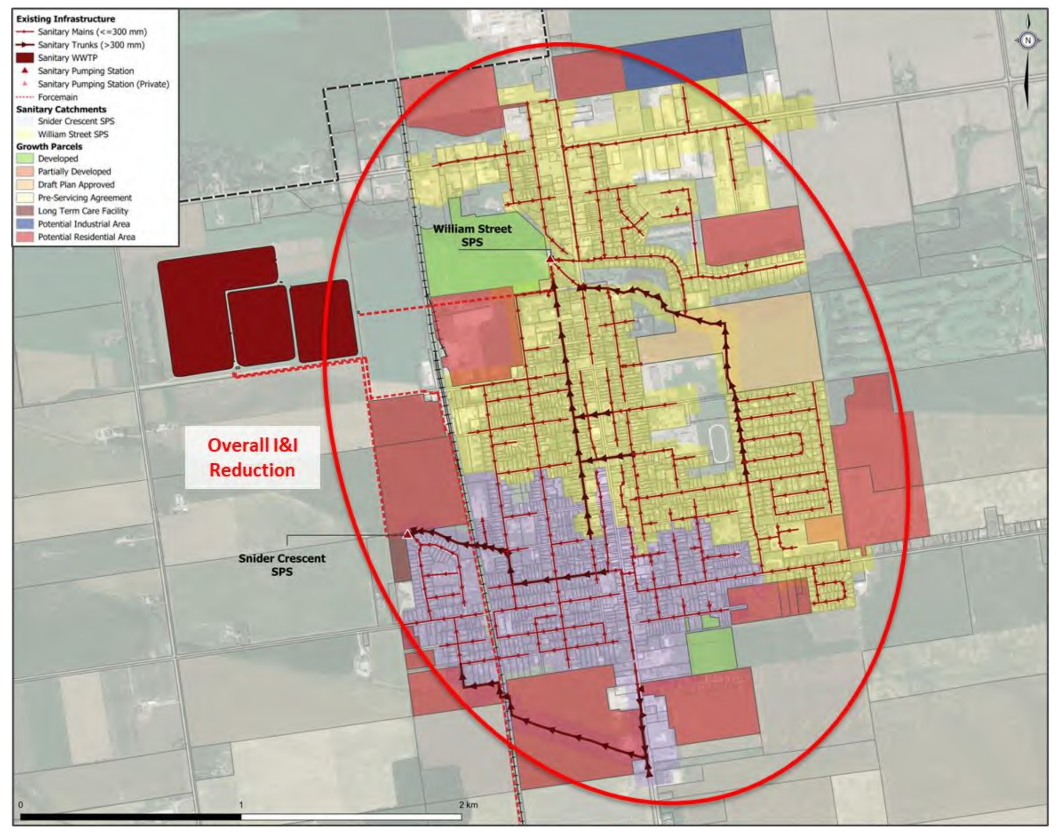
Alternative 2: Construct New Trunk Sewer

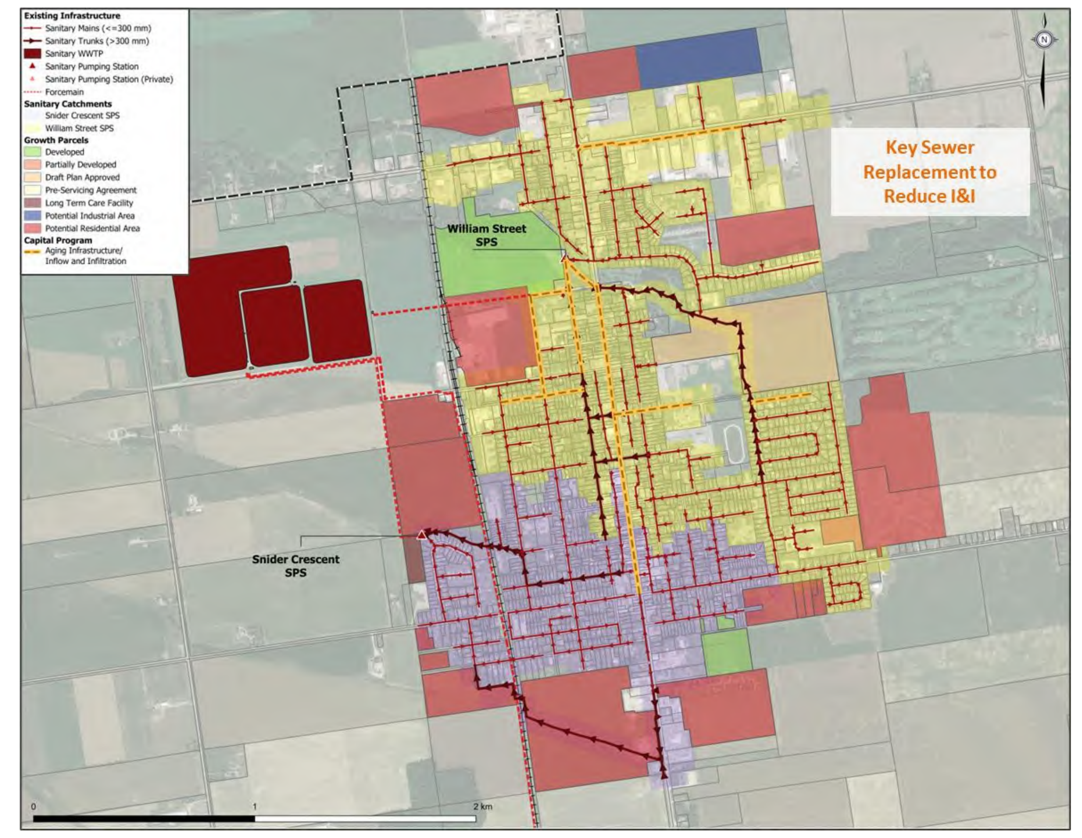
Advantages:
- Optimize trunk sewer capacity with potential oversizing to support all southeast growth
- Minimal impact to local traffic with majority of construction to be in undeveloped/farmland
- May be opportunity to optimize alignment with development draft plans
- Utilizes existing trunk sewer upstream of Mary Street at Waterloo Street

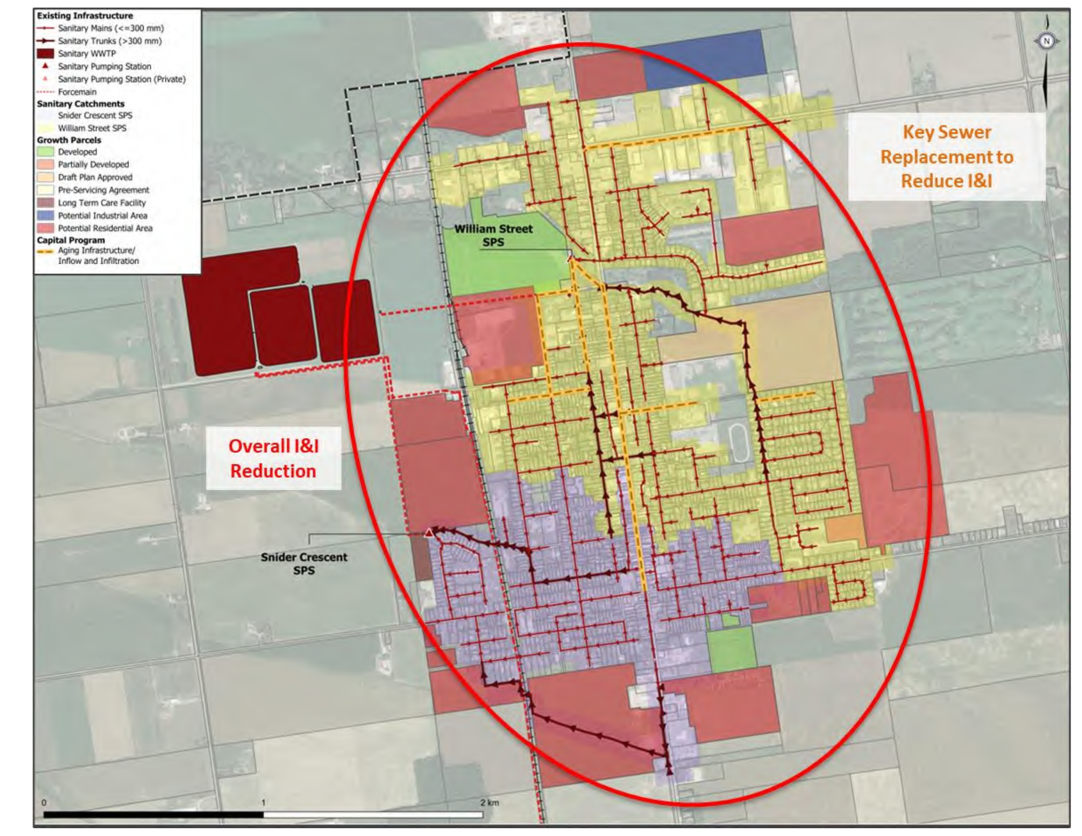
Disadvantages:
- Land acquisition required which may be difficult and costly
- Schedule 'B' EA required to determine the full extents of impacts
- Timing restrictions to complete EA and all associated studies, and acquire land if necessary



Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Upsize Sewer Following Existing Alignment	High	High	High	Med	**Recommended:** Can be initiated immediately as it does not require an EA or land acquisition
Alternative 2: Construct New Trunk Sewer	High	Med	High	Med	Not Recommended: Timing restriction of an EA puts limitation on potential growth servicing in south Exeter







Alternative 1: I&I Reduction Only

Advantages:
- Reduces pumping and treatment costs
- Least amount of new infrastructure
- Provides resilience to local system and to reduce total system baseflows helping to manage available growth capacity at the WWTF
- Lowest capital and O&M costs

Disadvantages:
- May be difficult to isolate and repair
- Could be a long time before seeing benefits
- Additional upgrades may be required if I&I reduction efforts are unsuccessful

Alternative 2: Sewer Upgrades Only

Advantages:
- Immediately deals with capacity constraints and provides growth related capacity

Disadvantages:
- Increased capital costs for sewer replacements
- Increased pumping and treatment costs for additional wet weather flows
- Additional flow monitoring still required
- No additional resilience to the local system as total system baseflows remain high

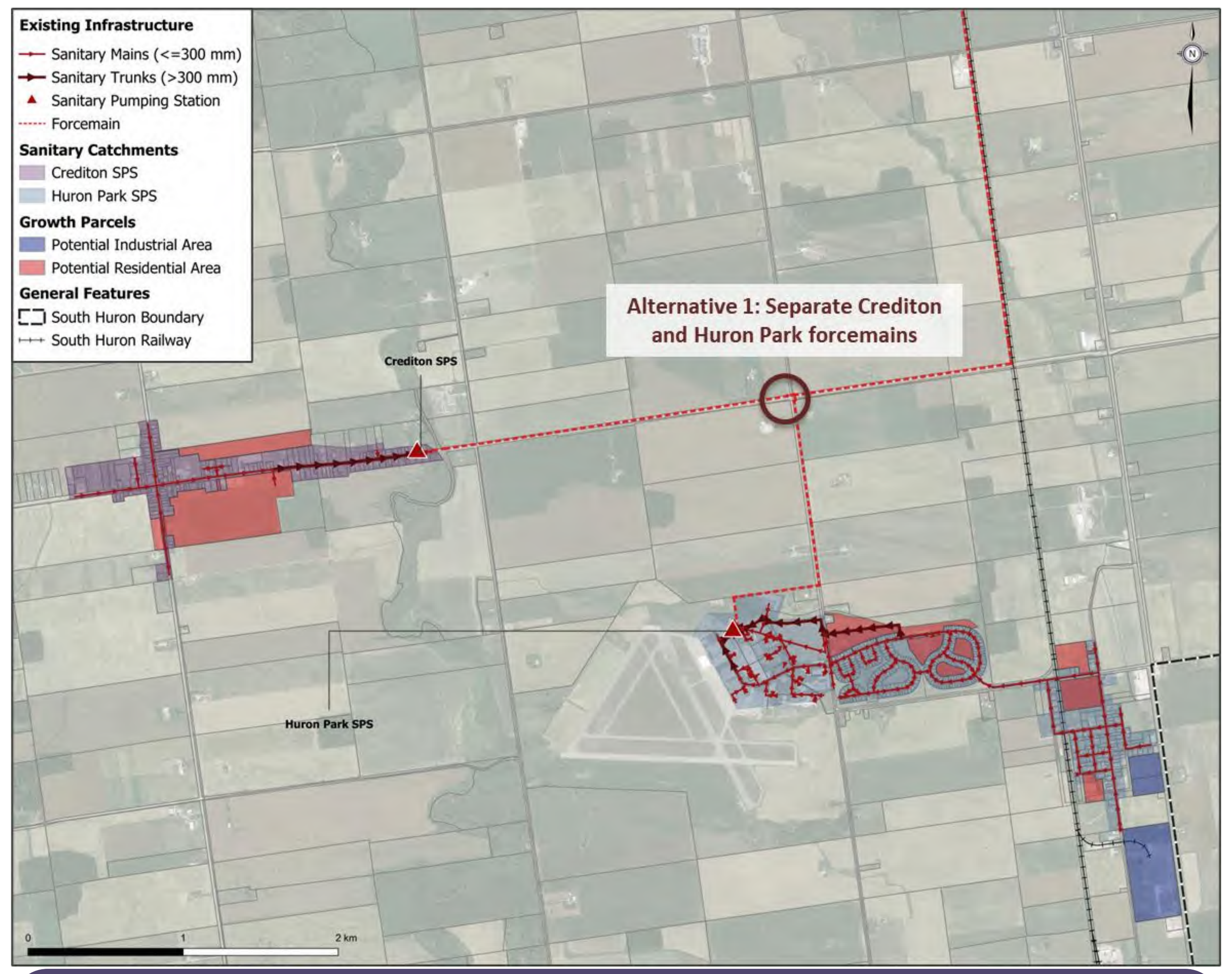
Alternative 3: I&I Reduction and Sewer Upgrades

Advantages:
- Reduces pumping and treatment costs
- Minimizes new infrastructure sizing
- Some immediate relief still achieved
- Ability to deal with deteriorating sewers that cannot be addressed through I&I reduction

Disadvantages:
- I&I may be difficult to isolate and repair
- Increased capital costs for sewer replacements

Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: I&I Reduction Only	Med	High	High	High	Not Recommended: Longer amount of time to see results and efforts may be unsuccessful
Alternative 2: Sewer Upgrades Only	Med	Med	High	Low	Not Recommended: High capital costs and O&M costs by upsizing infrastructure as opposed to reducing existing flows
Alternative 3: I&I Reduction and Sewer Upgrades	High	High	High	Med	**Recommended:** Provides the greatest overall benefit with some capital costs while also reducing wet weather flow

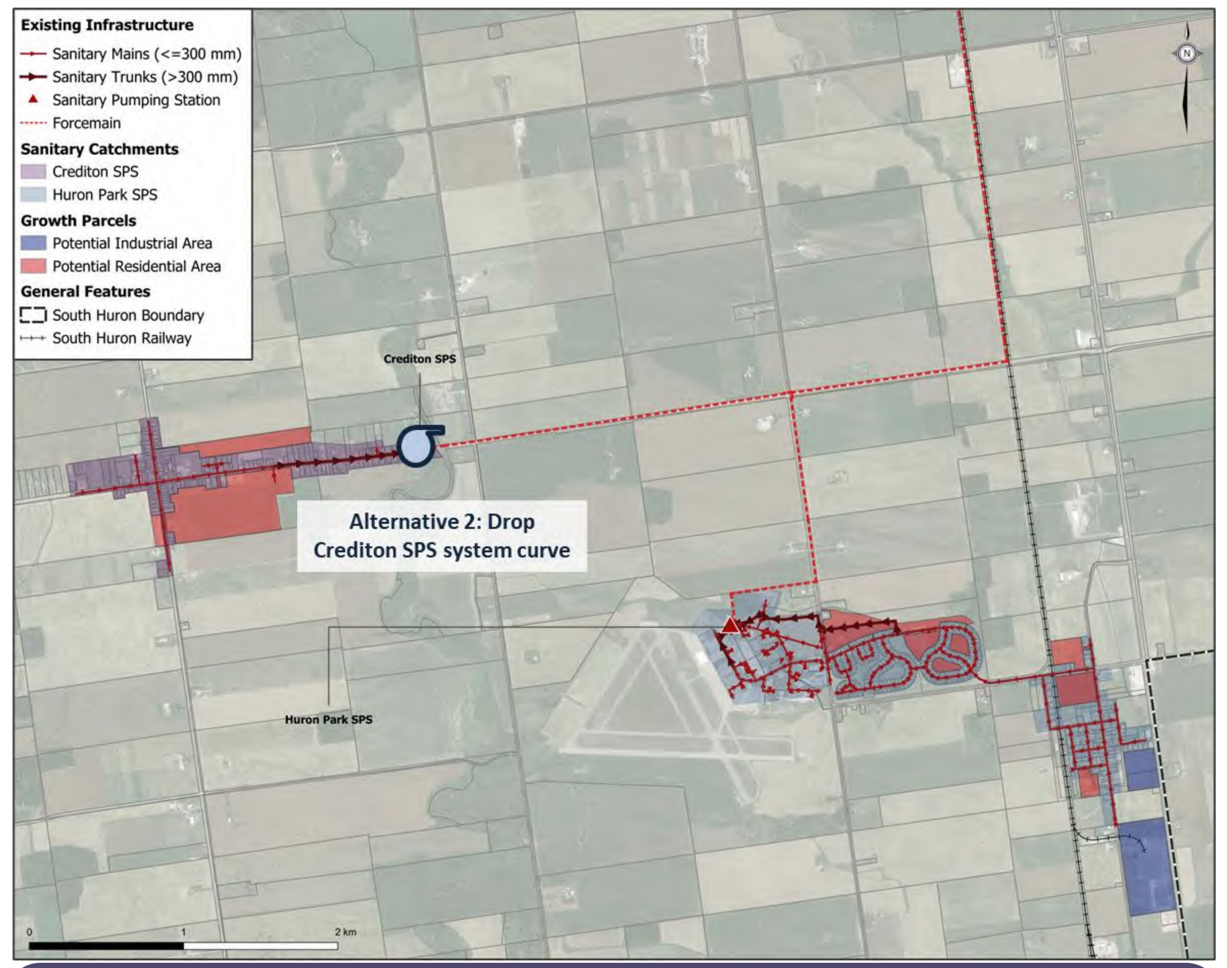
Wastewater Servicing – Crediton and Huron Park SPS



Alternative 1: Separate Crediton and Huron Park Forcemains

Advantages:
- Opportunity to upgrade capacity of Huron Park forcemain at the same time
- Reduced wear on Crediton pumps
- Mitigate risks of bypasses during storm events

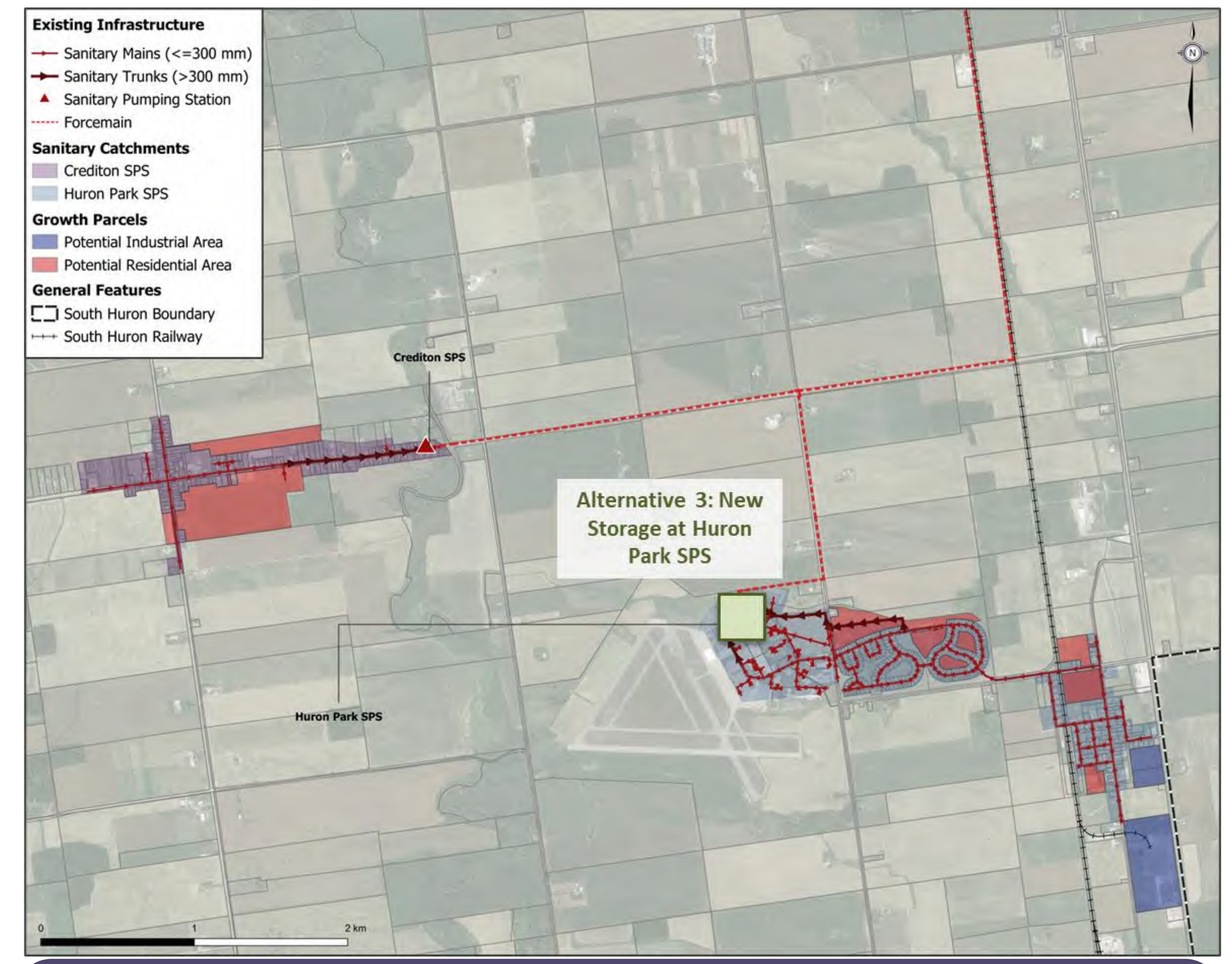
Disadvantages:
- High capital costs for new forcemain
- Does not address ongoing I&I issues
- Does not increase storage at Huron Park or include buffer room to mitigate peaks during peak flows



Alternative 2: Drop Crediton SPS System Curve

Advantages:
- Flow matching/ operating at lower speeds will alleviate wear on pumps
- Reduced maintenance

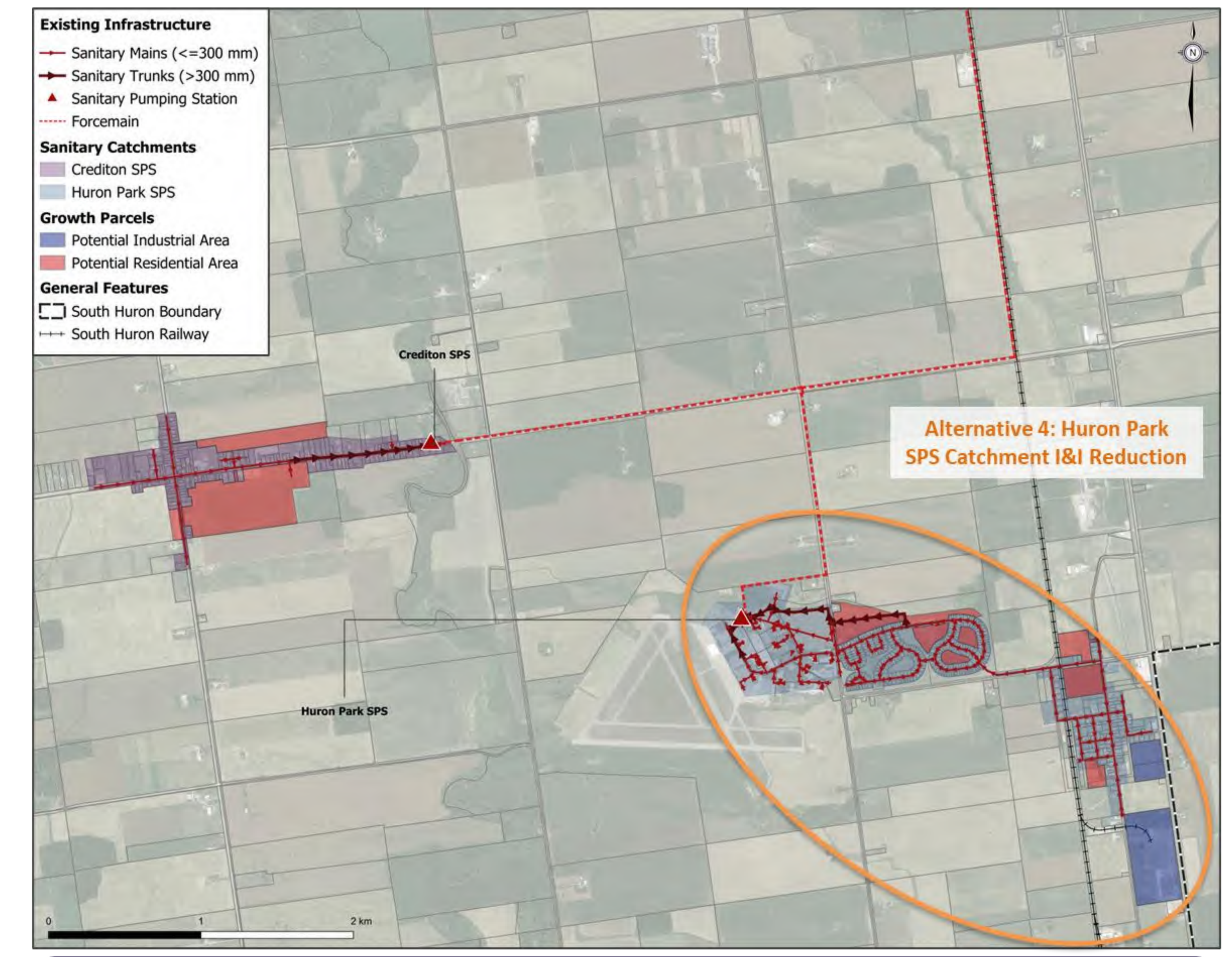
Disadvantages:
- Reduced capacity at Huron Park SPS when operating at a lower speed to permit Crediton wet well to empty
- Does not address ongoing I&I issues



Alternative 3: New Storage at Huron Park SPS

Advantages:
- New wet well permits optimized pump run times and adequate emergency storage to mitigate risk of bypasses
- Increased operating band resulting in less frequent pump cycles

Disadvantages:
- High capital cost for new storage
- Storage is oversized due to I&I issues
- Does not address ongoing I&I issues
- Station will still compete with Crediton SPS under high flow events



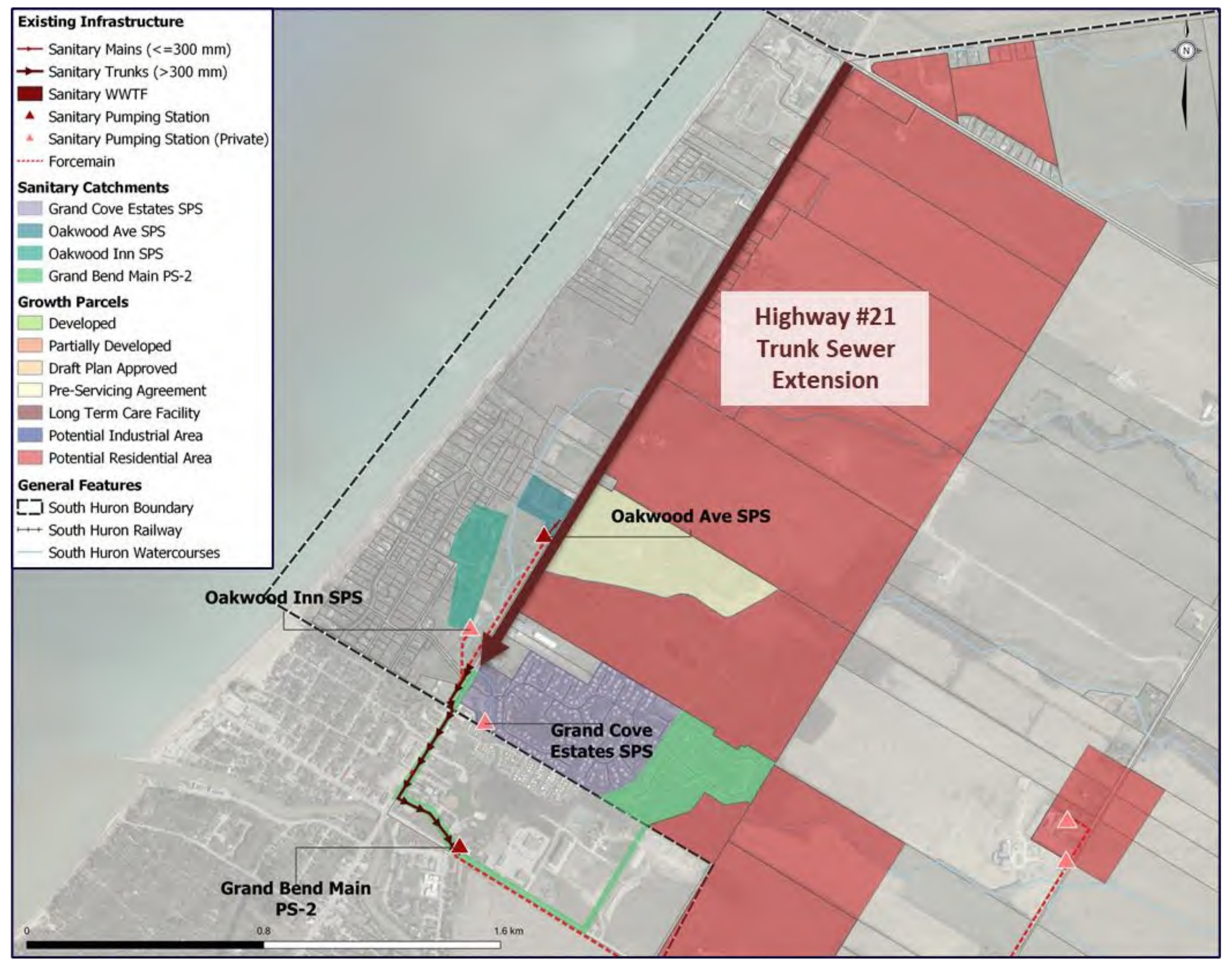
Alternative 4: Huron Park I&I Reduction

Advantages:
- Lower costs for greater benefit but addressing I&I issues prior to completing significant SPS upgrades
- Reduces wastewater treatment and pumping costs

Disadvantages:
- May be difficult to isolate and repair
- Could be a long time before seeing benefits

Alternative	Technical Ranking	Environmental Ranking	Social and Cultural Ranking	Financial Ranking	Recommended Alternative
Alternative 1: Separate Crediton and Huron Park Forcemains	Med	Med	High	Low	Not Recommended: High capital costs
Alternative 2: Drop Crediton SPS System Curve	Med	High	High	Low	Not Recommended: Highest ongoing operations and maintenance costs
Alternative 3: New Storage at Huron Park SPS	Med	High	High	Low	**Recommended:** Recommended in line with Alternative 4. Provides immediate relief with Alternative 4 addressing ongoing issues
Alternative 4: Huron Park I&I Reduction	High	High	High	High	**Recommended:** Recommended in line with Alternative 3. Longer time frame to realize results.

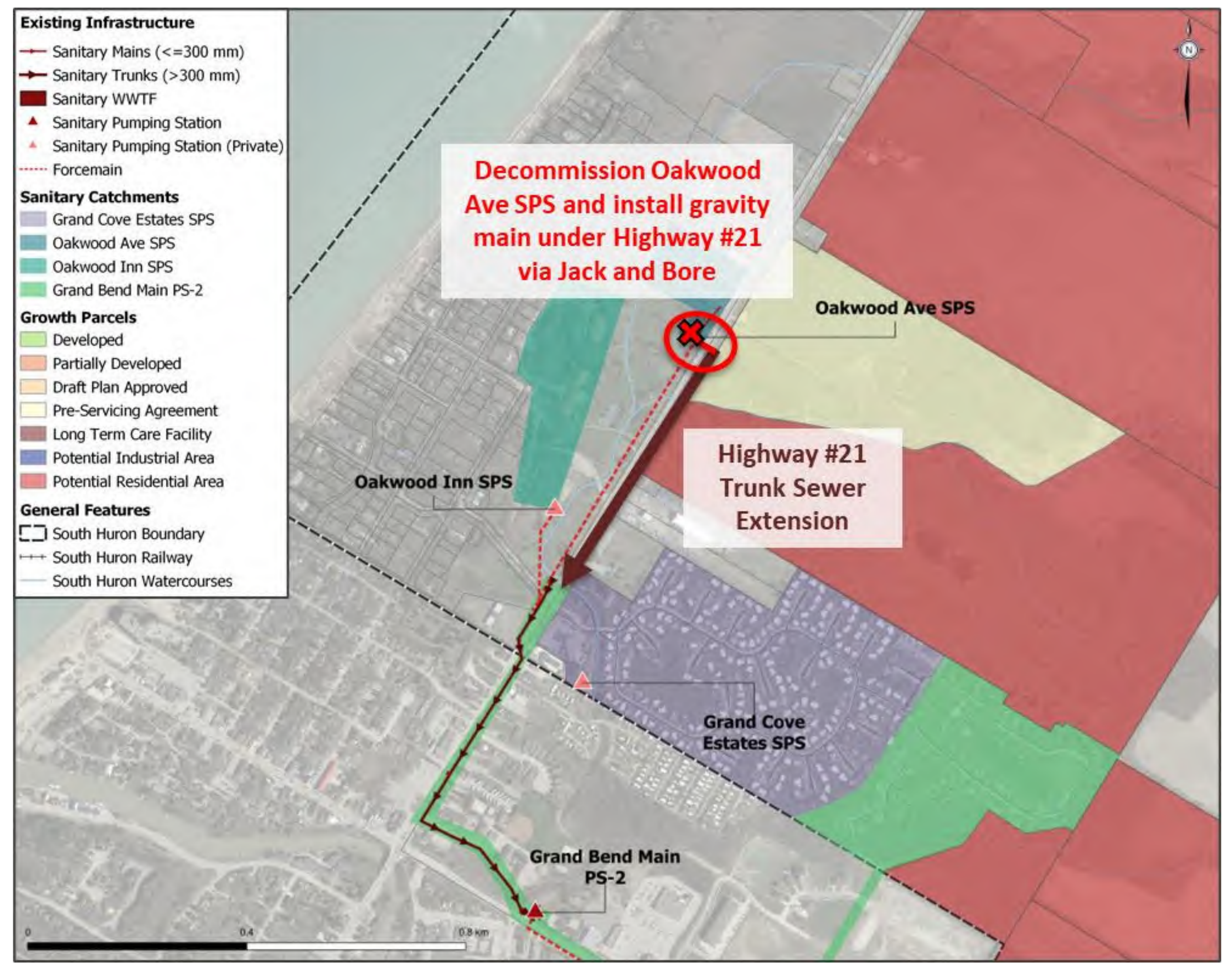
Wastewater Servicing – Grand Bend Area



Highway #21 Trunk Sewer Extension

Overview:

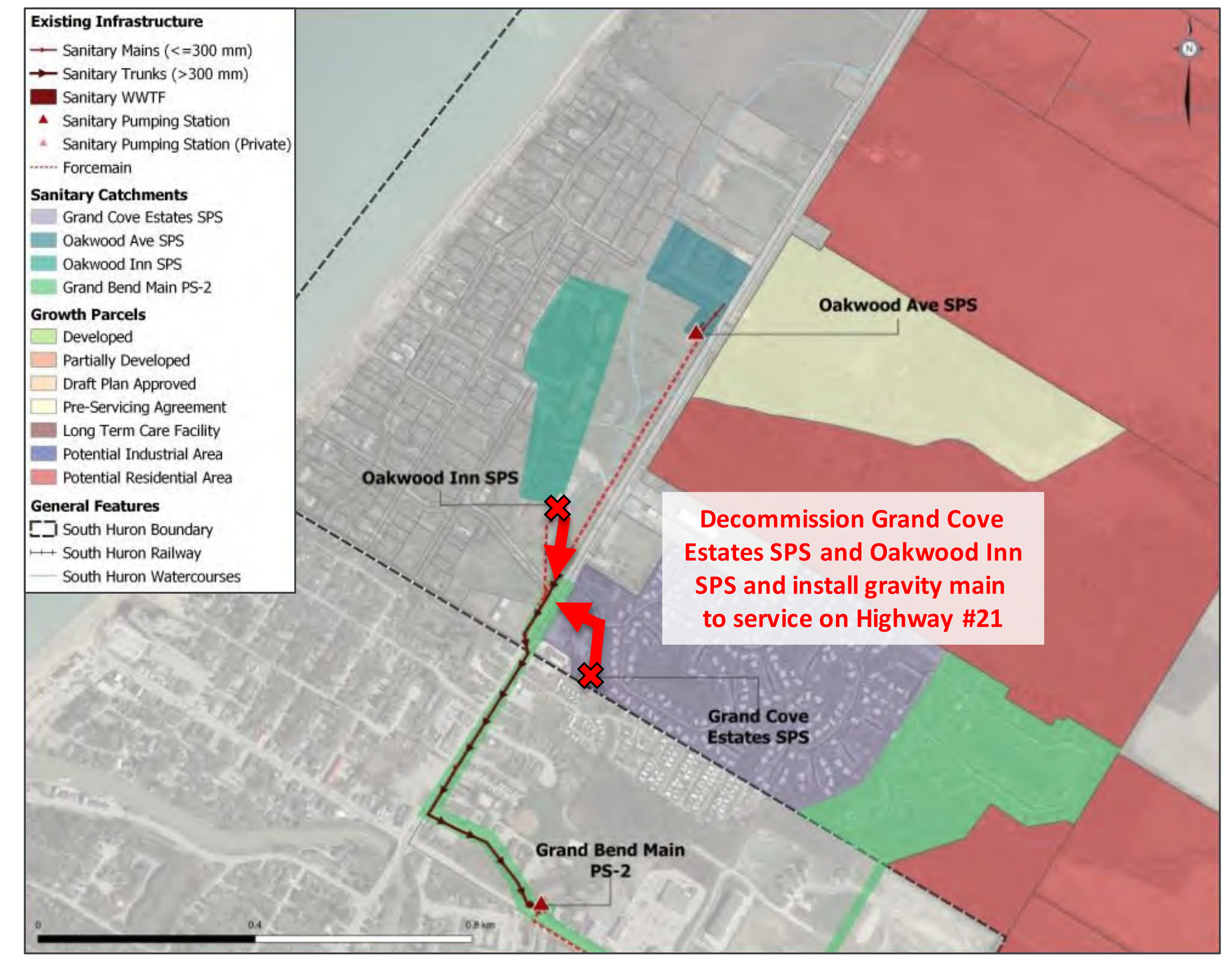
- Existing Highway #21 trunk sewer from the Grand Bend Main PS2 to Indian Road has sufficient capacity to accommodate all anticipated development flows within the catchment along Highway #21
- Trunk sewer extension to be sized to support north growth flows along Highway #21 to mitigate future capacity restrictions
- Forms an important piece of the overall servicing strategy for the Municipality of South Huron's Grand Bend service area
- Based on recommendation from Grand Bend Area Sewage Collection System Class EA



Oakwood SPS Decommissioning

Overview:

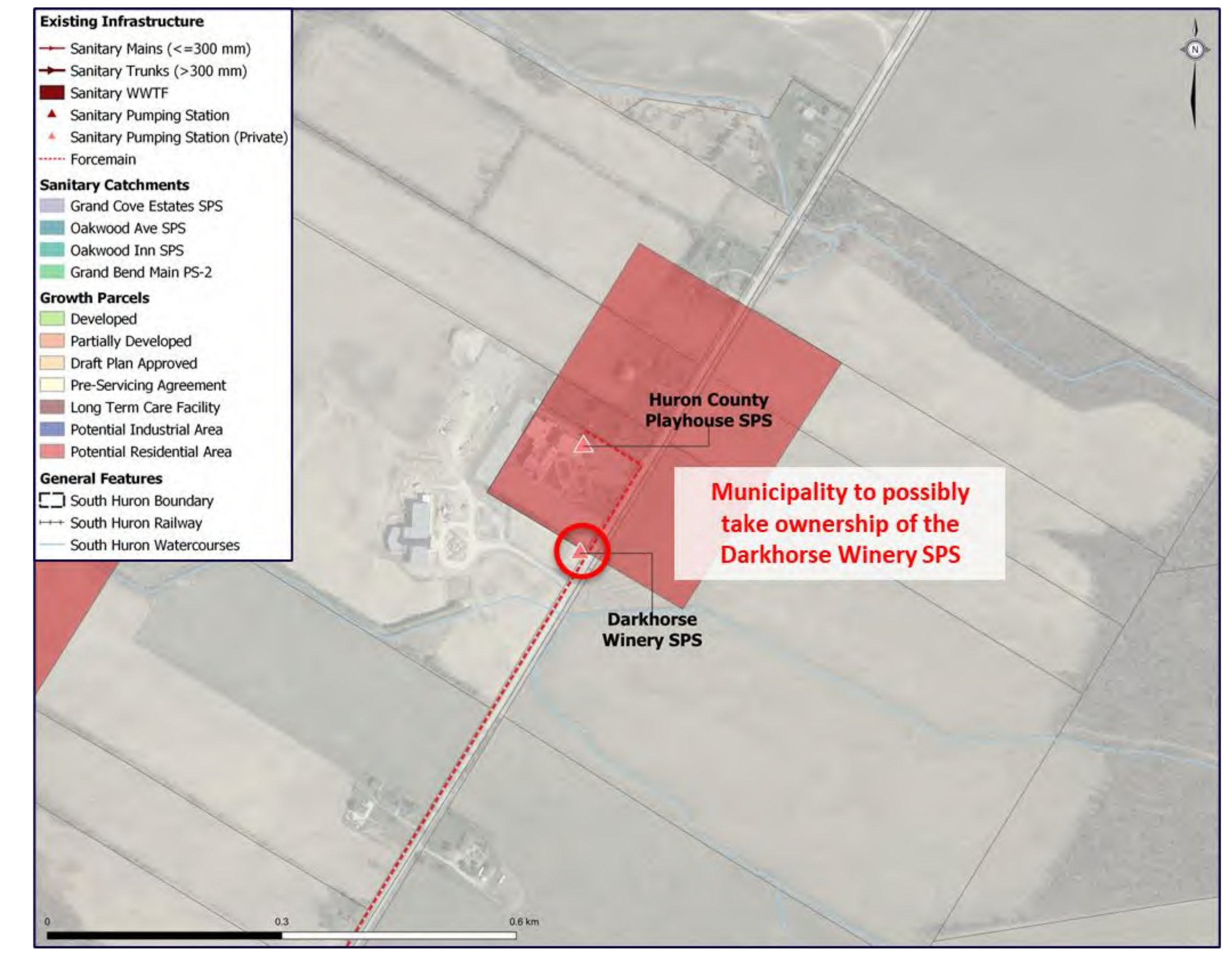
- The Oakwood SPS has a forcemain within an easement on private property along the west side of the Highway #21 ROW.
- Opportunity to decommission the Oakwood SPS and connect via gravity to the new trunk sewer on Highway #21 once constructed
- Include provisions for removal of structures
- Gravity connection (Jack & Bore) Across Highway #21 at Oakwood Links Condos



Grand Cove Estates SPS and Oakwood Inn SPS Decommissioning

Overview:

- Property owners to decommission Private Grand Cove Estates SPS and Oakwood Inn SPS and connect via gravity to the new trunk sewer on Highway #21 (Service installed across highway to Grand Cove Estates property line)
- Frees up Lambton Shores trunk sewer capacity, along Main Street East/County Road #81



Darkhorse SPS Ownership

Overview:

- Private SPS designed and constructed to Municipal standards, but some upgrades are required such as separate hydro service and emergency generator
- Development proposed surrounding the existing Darkhorse SPS
- To accommodate development, a SPS and forcemain are needed
- Municipality to potentially take ownership of Darkhorse SPS in future to support development
- Eliminates need for an additional SPS and forcemain

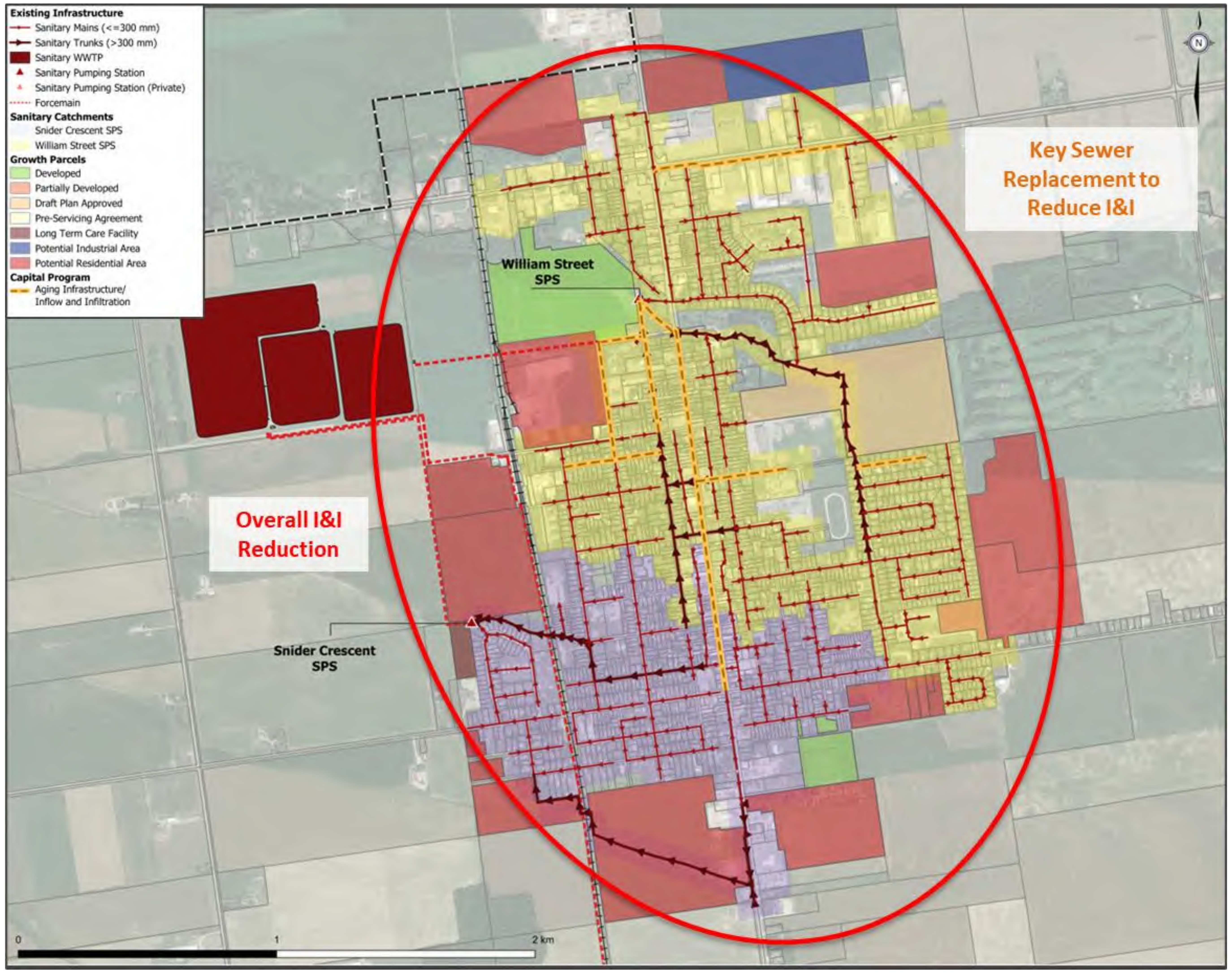
Wastewater Servicing – Wet Weather Management

Wet Weather Management Program

- Recommended to address areas of high inflow and infiltration (I&I) that result system capacity restrictions or basement flooding risk
- Is intended to deal with existing capacity constraints, and to provide growth-related capacity without expanding/upgrading existing infrastructure, or by minimizing the required expansion/upgrade
- Provides a proactive and targeted approach to addressing wet weather impacts

Reduction in Exeter and Huron Park Systems

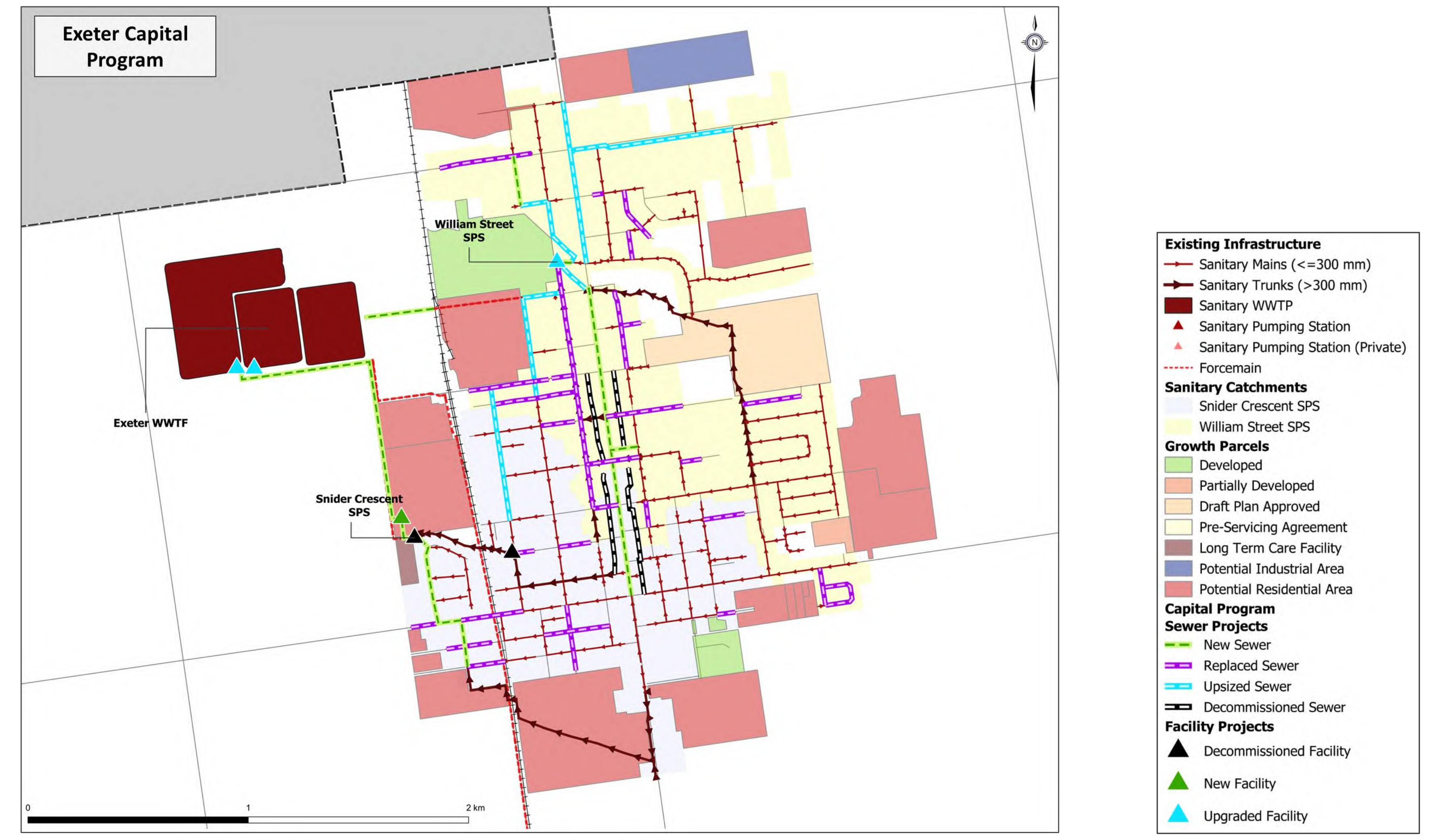
- I&I reduction is required for the Municipality F-5-1 requirements for nominally separated sewer systems that does not allow for system overflows under typical annual precipitation conditions
- Reduction program, in combination with the identify sewer and SPS upgrades are required to achieving a net reduction in system overflows and longer-term objective of eliminating overflows
- As there are existing system overflows, there should be a short-term objective of removing wet weather flows at a rate equal to or greater than new development flows



Wastewater Servicing – Capital Program

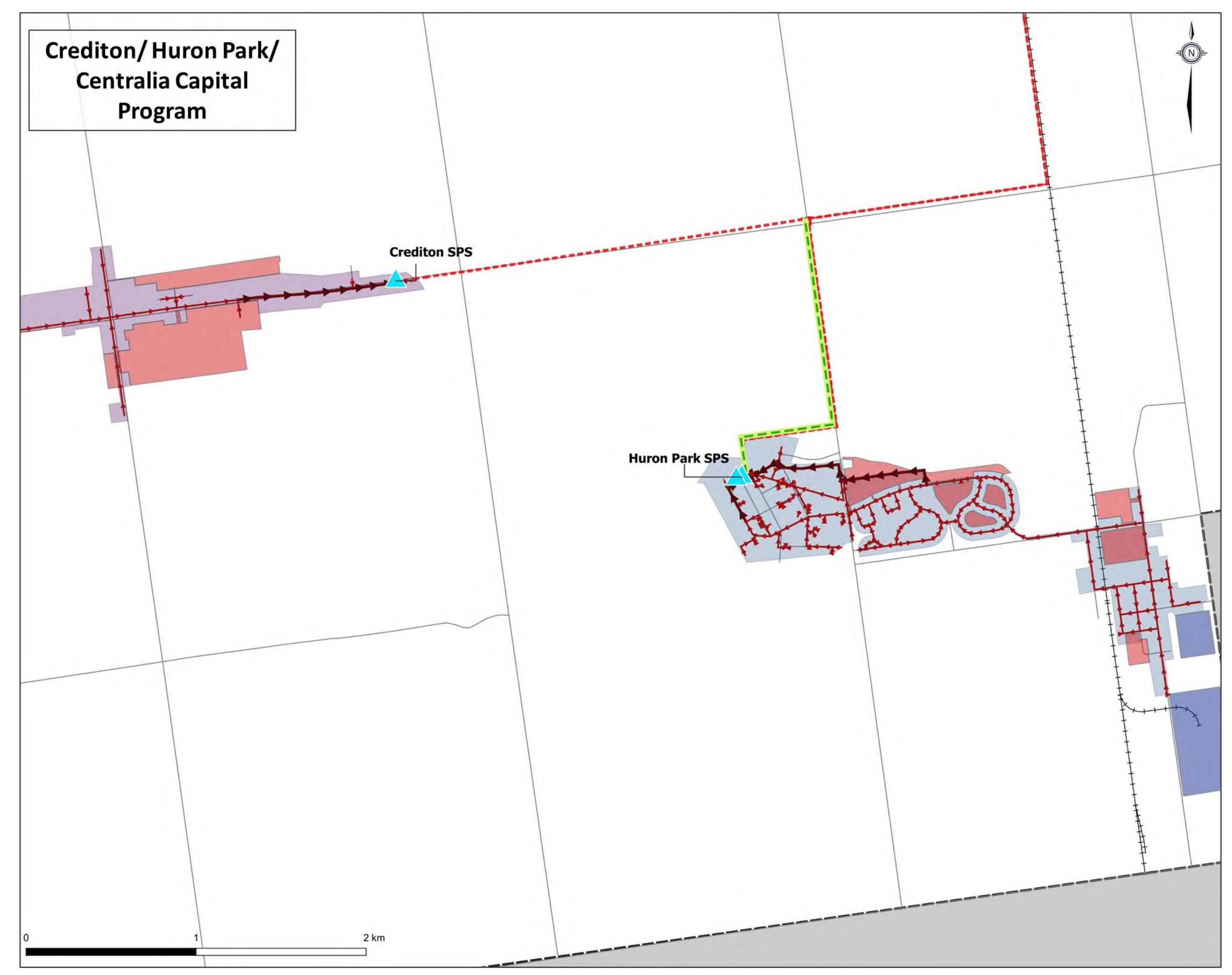
Preferred Wastewater Capital Program - Exeter

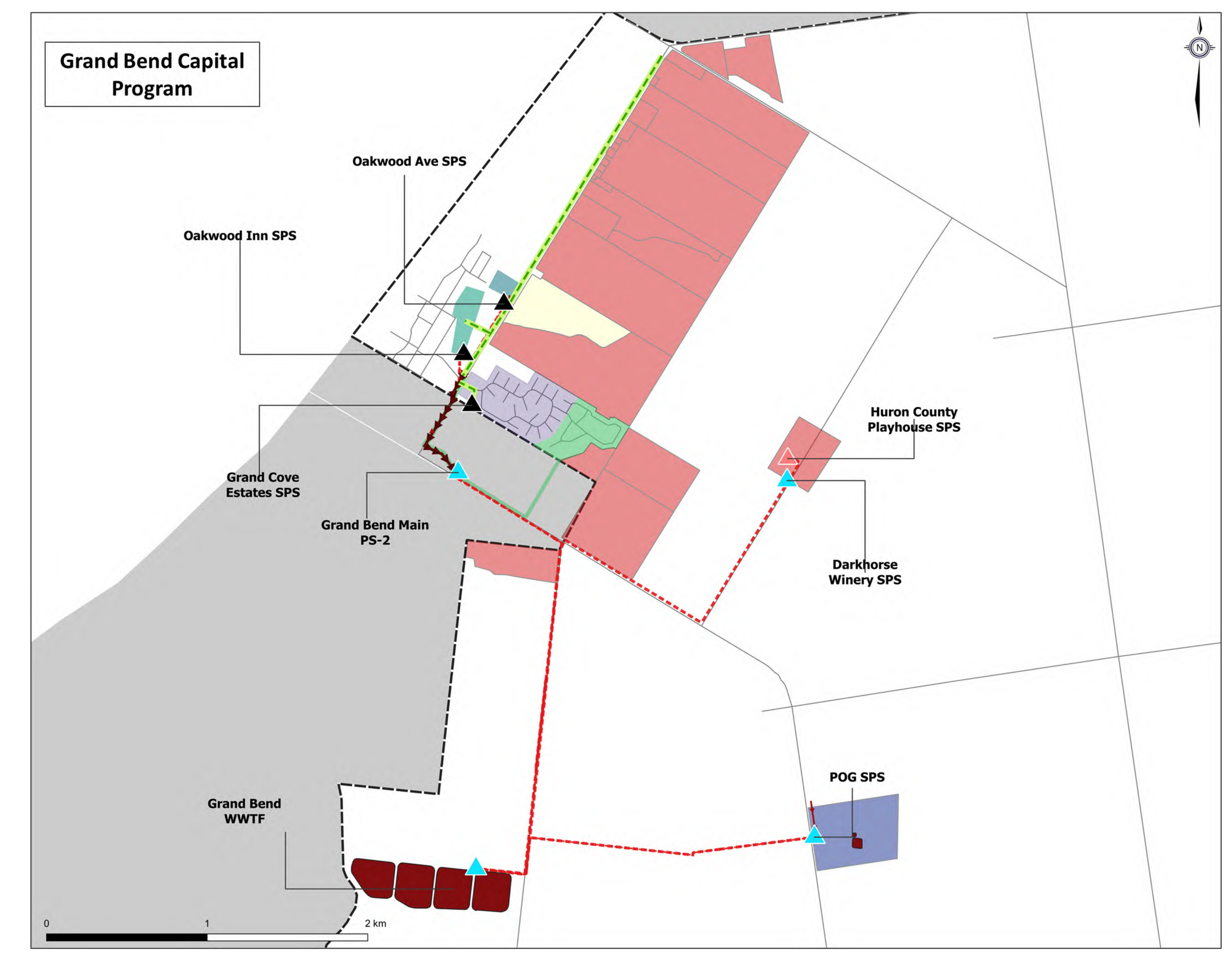
- Continued upgrades at the Exeter WWTF in line with the long-term strategy and as triggered by capacity and effluent criteria
- Construction and commissioning of the South Exeter SPS and forcemain to service proposed growth and existing Snider Crescent SPS flow
- Upsize sewer from Waterloo Street to the Snider Crescent SPS to accommodate existing and growth flows in south Exeter
- Implementing an I&I Reduction program in Exeter to address existing high peak wet weather flows
- Upgrade sewers in line with planned road reconstruction projects
- New trunk sewer along Main Street with services from all buildings fronting Main Street to allow for decommissioning of back-alley sewers



Preferred Wastewater Capital Program - Stephen

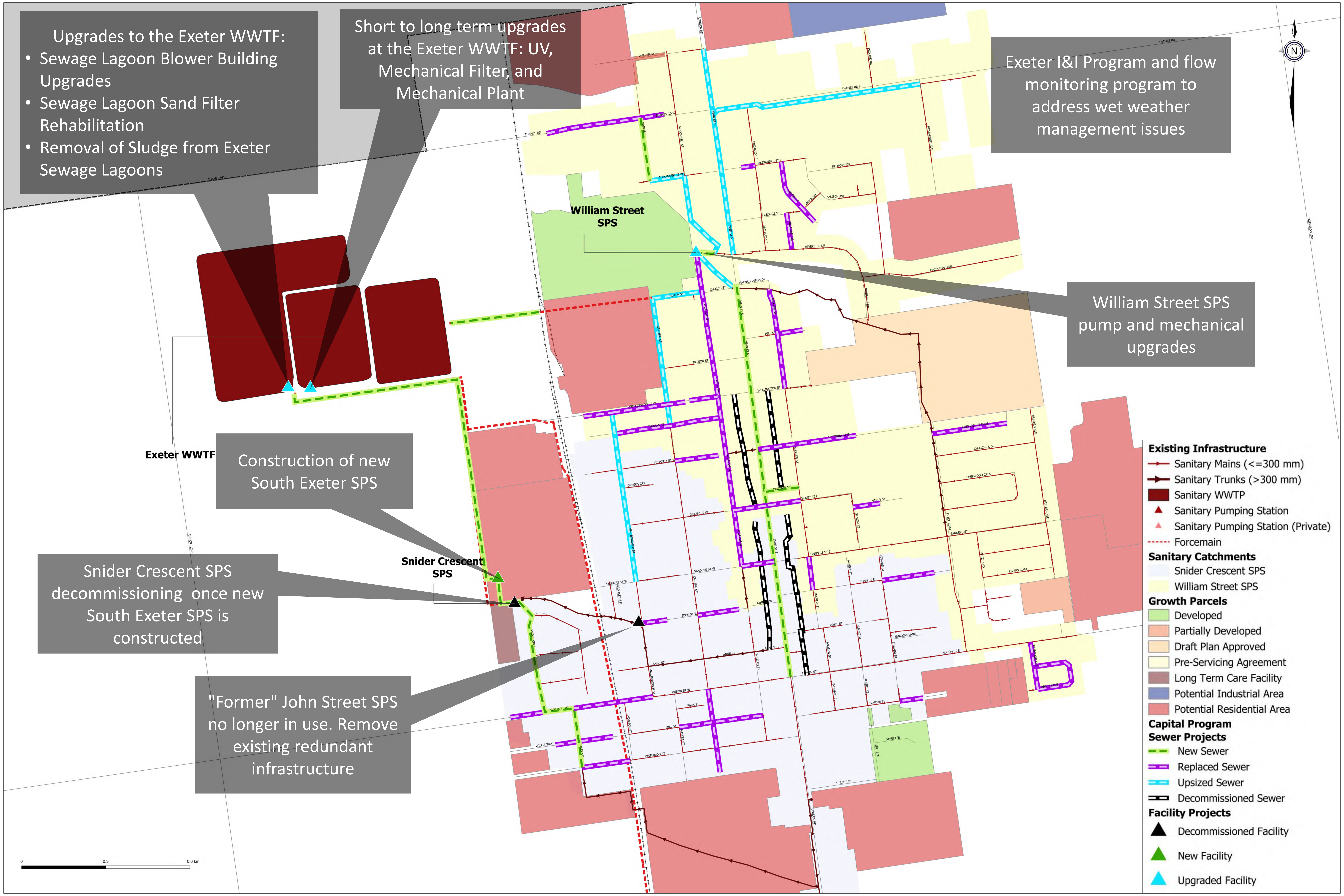
- Stephen includes Crediton, Huron Park, Centralia, and Grand Bend Capital Programs
- Extending the trunk sewer along Highway #21 to service development in Grand Bend
- Decommissioning private sanitary pumping stations and connecting to the existing gravity network along Highway #21
- Implementing an I&I Reduction program in Huron Park to address existing high peak wet weather flows



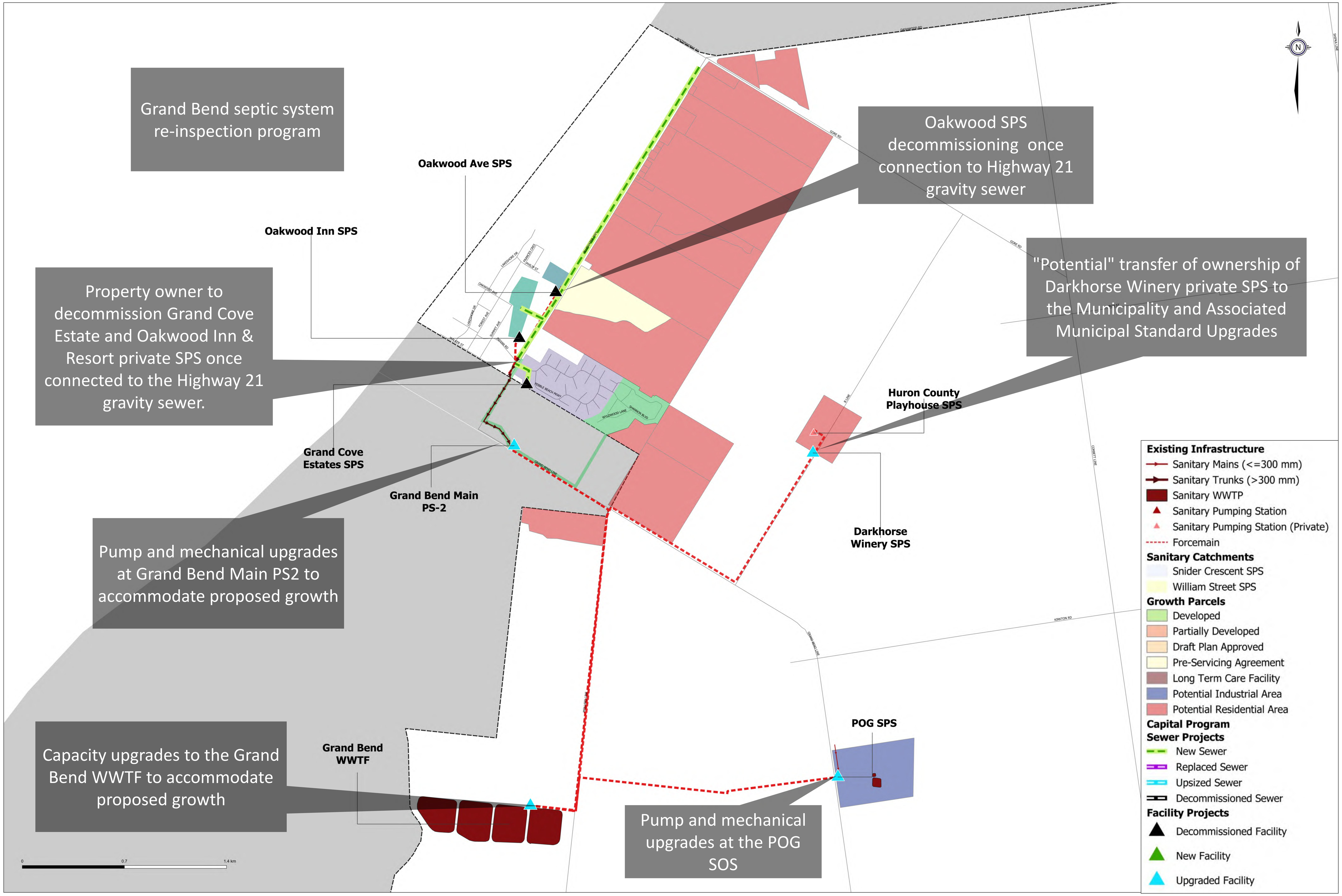


Capital Project	Exeter Project Costs	Stephen Project Costs	Total Project Costs
Linear Projects	$ 36,150,000	$ 12,298,000	$ 48,448,000
Facility Projects	$ 50,114,000	$ 13,160,000	$ 63,274,000
I/I Reduction Program	$ 6,235,000	$ 847,000	$ 7,082,000
Total Wastewater Capital Project Costs	**$ 92,499,000**	**$ 26,305,000**	**$ 118,804,000**

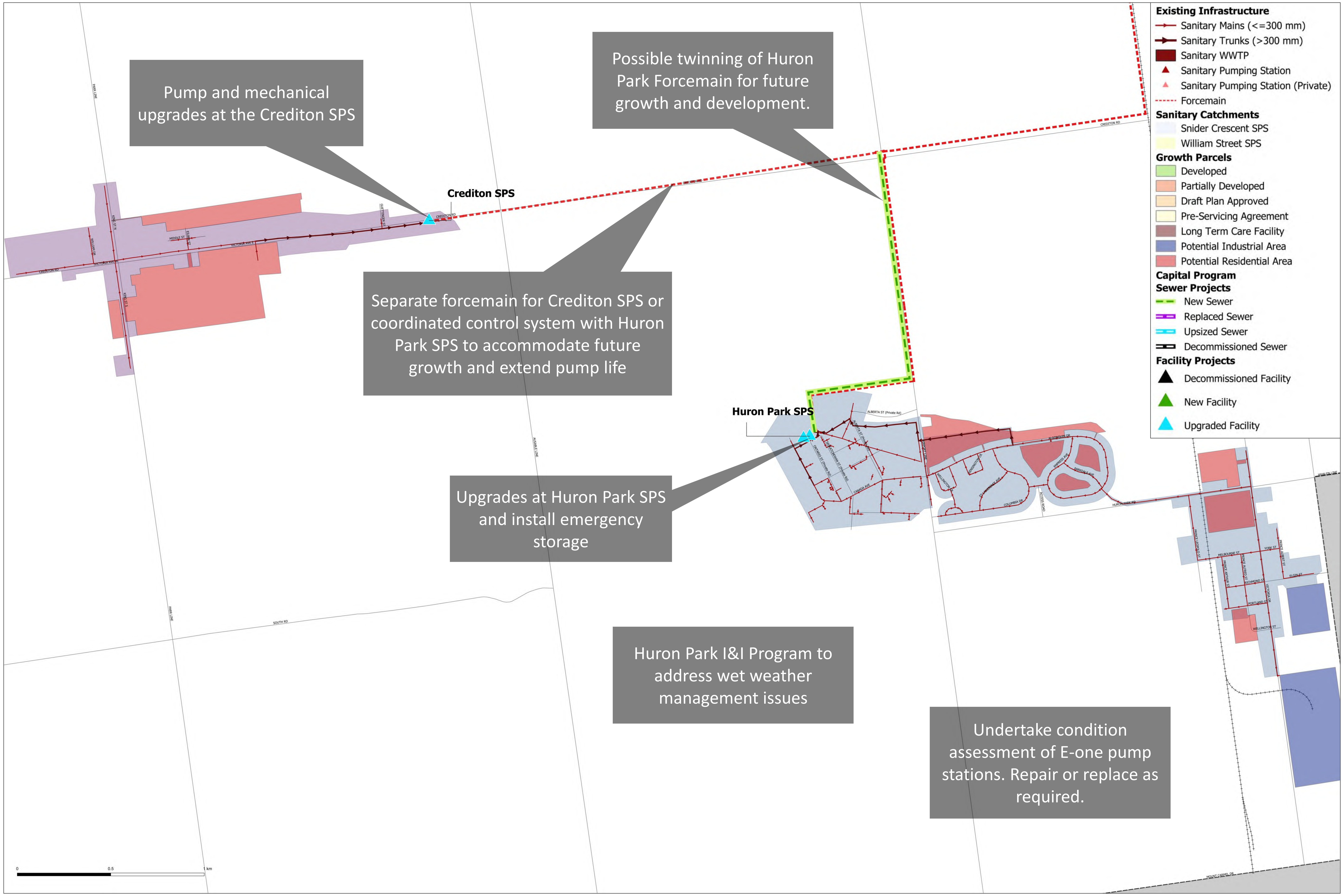
Wastewater Servicing – Capital Program (Exeter)



Wastewater Servicing – Capital Program (Grand Bend)



Wastewater Servicing – Capital Program (Huron Park, Centralia, and Crediton)



Thank you for your participation!

We want to hear from you!
Please let us know your thoughts by filling out a comment form.
If you have any questions or input, please speak with one of the project team members here, and/or you may contact the Municipality of South Huron Project Manager:

Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron
322 Main Street South
Exeter, Ontario N0M 1S3
Tel: 519-235-0310 x226
Email: dgiberson@southhuron.ca

Julien Bell, P.Eng.
Consultant Project Manager
GM BluePlan Engineering Limited
330 Trillium Drive, Unit D
Kitchener, Ontario N2E 3J2
Tel: 416-254-6247
Email: julien.bell@gmblueplan.ca

Please note that information related to this study will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*.
All comments received will become part of the public record and may be included in the study documentation prepared for public review.

APPENDIX D:
COMMENTS RECEIVED

Hydro One Networks Inc.

483 Bay Street
8th Floor South Tower
Toronto, Ontario M5G 2P5

HydroOne.com

November 28, 2023

Re: Water and Wastewater Master Plan

Attention:
Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron

Thank you for sending us notification regarding (Water and Wastewater Master Plan). In our preliminary assessment, we have confirmed that Hydro One has existing high voltage Transmission facilities within your study area. At this time we do not have sufficient information to comment on the potential resulting impacts that your project may have on our infrastructure. As such, we must stay informed as more information becomes available so that we can advise if any of the alternative solutions present actual conflicts with our assets, and if so; what resulting measures and costs could be incurred by the proponent. Note that this response does not constitute approval for your plans and is being sent to you as a courtesy to inform you that we must continue to be consulted on your project.

In addition to the existing infrastructure mentioned above, the applicable transmission corridor may have provisions for future lines or already contain secondary land uses (e.g., pipelines, watermains, parking). Please take this into consideration in your planning.

Also, we would like to bring to your attention that should (Water and Wastewater Master Plan) result in a Hydro One station expansion or transmission line replacement and/or relocation, an Environmental Assessment (EA) will be required as described under the Class Environmental Assessment for Minor Transmission Facilities (Hydro One, 2016). This EA process would require a minimum of 6 months for a Class EA Screening Process (or up to 18 months if a Full Class EA were to be required) to be completed. Associated costs will be allocated and recovered from proponents in accordance with the Transmission System Code. If triggered, Hydro One will rely on studies completed as part of the EA you are current undertaking.

Consulting with Hydro One on such matters during your project's EA process is critical to avoiding conflicts where possible or, where not possible, to streamlining processes (e.g., ensuring study coverage of expansion/relocation areas within the current EA). Once in receipt of more specific project information regarding the potential for conflicts (e.g., siting, routing), Hydro One will be in a better position to communicate objections or not objections to alternatives proposed.

If possible at this stage, please formally confirm that Hydro One infrastructure and associated rights-of-way will be completely avoided, or if not possible, allocate appropriate lead-time in your project schedule to collaboratively work through potential conflicts with Hydro One, which ultimately could result in timelines identified above.

In planning, note that developments should not reduce line clearances or limit access to our infrastructure at any time. Any construction activities must maintain the electrical clearance from the transmission line conductors as specified in the Ontario Health and Safety Act for the respective line voltage.

Be advised that any changes to lot grading or drainage within, or in proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.

Please note that the proponent will be held responsible for all costs associated with modifications or relocations of Hydro One infrastructure that result from your project, as well as any added costs that may be incurred due to increased efforts to maintain said infrastructure.

We reiterate that this message does not constitute any form of approval for your project. Hydro One must be consulted during all stages of your project. Please ensure that all future communications about this and future project(s) are sent to us electronically to secondarylanduse@hydroone.com

Sent on behalf of,

Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.

Ministry of the Environment, Conservation and Parks
Environmental Assessment Branch
1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Direction des évaluations environnementales
Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

Ontario

November 10, 2023

Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron
dgiberson@southhuron.ca

BY EMAIL ONLY

Re: **Water and Wastewater Master Plan**
Municipality of South Huron
Municipal Class Environmental Assessment, Master Plan (Phases 1- 2)
Acknowledgement of Notice of Commencement

Dear Don Giberson and Julien Bell,

This letter is in response to the Notice of Commencement for the above noted Master Plan. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Municipality of South Huron (proponent) has indicated that the study is following the approved environmental planning process for a Master Plan following Phases 1-2 under the Municipal Class Environmental Assessment (Class EA).

The **updated (August 2022)** attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please address all areas of interest in the EA documentation at an appropriate level for the EA study. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. **Further information is provided at the end of the Areas of Interest document relating to recent changes to the Environmental Assessment Act through Bill 197, Covid-19 Economic Recovery Act 2020.**

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing the projects identified in this Master Plan, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed Master Plan projects may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed projects**, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed Master Plan projects:

- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island)
- Caldwell First Nation
- Chippewas of Kettle and Stony Point
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed projects are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process". Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information, including the MECP's expectations for EA report documentation related to consultation with communities.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances after initial discussions with the communities identified by the MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed projects may adversely affect an Aboriginal or treaty right;
- Consultation with Indigenous communities or other stakeholders has reached an

impasse; or

- A Section 16 Order request is expected based on impacts to Aboriginal or treaty rights

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

A draft copy of the report should be sent directly to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments.

Please also ensure a copy of the final notice is sent to the ministry's Southwestern Region EA notification email account (eanotification.swregion@ontario.ca) after the draft report is reviewed and finalized.

Should you or any members of your project team have any questions regarding the material above, please contact me at mark.badali1@ontario.ca.

Sincerely,

Mark Badali

Senior Project Evaluator
Environmental Assessment Program Support, Environmental Assessment Branch
Project Review Unit, Environmental Assessment Branch

Cc: Pierre Adrien, Manager, London District Office, MECP
Adam Grant, Water Compliance Supervisor, London District Office, MECP
Julien Bell, Consultant Project Manager, GMBluePlan Engineering Limited
Kristen Farrell, Communications Coordinator, GM BluePlan Engineering Limited

Enclosed: Areas of Interest

Attached: Client's Guide to Preliminary Screening for Species at Risk

A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities

AREAS OF INTEREST (v. August 2022)

It is suggested that you check off each section after you have considered / addressed it.

☐ **Planning and Policy**

- Applicable plans and policies should be identified in the report, and the proponent should describe how the proposed Master Plan projects adhere to the relevant policies in these plans.
  - Projects located in MECP Central, Eastern or West Central Region may be subject to **A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)**.
  - Projects located in MECP Central or Eastern Region may be subject to the **Oak Ridges Moraine Conservation Plan (2017)** or the **Lake Simcoe Protection Plan (2014)**.
  - Projects located in MECP Central, Southwest or West Central Region may be subject to the **Niagara Escarpment Plan (2017)**.
  - Projects located in MECP Central, Eastern, Southwest or West Central Region may be subject to the **Greenbelt Plan (2017)**.
  - Projects located in MECP Northern Region may be subject to the **Growth Plan for Northern Ontario (2011).**

- The **Provincial Policy Statement (2020)** contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent sdvhould describe how the proposed projects are consistent with these policies.

- In addition to the provincial planning and policy level, the report should also discuss the planning context at the municipal and federal levels, as appropriate.

☐ **Source Water Protection**

The *Clean Water Act*, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**

    - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.

    - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- In order to determine if these Master Plan projects are occurring within a vulnerable area, proponents can use Source Protection Information Atlas, which is an online mapping tool available to the public. Note that various layers (including WHPAs, WHPA-Q1 and WHPA-Q2, IPZs, HVAs, SGRAs, EBAs, ICAs) can be turned on through the "Map Legend" bar on the left. The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.

- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

☐ **Climate Change**

The document "Considering Climate Change in the Environmental Assessment Process" (Guide) is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Proponents should review this Guide in detail.

- **The MECP expects proponents of Class EA projects to:**

  1. Consider during the assessment of alternative solutions and alternative designs, the following:
     a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
     b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
  2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "Community Emissions Reduction Planning: A Guide for Municipalities" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of these Master Plan projects, a quantitative air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for these projects if not already advised.**

- If a quantitative Air Quality Impact Assessment is not required for a project, the MECP expects that the report contain a qualitative assessment which includes:

    - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
    - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
    - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
    - A discussion of potential mitigation measures.

- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* report prepared for Environment Canada. March 2005.

- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- Natural heritage and hydrologic features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
  - Key Natural Heritage Features: Habitat of endangered species and threatened species, fish habitat, wetlands, areas of natural and scientific interest (ANSIs), significant valleylands, significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.
  - Key Hydrologic Features: Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.
  - Other natural heritage features and areas such as: vegetation communities, rare species of flora or fauna, Environmentally Sensitive Areas, Environmentally Sensitive Policy Areas, federal and provincial parks and conservation reserves, Greenland systems etc.

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, for projects located in Central Region you may consider the provisions of the Rouge Park Management Plan if applicable.

Species at Risk

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. Information, standards, guidelines, reference materials and technical resources to assist you are found at https://www.ontario.ca/page/species-risk.

- The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) has been attached to the covering email for your reference and use. Please review this document for next steps.

- For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

- **Surface Water**

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:

    - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
    - Watershed information, drainage conditions, and other relevant background information
    - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
    - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If a proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed Master Plan projects and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

- **Groundwater**

- The status of, and potential impacts to any well water supplies should be addressed. If the Master Plan projects involve groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.

- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

- Consultation with the railroad authorities is necessary wherever there is a plan to use construction dewatering in the vicinity of railroad lines or where the zone of influence of the construction dewatering potentially intercepts railroad lines.

☐ **Excess Materials Management**

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled "On-Site and Excess Soil Management" (O. Reg. 406/19) to support improved management of excess construction soil. This regulation is a key step to support proper management of excess soils, ensuring valuable resources don't go to waste and to provide clear rules on managing and reusing excess soil. New risk-based standards referenced by this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time, with the first phase in effect on January 1, 2021. For more information, please visit https://www.ontario.ca/page/handling-excess-soil.

- The report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014).

- All waste generated during construction must be disposed of in accordance with ministry requirements

☐ **Contaminated Sites**

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites. We recommend referring to the MECP's D-4 guideline for land use considerations near landfills and dumps.
    - Resources available may include regional/local municipal official plans and data; provincial data on large landfill sites and small landfill sites; Environmental Compliance Approval information for waste disposal sites on Access Environment.

- Other known contaminated sites (local, provincial, federal) in the study area should also be identified in the report (Note – information on federal contaminated sites is found on the Government of Canada's website).

- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

- **Servicing, Utilities and Facilities**

- The report should identify any above or underground utilities in the study area such as transmission lines, telephone/internet, oil/gas etc. The owners should be consulted to discuss impacts to this infrastructure, including potential spills.

- The report should identify any servicing infrastructure in the study area such as wastewater, water, stormwater that may potentially be impacted by the Master Plan projects.

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with MECP's Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's environmental land use planning guides to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

- **Mitigation and Monitoring**

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the Master Plan projects. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and <u>**describes how they have been addressed by the proponent**</u> throughout the planning process. The report should also include copies of comments submitted on the Master Plan by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

- Please include the full stakeholder distribution/consultation list in the documentation.

Class EA Process

- There are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference).**

- Any identified projects should also include information on the MCEA schedule associated with the project.

- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.

- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, MTO permits and approvals under the *Impact Assessment Act*, 2019.

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy. We encourage you to review all the available guides and reference any relevant information in the report.

Amendments to the EAA through the Covid-19 Economic Recovery Act, 2020
Once the EA Report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the proponent. The Notice of Completion must be sent to the appropriate MECP Regional Office email address.

The public can request a higher level of assessment on any of the Schedule B or Schedule C projects identified in the Master Plan if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director (of the Environmental Assessment Branch) will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project(s) within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project(s).

Therefore, the proponent cannot proceed with the Master Plan projects until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the proponent may not proceed after this time if:

- a Section 16 Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, or
- the Director has issued a Notice of Proposed order regarding the project(s).

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to:

Minister of the Environment, Conservation and Parks
Ministry of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Deshkan Ziibiing
Chippewas of the Thames
First Nation Treaties, Lands
and Environment

320 Chippewa Road
Muncey, ON, N0L 1Y0
Tel: 519-289-5555
Fax: 519-289-2230
info@cottfn.com

Project Name:
Municipality of South Huron Water and Wastewater Master Plan

FN Consultation ID:
521054

Consulting Org Contact:
Julien Bell

Consulting Organization:
GM BluePlan

Date Received:
Thursday, October 26, 2023

December 5, 2023

Dear: Julien Bell

We have received information concerning Municipality of South Huron Water and Wastewater Master Plan, dated October 26, 2023. The proposed project is located within the Huron Tract Treaty, and the Big Bear Creek Additions to Reserve (ATR) land selection area, as well as COTTFN Traditional Territory. Also this project is within 50km buffer from Chippewas of the Thames Reserve Land.

After screening this project, we have identified it to be of moderate concern. At this time COTTFN has no comments, but would like to be informed of any project updates in the future. Please upload these updates on NationsConnect using the conversation feature.

As a reminder, if there is an Archaeology Assessment conducted, we require notification and the opportunity to actively participate by sending First Nation Field Liaisons on behalf of this First Nation.

We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocols - a document and a process that will guide positive working relationships. We would be happy to meet with you to review COTTFN's Consultation Protocols. As per ‘Appendix C’ of the Wiindmaagewin, we will be sending invoices based on our time to review any documentation. The invoice will come from COTTFN's Finance Department. Please do not hesitate to contact me if you need further clarification of this letter.

Sincerely,

Original Signed
Erna Leclair
Consultation Analyst
Chippewa of the Thames First Nation
320 Chippewa Road, Muncey, ON, N0L 1Y0
(519) 289-5555
emleclair@cottfn.com or consultation@cottfn.com

UPPER THAMES RIVER
CONSERVATION AUTHORITY

Thames
Canadian Heritage River

"Inspiring a Healthy Environment"

January 8, 2024

GM BluePlan Engineering Limited
330 Trillium Drive, Unit D
Kitchener, ON
N2E 3J2

Municipality of South Huron
322 Main Street South
Exeter, ON
N0M 1S3

Attention: **Julien Bell, GM Blue Plan -** (sent via e-mail: Julien.bell@gmblueplan.ca)
Don Giberson, South Huron – (sent via e-mail: dgiberson@southhuron.ca)

Re: **Water and Wastewater Master Plan**
Notice of Study Commencement
Municipality of South Huron

Upper Thames River Conservation Authority (UTRCA) staff are in receipt of the Notice of Commencement for the Municipality of South Huron's Water and Wastewater Master Plan Update. We are of the understanding the update will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

We offer the following comments under Ontario Regulation 157/06 and our responsibilities as a commenting agency providing technical review and advisement related to water resources, pollution prevention and natural hazard management pursuant to relevant legislation and policies set out in the UTRCA Planning Policy Manual (June 28, 2006).:

General Comments

1) We would appreciate the opportunity for our technical staff to review and provide comments on any upcoming draft documents and proposed alternatives including any draft Water and Wastewater Master Plan. Please note that our scope of review is based on the policies set out in the Upper Thames River Conservation Authority Planning Policy Manual (June 28, 2006). Master Plan and any subsequent detail design project review for site specific works would generally be guided by, but not limited to, natural hazard and pollution prevention areas of concern for lands regulated within our jurisdiction.

Conservation Authority Regulated Areas

2) The UTRCA regulates development within the Regulation Limit in accordance with Ontario Regulation 157/06 made pursuant to Section 28 of the *Conservation Authorities Act*. This regulation requires proponents to obtain written approval from the UTRCA prior to undertaking any works in the regulated area including filling, grading, construction, alteration to a watercourse and/or interference with a wetland (including the removal of wetland vegetation).

3) Portions of the study area are regulated by the UTRCA due to the presence of: a) a variety of watercourses including Fish Creek; b) riverine flooding and erosion hazard lands associated with these watercourses; c) Wetlands; and, d) the Area of Interference surrounding these wetland features.

4) Portions of the study areas either lie outside our watershed or are shared with the Ausable Bayfield Conservation Authority (ABCA) who also has jurisdiction for those areas. We recommend you contact ABCA directly for their comments regarding any works/plans proposed in their portion of the study area.

Digital Mapping

5) Our staff can provide digital mapping which outlines the approximate boundaries of the natural hazard features as well as Drinking Water Source Protection Areas present within the UTRCA portion of the study area. Our digital mapping may be obtained by contacting our GIS department (contact: Phil Simm, 519-451-2800 x 247). Generally there is a fee involved with obtaining digital mapping of our natural hazard features but this fee will be waived as the mapping is intended for use by one of our member municipalities for a Servicing Master Plan.

Drinking Water Source Protection

6) This Water and Wastewater Master Plan is the best time to consider regulatory requirements of the Ontario *Clean Water Act* and local Source Protection Plans as well as designated vulnerable areas. The Master Planning process offers an excellent opportunity to document how these factors have been considered in assessing alternatives through the planning process.

7) If the Water and Wastewater Master Plan preferred option is either a new well, change in location of existing well, or expansion of current well within the Thames-Sydenham Source Protection Region, please engage our office as soon as you can as this is subject to s.34 amendments to the Thames-Sydenham Source Protection Plans and Assessment Reports as per the *Clean Water Act, 2006*. These changes could affect the Wellhead Protection Area delineation for which polices could apply.

8) The municipality is required by s. 27(3) of O. Reg. 287/07 to notify the CA of the creation of, or modification of any transport pathways.

1424 Clarke Road, London, Ont. N5V 5B9 · Phone: 519.451.2800 · Fax: 519.451.1188 · Email: infoline@thamesriver.on.ca · www.thamesriver.on.ca

9) If the proponents have questions on how source protection and the local plan may affect the proposed alternatives they may contact UTRCA Drinking Water Source Protection (DWSP) staff or their municipal Risk Management Official (RMO).

Summary

Please note that given the broad concept proposal at this time, we are unable to provide detailed technical comments regarding the project. However, we appreciate being contacted early in the process and are always open to meeting with you to discuss and work through any concerns or complications along the way.

Our office would like to be included in future circulations regarding this project. We would appreciate receiving information and reports as they become available in order to ensure that we can meet the project deadlines with our comments.

If you have any questions regarding the above information, please contact the undersigned.

Yours truly,
UPPER THAMES RIVER CONSERVATION AUTHORITY

Karen M. Winfield

Karen Winfield
Land Use Regulations Officer

JW/KW/kw

c.c. – Kristen Farrell, GM Blue Plan – (via e-mail: Kristen.Farrell@gmblueplan.ca)
Laura Biancolin, UTRCA
Eric Gaskin, UTRCA
Cari Ramsey, UTRCA
Julie Welker, UTRCA
Geoff Cade, ABCA

1424 Clarke Road, London, Ont. N5V 5B9 · Phone: 519.451.2800 · Fax: 519.451.1188 · Email: infoline@thamesriver.on.ca · www.thamesriver.on.ca

Hydro One Networks Inc.

483 Bay Street
8th Floor South Tower
Toronto, Ontario M5G 2P5

HydroOne.com

April 24, 2024

Re: Water and Wastewater Master Plan

Attention:
Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron

Thank you for sending us notification regarding Water and Wastewater Master Plan. In our assessment, we have confirmed that Hydro One has existing high voltage Transmission facilities within your study area.

At this time we do not have sufficient information to comment on the potential resulting impacts that your project may have on our infrastructure. As such, we must stay informed as more information becomes available so that we can advise if any of the alternative solutions present actual conflicts with our assets, and if so; what resulting measures and costs could be incurred by the proponent. Note that this response does not constitute approval for your plans and is being sent to you as a courtesy to inform you that we must continue to be consulted on your project.

We reiterate that this message does not constitute any form of approval for your project. Hydro One must be consulted during all stages of your project. Please ensure that all future communications about this and future project(s) are sent to us electronically to secondarylanduse@hydroone.com

Sent on behalf of,

Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.

From: Steven Lund
Sent: Friday, October 13, 2023 10:18 AM
To: Kristen Farrell - GM BluePlan
Cc: Imran Khalid
Subject: RE: Notice of Study Commencement - Water and Wastewater Master Plan Update

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Hi Kristan -Please add Imran Khalid as contact as I will retiring on November 23, 2023.

Thanks Steve

Steven Lund, P.Eng., PWLF

County Engineer/Director of Operations | Public Works and Emergency Services
County of Huron | www.HuronCounty.ca
1 Courthouse Square | Goderich, ON N7A 1M2
(519) 524.8394 ext 3318| Cell 226.222.1371

HURON COUNTY

Have Your Say at HuronCountyConnects.ca!

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Friday, October 13, 2023 10:00 AM
To: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Cc: Michelle Klaver - GM BluePlan <Michelle.Klaver@gmblueplan.ca>
Subject: Notice of Study Commencement - Water and Wastewater Master Plan Update

Good Morning,

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update that will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

Please find attached the Notice of Study Commencement which provides further details about the study. As part of the study's consultation program, you are currently included in the study contact list. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the study contact list and you will be notified of all future consultation opportunities during the undertaking of this study.

If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Bob Schram
Sent: Thursday, October 19, 2023 6:05 PM
To: Kristen Farrell - GM BluePlan; Michelle Klaver - GM BluePlan
Cc: 'president@oakwoodparkassociation.com'; 'hughes.lion@gmail.com'; 'Marc Trudell'
Subject: Notice of Study Commencement - Water and Wastewater Master Plan Update
Attachments: image001.jpg

Follow Up Flag: Follow up
Flag Status: Completed

Hello Kristen

The former President of Oakwood Park Association, Nancy Dubois, received this notice. Can you please re-issue the notice and content regarding the Study Commencement - Water and Wastewater Master Plan Update to the President of Oakwood Park, Mr. Dave Ross. His e-mail address is president@oakwoodparkassociation.com.

Also please include the following people to the contact list:
Mark Hughes - hughes.lion@gmail.com
Marc Trudell - m.trudell@rogers.com
Bob Schram – bschram@sterling.ca

Thank you for your assistance

Bob Schram
Director Oakwood Park Association Inc.
23 Lake Shore Dr.
South Huron, ON
T: 519-872-0068

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Friday, October 13, 2023 10:00 AM
To: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Cc: Michelle Klaver - GM BluePlan <Michelle.Klaver@gmblueplan.ca>
Subject: Notice of Study Commencement - Water and Wastewater Master Plan Update

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support the needs of existing users and to support potential population and employment growth within the Municipality.

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If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator
GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Marcy McKillop
Sent: Thursday, October 19, 2023 1:20 PM
To: Kristen Farrell - GM BluePlan
Cc: Andrew Henry; Billy Haklander; Ryan Armstrong
Subject: RE: Notice of Study Commencement - Water and Wastewater Master Plan Update

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Follow Up Flag: Follow up
Flag Status: Completed

Good afternoon Kristen,

Please add Ryan Armstrong and me to your project contact list for this Master Plan Update. Ryan and I will then serve as the main point of contact for the Lake Huron Primary Water Supply System.

Thanks,

Marcy McKillop, P.Eng. (she/her)
Environmental Services Engineer, Regional Water Supply

Lake Huron & Elgin Area Primary Water Supply Systems
235 North Centre Road, Suite 200
London, Ontario N5X 4E7
T: 519-930-3505 ext. 4976
E: mmckillop@huronelginwater.ca
https://huronelginwater.ca
www.facebook.com/RegionalWaterSupply

The Lake Huron and Elgin Area Primary Water Supply Systems serve communities and people within the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron. We honour and respect the history, languages and culture of the diverse Indigenous people who call this territory home. This region is currently home to many First Nations, Inuit and Métis. We are grateful to have the opportunity to work and live in this territory.

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Friday, October 13, 2023 10:00 AM
To: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Cc: Michelle Klaver - GM BluePlan <Michelle.Klaver@gmblueplan.ca>
Subject: Notice of Study Commencement - Water and Wastewater Master Plan Update

Good Morning,

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update that will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

Please find attached the Notice of Study Commencement which provides further details about the study. As part of the study's consultation program, you are currently included in the study contact list. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the study contact list and you will be notified of all future consultation opportunities during the undertaking of this study.

If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Kristen Farrell - GM BluePlan
Sent: Monday, October 23, 2023 3:00 PM
To: Jennifer White
Subject: RE: Water & Wastewater Management Contact List
Attachments: Water & Wastewater Master Plan - Notice of Commencement.pdf

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Good Afternoon Jennifer,

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update that will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

Please find attached the Notice of Study Commencement which provides further details about the study. As part of the study's consultation program, you have been added to the study contact list and you will be notified of all future consultation opportunities during the undertaking of this study.

If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Jennifer White <jen@whitewaveconsulting.com>
Sent: Friday, October 20, 2023 10:35 AM
To: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Subject: Water & Wastewater Management Contact List

Hi Kristen,

Please re-issue the notice and content regarding the Study Commencement - Water and Wastewater Master Plan Update to the President of Maple Grove, Jennifer White
My e-mail address is jen@whitewaveconsulting.com.

Please add me to the contact list for future communications related to Water and Wastewater Management.

Thanks,
Jennifer

From: Kristen Farrell - GM BluePlan
Sent: Monday, October 23, 2023 2:52 PM
To: [redacted]
Subject: RE: Notice of Study Commencement - Water and Wastewater Master Plan
Attachments: Water & Wastewater Master Plan - Notice of Commencement.pdf

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Good Afternoon [redacted],

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update that will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

Please find attached the Notice of Study Commencement which provides further details about the study. As part of the study's consultation program, you have been added to the study contact list. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the study contact list and you will be notified of all future consultation opportunities during the undertaking of this study.

If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: [redacted]>
Sent: Friday, October 20, 2023 10:46 AM
To: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Cc: Bob Schram <BSchram@sterling.ca>
Subject: Notice of Study Commencement - Water and Wastewater Master Plan

Hi Kristen,
Could you please send me the notice and content regarding the Study Commencement - Water and Wastewater Master Plan Update for South Huron.

Thank you,
[redacted]
South Huron

From: Craig Metzger
Sent: Monday, October 23, 2023 9:17 AM
To: Kristen Farrell - GM BluePlan
Subject: RE: Notice of Study Commencement - Water and Wastewater Master Plan Update
Attachments: Water & Wastewater Master Plan - Notice of Commencement.pdf

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Follow Up Flag: Follow up
Flag Status: Flagged

Good morning, Kristen.
Please send all future consultation opportunities regarding South Huron's Water and Wastewater Master Plan Update project to me directly as the County planner assigned to South Huron, rather than sending it to our general email (planning@huroncounty.ca).

Thanks,

Craig Metzger

Senior Planner | Planning & Development Department
County of Huron | www.HuronCounty.ca
(519) 524-8394 ext. 3235

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Friday, October 13, 2023 10:00 AM
To: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Cc: Michelle Klaver - GM BluePlan <Michelle.Klaver@gmblueplan.ca>
Subject: Notice of Study Commencement - Water and Wastewater Master Plan Update

Good Morning,

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update that will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

Please find attached the Notice of Study Commencement which provides further details about the study. As part of the study's consultation program, you are currently included in the study contact list. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the study contact list and you will be notified of all future consultation opportunities during the undertaking of this study.

If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: ONT Environment / Environnement ONT
Sent: Tuesday, October 24, 2023 2:28 PM
To: Kristen Farrell - GM BluePlan; Julien Bell - GM BluePlan; dgiberson@southhuron.ca
Cc: Michelle Klaver - GM BluePlan
Subject: RE: [External/Externe]: Notice of Study Commencement - Water and Wastewater Master Plan Update
Attachments: Water & Wastewater Master Plan - Notice of Commencement.pdf

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Greetings,

Thank you for your correspondence.

Please note Transport Canada does not require receipt of all Individual or Class EA related notifications. We request that project proponents self-assess whether their project:

1. Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available at at www.tbs-sct.gc.ca/dfrp-rbif/; **and**
2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at http://www.tc.gc.ca/eng/acts-regulations/menu.htm.

Proposed projects that will occur on federal property (including reserve lands or lands owned by federal departments other than Transport Canada) will be subject to an Impact Assessment per Section 82 of the *Impact Assessment Act, 2019* prior to exercising a federal power (including full or partial funding), and/or performing a function or duty (e.g. regulatory approval or issuance of a lease) in relation to that project.

If the criteria above do not apply, Transport Canada's Environmental Assessment program should not be included in any further correspondence, and future notifications will not receive a response. If there is a role under the program, correspondence should be forwarded to: EnviroOnt@tc.gc.ca with a **brief description of Transport Canada's expected role**.

*Below is a summary of the most common Acts that apply to projects in an Environmental Assessment context:

- ***Canadian Navigable Waters Act (CNWA)*** – the Act applies primarily to works constructed or placed in, on, over, under, through, or across navigable waters set out under the Act. The Navigation Protection Program administers the CNWA through the review and authorization of works affecting navigable waters. Information about the Program, CNWA and approval process is available at: http://www.tc.gc.ca/eng/programs-621.html. Inquiries can be directed to NPPONT-PPNONT@tc.gc.ca or by calling (519) 383-1863.

- ***Railway Safety Act (RSA)*** – the Act provides the regulatory framework for railway safety, security, and some of the environmental impacts of railway operations in Canada. The Rail

Safety Program develops and enforces regulations, rules, standards and procedures governing safe railway operations. Additional information about the Program is available at: https://www.tc.gc.ca/eng/railsafety/menu.htm. Inquiries can be directed to RailSafety@tc.gc.ca or by calling (613) 998-2985.

- ***Transportation of Dangerous Goods Act (TDGA)*** – the transportation of dangerous goods by air, marine, rail and road is regulated under the TDGA. Transport Canada, based on risks, develops safety standards and regulations, provides oversight and gives expert advice on dangerous goods to promote public safety. Additional information about the transportation of dangerous goods is available at: https://www.tc.gc.ca/eng/tdg/safety-menu.htm. Inquiries can be directed to TDG-TMDOntario@tc.gc.ca or by calling (416) 973-1868.

- ***Aeronautics Act*** – this Act and the associated Canadian Aviation Regulations (CARs) govern civil aviation in Canada. Transport Canada should be notified of projects involving aerodromes and associated structures, or activities that could affect aviation safety. Elevated structures, such as wind turbines and communication towers, are examples of projects that must be assessed for lighting and marking requirements in accordance with the CARs. Transport Canada also has an interest in projects that have the potential to cause interference between wildlife and aviation activities. One example would be waste facilities, which may attract birds into commercial and recreational flight paths. Additional guidance can be found in the *Land Use In The Vicinity of Aerodromes* publication, available at: https://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm. Information about Transport Canada's Civil Aviation program can be found at: https://tc.canada.ca/en/aviation. Inquires can be directed to aviation.ont@tc.gc.ca or by calling 1 (800) 305-2059 / (416) 952-0230.

Please advise if additional information is needed.

Thank you,

Environmental Assessment Program, Ontario Region
Transport Canada / Government of Canada / 4900 Yonge St., Toronto, ON M2N 6A5
EnviroOnt@tc.gc.ca

Programme d'évaluation environnementale, Région de l'Ontario
Transports Canada / Gouvernement du Canada / 4900, rue Yonge, Toronto, ON, M2N 6A5
EnviroOnt@tc.gc.ca

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Friday, October 13, 2023 10:00 AM
To: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Cc: Michelle Klaver - GM BluePlan <Michelle.Klaver@gmblueplan.ca>

Subject: [External/Externe]: Notice of Study Commencement - Water and Wastewater Master Plan Update

Good Morning,

The Municipality of South Huron has initiated the Water and Wastewater Master Plan Update that will aim to develop and evaluate the optimal water and wastewater servicing strategies to support the needs of existing users and to support potential population and employment growth within the Municipality.

Please find attached the Notice of Study Commencement which provides further details about the study. As part of the study's consultation program, you are currently included in the study contact list. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the study contact list and you will be notified of all future consultation opportunities during the undertaking of this study.

If you would like to submit comments, please contact Don Giberson, General Manager of Infrastructure and Development (dgiberson@southhuron.ca) or Julien Bell, Consultant Project Manager (julien.bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Communications Coordinator

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
c: 289-442-2979
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Julien Bell - GM BluePlan
Sent: Wednesday, November 08, 2023 3:10 PM
To: [redacted]
Cc: Don Giberson; Michelle Klaver - GM BluePlan
Subject: RE: South Huron Water & Wastewater Master Plan Study

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Hi [redacted],

Thank you for your questions. I have also received your voicemail and can arrange a time this Thursday for a call.

My initial answers to your questions are below.

1. What triggered this study as there was one completed by Stantec in 2018?
   It's a part of the standard practice for municipalities to review their strategic plans on a regular basis. Over time and as prior project recommendations are implemented, the water and wastewater system infrastructure needs may change due to a variety of factors including changes in municipal and provincial regulations, changes in growth needs, changes in existing users/system flows profiles, infrastructure performance/condition deterioration occurring more/less quickly than initial planned, etc. This update will allow us to take an inventory on the current state of affairs and to reconfirm and/or adjust the long-term strategy appropriately based on the latest municipal and provincial regulations and municipal priorities.

2. As part of the Stantec report, there were several Class EA completed in 2012. Have they now expired? Are they being amended?
   Typically, Municipal Class EAs are valid for 10 years. EAs completed more than 10 years ago where construction of the project recommendations has been initiated but are not yet complete would not be considered expired; however, may be subject to the requirement of an EA addendum and/or re-investigation of key site condition studies if overall site conditions and/or construction approaches have changed. EAs completed more than 10 years ago where no work has started may require the EAs to be updated.

Regards

Julien Bell, P.Eng.
Infrastructure Planning, Partner

GM BluePlan Engineering Limited
330 Trillium Drive, Unit D | Kitchener ON N2E 3J2
t: 519.748.1440 ext. 4264 | c: 416.254.6247
julien.bell@gmblueplan.ca | www.gmblueplan.ca

From: [redacted]>
Sent: Monday, November 06, 2023 9:55 AM
To: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>
Subject: South Huron Water & Wastewater Master Plan Study

Hi Julien,
I have a couple of quick questions:

1. What triggered this study as there was one completed by Stantec in 2018?

2. As part of the Stantec report, there were several Class EA completed in 2012. Have they now expired? Are they being amended?

I appreciate your prompt response.

Kindest regards,
[redacted]

From: Floerke, Lilly (MECP)
Sent: Tuesday, November 14, 2023 11:33 AM
To: dgiberson@southhuron.ca
Cc: Kristen Farrell - GM BluePlan; Grant, Adam (He/Him) (MECP); Badali, Mark (He/Him) (MECP)
Subject: South Huron W-WW Master Plan Acknowledgement Letter
Attachments: MECP Acknowledgement of NOC - MEA Class EA - South Huron W-WW Master Plan.pdf; A Proponent's Introduction to the Delegated Aspects of Consultation with.pdf; DRAFT-Proponents Guide to Preliminary Screening-May 2019.pdf

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Follow Up Flag: Follow up
Flag Status: Flagged

Dear Don Giberson,

Attached in this e-mail is the Acknowledgement letter and supporting attachments in response to the Notice of Commencement for the Water and Wastewater Master Plan for the Municipality of South Huron. Please contact the assigned Regional Environmental Planner at markbadali1@ontario.ca if you have any questions or concerns.

Please note that Section A.2.7 and Appendix 4 of the Municipal Class EA parent document outline various approaches to conducting master plans. While all master plans must at a minimum address Phases 1 and 2, as is indicated in the Notice of Commencement, as the Class EA process proceeds the proponent must determine whether the master plan will be completed at a broad level of assessment such that more detailed investigations will be required for future projects (i.e. Approach #1), or whether it will fulfill all Class EA requirements for any Schedule B projects that the master plan identifies (i.e. Approach #2).

Thank you,

Lilly Floerke | Assistant Project Officer
Environmental Assessment and Permissions Division | Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks
lilly.floerke@ontario.ca
647-825-1869

From: Rebekah Msuya-Collison <cao@southhuron.ca>
Sent: Thursday, November 23, 2023 4:52 PM
To: Don Giberson <dgiberson@southhuron.ca>
Subject: FW: GM File 521016-1

From: Bob Schram <bschram@sterling.ca>
Sent: Thursday, November 23, 2023 4:49 PM
To: Rebekah Msuya-Collison <cao@southhuron.ca>
Cc: julien.bell@gmblueplan.ca; Michelle.Klaver@gmblueplan.ca; Mayor Finch <gfinch@southhuron.ca>
Subject: GM File 521016-1

Hello Rebekah

I am attaching the extract of your GMBP File 521016-1 which is the cost estimate for the **Tridon + Oversize sewer project**, Tridon Phase 1, Phase 2, and the Tridon Tennis Court lands plus oversize pipe.
As part of this particular file there was also a $104,000 expenditure B.2.4.1 specifically designated for the Oakwood Links pumping station. This project costs estimate is specific only for the Tridon + Oversize configuration.

There would have been a detailed design with full technical specifications, pipe sizing etc., for the **Tridon Only sewer project**, Tridon Phase 1, Phase 2, and the Tridon Tennis Court lands **WITHOUT** the oversizing and provision for item B.2.4.1. I am looking for the technical details and cost estimates for this configuration of the project. This costing was not provided as part of the presentation to Council or the public. Can you please provide these cost estimates for the **Tridon Only** sewer project without the oversizing and item B.2.4.1.

GMBluePlan or another consulting engineering firm would have provided flow capacity for both the Tridon Only and Tridon + Oversize. Can you please provide this information and any engineering reports which were used to determine the oversizing rationale. Additionally, was there any evaluation of the efficacy of oversizing, added maintenance cost, or flow calculation to support an oversized pipe which South Huron can provide? The professional engineers would have considered all these variables when advising on the actual oversize and efficacy. If GMBluePlan did not advise on the actual oversize then which engineering firm made the calculations and can we get their report.

I am addressing this issue to you as the Chief Administrative Officer at the Municipality of South Huron responsible for general control and management of the municipality for the purpose of ensuring the efficient and effective operation of the municipality. Having the accurate costs estimate for the **Tridon Only sewer project** is absolutely imperative to insure effective control and management of municipal affairs. The Tridon + Oversize cost estimate we have in the attached document already.

Should you wish to discuss this request more fully I can be reached by telephone at 519-872-0068 at your convenience and at almost any hour.

Thanking in advance for your assistance,

Bob Schram
27 Lake Shore Drive
South Huron, ON
N0M 1TO

From: Bob Schram
Sent: Thursday, November 23, 2023 1:57 PM
To: toke@southhuron.ca; mdietrich@southhuron.ca; jdietrich@southhuron.ca
Cc: TRowe@mte85.com; Julien Bell - GM BluePlan
Subject: MTE Consultants and GMBluePlan

Good day Mayor Finch and Councillors

Some requests to assist South Huron Councillors in gathering accurate and professional information to help inform your Municipal decision making follow:

1. **Capacity of Oakwood Links pumping station:**
   MTE Consultants are the professional engineers who determined the status and capacity of the Oakwood Links pumping station. The MTE report was the only report from accredited engineers used to justify approval of Phase 1 Sol Haven by South Huron. MTE are the responsible and trusted resource that South Huron should be talking to directly. I am sure, MTE would welcome the opportunity to meet in person with Council to share their Oakwood Links findings and provide informed professional answers to Councillor's questions. South Huron does not have the engineering resources and must avail themselves of MTE's knowledge and professional assessment of the Oakwood Links pumping station. As tax paying constituents of South Huron, we want great decisions informed by the professional knowledge which MTE can provide.

2. **Future Oakwood Links pumping capacity for future development:**
   MTE will be able to quantify the available capacity in the Oakwood Links pumping station. If Tridon are no longer going to use the available capacity for their Phase 1 development then this will provide significant additional capacity for future potential development. Should any upgrades be needed to support actual future building then those developers will make the needed investments for their commercial interests. Development will pay for development and South Huron will avoid further unfunded debt load and interest expenses.

3. **Implications of oversizing:**
   There has not been a professional engineering study and opinion provided to address the efficacy or extent to oversize the sewer required for Tridon's Phase 1, Phase 2, and Tennis Court lands.
   Nothing has been presented to the public or Council, that I recollect. There have been many instances where oversized sewers actually degrade and are very expensive to maintain due to lack of flow.
   Council must get a professional engineer's report before any oversizing can be considered let alone costs the actual incremental cost. Oakwood Links pumping station capacity addresses any perceived but unsubstantiated future focused needs.

4. **Tridon Sol Haven Phase 1, Phase 2 and Tennis Court sewer requirement cost estimate:** GMBLuePlan needs to provide Council the sewer pipe specifications and cost estimate required for an **Tridon's Sol Haven Phase 1, Phase 2, and Tennis Court lands, ONLY.** GmBluePlan's cost estimate for the Tridon sewer **plus** oversizing, including a $104,000 specific item designated for the Oakwood Links pumping station, has been presented to Council. The GMBluePlan, Tridon only cost estimate, was not presented to Council or available in any public documents I can find. Council needs the Tridon only cost estimate from the engineers at GMBluePlan. Until, the Tridon only cost estimate is available to Council and the public no comparative technical and financial analysis can be made. GMBluePlan has the "engineering services" to deliver better decisions for South Huron. South Huron and the taxpayers need to see the GMBluePlan specifications and sewer costs estimates for the Tridon only and the Oversize option. Please arrange for this information to be made available.

Kudos to ABCA and Thames Valley for their program and financial successes. ABCA evaluated a program and reduced cost to one person from two. Thames Valley increased earned revenue as a percentage of total operating expense. Both organizations are bringing in 2024 budgets with less than a 3% increase.

Respectfully submitted to all Councillors,

Bob Schram
27 Lake Shore Road
South Huron, ON
N0M 1T0

From: Julien Bell - GM BluePlan
Sent: Tuesday, December 05, 2023 2:13 PM
To: Kristen Farrell - GM BluePlan; Michelle Klaver - GM BluePlan
Subject: FW: Decision regarding consultation: 521054 - Municipality of South Huron Water and Wastewater Master Plan
Attachments: consultation-response-34142-521054-20231205-1226.pdf; wiindmaagewin-consultation-protocol-120623-approved.pdf

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Follow Up Flag: Follow up
Flag Status: Flagged

Julien Bell, P.Eng.
Infrastructure Planning, Partner

GM BluePlan Engineering Limited
330 Trillium Drive, Unit D | Kitchener ON N2E 3J2
t: 519.748.1440 ext. 4264 | c: 416.254.6247
julien.bell@gmblueplan.ca | www.gmblueplan.ca

From: Chippewas of the Thames First Nation <no-reply-cottfn@knowledgekeeper.ca>
Sent: Tuesday, December 05, 2023 12:27 PM
To: fburch@cottfn.com; jmills@cottfn.com; emleclair@cottfn.com; Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Subject: Decision regarding consultation: 521054 - Municipality of South Huron Water and Wastewater Master Plan

Please see attached PDF response letter. As per ‘Appendix C’ of the Wiindmaagewin Consultation Protocol, we will be sending an invoice based on our time to engage in the consultation process. The invoice will be sent from COTTFN's Finance Department.

From: Karen Winfield
Sent: Monday, January 08, 2024 3:34 PM
To: dgiberson@southhuron.ca; Julien Bell - GM BluePlan
Cc: Cari Ramsey; Eric Gaskin; Geoff Cade; Julie Welker; Kristen Farrell - GM BluePlan; Laura Biancolin
Subject: [EXT] South Huron W & WW Master Plan - Notice of Commencement
Attachments: UTRCA Comments - South Huron W, WW MP Notice of Commencement.pdf

---

EXTERNAL EMAIL

Hi Julien/Don,

Please see attached UTRCA request to be kept on the circulation list for this project.

Thank-you,

Karen Winfield
Planning & Regulations Resource Specialist
1424 Clarke Road London, Ontario, N5V 5B9
519.451.2800 Ext. 237 | Fax: 519.451.1188
winfieldk@thamesriver.on.ca

UPPER THAMES RIVER
CONSERVATION AUTHORITY

From: Craig Metzger
Sent: Tuesday, April 02, 2024 8:50 AM
To: Kristen Farrell - GM BluePlan
Cc: Celina McIntosh
Subject: [EXT] RE: Notice of Public Information Centre - Water & Wastewater Master Plan Update

---

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL EMAIL

Good morning, Kristen.
Celena McIntosh is now the Planner for South Huron so please remove me from the contact list for this project. I've cc'd Celina on this message so she can let you know whether she wants her name added to the circulation list.

Have a great day,

Craig Metzger

Senior Planner | Planning & Development Department
County of Huron | www.HuronCounty.ca
(519) 524-8394 ext. 3235

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Monday, April 1, 2024 3:19 PM
Cc: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Subject: Notice of Public Information Centre - Water & Wastewater Master Plan Update

Good afternoon,

The Municipality of South Huron is completing a Water and Wastewater Master Plan Update to develop and evaluate optimal water and wastewater strategies in the Municipality.

Please find attached the Notice of Public Information Centre which contains further details about the study and details about the upcoming Public Information Centre on April 16, 2024. You are invited to attend to ask questions and provide input to the study.

As part of the Study's Consultation Program, you are currently included in the Study Contact List. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the Study Contact List and you will be notified of all future consultation opportunities during the undertaking of this study.

If you have any comments or questions, please contact a member of the project team: Don Giberson (dgiberson@southhuron.ca) or Julien Bell (Julien.Bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Office/Project Coordinator
(she/her)

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
t: 905-643-6688 ext. 6243 c: 519-829-0693
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Marcy McKillop
Sent: Tuesday, April 02, 2024 9:04 AM
To: Kristen Farrell - GM BluePlan
Cc: Submissions
Subject: [EXT] RE: Notice of Public Information Centre - Water & Wastewater Master Plan Update

---

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL EMAIL

Hi Kristen,

Please ensure all Master Plan correspondence is directed to submissions@huronelginwater.ca

Lake Huron Primary Water Supply System staff can then review and respond as needed.

Thank you,

Marcy McKillop, P.Eng. (she/her)
Environmental Services Engineer, Regional Water Supply

Lake Huron & Elgin Area Primary Water Supply Systems
235 North Centre Road, Suite 200
London, Ontario N5X 4E7
T: 519-930-3505 ext. 4976
E: mmckillop@huronelginwater.ca
https://huronelginwater.ca
www.facebook.com/RegionalWaterSupply

The Lake Huron and Elgin Area Primary Water Supply Systems serve communities and people within the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron. We honour and respect the history, languages and culture of the diverse Indigenous people who call this territory home. This region is currently home to many First Nations, Inuit and Métis. We are grateful to have the opportunity to work and live in this territory.

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Monday, April 1, 2024 3:19 PM

Cc: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Subject: Notice of Public Information Centre - Water & Wastewater Master Plan Update

You don't often get email from kristen.farrell@gmblueplan.ca. Learn why this is important

Good afternoon,

The Municipality of South Huron is completing a Water and Wastewater Master Plan Update to develop and evaluate optimal water and wastewater strategies in the Municipality.

Please find attached the Notice of Public Information Centre which contains further details about the study and details about the upcoming Public Information Centre on April 16, 2024. You are invited to attend to ask questions and provide input to the study.

As part of the Study's Consultation Program, you are currently included in the Study Contact List. If you wish to be removed or would like to suggest an alternative representative, please contact the undersigned. Should we not hear from you, your details will remain on the Study Contact List and you will be notified of all future consultation opportunities during the undertaking of this study.

If you have any comments or questions, please contact a member of the project team: Don Giberson (dgiberson@southhuron.ca) or Julien Bell (Julien.Bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Office/Project Coordinator
(she/her)

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
t: 905-643-6688 ext. 6243 c: 519-829-0693
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Celina McIntosh
Sent: Wednesday, April 03, 2024 11:23 AM
To: Kristen Farrell - GM BluePlan
Subject: [EXT] RE: Notice of Public Information Centre - Water & Wastewater Master Plan Update

---

EXTERNAL EMAIL

Hi Kristen,
Further to Craig's email, I would like to be added to the circulation list.
Thank you!
Celina

Celina McIntosh (she/her)

Planner | Planning & Development Department
County of Huron | www.HuronCounty.ca
(519) 524-8394 ext. 3

Have Your Say at HuronCountyConnects.ca!

From: Craig Metzger <cmetzger@huroncounty.ca>
Sent: Tuesday, April 2, 2024 8:50 AM
To: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Cc: Celina McIntosh <cmcintosh@huroncounty.ca>
Subject: RE: Notice of Public Information Centre - Water & Wastewater Master Plan Update

Good morning, Kristen.
Celena McIntosh is now the Planner for South Huron so please remove me from the contact list for this project. I've cc'd Celina on this message so she can let you know whether she wants her name added to the circulation list.

Have a great day,

Craig Metzger

Senior Planner | Planning & Development Department
County of Huron | www.HuronCounty.ca
(519) 524-8394 ext. 3235

From: Kristen Farrell - GM BluePlan <Kristen.Farrell@gmblueplan.ca>
Sent: Monday, April 1, 2024 3:19 PM
Cc: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Subject: Notice of Public Information Centre - Water & Wastewater Master Plan Update

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Sincerely,

Kristen Farrell, EPt
Office/Project Coordinator
(she/her)

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
t: 905-643-6688 ext. 6243 c: 519-829-0693
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: Nick Verhoeven
Sent: Friday, April 12, 2024 3:46 PM
To: Kristen Farrell - GM BluePlan
Subject: [EXT] RE: Notice of Public Information Centre - Water & Wastewater Master Plan Update

---

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL

Hello Kristen,

Can you please replace Susan with myself on the contact list and please keep me informed of future project updates.

Thanks,

Nick

Nick Verhoeven, P.Eng.
Director of Public Works
519-243-1400 ext. 8213
9577 Port Franks Road, Thedford, ON N0M 2N0

From: Susan Mills <smills@lambtonshores.ca>
Sent: Friday, April 12, 2024 9:31 AM
To: Nick Verhoeven <nverhoeven@lambtonshores.ca>
Subject: FW: Notice of Public Information Centre - Water & Wastewater Master Plan Update

Hi Nick

I'm thinking you should be the contact point for the municipality on South Huron's Water and Wastewater Master Plan Update consultation list.

If you didn't receive the email already, maybe let them know to keep you apprised of progress.

Thanks

Susan Mills
Transit Coordinator
Huron Shores Area Transit
smills@lambtonshores.ca
Office: 519-243-1400 ext. 8108 / Cell: 519-200-5493
9577 Port Franks Road, Thedford, ON N0M 2N0

From: Kristen Farrell - GM BluePlan [mailto:Kristen.Farrell@gmblueplan.ca]
Sent: Monday, April 1, 2024 3:19 PM
Cc: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Subject: Notice of Public Information Centre - Water & Wastewater Master Plan Update

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Sincerely,

Kristen Farrell, EPt
Office/Project Coordinator
(she/her)

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
t: 905-643-6688 ext. 6243 c: 519-829-0693
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From: [Susan Mills]
Sent: Friday, April 12, 2024 9:33 AM
To: Kristen Farrell - GM BluePlan
Subject: [EXT] FW: Notice of Public Information Centre - Water & Wastewater Master Plan Update
Attachments: Notice of Public Information Centre - Water and Wastewater Master Plan.pdf

---

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL

Hi Kristen

Please remove my name from the consultation list. You may wish to add Nick Verhoeven - Director of Public Works. 519-243-1400 ext. 8213. nverhoeven@lambtonshores.ca

Regards,

Susan Mills
Transit Coordinator
Huron Shores Area Transit
smills@lambtonshores.ca
Office: 519-243-1400 ext. 8108 / Cell: 519-200-5493
9577 Port Franks Road, Thedford, ON N0M 2N0

From: Kristen Farrell - GM BluePlan [mailto:Kristen.Farrell@gmblueplan.ca]
Sent: Monday, April 1, 2024 3:19 PM
Cc: Julien Bell - GM BluePlan <julien.bell@gmblueplan.ca>; dgiberson@southhuron.ca
Subject: Notice of Public Information Centre - Water & Wastewater Master Plan Update

This is the first email you've received from this external sender.

Do not click links or open attachments unless it is an email you expected to receive.

Good afternoon,

The Municipality of South Huron is completing a Water and Wastewater Master Plan Update to develop and evaluate optimal water and wastewater strategies in the Municipality.

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If you have any comments or questions, please contact a member of the project team: Don Giberson (dgiberson@southhuron.ca) or Julien Bell (Julien.Bell@gmblueplan.ca).

Sincerely,

Kristen Farrell, EPt
Office/Project Coordinator
(she/her)

GM BluePlan Engineering Limited
1266 South Service Road, Unit C31 | Stoney Creek, ON L8E 5R9
t: 905-643-6688 ext. 6243 c: 519-829-0693
kristen.farrell@gmblueplan.ca | www.gmblueplan.ca

From:	Don Giberson
Sent:	Wednesday, April 24, 2024 4:05 PM
To:	Bell, Julien
Cc:	Kochanski, Alyssa; Farrell, Kristen
Subject:	[EXT] FW: Hydro One Response: 20240424-NoticeOfPIC1-Water and Wastewater Master Plan
Attachments:	20240424-NoticeOfPIC1-Water and Wastewater Master Plan.pdf

Follow Up Flag:	Follow up
Flag Status:	Flagged

EXTERNAL EMAIL

Julien,
Please find attached a copy of correspondence from Hydro One regarding the PIC.

Don Giberson
General Manager of Infrastructure and Development
Municipality of South Huron
519-235-0310 Ext226
dgiberson@southhuron.ca

-----Original Message-----
From: SUN Hongxia <Susan.SUN@HydroOne.com> On Behalf Of SECONDARY LAND USE Department
Sent: Wednesday, April 24, 2024 3:29 PM
To: Don Giberson <dgiberson@southhuron.ca>
Cc: SECONDARY LAND USE Department <Department.SecondaryLandUse@hydroone.com>
Subject: Hydro One Response: 20240424-NoticeOfPIC1-Water and Wastewater Master Plan

Please see the attached for Hydro One's Response.

Hydro One Networks Inc

SecondaryLandUse@HydroOne.com

From: Bell, Julien
Sent: Monday, April 29, 2024 3:07 PM
To: Jessica Wakefield; dgiberson@southhuron.ca
Cc: Consultation; Farrell, Kristen
Subject: RE: Notice of Public Information Centre - Municipality of South Huron Water and Wastewater Master Plan

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Jessica,

Thank you for your response. We have updated the project contact information and will continue to notify you in future project correspondence.

Regards

Julien Bell, P.Eng.
Vice President | Infrastructure Planning
(he\him)

GM BluePlan Engineering Limited
c: 416.254.6247
julien.bell@gmblueplan.ca | www.gmblueplan.ca

From: Jessica Wakefield <Jessica.Wakefield@threefires.com>
Sent: Friday, April 26, 2024 9:12 AM
To: dgiberson@southhuron.ca; Bell, Julien <Julien.Bell@gmblueplan.ca>
Cc: Consultation <Consultation@kettlepoint.org>
Subject: [EXT] Notice of Public Information Centre - Municipality of South Huron Water and Wastewater Master Plan

EXTERNAL EMAIL

Hello Don and Julien,

I recently took on the major projects role at Three Fires Group and now oversee consultation for the Chippewas of Kettle and Stony Point First Nation. I am reaching out to acknowledge receipt of your public information centre notice for the water and wastewater plan update and to share my contact information. This is important work and we would like to stay involved through project updates and information sharing.

Thank you for the notification and I look forward to learning more about the project!

Three Fires GROUP

Jessica Wakefield, MSc., MES, RPP Pre-Candidate

Executive Director -
Major Projects and IBAs

Mobile: 613 539 9421

Email: jessica.wakefield@threefires.com

A-9119 W Ipperwash Rd

Kettle & Stony Point First Nation

Ontario N0N 1J1

www.threefires.com

From: Bell, Julien
Sent: Thursday, April 25, 2024 10:45 AM
To: Farrell, Kristen
Cc: Kochanski, Alyssa
Subject: FW: South Huron MCEA Waste and Wastewater Mast Plan circulations

---

Follow Up Flag: Follow up
Flag Status: Flagged

Julien Bell, P.Eng.
Vice President | Infrastructure Planning
(he\him)

GM BluePlan Engineering Limited
c: 416.254.6247
julien.bell@gmblueplan.ca | www.gmblueplan.ca

From: Notice Review <NoticeReview@infrastructureontario.ca>
Sent: Thursday, April 25, 2024 10:17 AM
To: dgiberson@southhuron.ca; Bell, Julien <Julien.bell@gmblueplan.ca>
Subject: [EXT] South Huron MCEA Waste and Wastewater Mast Plan circulations

EXTERNAL EMAIL

Hello

Please send circulations related to this project to this address. Thank you

Infrastructure Ontario

www.infrastructureontario.ca

Follow IO at:

APPENDIX E:
STUDY COMPLETION

Water Master Plan

Water and Wastewater Master Plan Update

January 2025

235 North Centre Road, Suite 103
London, ON N5X 4E7
519-672-9403

Municipality of South Huron

GMBP Project: 521054

Table of Contents

APPENDICES

1 INTRODUCTION AND BACKGROUND

1.1 Municipality of South Huron Background

The Municipality of South Huron (Municipality) is located in southwest Ontario, along the southern border of Huron County, approximately 45 km north of the City of London. The Municipality consists of predominantly agricultural land and includes the town of Exeter, the greater Grand Bend area, the small rural communities of Centralia, Crediton, Dashwood, Huron Park, and Kirkton, plus the hamlets of Corbett, Elimville, Greenway, Mount Carmel, Winchelsea and Woodham. The Municipality of South Huron is a single tier municipality, which owns and is responsible for the planning, construction, and management of municipal water and wastewater infrastructure.

The Municipality owns and operates storage facilities, pumping stations, and trunk and distribution watermains within its water system. The Municipality's water is supplied by the Lake Huron Primary Water Supply System (LHPWSS) Water Treatment Plant (WTP) that draws water from Lake Huron and is operated by the Ontario Clean Water Agency (OCWA). The Municipality receives its treated water from the LHPWSS WTP at various supply points throughout the water system.

Readily available and accessible public infrastructure is essential to the viability of existing and growing communities. Infrastructure planning, land use planning, and infrastructure investment require close integration to ensure efficient, safe, and economically achievable solutions to provide the required water and wastewater infrastructure.

To balance the needs of growth with the protection and preservation of natural, environmental, and heritage resources, the Municipality of South Huron initiated the 2023 Master Plan Update (MPU) for water and wastewater under the Municipal Engineers Association (MEA) Master Plan Class Environmental Assessment process.

1.2 Master Plan Update

The Master Plan comprehensively documents the development of the preferred water and wastewater servicing strategies for the Municipality of South Huron to meet the servicing needs of existing users and future development.

The Master Plan evaluates the ability of existing and planned water and wastewater infrastructure within the Municipality of South Huron to service the Municipality's existing population, service the forecasted growth, and evaluate/develop recommended servicing strategies efficiently and effectively.

The 2023 Master Plan Update is a critical component of the Municipality's planning for growth and will provide the framework for the management, expansion and funding of the water and wastewater systems for the Municipality.

1.3 Master Plan Update Objectives

The key objectives of the Master Plan Update are as follows:

- Review potential residential and employment areas and determine the impacts on servicing needs for the Municipality's water and wastewater infrastructure;
- Review and integrate the water and wastewater system renewal and replacement needs;
- Evaluate the ability of existing and planned water and wastewater infrastructure to efficiently and effectively service the Municipality's existing users and potential growth;
- Undertake a comprehensive review and analysis for the water and wastewater servicing requirements;
- Address key servicing considerations as part of the development and evaluation of servicing strategies including:
    - Level of Service to existing users and anticipated growth
    - Operational flexibility and security of supply
    - Mitigation of impacts to natural, social, and economic environments
    - Opportunity to meet policy, policy statements, regulations and technical criteria
    - Opportunity to optimize existing infrastructure and servicing strategies
    - Ensuring the strategies are cost effective
- Consider and develop sustainable servicing solutions;
- Utilize recently completed and on-going projects to update infrastructure status, capacity and cost estimates;
- Utilize the newly developed water and wastewater hydraulic models for the analysis of servicing alternatives;
- Establish a complete and implementable water and wastewater capital program;
- Extensive consultation with the public and stakeholders; and
- Complete the Master Plan in accordance with the MEA Class EA process for Master Plans (further described in **Volume I**).

1.4 Master Plan Update Documentation Layout

The Master Plan Update Report, including all supporting volumes, is the documentation placed on public record for the prescribed review period. This documentation, in its entirety, describes all required phases of the planning process and incorporates the procedure considered essential for the compliance with the **Environmental Assessment Act**.

The MPU Report is organized into three volumes as described below.

Volume I – Water and Wastewater Master Plan Update

Volume I provides a brief overview of the Master Plan Update. It details the problem statement, purpose of the study, significant planning, environmental and technical considerations, master planning process, population and employment growth forecasts, existing environmental and servicing conditions, evaluation methodology, and future considerations.

This volume will also detail all relevant documentation of the public consultation process including notices, comments and responses, and distribution information. Presentation material from the Public Information Centre (PIC) held during this process is included. Other presentation material and discussion information from workshops held during this process is included. Other discussion information with relevant agencies, approval bodies and other stakeholders are also included within the appendices:

- Appendix A – Study Stakeholder List
- Appendix B – Study Commencement
- Appendix C – Public Information Centre
- Appendix D – Comments Received
- Appendix E – Study Completion

Volume II – Water Master Plan

Volume II consists of the principal document summarizing the study objectives, approach, methodologies, technical analyses, evaluation and selection of the preferred water servicing strategy. This volume outlines the water policies, design criteria and Level of Service needed to be achieved by the water network. In addition, **Volume II** identifies the existing water network and describes the hydraulic modelling tool used for the analysis. Further **Volume II** outlines the detailed evaluation and decision-making process as well as the preferred servicing strategy and associated capital program and implementation plan.

A significant amount of technical background information has been compiled, which is critical to the development of the Water Master Plan Update. This information is included as appendices in **Volume II**. The technical appendices contain relevant project, implementation, and technical analysis information including:

- Appendix A – Water System Schematic
- Appendix B – Water Condition Assessments
- Appendix C – Growth Demand
- Appendix D – Evaluation Tables
- Appendix E – Capital Program Project Sheets

Volume III – Wastewater Master Plan

Volume III consists of the principal document summarizing the study objectives, approach, methodologies, technical analyses, evaluation and selection of the preferred wastewater servicing strategy. This volume outlines the wastewater policies, design criteria and Level of Service needed to be achieved by the wastewater network. In addition, **Volume III** identifies the existing wastewater network and describes the hydraulic modelling tool used for the analysis. Further in **Volume III** is the detailed evaluation and decision-making as well as the preferred servicing strategy and associated capital program and implementation plan.

A significant amount of technical background information has been compiled, which is critical to the development of the Wastewater Master Plan Update. This information is included in appendices in **Volume III**.

The technical appendices contain relevant project, implementation, and technical analysis information including:

- Appendix A – F-5-1 Effluent Design Objectives
- Appendix B – Wastewater Condition Assessments
- Appendix C – Wastewater System Schematic
- Appendix D – Growth Flows
- Appendix E – Evaluation Tables
- Appendix F – Capital Program Project Sheets

2 WATER DESIGN CRITERIA AND HYDRAULIC PERFORMANCE CRITERIA

A guiding principle of design criteria is to ensure that the demand projections are adequately predicted with an appropriate factor of safety and risk management. This overall principle also ensures that infrastructure has sufficient capacity to meet the growing needs of the Municipality and does not impede the approved/planned growth.

The design criteria were reviewed as part of this MPU to ensure water demands are accurate and will support sizing and timing of future infrastructure such as pipes and facilities.

The development of design criteria utilized historical billing data in combination with Ontario Ministry of Environment, Conservation, and Parks (MECP) Design Standards and Guidelines. Level of Service and water policies were discussed and established at the outset of the project. The following sections outline the background information used to form the water design and Level of Service criteria.

2.1 Water Use Design Criteria

Water use is assessed by means of per capita demand and peaking factors. To estimate growth demand rates, these per capita demand and peaking factors must be defined. Development of the water design criteria are detailed further in the sections below.

2.1.1 Historic Water Use

The basis of the growth water system evaluation relies heavily on water per capita consumption and maximum day demand (MDD) peaking factors as these design criteria will be used to estimate growth demands.

A summary of the water purchase records and total billed demand was received from the Municipality between the years of 2019 to 2022, as outlined in **Table 1**. The total supplied water consists of the water purchase records from each of the distribution system's LHPWSS supply points. The non-revenue water (NRW) is the difference between the total supplied and total billed which includes both non-billed accounted for water and water losses.

The supply and billing data was separated by pressure zone, as detailed in **Table 2**, based on the addresses in each corresponding pressure zone. For each parcel with water billing records, the data across the 4 years was consolidated into a representative average water use rate considered to be applicable to the analysis years. These values were used to establish existing system demands and to estimate appropriate system peaking factors as outlined in **Section 2.1.2** and **Section 2.1.3**.

Table 1: Municipality of South Huron Historic Water Use

Description	2019	2020	2021	2022	Average	Corrected Average
Total Supplied (ML)	1,308	1,469	1,465	1,418	**1,415**	**1,415**
Total Supplied (L/s)	41.5	46.6	46.5	45.0	**44.9**	**44.9**
Billed Demand (L/s)	28.8	33.2	31.9	27.8	**30.4**	**36.5**[1]
Non-Revenue Water	31%	28%	31%	38%	**32%**	**19%**[2]

[1]Representative average for 2019-2022
[2]Total production average minus representative billed demand average

Table 2: Pressure Zone Historic Water Use

Pressure Zone	Production (L/s)	Billing (L/s)	NRW (L/s)	NRW % of Pressure Zone Total
Dashwood	3.97	3.64	0.33	8%
Huron Park	5.50	5.34	0.16	3%
North Exeter	8.87	8.11	0.76	9%
Shipka	1.69	1.67	0.02	1%
South Exeter	11.34	11.09	0.24	2%
West Crediton	0.87	0.85	0.02	2%
West[1]	12.63	5.80	6.82	54%
Total	**44.87**	**36.51**[2]	**8.36**	**19%**

[1]For calculation purposes, the West consists of both the West Pressure Zone and Lower West Pressure Zone as they were previously one combined Pressure Zone
[2]Based on the representative average

2.1.2 Per Capita Demand

To determine the recommended per capita demand for the MPU, the MECP criteria as well as past Municipality and Master Plan criteria were compared against the calculated per capita demands. These criteria guidelines are shown below in **Table 3**.

Table 3: Per Capita Rate Guidelines

Description	MECP	South Huron Design Criteria (2017)	2008 Exeter Water Master Plan
Residential	270-450 L/c/d	No Criteria	375 L/c/d
Employment	28 m^3/ha/d (Commercial/Institutionnel) 35-55 m^3/ha/d (Industrial)	No Criteria	

Based on the Municipality's supply and billing data presented in **Section 2.1.1**, per capita rates were calculated using an estimate of the supplied population. These per capita rates were calculated using just the billing data, the production data, and the production data excluding the West Pressure Zone due to the high NRW as outlined in **Table 4**.

Table 4: Municipality of South Huron Calculated Per Capita Rates

Year	Billing – Total Equivalent Per Capita (L/c/d)[1]	Supplied – Total Equivalent Per Capita (L/c/d)[2]	
		All Pressure Zones	Excluding West Pressure Zone[3]
2019	183.6	264.2	223.6
2020	211.8	296.0	244.8
2021	203.0	296.0	274.6
2022	176.9	286.5	262.9
Average	**232.6**	**285.9**	**251.5**

[1]Calculated using population of 9,560 (based on total number of addresses × 2.37 people per unit (PPU)) and 4,000 jobs (based on Development Charges Background Study)
[2]Includes NRW
[3]Population number excludes West Pressure Zone

Based on the review completed, the recommended design criteria to be used for water use is as follows:

- Growth related per capita rate of 300 L/c/d
  - This represents a decrease in the 2008 Water Master Plan design criteria by 20% and is in line with the recommended wastewater per capita rate.
  - The recommended per capita rate remains above the observed historic per capita rates outlined in **Table 4**; providing reasonable flexibility in the criteria to accommodate changes in future usage rates.
  - While there is an observed decreasing trend in per capita rates, a stepped approach to lowering per capita rates is recommended with the next MPU to ensure water conservation measures are maintained.

2.1.3 Peaking Factor

Similar to the per capita demand, historic values as well as the MECP criteria were compared to the calculated peaking factor to provide a recommendation. The MECP and past criteria peaking factor recommendations are shown in **Table 5**.

Table 5: Peaking Factor Guidelines

Description	MECP	South Huron Design Guidelines (2017)	2008 Exeter Water Master Plan
Peaking Factor	2.0 (3,001 to 10,000 population) 1.9 (10,001 to 25,000 population)	No Criteria	2.1

A peaking factor was calculated for the Town of Exeter through the analysis of historic water treatment supply, including average and maximum day demands as presented in **Table 6**. Based on the 2019 to 2022 historic results, an average peaking factor of 1.9 was observed. This factor is in line with the MECP guidelines population based peaking factor.

Table 6: Exeter Calculated Peaking Factor

Year	Average Day Demand (MLD)	Max Day Demand (MLD)	Peaking Factor
2019	9.2	11.6	1.3
2020	12.9	28.9	2.2
2021	16.8	29.7	1.8
2022	17.8	27.5	1.5
Average	**15.6**	**29.7**	**1.9**

The recommended peaking factor to be utilized for water use is as follows:

- Peaking factor of 1.9
    - This represents a decrease in the 2008 Water Master Plan design criteria maximum day peaking factor of 10%.
    - The recommended peaking factor is in line with the MECP recommended maximum peaking factor of 2.0 for a population base between 3,001 to 10,000 or 1.9 for a population base of 10,001 to 25,000; providing reasonable flexibility in the criteria to accommodate potential changes in future usage rates.

2.1.4 Water Design Criteria

As presented in the above sections, there is an opportunity to utilize lower per-capita criteria for the Municipality. The water demand criteria updated as part of the 2023 MPU are summarized below in **Table 7**.

Table 7: Water Design Criteria

Description		Criteria
Per Capita Consumption	Residential	300 Liters/capita/day
	Industrial / Commercial / Institutional	14 m^3/ha/day
Peaking Factor	Maximum Day	1.9

2.1.5 Starting Point Methodology

Existing system demands were defined using the "starting point" methodology. The 2023 starting point was calculated based on the average of the 2019 to 2022 billing and water supply records received from the Municipality. The 2023 starting point also considers the typical percentage of NRW for the Municipality based on historical records – approximately 19%.

2.1.6 Growth Demand Projections

Future system demands were also developed using the starting point methodology, the standard approach within Southern Ontario for projecting future growth demands. Expected demand due to growth was added to the starting point demand using population projection and the Municipality's water average day demand (ADD) design criteria values to establish future demands.

2.2 Hydraulic Performance Criteria

A water model was developed and calibrated, as outlined in **Section 4.4** and was used in the analysis of existing water system performance. This process detailed existing system performance without the application of growth demands and could be used as a guideline for potential system upgrades.

2.2.1 Distribution Pressures

Recommended design criteria to be utilized for in-distribution pressure are as follows:

- Maintain pressure design criteria between 40-100 psi, consistent with the MECP criteria;
- Maintain system pressures above 20 psi under MDD + fire flow conditions; and,
- Reduction of the pressure bounds would require system operations modifications and water system upgrades with minimal to moderate benefit.

2.2.2 Fire Flow – Network Capacity

There is currently an opportunity to define fire flow targets within the existing system and future network as the previous MPU did not evaluate fire flows on a local basis and the current Level of Service is undefined. Further, the intent of defining these targets:

- Commits a certain Level of Service for a typical property of a specific land use;
- Provides guidance in the prioritization of the Municipality's State of Good Repair (SOGR) program and clearly identifies upsizing needs; and,
- Requires developers to meet the Municipality's fire flow targets should they require a higher fire flow based on the Fire Underwriters Survey (FUS) evaluation.

The recommended process of defining fire flow targets is as follows:

- FUS and land use-based approach; and,
- Fire flow at a hydrant is governed by land use with the highest fire flow target.

Table 8 summarizes the range of recommended fire flows, including typical FUS ranges and hydrants used in the event of a fire, which was subjected to a further sensitivity analysis. In consultation with the Municipality, the Low Fire Flow Scenario targets will be used as the Fire Flow targets when assessing system capacity.

Table 8: Range of Recommended Fire Flow Targets

Landuse	Typical FUS Range (L/s)	# of Hydrants	Low Fire Flow Option (L/s)	High Fire Flow Option (L/s)
Dead End / Rural Residential	27-100	-	**50**	50
Single / Semi Family	27-162	1	**50**	75
Townhouse / Multi Family	82-368	1-2	**125**	175
ICI properties	96-334	2-4	**150**	200

2.2.3 Water Facilities

The evaluation of facility capacities and future needs was assessed first by the historic condition's max day demands and further by growth demands using the per capita rate and peaking factor outlined in **Section 2.1.2** and **Section 2.1.3**. A sensitivity analysis on the facility capacities was completed using a starting point methodology and applying varying per capita rates and peaking factors which presented the impacts of facility needs by changing these criteria.

2.2.3.1 Facility Upgrade Triggers

The industry best practice and recommended methodology for supply and pumping station facility upgrade triggers are as follows:

- At 80% utilization of a facility's capacity the planning process will begin to assess upgrade capacity needs.
- At 90% utilization of a facility's capacity the construction process begins through either an upgrade to an existing facility or construction of a new facility.

2.2.3.2 Storage Capacity

The potential short-term loss of treated water supply from the LHPWSS has been identified as a significant concern due to ongoing plant shutdowns and as it is the Municipality's single supply source. System storage will be evaluated on a pressure zone by pressure zone basis using the approach of:

Total Storage = Fire Storage (A) + Equalization Storage (B) + Emergency Storage (C)

- Fire Storage (A) needs for water reservoirs will be sized to be the greater of:
  - FUS fire storage need based on the highest land use needs as identified within the pressure district; or,
  - MECP population-based storage requirement.
- Equalization Storage (B) to be based on the MECP 25% of maximum day demand to meet peak demands.
- Emergency Storage (C) to be based on the 25% of Fire Storage (A) + Equalization Storage (B).

2.2.3.3 Pumping Firm Capacity

The evaluation of pumping firm capacities considered historic and future pumping needs, current firm capacity definition, and storage within a pressure zone. The recommended approach in the determination of pumping firm capacities is as follows:

- Firm capacity is defined as the largest pump out of service.
- Pump capacity shall be sized to provide:
  - MDD where sufficient elevated storage is available; or,
  - The greater of peak hour demand (PHD) or max day demand + fire flow (MDD+FF) where no/ insufficient elevated storage is available; further, fire flow needs are based on the highest land-use based fire flow target within the pressure zone.

2.2.3.4 Watermains

The Municipality's all-pipe hydraulic model was used to assess the water distribution network's ability to deliver adequate flows and pressures as well as to further refine watermain capacities. Four hydraulic modelling demand scenarios (minimum hour, maximum day, peak hour, and maximum day plus fire) were evaluated to confirm watermain requirements.

Additional criteria considered typical of best practices were also referenced to establish existing and future watermain capacities. These criteria are as follows:

- Watermains that are part of the local distribution system are sized for the greater of MDD+FF or PHD.
- Minimum pressure of 40 psi at ground level under normal operating conditions (PHD).
- Maintain a minimum pressure of 20 psi at ground level under MDD+FF conditions.
- Maximum pressure in the distribution system shall not exceed 100 psi.
- Maximum velocity in watermains under all flow conditions shall not exceed 5.0 m/s.
- Trunk watermain capacity expansions are based on service level (e.g., pressure, velocity). Oversizing was considered in areas where future potential growth and build out is expected to occur.

2.2.4 Level of Service Summary

As presented in the above sections, the Level of Service criteria is summarized below in **Table 9**.

Table 9: Level of Service Criteria

<table>
<tr><th colspan="2">Description</th><th colspan="2">Criteria</th></tr>
<tr><td>System Performance Targets</td><td>Pressure</td><td colspan="2">40 – 100 psi</td></tr>
<tr><td rowspan="6">Fire Flow</td><td rowspan="5">Flow Target</td><th>Landuse</th><th>Flow (L/s)</th></tr>
<tr><td>Dead-End / Rural Residential</td><td>50</td></tr>
<tr><td>Single / Semi Family</td><td>50</td></tr>
<tr><td>Townhouse / Multi Family</td><td>125</td></tr>
<tr><td>Institutional, Commercial, and Industrial (ICI) Properties</td><td>150</td></tr>
<tr><td>Fire Storage</td><td colspan="2">MECP guideline</td></tr>
<tr><td rowspan="3">Facility Capacity</td><td>Facility Triggers</td><td colspan="2">80% Planning and Design
90% Construction</td></tr>
<tr><td>Storage</td><td colspan="2">MECP Methodology (A+B+C)
A = Fire Storage
B = Equalization Storage (25% of MDD)
C = Emergency Storage (25% of A+B)</td></tr>
<tr><td>Pumping</td><td colspan="2">Firm capacity = Largest pump out of service
Pump capacity sized to provide:
• MDD where sufficient elevated storage is available; or,
• Greater of PH) or MDD+FF where no/ insufficient elevated storage is available; further, fire flow needs are based on the highest land-use based fire flow target within the pressure zone.</td></tr>
</table>

2.3 Capital Cost Projections

A capital cost is provided for all projects proposed as part of this MPU. For the majority of the water system projects, a base construction cost was obtained using either a unit rate construction cost, based on pipe diameter, or unique project analysis. The base construction cost considers several factors specific to each project such as creek crossings, railway crossings, and highway crossings, tunneling requirements, and location of construction (rural, suburban, urban). Design, administration, contingency, and non-recoverable HST costs were added to arrive at a final project cost. Detailed costing sheets were developed to support the financial evaluation for each capital project. Details on the capital cost methodology are outlined in **Volume I**.

3 PLANNING AND GROWTH PROJECTIONS

This section summarizes the growth scenario considered under the MPU and the rational for the preferred growth scenario utilized to develop the recommended water and wastewater upgrade alternatives.

Due to the general uncertainty in the long-term growth rate within the Municipality of South Huron Settlement Area Boundary (SAB), as well as, the phasing and timing of individual development blocks; the basis of the MPU is to identify the long-term servicing requirement to support the full buildout of the SAB with consideration of potential future SAB expansions where such expansions are reasonably feasible and do not result in excessive infrastructure oversizing and do not negatively impact the operation of existing systems. Further to the SAB buildout, a number of potential rural development areas outside the SAB were also identified and appropriate servicing solutions were also identified.

Growth projections outlined within this MPU are based on best available planning information as provided by the Municipality. It is understood that identified development areas including development status, unit counts, and growth projections may be adjusted. Further, it is understood that this MPU is intended to serve as a guiding document and that the Municipality will review individual applications based on their own merit and may adjust the identified capacity project timing and/or capacity requirements based on development applications received.

3.1 Existing Population

Existing population data was taken from both the 2021 census and 2020 Development Charges Background Study and compared against the total number of addresses at 2.37 people per unit (PPU) which was the average from the 2020 Development Charges Background Study. The existing population of South Huron is detailed in **Table 10**.

Table 10: Municipality of South Huron Existing Population

Description	Development Charges Background Study	Statistics Canada – Municipality of South Huron	South Huron Billing Data
Year	2020	2021	2022
Population	10,303	10,063	9,560
Total Households	4,344	4,339	4,034
PPU	2.37	2.32	2.37[1]
Employment	3,992	-	-
Total Population + Employment	14,295	-	-

[1]Development Charges Background Study, 2020 PPU average

The South Huron billing data is based on the properties serviced by water infrastructure noting that the serviced wastewater population is lower than the serviced water population. Based on the comparison, the calculated population is in line with the population in the Municipality.

3.2 Growth Areas

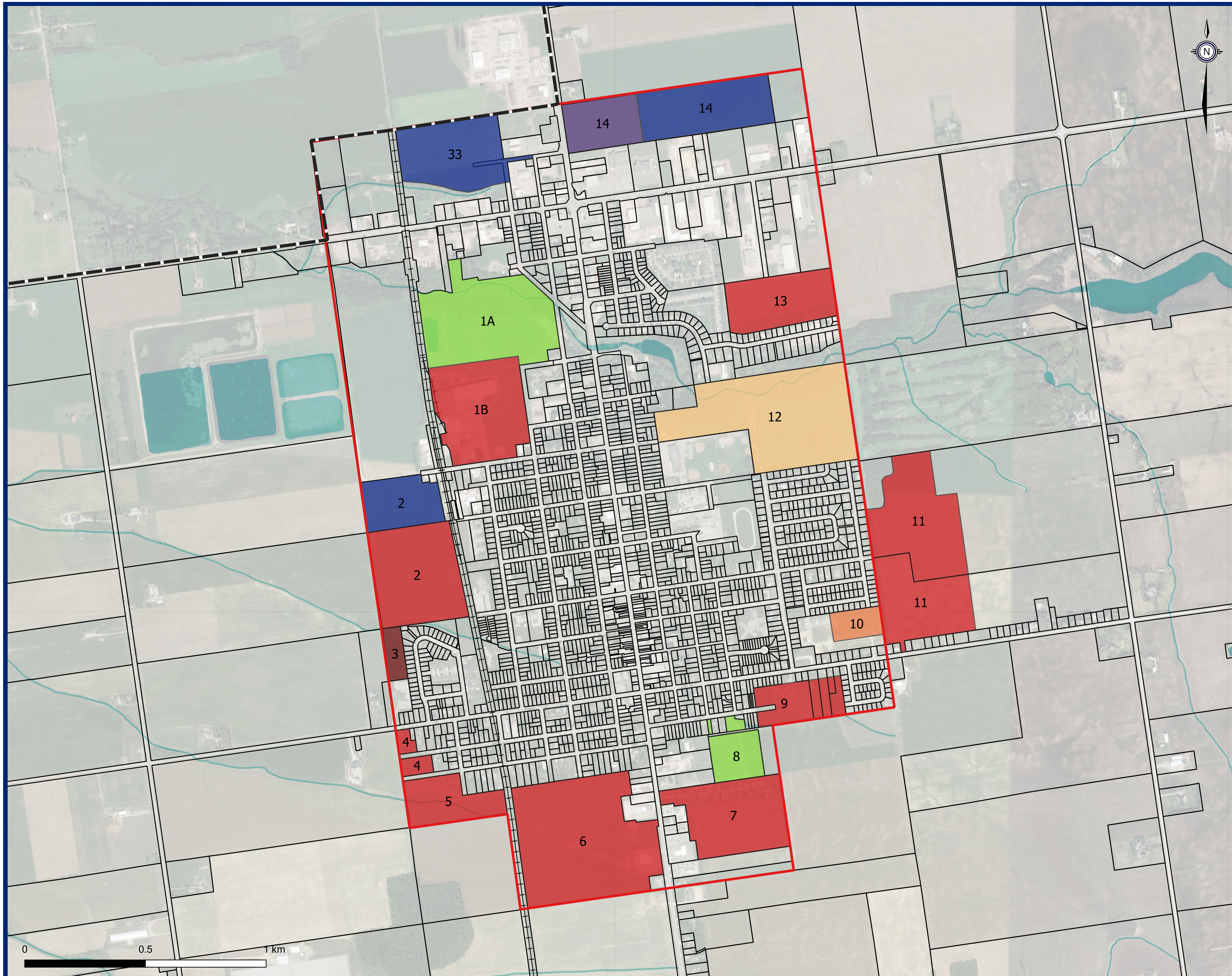
Growth projections were derived using the development and planning information provided by the Municipality. These growth populations were estimated using the design criteria listed below:

- Where the number of development units were known: 2.3 people per unit
- Where the number of development units were unknown: 40 people per hectare

Figures 1 through **4** and **Table 11** highlight the development blocks and their corresponding status and population. Some of the development blocks have corresponding population and employment projections while other blocks are based on the growth projection assumptions.

Table 11: Growth Estimates

#	Status	Name	Town	Type	Area (ha)	Units	Potential Population
1A	Developed	Buckingham Estates	Exeter	Res	18.8	120	276
8	Developed	Southpoint Subdivision	Exeter	Res	1.8	38	87
10	Partially Developed	Stoney Ridge	Exeter	Res	3.7	32	74
1B	Potential Residential Area	HDC Lands	Exeter	Res	11.4	328	754
2	Potential Commercial/ Industrial/ Residential Area	Ondrejicka	Exeter	Res/Emp	13.8	-	552
3	Long Term Care Facility	Southbridge	Exeter	Res	1.7	99	228
4	Potential Residential Area	Willis Way	Exeter	Res	1.6	6	14
5	Potential Residential Area	Shapton	Exeter	Res	2.2	38	87
6	Potential Residential Area	McBride	Exeter	Res	26.5	-	1,060
7	Potential Residential Area	Hamather	Exeter	Res	12.1	120	276
9	Potential Residential Area	Pooley	Exeter	Res	5.8	100	230
11	Potential Residential Area	Hamather/McBride	Exeter (Outside SAB)	Res	19.0	178	409
12	Draft Plan Approved	Windermere Subdivision	Exeter	Res	23.6	160	368
13	Potential Residential Area	Rasenberg	Exeter	Res	9.4	163	375
14	Potential Residential Area	CVD Subdivision	Exeter	Res/Emp	17.5	238	916
33	Potential Commercial/ Industrial Area	Exeter Produce	Exeter	Emp	11.9	-	475
17B	Pre-Servicing Agreement	Sol Haven Phase I	Grand Bend	Res	12.2	182	490
15	Potential Residential Area	South of Pollock Farms	Grand Bend (Outside SAB)	Res	10.7	127	292
16	Potential Residential Area	Turnbull Lands	Grand Bend (Outside SAB)	Res	41.1	456	1,049
17A	Potential Residential Area	Sol Haven Phase II	Grand Bend	Res	40.4	241	501
18	Potential Residential Area	Zone 2 Future Development	Grand Bend	Res	164.9	1,088	2,502
19	Potential Residential Area	Grand Cove Estates Phase 5	Grand Bend	Res	4.0	34	78
28	Potential Commercial/ Industrial Area	Bendtech	Grand Bend (Outside SAB)	Emp	21.2	-	850
31	Potential Commercial Area	Watson	Grand Bend	Emp	3.5	-	141
35	Potential Residential Area	Hotson	Grand Bend	Res	8.4	-	336
36	Potential Commercial Area	Grand Bend Proposed Commercial	Grand Bend (Outside SAB)	Emp	11.1	-	444
20	Potential Residential Area	Crediton Village Centre	Crediton	Res	33.6	337	775
21	Potential Residential Area	Morrisey	Crediton	Res	1.3	8	18
22	Potential Residential Area	Stephan	Crediton	Res	7.4	-	298
23	Potential Residential Area	Huron Park Proposed 1	Huron Park	Res	4.1	48	110
24	Potential Residential Area	Huron Park Proposed 2	Huron Park	Res	9.5	98	225
29	Potential Residential Area	Huron Park Proposed 3	Huron Park	Res	1.3	-	51
30	Potential Residential Area	Huron Park Proposed 4	Huron Park	Res	1.5	-	58
25	Potential Residential Area	Pavkeje Subdivision	Centralia	Res	3.4	13	30
26	Potential Residential Area	Hodgins	Centralia	Res	4.8	-	194
27	Potential Residential Area	Centralia Proposed 1	Centralia	Res	2.0	-	81
34	Potential Industrial Area	Centralia Proposed 2	Centralia	Emp	5.1	-	204
37	Potential Industrial Area	Centralia Proposed 3	Centralia (Outside SAB)	Emp	6.1	-	244
				Centralia	**21.5**	**13**	**753**
				Exeter	**180.7**	**1,620**	**6,181**
				Grand Bend	**317.5**	**2,128**	**6,737**
				Crediton	**42.3**	**345**	**1,091**
				Huron Park	**16.3**	**146**	**445**
				Total	**578.4**	**4,252**	**15,208**



The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 1

Exeter Proposed Growth

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

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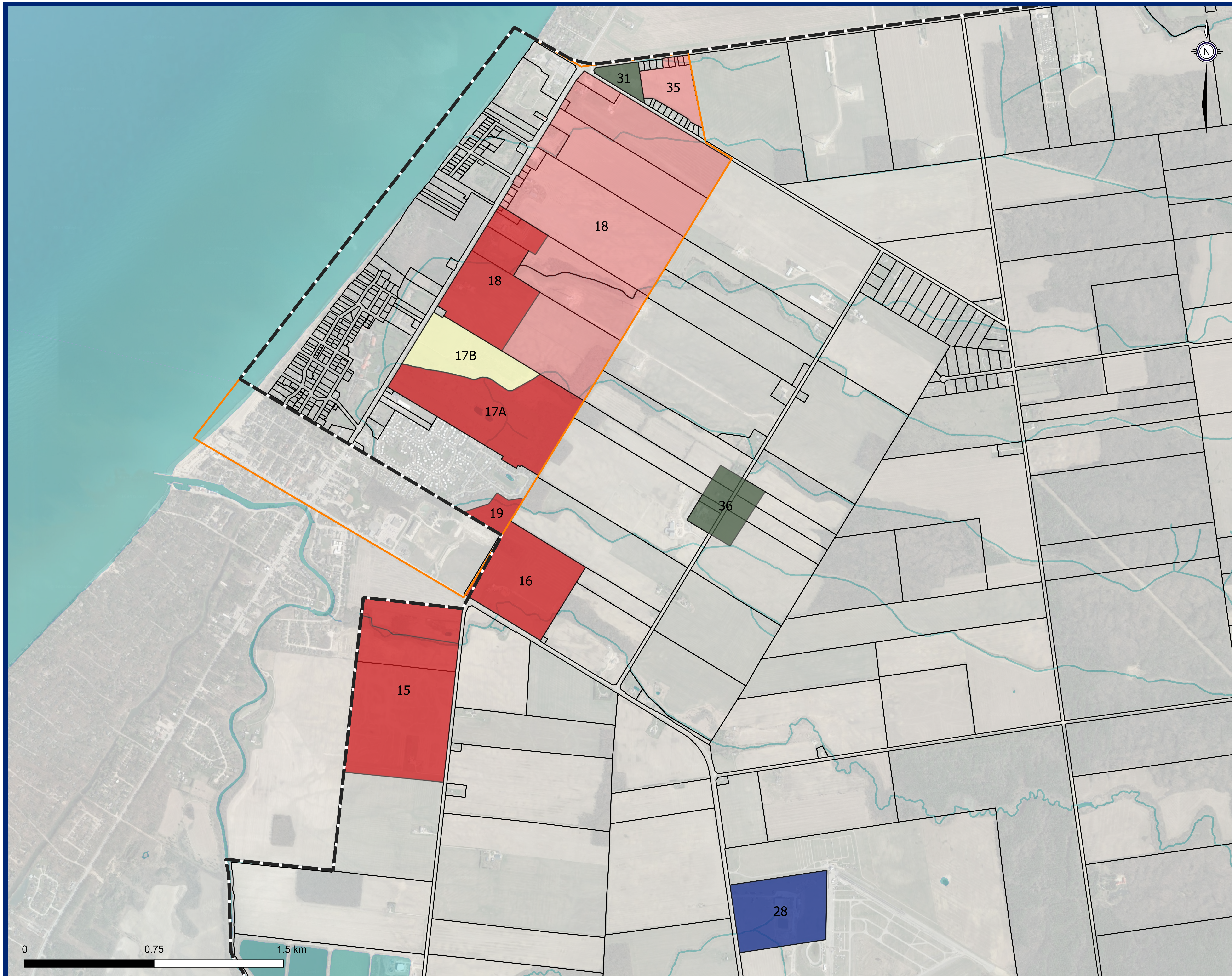
The Municipality of South Huron Water and Wastewater Masterplan



General

- Settlement Area
- Port Blake Planning Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 2

Grand Bend Proposed Growth

January, 2025
521054-G-001
Projection EPSG:26917

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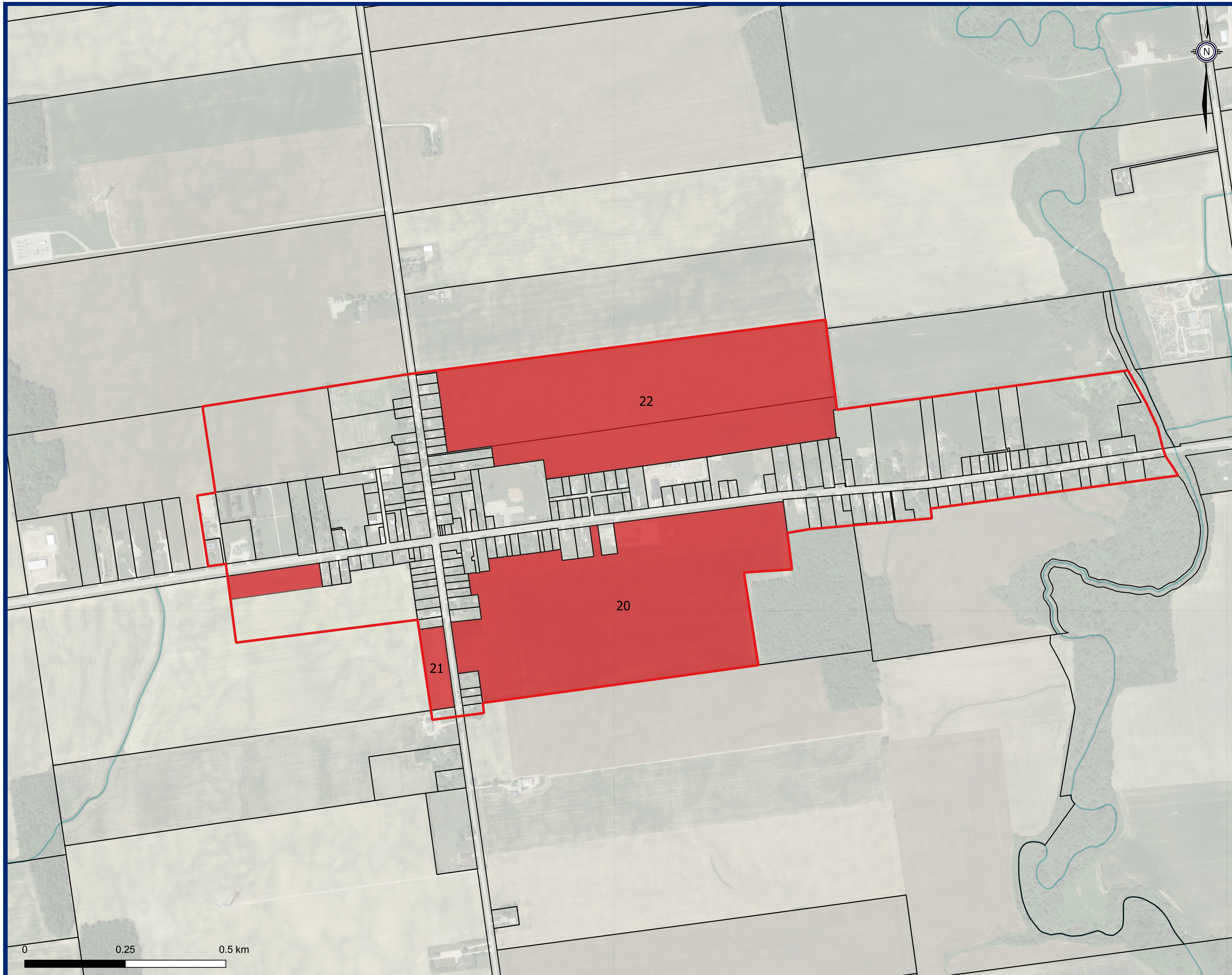

MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
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Growth Parcels

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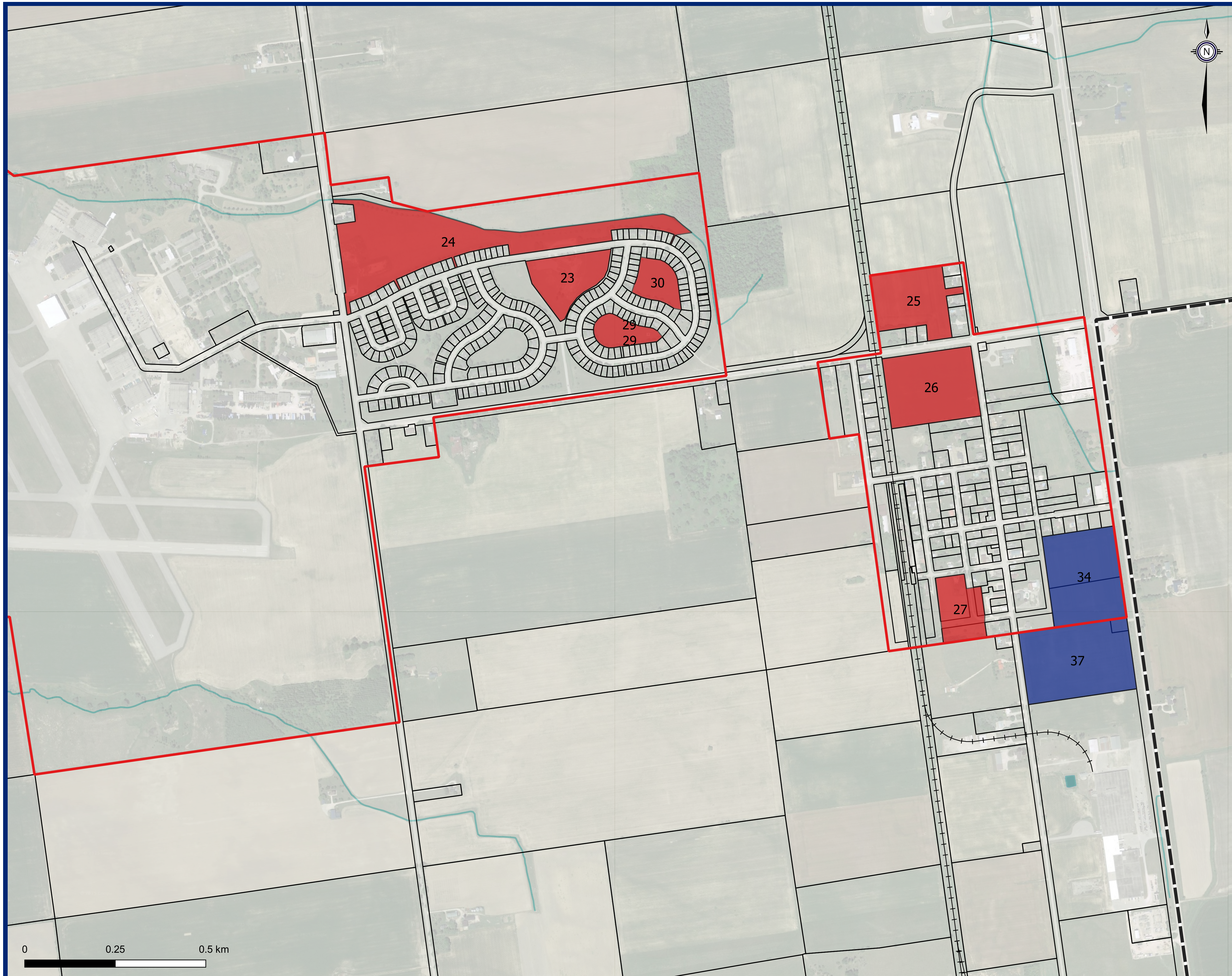
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 3

Crediton Proposed Growth

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917



The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
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- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
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- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 4

Huron Park / Centralia Proposed Growth

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January, 2025
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Projection EPSG:26917

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3.2.1 Growth by Water Pressure Zone

Table 12 summarizes growth needs by water pressure zone.

Table 12: Pressure Zone Population and Employment Growth

Pressure Zone	Potential Population (Residential & Employment)
Lower West & West[1]	6,737
Shipka	0
Dashwood	0
West Crediton	1,091
Huron Park	1,198
Exeter South	4,416
Exeter North	1,765
Total	**15,208**

[1]For calculation consistency, the West consists of both the West Pressure Zone and Lower West Pressure Zone as they were previously one combined Pressure Zone

3.3 Post Period Considerations

The servicing analysis focuses on servicing the proposed development, mostly within the existing SAB; however, in the development of the recommended servicing strategy and infrastructure sizing, consideration for the buildout of the expansion of the Municipality's SAB was considered assuming similar population and employment densities. Where applicable, identification of future facility expansion needs and/or strategic upsizing of linear infrastructure was identified and incorporated into the final recommended servicing plan.

3.3.1 Exeter

In the future, the SAB may be expanded to capture lands east to Morrison Line, south to Kirkton Road, west to Airport Line and north of Thames Road. This expansion will be reviewed under the Municipality's new Official Plan which will determine if and to what extent to which the SAB is to be expanded. The proposed land use designations for the expansion areas will also be determined at that time. The possibility of these additional lands was considered when reviewing the Municipality's existing infrastructure as well as new infrastructure and upgrades.

3.3.2 Grand Bend

The Grand Bend SAB, includes the properties along the east side of Highway #21, currently designated as Agricultural Lands. As these lands are within the Planning Area and have potential for development in the future, they have been included in the strategic sizing of linear infrastructure within the Grand Bend system.

There are also lands outside of the Planning Area, such as surrounding the Darkhorse Winery and Huron County Playhouse, as well as the POG property. These lands have also been assessed when reviewing the recommended servicing strategy and infrastructure sizing.

4 EXISTING WATER SYSTEM

4.1 Existing Water Infrastructure

The South Huron water system consists of distribution piping, two Booster Pumping Stations (BPS), two Elevated Tanks (ET), and one Storage Reservoir. A water system schematic is provided in **Appendix A**. Further, the Municipality's water system is organized into eight pressure zones: Lower West, West, Shipka, Dashwood, West Crediton, Huron Park, Exeter South and Exeter North. An overview of the existing water distribution system is provided in **Figure 5**.

Water supply originates from Lake Huron and is treated at the LHPWSS WTP. The LHPWSS delivers water to five connection points in the Municipality's water system, which typically divide the pressure zones, consisting of the following:

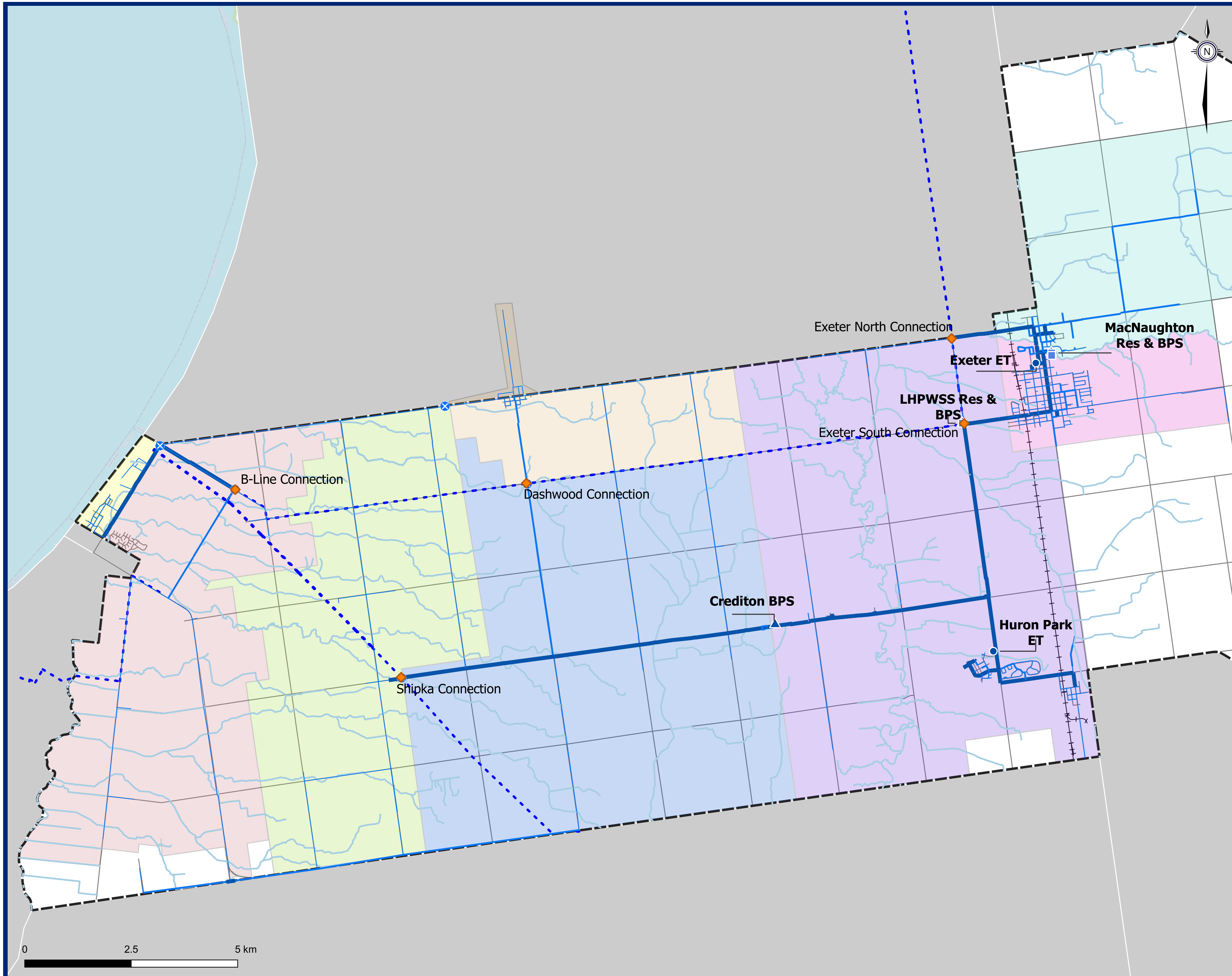
- B-Line Connection – Gore Road and B-Line
- Shipka Connection – Crediton Road, east of Shipka
- Dashwood Connection – Huron Street and Bronson Line
- Exeter South Connection – Huron Street and Airport Line
- Exeter North Connection – Airport Line and Thames Road

The boundaries along the pressure zones consist of a series of closed valves and pipes, and pressure reducing valves (PRV) to decrease the pressure to the acceptance range of Level of Service. The hydraulic grade lines (HGL) for the eight pressure zones are included in **Table 13**.

Table 13: Pressure Zone HGL

Pressure Zone	HGL (m)	LHPWSS Supply Point
Lower West Pressure Zone	239	B-Line Connection with additional PRV located at Highway #21 and Waterworks Road
West Pressure Zone	250	B-Line Connection
Shipka Pressure Zone	263	Shipka Connection
Dashwood Pressure Zone	275	Dashwood Connection
West Crediton Pressure Zone	281	Shipka Connection
Huron Park Pressure Zone	307	Shipka Connection, with water conveyed along Crediton Road through the Crediton BPS
Exeter South Pressure Zone	307	Exeter South Connection
Exeter North Pressure Zone	313	Exeter North Connection

A number of residents along the south boundary of the Municipality are serviced from the Municipality of North Middlesex water system through two watermain stubs that extend north from North Middlesex on Eagleson Line and Airport Line, noting that they do not have a connecting watermain in South Huron. Similarly, South Huron supplies customers along the north boundary that are within the Municipality of Bluewater and within the Bluewater portion of the village of Dashwood. The Municipalities of South Huron, North Middlesex and Bluewater are all supplied by the LHPWSS.



The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure

- Elevated Tank
- Pumping Station
- Reservoir
- PRV
- Supply Connection Points
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Mains (LWHPSS)

Pressure Zones

- Dashwood Zone
- Huron Park Zone
- Exeter North
- Shipka Zone
- Exeter South
- West Crediton Zone
- West Zone
- Lower West Zone

General Features

- South Huron Boundary
- South Huron Rail
- South Huron Watercourses

Figure 5

Existing Water System

March, 2024
521054-W-001
Projection EPSG:26917

4.1.1 Lake Huron Primary Water Supply System

The LHPWSS WTP is located at 71155 Bluewater Highway in Grand Bend, within the Municipality of South Huron, and draws water from Lake Huron with OCWA as the accredited operating authority. The LHPWSS supplies the Municipalities of London, Lambton Shores, North Middlesex, South Huron, Bluewater, Lucan-Biddulph, Middlesex Centre, and Strathroy-Caradoc. The WTP has a current rated treatment capacity of 340 MLD (Million Liters per Day) based on the Drinking Water Works Permit.

No supply capacity is allocated to any individual municipality and supply is available to all benefitting municipalities on an aggregate supply basis. Based on growth projections, it is expected that there is sufficient capacity to supply all municipalities with the existing infrastructure at the LHPWSS WTP.

4.1.2 Booster Pumping Stations

In the South Huron water distribution system, there are currently two booster pumping stations; the Crediton BPS and the MacNaughton Drive BPS with detailed capacities outlined in **Table 14**. The Crediton BPS supplies the Huron Park Pressure Zone and pumps water along Crediton Road to the Huron Park ET. It is typically controlled by the Huron Park ET levels. It can also be used as an emergency backup supply to Exeter by opening a normally closed valve in a chamber at Airport Line and Huron Street.

The MacNaughton BPS is located in Exeter and has one pump and fire pump dedicated to the Exeter North Pressure Zone and one pump dedicated to the Exeter South Pressure Zone. It is controlled by a SCADA set points and normally operates by filling and draining the MacNaughton Drive in-ground reservoirs.

Table 14: Pumping Facilities

<table>
<tr><th rowspan="2">Pumping Facility</th><th rowspan="2">Pressure Zones Supplied</th><th rowspan="2">Installed Capacity (L/s)[1]</th><th rowspan="2">Firm Capacity (L/s)</th><th colspan="3">Pumps</th></tr>
<tr><th>Flow</th><th>Type</th><th>Total Dynamic Head (m)</th></tr>
<tr><td rowspan="3">Crediton Booster Pumping Station</td><td rowspan="3">Huron Park</td><td rowspan="3">81.0</td><td rowspan="3">54.0[2]</td><td>27.0</td><td>VFD</td><td>60.7</td></tr>
<tr><td>27.0</td><td>VFD</td><td>60.7</td></tr>
<tr><td>27.0</td><td>VFD</td><td>60.7</td></tr>
<tr><td rowspan="3">MacNaughton Booster Pumping Station</td><td rowspan="3">Exeter North, Exeter South</td><td rowspan="3">262.0</td><td rowspan="3">69.0 (PHD)
175.0 (MDD+FF)</td><td>69.0</td><td>VFD</td><td>49.4</td></tr>
<tr><td>18.0</td><td>VFD</td><td>65.0</td></tr>
<tr><td>175.0</td><td>VFD</td><td>65.0</td></tr>
</table>

[1]Installed capacity is the total installed capacity of all pumps at the facility based on pump specifications.
[2]Firm capacity is the capacity with the largest pump out of service based on pump specifications.

4.1.3 Water Storage Facilities

There are currently two ETs and one Reservoir operated in the Municipality of South Huron's water distribution system with capacity outlined in **Table 15**. The Huron Park ET is located in the Huron Park Pressure Zone with the water levels controlling the pumps at the Crediton BPS. The HGL for the Huron Park ET is the same as the Exeter ET and the distribution system is configured so that it can operate as a backup for the Exeter ET and associated pressure zones.

The Exeter ET is located Exeter and provides storage and pressure regulation for the Exeter South Pressure Zone and can be used as an emergency supply for the Exeter North Pressure Zone. The water level in the Exeter ET is used to control the source supply for the Exeter South connection to the LHPWSS. Similar to the Huron Park ET, the Exeter ET can operate as a backup for the Huron Park ET and associated pressure zones as they operate at the same elevation.

The MacNaughton Drive Reservoir consists of two in-ground reservoirs and provides additional storage for the Exeter North and South Pressure Zones. These reservoirs are filled from the distribution system during off-peak hours and normally operate in series as a single reservoir.

A reservoir and BPS are located at Airport Line and Huron Street which is owned and operated by the LHPWSS and are used to store water for the Municipalities of South Huron and Bluewater with 69.81% dedicated to South Huron and 19.12% dedicated to Bluewater.

Table 15: Storage Facilities

Facility	Pressure Zones Supplied	Installed Capacity (m^3)	Type	Top Water Level (m)
Huron Park ET	Huron Park	2,700	Floating	307.10
Exeter ET	Exeter South	1,515	Floating	307.10
MacNaughton Drive Reservoir	Exeter North, Exeter South	1,136	Pumped	262.85
		2,490	Pumped	264.45
Airport Line and Huron Street Reservoir[1]	Exeter North, Exeter South	8,000	Pumped	-

[1]Owned and operated by the LHPWSS

[2]Capable of expanding to 16,000 m^3

4.2 Condition Assessment

An assessment of the condition of the existing facilities and associated infrastructure was undertaken to inform the evaluation of alternatives involving rehabilitation of the existing works where required. The Condition Assessment assigned a condition score to each asset based on physical condition and performance condition (if applicable) as well as consequence of failure. The results of this Condition Assessment are outlined in **Appendix B** and were reviewed in line with the proposed Capital Program projects.

4.3 System Demands

The population projections presented in **Table 11** and Design Criteria presented in **Table 7** were used to calculate the growth ADD and MDD. Future system demands were developed using the starting point methodology previously discussed. The total projected ADD and MDD are shown in **Table 16** and further detailed in **Appendix C**.

Table 16: System Demands

Pressure Zone	ADD (L/s)		MDD (L/s)	
	Existing	Existing + Growth	Existing	Existing + Growth
West[1]	12.6	36.2	24.0	68.9
Shipka	1.7	1.7	3.2	3.2
Dashwood	4.0	4.0	7.5	7.5
West Crediton	0.9	4.7	1.7	8.9
Huron Park	5.5	9.9	10.5	18.9
Exeter South	11.3	26.7	21.5	50.7
Exeter North	8.9	15.2	16.8	28.9
Total	**44.9**	**98.5**	**85.2**	**187.0**

[1]For calculation consistency, the West consists of both the West Pressure Zone and Lower West Pressure Zone as they were previously one combined Pressure Zone

4.3.1 Settlement Area Boundary Expansion

The servicing analysis focuses on servicing the proposed growth; however, in the development of the recommended servicing strategy and infrastructure sizing, consideration for the expansion of the SAB Lands was considered, assuming similar population and employment densities. Where applicable, identification of future facility expansion needs and/or strategic upsizing or extension of linear infrastructure was identified and incorporated into the final servicing plan.

4.4 Hydraulic Water Model

The Municipality's existing hydraulic model was updated using WaterCAD, a water distribution system modelling and management software package by Bentley Systems.

The model was updated through the following procedure:

- System review through facilities drawings, SCADA, and GIS data.
- Direct GIS to model link for pipes, valves, and hydrants.
- Demand analysis and allocation based on billing and production supply records.
- Steady state validation through hydrant testing and EPS validation through SCADA.
- Establish model scenarios (ADD, MDD, MDD+FF).

4.4.1 Network Development

Updates to the system and watermain were imported directly into the model using the Municipality's existing GIS water system infrastructure data. Before importing the network information into the model, the GIS and existing model pipes were assessed for any discrepancies with respect to watermain diameter and material. Some discrepancies were found and the correct source of information was identified for each case (GIS or existing model).

System network elevations for each model junction were based on the Municipality's ground surface contours.

4.4.2 Facility Development

Each system facility was manually reviewed and updated in the model based on available facility site plan drawings, and process flow diagrams, pump curves, and other available information. The scope of the facility development included:

- Reviewing and updating the network configuration around each facility.
- Updating the system pumps and pump curves.
- Reviewing system storage elements and defining the storage geometry.

4.4.3 System Demand Analysis

The system's water demands, detailed in **Table 6**, were evaluated based on SCADA and billing information provided. This process supports determination of:

- Average system demands, including determination of system NRW usage;
- Spatial allocation of system demands; and,
- Temporal variation of system demands and peaking factors.

4.4.3.1 Demand Allocation

Using the billing data, ADD was allocated to nodes in the model using a method of spatial allocation. This method takes the average demand of each water meter's parcel and assigns it to the node in the closest proximity.

Further, the average NRW from the 2019 to 2022 billing data was determined for each pressure zone and distributed equally at each meter across the corresponding pressure zone and allocated to nodes in the model using the same method of spatial allocation for the billed demands. The NRW remains constant for all scenarios.

4.4.3.2 Diurnal Demand

Variation of demands differs for ADD and MDD. Synthetic diurnal curves were loaded into the model to reflect varied consumption in 1-hour intervals over a 24-hour period. **Figure 6** shows the diurnal curves used in the model to calculate the daily demand patterns.

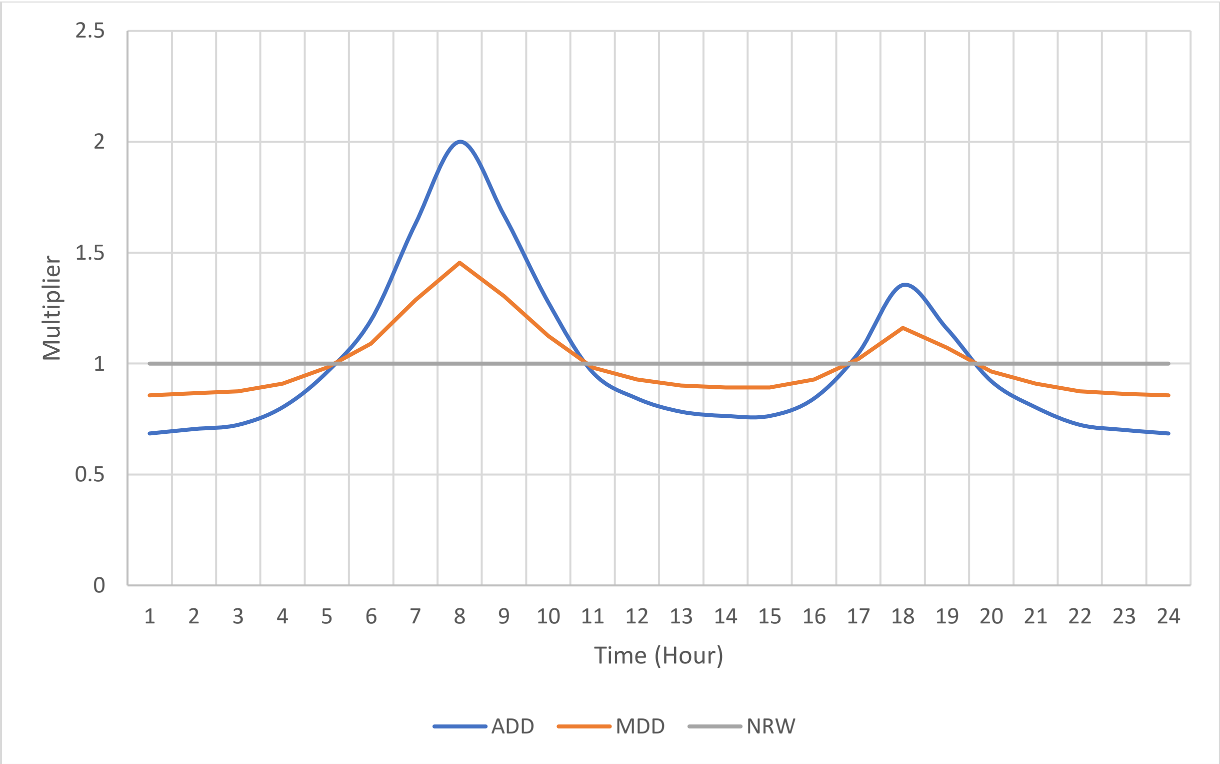


Figure 6: Diurnal Curve

4.4.4 Model Validation

The South Huron water model was validated for both steady state and extended period simulation (EPS) using hydrant testing results. This ensured that the model is an accurate representation of the water distribution system. Steady state validation was done through historic hydrant testing to evaluate the model's C-factors and system losses. EPS validation was done for ADD and MDD using SCADA information to ensure pump controls and tank levels were being accurately represented.

4.4.4.1 Hydrant Tests

The Municipality had previously performed fire flow tests throughout the Municipality in 2017 for the Dashwood, Huron Park, Exeter South, and Exeter North Pressure Zones and in 2013 for the West Pressure Zone. The selection of the hydrant tests used for the validation were based on the spatial distribution (focused on gaps in historic data and key areas), and watermain material coverage.

The hydrant tests involved water flowing through a "flow" hydrant and monitoring the change in static and residual pressure at a "pressure" hydrant. This indicates the system losses by comparing the drop in static and residual pressures in both field and model measurement.

Table 17 summarizes the validation of the model in comparison to the historic field results for both the static pressures and the drop in pressure at the first "pressure" hydrant. The following observations were made:

- Generally, the model shows a slight over prediction of losses within the system.
- Dashwood Pressure Zone tests were inconsistent; disregarded Hydrant Tests 11 and 13.
- West Pressure Zone tests were from 2013; disregarded results as tests were outdated.
- Hydrant Test 24 in the Exeter South Pressure Zone, was off as a new PVC watermain was installed in 2020 where previously, when tested was Cast Iron.

Table 17: Historic Hydrant Testing Results and Model Comparison

Pressure Zone	Test No.	Field		Model		Comparison	
		Monitoring Static HGL (m)	Monitoring Drop (m)	Monitoring Static HGL (m)	Monitoring Drop (m)	Monitoring Static HGL (m)	Monitoring Drop (m)
Dashwood	11	294.5	23.9	297.7	45.6	-3.2	**-21.7**
	12	296.9	43.0	297.7	44.6	-0.8	-1.6
	13	293.0	26.1	297.7	49.2	**-4.7**	**-23.0**
	14	297.7	42.5	297.7	44.7	0.0	-2.2
Huron Park	1	304.3	9.8	306.0	10.6	-1.7	-0.8
	2	304.5	24.1	306.7	22.2	-2.1	1.9
	4	305.7	17.7	305.8	15.1	-0.1	2.6
	5	306.8	1.2	305.8	0.6	1.0	0.6
	6	305.5	4.9	305.8	8.4	-0.3	-3.5
	7	306.3	21.4	306.4	23.0	-0.1	-1.6
	8	304.3	8.8	305.8	9.1	-1.5	-0.3
	9	306.2	7.3	305.8	5.5	0.4	1.8
	10	305.6	4.3	305.8	4.5	-0.2	-0.2
	15	306.5	21.9	306.6	21.9	-0.1	0.0
Exeter North	21	314.6	16.2	313.9	16.0	0.7	0.2
	23	313.3	10.6	313.8	12.0	-0.5	-1.4
	24	316.7	15.6	313.8	11.5	3.0	**4.1**
	26	312.2	13.2	313.9	11.8	-1.7	1.3
Exeter South	16	307.2	4.5	306.5	4.3	0.7	0.3
	17	307.1	5.1	306.5	2.7	0.5	2.4
	18	306.7	4.6	306.5	3.4	0.1	1.1
	19	304.4	10.2	306.5	3.7	-2.1	**6.5**
	20	305.6	3.3	306.5	1.5	-0.9	1.8
	22	305.5	6.3	306.6	3.7	-1.2	2.7
	25	304.9	4.2	306.6	3.7	-1.7	0.5
West	27	255.1	12.9	250.3	15.8	**4.8**	-2.9
	28	255.7	10.5	250.3	3.0	**5.4**	**7.5**

4.4.4.2 Facility Details, System Control Narrative, and SCADA Validation

SCADA was also used to understand the system control narrative and validate model controls. The model was validated, SCADA versus Model EPS, over seven days during an average day based on operations and pump curves. This comparison ensured that the model was accurately predicting LHPWSS supply point flow rates, ET levels and cycles, pump controls, and other general system performance.

Calibration is mandatory prior to the use of the model for any capital works decision-making analysis, as well as further applications of the model such as water quality, operations, or energy management modelling. The benefits of calibration include discovering and correcting discrepancies in the model data and, occasionally, identification of problems in the field. For further improvements to the model, it is recommended that the Municipality completes new hydrant tests, to reflect system changes since 2017.

5 ASSESSMENT OF EXISTING WATER INFRASTRUCTURE

A critical step in the master planning process is the assessment of the existing infrastructure to establish the water system baseline conditions. These baseline conditions will become the basis of the future recommendations of the MPU; therefore, it was important to ensure that they were determined through a comprehensive detailed analysis of the system. Once the existing system conditions were established, the potential impacts of the future growth demand on the water distribution system were analyzed to develop and recommend future servicing strategies.

The following sections describe current opportunities and constraints within the existing water system and assess the system's ability to accommodate growing demands.

5.1 2018 Master Plan Recommendations

The Municipality of South Huron Water and Wastewater Master Plan completed by Stantec Consulting Ltd. in 2018 has been reviewed and considered throughout the master planning process and selection of preferred servicing strategies. The recommendations including Capital Program projects not yet been completed were carried forward in this MPU and help to make up the final preferred servicing strategy.

5.2 Opportunities and Constraints

Existing and future water opportunities and constraints were identified through discussions with Municipal staff, as well as through hydraulic analyses and review of infrastructure data (e.g. GIS, design reports, as-built information, etc.). The WaterCAD hydraulic model was used to analyze the performance of the existing and future system under different demand conditions such as ADD, MDD, and MDD+FF.

In general, the water distribution system has sufficient capacity to deliver water at acceptable service levels, though there are some areas at the higher or lower end of the acceptable pressure range. **Figure 7** highlights some of the key opportunities and constraints within the Municipality's existing distribution system. The key opportunities and constraints identified by the Municipality and through the modelling exercise include:

Storage

- Opportunity to replace aging Exeter ET with a new, larger ET to optimize the Exeter Pressure Zone operation under existing and future growth.
- Opportunity to increase storage in the Stephen system during WTP shutdowns and emergency situations.
- Opportunity at the existing Airport Reservoir and BPS site for the twinning of the 8,000 m^3 reservoir to increase storage capacity within Municipality to service all pressure zones under LHPWSS WTP shut-down conditions.

Pumping

- Opportunity for valving enhancements at the Crediton BPS.
- MacNaughton BPS may need pumping upgrades to accommodate future pressure zone and storage strategy.

Transmission

- Aging watermains will need to be replaced to improve local conveyance.
- Existing system fire flow deficiencies are located east of Grand Bend, in Dashwood, and in Exeter due to areas of older cast iron watermains, limited trunk conveyance and an increase in elevations.
- New trunk watermains are needed to support growth areas in Exeter and Grand Bend. There are opportunities to provide additional system looping to help with security of supply and greater system flexibility.
- Additional conveyance is needed to support back-feeding in Stephen Pressure Zones during LHPWSS WTP shutdowns and emergency situations.

Pressure

- High and low pressures exist due to variation in elevations, current pressure zone configuration, and existing pressure zone setpoints.
- Pressure zone reconfiguration opportunities to help address high and low pressures in existing and proposed growth lands throughout Municipality.

Aging Infrastructure

- Municipality to continue to complete ongoing replacement of aging watermains, where breaks and higher leakage can occur more frequently due to structural defects.
- High water loss is observed in the West and Lower West Pressure Zones, with an opportunity for a Water Loss Program and Water Meter Program within identified areas.

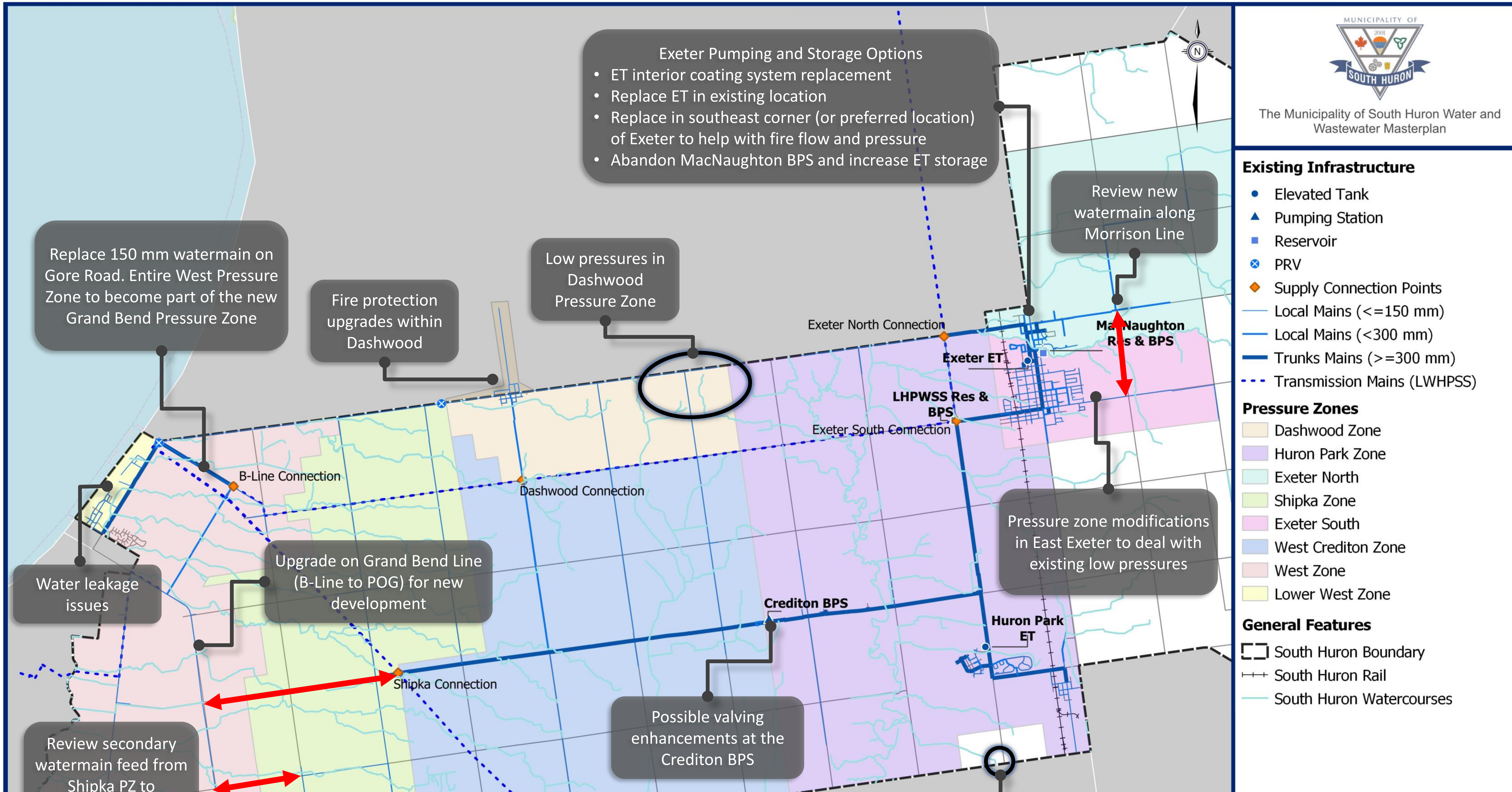


Figure 7
Water Opportunities and Constraints

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5.3 Facility Capacity & Condition

The facility capacity utilization for storage and pumping are presented in the following section.

5.3.1 LHPWSS WTP

The LHPWSS WTP has a current rated treatment capacity of 340 MLD based on the Drinking Water Works Permit. No supply is allocated to any individual municipality and supply is available to all benefitting municipalities on an aggregate supply basis. Based on growth projections, it is expected that there is sufficient capacity to supply all municipalities with the existing infrastructure.

5.3.2 Pump Station Capacity

Assessment of pumping capacity was based on the ability of the pumping stations to provide observed firm capacity to meet the required demands in the system on a pressure zone by pressure zone basis. **Table 18** presents the pumping requirements within the Municipality, including growth.

The Huron Park and Exeter South Pressure Zones have existing elevated storage facilities which both have sufficient floating storage to independently provide balancing and fire storage to support peak flow needs. The Exeter North Pressure Zone has no floating storage; however, there is a connection to the LHPWSS supply. The pumping capacity requirements for the Exeter North Pressure Zone is to provide the greater of PHD or MDD+FF.

Table 18: Water Pumping Requirements

Facility	Pressure Zones	Firm Capacity (L/s)	Design Condition	Existing Demand (L/s)	Existing Surplus / Deficit (L/s)[1]	Future Demand (L/s)	Future Surplus / Deficit (L/s)[1]
Crediton BPS	Huron Park	54.0	MDD	10.5	**43.5**[1]	13.4	**40.6**
MacNaughton BPS	Exeter South	87.0	MDD	21.5	**65.5**	50.7	**36.3**
	Exeter North	175.0	MDD+FF	166.8	**8.2**	178.9	**0.3**
	Exeter South & Exeter North	87.0	MDD	38.4	**48.6**	79.6	**11.6**

[1]Pumping Station capacity utilization colour based on firm capacity (<80% capacity, 80-100% capacity, >100% capacity)

The results of the pumping capacity review are as follows:

- The Crediton BPS has sufficient capacity to service the Huron Park Pressure Zone under existing and growth conditions.
- The MacNaughton BPS has sufficient capacity to service the Exeter South Pressure Zone under existing and growth conditions; however, reaches above 80% of the capacity to meet the MDD+FF demand conditions for the Exeter North Pressure Zone under existing and growth conditions.
- The MacNaughton BPS has sufficient capacity to service the entirety of Exeter under one consolidated Pressure Zone, assuming sufficient storage, under existing conditions; however, will be above 80% capacity under growth conditions.

Servicing strategies and concepts related to the Exeter North Pressure Zone are further described in **Section 6.2.1**.

5.3.3 Storage Capacity

The existing and projected growth storage volume requirement for each facility within the Municipality are outlined by pressure zone in **Table 19** and **Table 20**.

Table 19: Existing Storage Requirements

Facility	Pressure Zone	Storage Capacity (ML)	Existing Capacity Required (ML)				Existing Surplus / Deficit (ML)[2]
			Fire[1]	Equalization	Emergency	Total	
Huron Park ET	Huron Park	2.7	1.1	0.2	0.3	**1.6**	**1.1**
Exeter ET	Exeter South	1.515	1.1	0.5	0.4	**1.9**	**-0.4**
Exeter ET and MacNaughton Reservoirs	Exeter South, Exeter North	5.141	1.1	0.8	0.5	**2.4**	**2.8**

[1]Fire storage based on 150 L/s for 2 hours
[2]Storage facility capacity utilization colour based on available capacity (capacity surplus, capacity deficit)

Table 20: Existing + Growth Storage Requirements

Facility	Pressure Zone	Storage Capacity (ML)	Growth Capacity Required (ML)				Existing + Growth Surplus / Deficit (ML)[2]
			Fire[1]	Equalization	Emergency	Total	
Huron Park ET	Huron Park	2.7	1.1	0.4	0.4	**1.9**	**0.8**
Exeter ET	Exeter South	1.515	1.1	1.1	0.5	**2.7**	**-1.2**
Exeter ET and MacNaughton Reservoirs	Exeter South, Exeter North	5.141	1.1	1.7	0.7	**3.5**	**1.6**

[1]Fire storage based on 150 L/s for 2 hours
[2]Storage facility capacity utilization colour based on available capacity (capacity surplus, capacity deficit)

Based on the storage review, growth needs are not anticipated to trigger storage deficits in the pressure zones with existing storage. Under Existing + Growth, the Exeter South Pressure Zone does not have sufficient storage with the Exeter ET alone; however, has sufficient storage when including both the Exeter ET and MacNaughton Reservoirs. Additionally, the Airport Reservoir has not been included in the above calculations and provides additional storage for the Exeter Pressure Zones.

Based on discussions with the Municipality, the Exeter ET will need ongoing rehabilitation or replacement, presenting an opportunity to replace and relocate the Exeter ET to optimize the Exeter Pressure Zones. It is noted that the existing Exeter ET HGL limits the available pressures within the Exeter South Pressure Zone, resulting in low pressures in the high elevation areas in southeastern Exeter. The replacement of the Exeter ET provides an opportunity to optimize the operating levels of the Exeter South Pressure Zone and improves system pressures. This is further discussed in **Section 6.2.1**.

5.4 System Performance & Condition

The Municipality's hydraulic water model was used to support the assessment of the water system's watermain capacity.

5.4.1 Transmission Watermains

Based on hydraulic modelling, the existing trunk watermains generally have sufficient capacity to move water under MDD conditions; however, the following trunk watermain needs were identified:

- New watermain is needed from North Exeter along Morrison Line to convey flows to southeast Exeter growth lands.
- New watermain is needed along South Road from Corbett Line to Grand Bend Line to provide conveyance between the West Crediton Pressure Zone and West Pressure Zone and provide emergency backup supply for West Pressure Zone.
- New trunk watermain through growth lands in southern Grand Bend, to connect the existing Highway #21 watermain to the Grand Bend Line/B-Line watermain to complete loop.
- Inspect condition of the Airport Line watermain from Crediton Road to Huron Street due to reliance on conveyance watermain and the break history.

5.4.2 Distribution Pressures

Pressures within the existing system, detailed as a percent of the system are outlined in **Table 21**, and are typically between 40-100 psi under both ADD and MDD scenarios. Low pressure areas in the existing system were identified as presented in **Figure 8** and include:

- Low pressures (<40 psi) are experienced along the eastern extent of the Dashwood Pressure Zone
- Low pressures (<40 psi) as elevation increases east of Exeter, in both the North Exeter and South Exeter Pressure Zones

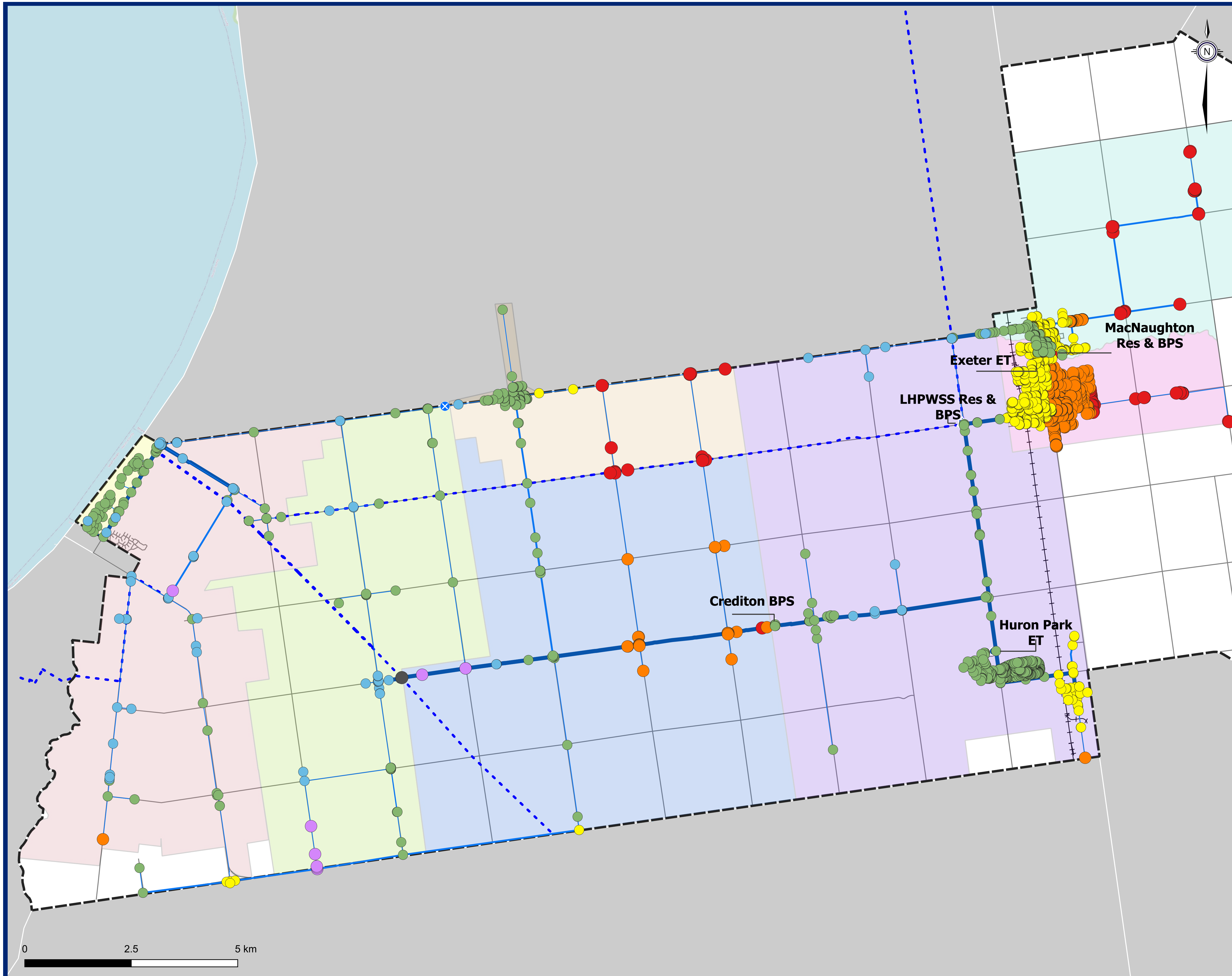
Table 21: Existing System Pressures by Percent of System

Pressure (psi)	Average Day Demand	Maximum Day Demand
<40	2%	3%
40-50	8%	15%
50-60	30%	35%
60-80	43%	34%
80-90	8%	6%
90-100	6%	6%
>100	2%	2%

5.4.3 Distribution Watermains

Fire flow deficiencies were identified using a land-use based approach, where the governing land-use, at the closest fire hydrant, determined the fire flow target. **Figure 9** presents the fire flow deficiencies under existing conditions, and with the proposed growth. Deficiencies are typically along growth areas, pressure zone limits, and along older or smaller watermains.

Previous Master Plan identified need to update the 200mm watermain feed to Dashwood (Huron Street to Main Street) to improve fire flow.



The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure
- Elevated Tank
- Pumping Station
- Reservoir
- PRV
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Mains (LWHPSS)

Pressure Zones
- Dashwood Zone
- Huron Park Zone
- Exeter North
- Shipka Zone
- Exeter South
- West Crediton Zone
- West Zone
- Lower West Zone

Minimum Pressure (psi)
- < 40 psi
- 40 - 50 psi
- 50 - 60 psi
- 60 - 80 psi
- 80 - 90 psi
- 90 - 100 psi
- > 100 psi

General Features
- South Huron Boundary
- South Huron Rail
- South Huron Watercourses

Figure 8
Existing Max Day Demand (MDD) Minimum Pressure

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521054-W-001
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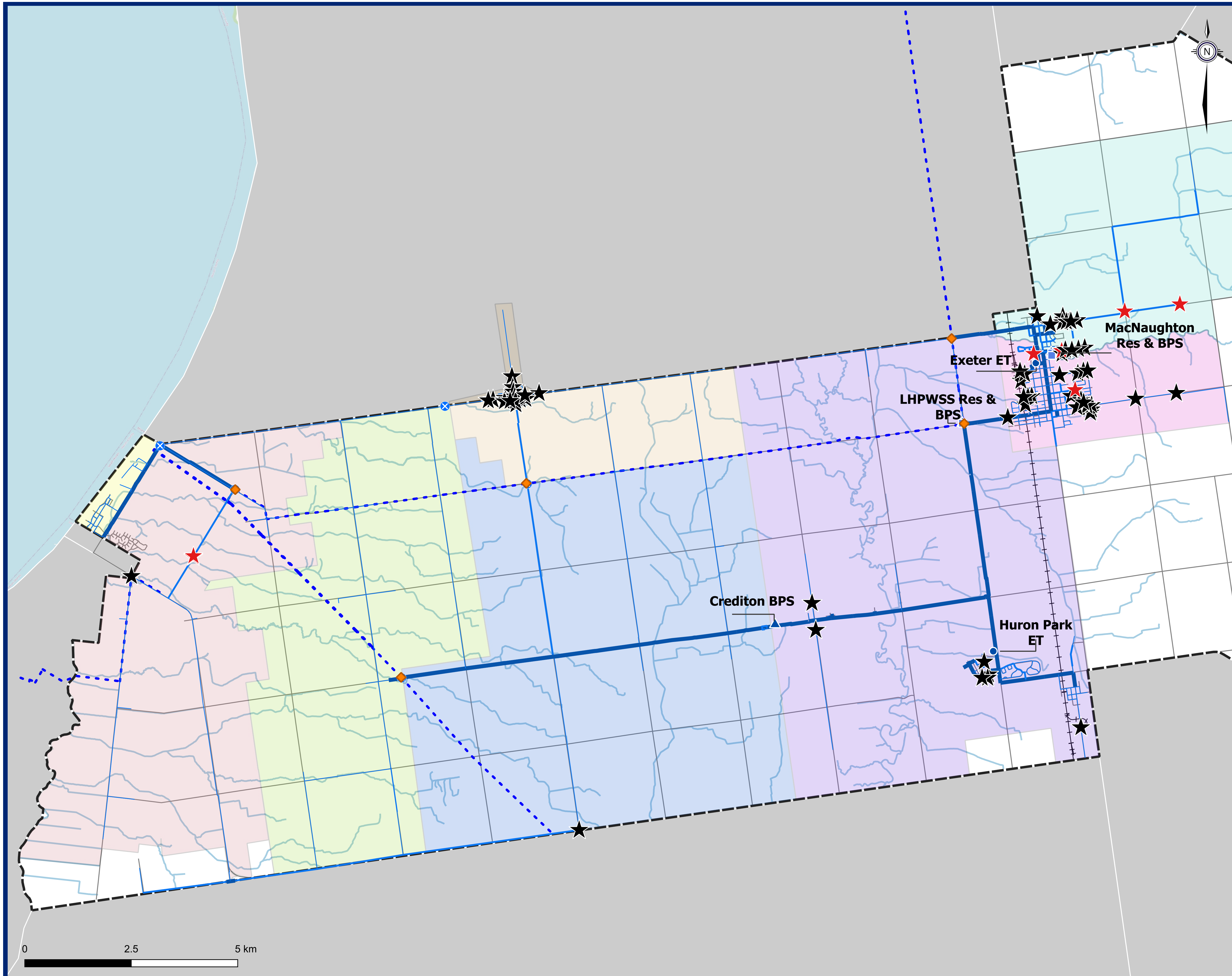

The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure

- Elevated Tank
- Pumping Station
- Reservoir
- PRV
- Supply Connection Points
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Mains (LWHPSS)

Pressure Zones

- Dashwood Zone
- Huron Park Zone
- Exeter North
- Shipka Zone
- Exeter South
- West Crediton Zone
- West Zone
- Lower West Zone

Fire Flow Deficiencies

- Existing Fire Flow Deficiency
- Growth Fire Flow Deficiency

General Features

- South Huron Boundary
- South Huron Rail
- South Huron Watercourses

Figure 9

Existing + Growth Fire Flow Deficiencies

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6 WATER SERVICING ALTERNATIVES AND EVALUATION

Water servicing alternatives were developed under the context of identifying high level servicing solutions or alternatives to address both system wide and local opportunities and constraints. These alternatives focus on the existing water system while still accommodating growth. Collectively, all the area specific servicing solutions will form the overall water servicing strategy for the Municipality.

6.1 Servicing Strategy Development

As part of this MPU, water alternative servicing strategies were reviewed for existing and future growth areas in order to select the servicing strategies that:

- Make best use of existing infrastructure to avoid new infrastructure where possible;
- Minimize cost of new infrastructure;
- Consider operation and maintenance costs to ensure financial sustainability;
- Ensure long term reliability and security of the water system;
- Increase system resilience to climate change;
- Avoid/minimize environmental crossings and other disruptions to the environment where possible;
- Avoid disruptions to cultural heritage resources;
- Plan for future infrastructure in the existing roads right-of-way where possible;
- Avoid/reduce production of Greenhouse Gas Emissions; and,
- Avoid/minimize impact to areas where a disturbance could represent a significant drinking water threat.

The following sections summarize the development of the alternative servicing strategies for key areas within the Municipality.

6.2 System Wide & Pressure Zone Servicing Strategies

6.2.1 Exeter Pressure Zones

The Exeter water system consists of two pressure zones including Exeter North Pressure Zone at an HGL of 313 m and Exeter South Pressure Zone at an HGL of 307 m. Water alternatives were developed to address system wide opportunities and constraints within the Town of Exeter’s existing water system.

The existing Exeter ET has sufficient storage for the existing and proposed demands within Exeter; however, will require ongoing maintenance due to its aging structure.

Any development ground elevations in southeast Exeter requires an extension of Exeter North Pressure Zone, as the Exeter South Pressure Zone has an HGL that is too low to maintain acceptable service pressures. Available pressures within southeast Exeter are below the Level of Service targets and upgrades to the servicing will be required to improve pressures to the existing area as well as proposed growth. Two servicing alternatives were reviewed to determine the preferred pressure zone strategy including:

- Alternative 1 – Maintain Two Pressure Zones
- Alternative 2 – Operate as One Pressure Zone at a Higher HGL

Alternative 1: Maintain Two Exeter Pressure Zones

Under Alternative 1, the existing pressure zone boundaries and pressures will be maintained with no HGL adjustments. In the short-term, the existing Exeter ET will require upgrades including evaluation of the ladder to meet current safety standards. For long-term growth, a watermain from the Exeter North Pressure Zone to the southeast lands along Morrison Line is needed to provide growth lands with sufficient pressures. The key projects required for Alternative 1 include:

- Morrison Line Watermain (Thames Road to Huron Street East): New Watermain from North Exeter to southeast Exeter growth to provide sufficient pressures.
- Exeter ET Ladder Evaluation.

Alternative 2: Operate Exeter as One Pressure Zone at a Higher HGL

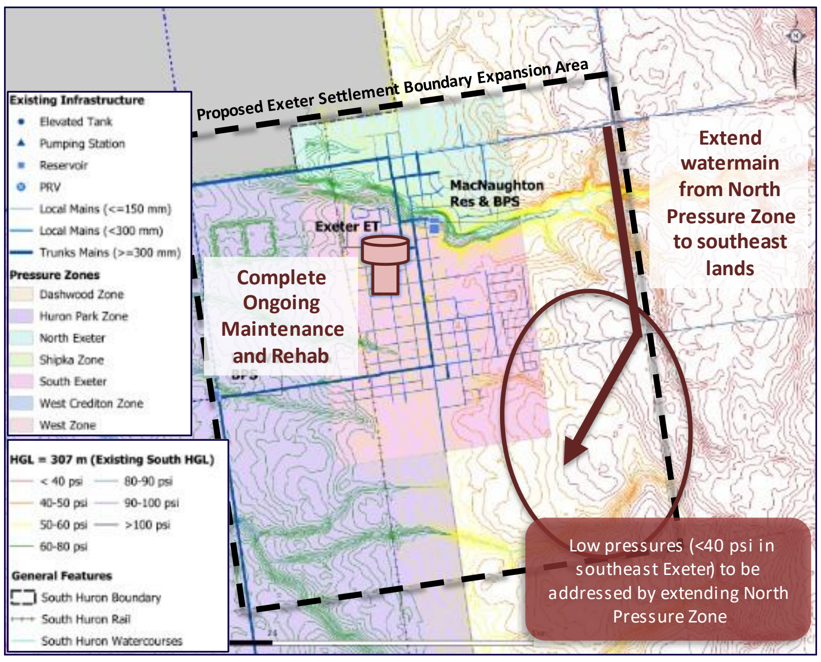
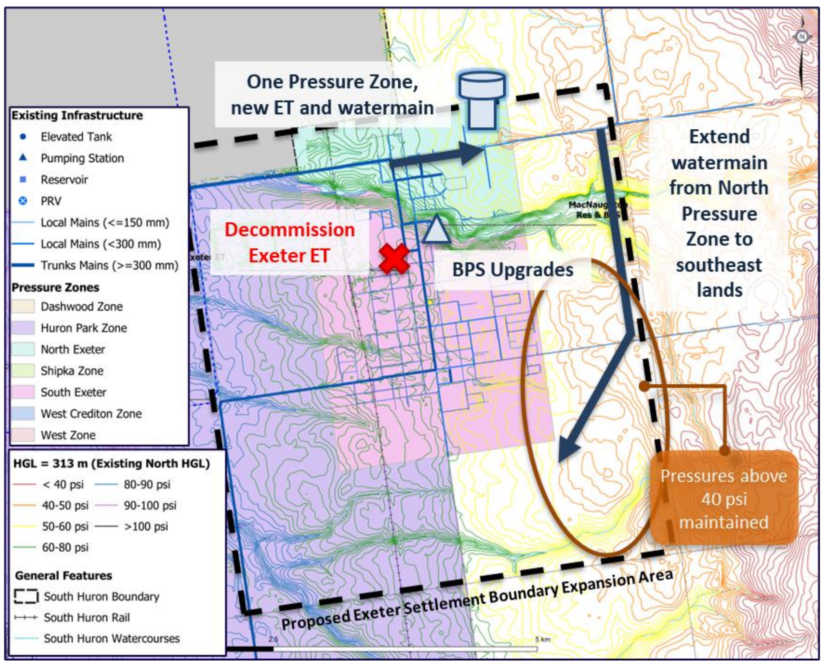
Under Alternative 2, the entirety of Exeter will operate as one Pressure Zone at a higher HGL, similar to the existing Exeter North Pressure Zone HGL. A new ET operating at a higher HGL will be installed in north Exeter and will be able to service the entirety of the Exeter including the possible expansion of the Settlement Area Boundary with pressures between 40-90 psi. The key projects required to service Alternative 2 include:

- North Exeter ET: New ET at a higher HGL; more in line with the existing North Exeter Pressure Zone HGL.
- Decommission existing Exeter ET.
- MacNaughton BPS upgrades to accommodate a change in HGL.
- Morrison Line Watermain (Thames Road to Huron Street East): Opportunity to loop with existing or proposed watermains within South Exeter.

For this Alternative, the Municipality may wish to accelerate the ET timing to support growth in South Exeter. Further, the Municipality may wish to secure the appropriate land parcel (minimum of 60m x 60m) to facilitate the future ET construction.

The overview, advantages, disadvantages, and evaluation of Alternative 1 and Alternative 2 are summarized in **Table 22**.

Table 22: Exeter Pressure Zone Alternatives and Evaluation

Exeter Pressure Zone Alternatives								
	Alternative 1: Maintain Two Exeter Pressure Zones				**Alternative 2:** Operate Exeter as One Pressure Zone at a Higher HGL			
Map								
Overview	• Existing pressure zone boundaries and settings within Exeter will be maintained (Exeter North and Exeter South) • Current pressures are maintained with no HGL adjustments • New trunk watermain from Exeter North Pressure Zone to southeast Exeter lands to provide growth lands with sufficient pressure (currently <40 psi)				• New ET in Exeter North Pressure Zone and decommission existing Exeter ET (location of a new ET will be subject to a separate EA) • Operate Exeter as one Pressure Zone at similar HGL to existing Exeter North Pressure Zone HGL • Upgrades at the MacNaughton BPS to accommodate change in HGL • New trunk watermain along Morrison Line for additional system flexibility. Opportunity to loop with existing or growth watermains in existing Exeter South Pressure Zone			
Advantages	• Existing storage within Exeter is sufficient to service existing and proposed growth; utilizes existing storage capacity • No significant construction challenges • No operational changes • Can continue to operate Exeter ET in parallel with Huron Park ET • Maximizes use of existing pumping and storage facilities				• Pressures can be optimized; pressures between 40-90 psi throughout entire proposed settlement boundary expansion with higher HGL in southern Exeter • System operations can be optimized by operating as one pressure zone • Location of new ET can be optimized to reduce infrastructure required to service all growth within the settlement boundary • May be opportunity to locate in northern Exeter employment lands • Provides greater hydraulic benefit • Better overall system looping (for future growth) • Reduced O&M costs due to new ET			
Disadvantages	• Existing Exeter ET will require ongoing upgrades including recoating the interior which will be cost prohibitive • No operational improvements or additional system flexibility • Low pressures in southeast Exeter (<40 psi) with no HGL adjustments due to existing topography • Dependence on longer conveyance for growth in southeast Exeter • Additional O&M to operate two pressure zones and maintain reliability of existing Exeter ET				• Land acquisition could result in potential delays for new ET • ET will be oversized until growth lands are constructed • Construction of storage facilities (especially highly visible elevated tanks) are historically opposed by area residents and businesses • The increase in HGL for the new ET may require minor upgrades at the MacNaughton BPS to accommodate for a change in Total Dynamic Head (TDH) • With the increased HGL, can no longer operate the Exeter ET in parallel with the Huron Park ET			
Costing	• Morrison Line Watermain: $4.8 M • Exeter ET Ladder Evaluation: $0.06 M • **Total: $6.9 M**				• North Exeter ET: $8.7 M • Decommission Existing Exeter ET: $0.8 M • MacNaughton BPS Upgrades: $0.5 M • Morrison Line Watermain: $4.8 M • Thames Road East Watermain: $2.6 • **Total: $17.4 M**			
Four-Point Criteria Evaluation	🔴 Technical	🟢 Environmental	🟢 Social & Cultural	🟡 Financial	🟢 Technical	🟢 Environmental	🟡 Social & Cultural	🔴 Financial
Recommended Alternative	**Not Recommended:** No improvements to system under existing or growth conditions				**Recommended:** Hydraulically, more beneficial and allows for future accommodation of growth lands			

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

The full evaluation is included in **Appendix D**. Alternative 2 (Operate Exeter as One Pressure Zone at a Higher HGL) is hydraulically more beneficial to the existing system and accommodates future growth by constructing a new ET at the preferred HGL for the entire Exeter servicing area. On the balance of system benefit vs. cost, Alternative 2 was selected as the preferred alternative.

6.2.2 Stephen Pressure Zones

Water alternatives were developed to address system wide opportunities and constraints within the existing Stephen water system. The Stephen water system consists of six pressure zones detailed in **Table 23**.

Table 23: Stephen Pressure Zones

Pressure Zone	HGL (m)
Lower West	239
West	250
Shipka	263
West Crediton	281
Dashwood	275
Huron Park	307

A high-level analysis was completed to review and evaluate system pressures within the Stephen Pressure Zones which assessed if pressure zone realignment could have the potential to optimize both pressure bands and system operations. These alternatives are focused on pressures and not system pumping and storage as the Stephen Pressure Zones (excluding Huron Park Pressure Zone) currently do not have any pumping or storage and rely on the LHPWSS supply.

Where the pressure zone boundaries were realigned from existing, a range of potential boundaries were established such that pressure zones could be optimized if the alternative was carried forward. To determine the best overall operation of the system while incorporating the future increased demands, a variety of pressure zone splits were reviewed prior to determining four system alternatives. For analyses purposes, the Huron Park Pressure Zone has been excluded as the Huron Park Pressure Zone HGL is regulated by the Crediton BPS and Huron Park ET.

Four Stephen Pressure Zone alternatives were reviewed to determine the preferred pressure zone strategy including:

- Alternative 1 – Do Nothing
- Alternative 2 – Status Quo
- Alternative 3 – Moderate Alterations
- Alternative 4 – Reconfiguration

Alternative 1: Do Nothing

Under Alternative 1, the existing pressure zone boundaries and pressures will be maintained with no HGL adjustments. This system configuration requires no upgrades to supply, storage, or pumping. There are low pressures existing on the eastern extent of the Dashwood Pressure Zone due to local high ground elevations. No new infrastructure or system operation updates are required.

Alternative 2: Status Quo

Under Alternative 2, the existing pressure zone boundaries will be maintained with some minor HGL adjustments to address areas outside of the Level of Service criteria, including the eastern extent of the Dashwood Pressure Zone. To increase the existing low pressures on the eastern extent of the Dashwood Pressure Zone, the Dashwood Pressure Zone HGL will need to be increased. This system configuration requires minimal changes to existing operations and no upgrades to supply, storage or pumping.

The key projects required to service Alternative 2 include:

- Changing the operating HGL of the Dashwood Pressure Zone through a PRV set point change.

Alternative 3: Moderate Alterations

Under Alternative 3, there will be moderate alterations to the existing pressure zone boundaries including:

- Expanding the Lower West Pressure Zone to capture the West Pressure Zone.
- Expanding the West Crediton Pressure Zone to capture the Dashwood Pressure Zone.

These alterations will improve the system operations for the existing West Pressure Zone, by merging it with the Lower West Zone and provide improved pressures for the eastern extent of the Dashwood Pressure Zone; however, the Level of Service criteria will not be met at all properties along the eastern extent of the existing Dashwood Pressure Zone. The reduced number of pressure zones to operate will improve system operations.

The key projects required to service Alternative 3 include:

- Opening valves along the existing West Crediton/Dashwood Pressure Zone boundary.
- Replace existing 150 mm watermain on Gore Road with a 300 mm watermain. Entire West Pressure Zone to become part of the new Grand Bend Pressure Zone.

Alternative 4: Pressure Zone Reconfiguration

Under Alternative 4, the existing Stephen Pressure Zones will be reconfigured to create two pressure zones. This will include expanding the Lower West Pressure Zone to east of Shipka Line to capture the West Pressure Zone and part of the Shipka Pressure Zone. The West Crediton Pressure Zone will be expanded north and to the west of Blackbush Line to capture the Dashwood Pressure Zone and part of the Shipka Pressure Zone.

These pressure zone modifications will allow system operations to be more efficient and provide additional flexibility for the system; however, both low end (40-50 psi) and high end (90-100 psi) pressures will be observed due to the large elevation change across the two proposed pressure zones.

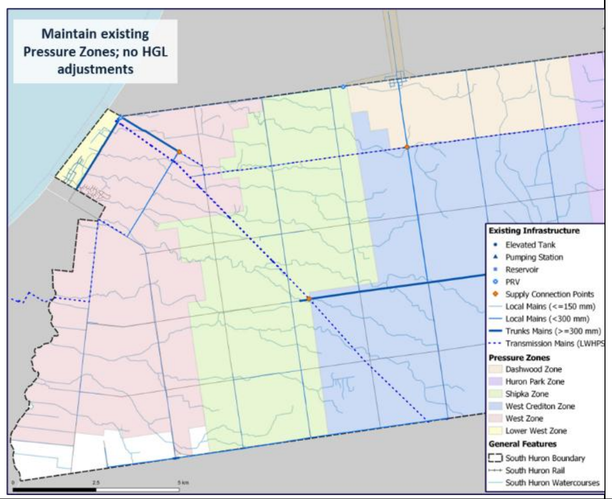
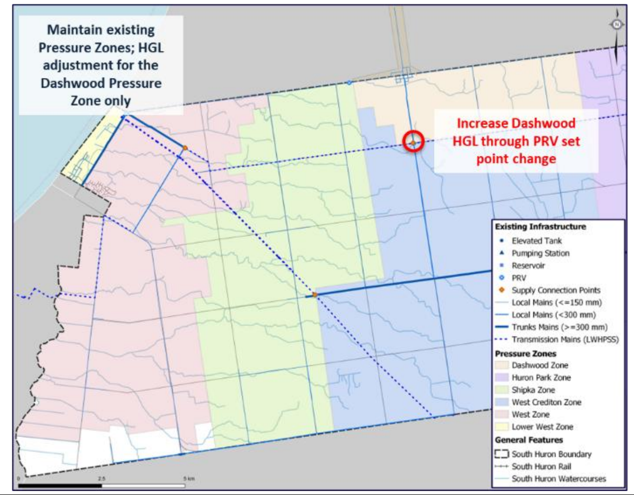
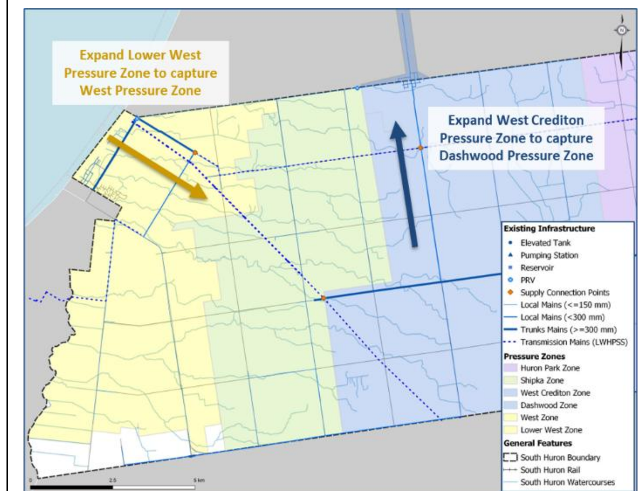
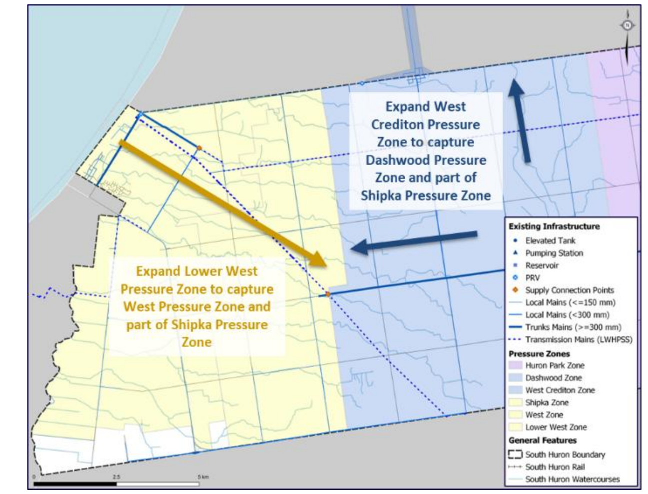
The key projects required to service Alternative 4 include:

- Opening valves along the existing West Crediton/Dashwood Pressure Zone boundary.
- Additional valving needed for new boundary delineation between Shipka Line and Blackbush Line.
- Replace existing 150 mm watermain on Gore Road with 300 mm watermain.

The overview, advantages, disadvantages and evaluation for the Stephen Pressure Zones are summarized in Table 24.

The full evaluation is included in **Appendix D**. Alternative 3 (Moderate Alterations) is hydraulically the most beneficial to the existing system and improves existing system operations. Alternative 3 was selected as the preferred alternative.

Table 24: Stephen Pressure Zone Boundary Alternatives and Evaluation

Stephen Pressure Zone Boundary Alternatives				
	Alternative 1: Do Nothing	**Alternative 2:** Status Quo	**Alternative 3:** Moderate Alterations	**Alternative 4:** Pressure Zone Reconfiguration
Map				
Overview	• Existing pressure zone boundaries will be maintained, including the current pressure zone boundary alignments and existing servicing from the LHPWSS supply points • Current pressures are maintained • Maintain 5 Pressure Zones in Stephen (excluding Huron Park Pressure Zone)	• Existing pressure zone boundaries will be maintained, including the current pressure zone boundary alignments and existing servicing from the LHPWSS supply points • Dashwood Pressure Zone HGL is increased to address areas outside of the Level of Service criteria (low pressures along eastern extent of Dashwood Pressure Zone) • Maintain 5 Pressure Zones in Stephen (excluding Huron Park Pressure Zone)	• Expand the Lower West Pressure Zone to capture the West Pressure Zone • Expand the West Crediton Pressure Zone to capture the Dashwood Pressure Zone • 3 Pressure Zones instead of previous 5	• Expand the Lower West Pressure Zone to east of Shipka Line to capture the West Pressure Zone and part of the Shipka Pressure Zone • Expand West Crediton Zone north and to the west of Blackbush Line to capture the Dashwood Pressure Zone and part of the Shipka Pressure Zone • 2 Pressure Zones (Split in between Shipka Line and Blackbush Line)
Advantages	• No new infrastructure or system operation updates required • Optimized system pressures with multiple pressure zones operating at ideal HGL's	• Minimal system operation updates required • Some operational improvements for existing low-pressure areas in eastern Dashwood pressure zone • Optimized system pressures with multiple pressure zones operating at ideal HGL's	• Merging of Lower West and West pressure zones and West Crediton and Dashwood Pressure Zones • Minimal to moderate system operation upgrades • Some improved pressures for eastern Dashwood Pressure Zone; however, Level of Service criteria not met for properties on eastern extent • Reduced number of pressure zones to operate	• Moderate system operation updates required • Some improved pressures for eastern Dashwood Pressure Zone; however, Level of Service criteria not met for properties on eastern extent • Reduced number of pressure zones to operate; operational improvements
Disadvantages	• Level of Service not met for all areas; low pressures along eastern extent of Dashwood Pressure Zone. Recommend maintaining existing individual property booster pumps • Highest number of pressure zones to operate • No operational improvements or system flexibility • Limited to existing supply feeds from LHPWSS	• Pressures at both ends of the level of service criteria within existing Dashwood Pressure Zone with pressures near 100 psi at western extent and pressures just above 40 psi at eastern extent • Highest number of pressure zones to operate • Limited to existing supply feeds from the LHPWSS	• Level of Service not met for all areas; low pressures along eastern extent of Dashwood Pressure Zone. Recommend maintaining existing individual property booster pumps • Limited to existing supply feeds from the LHPWSS	• Additional valving needed for new boundary delineation • Pressure zone boundary realignment does not have much flexibility due to existing ground elevations • Low and high pressures at new pressure zone boundaries due to large elevation change over pressure zone • Level of Service not met for all areas, low pressures along eastern extent of Dashwood Pressure Zone. Recommend maintaining existing individual property booster pumps
Cost	• **Total: $0**	• Dashwood Pressure Zone HGL Alteration: $0.1 M • **Total: $0.1 M**	• Gore Road Watermain: $4.1 M • **Total: $4.1 M**	• Shipka Line and Blackbush Line Valves: $0.5 M • Gore Road Watermain: $4.1 M • **Total: $4.6 M**
Four-Point Criteria Evaluation	🟡 Technical 🟡 Environ-mental 🔴 Social & Cultural 🟢 Financial	🟢 Technical 🟡 Environ-mental 🟡 Social & Cultural 🟡 Financial	🟢 Technical 🟢 Environ-mental 🟡 Social & Cultural 🟡 Financial	🟢 Technical 🟢 Environ-mental 🔴 Social & Cultural 🟡 Financial
Recommended Alternative	• **Not Recommended:** Does not improve system pressures	• **Not Recommended:** Improves Level of Service in Dashwood Pressure Zone; however, also increases risk of watermain breaks and issues from high pressures	• **Recommended:** Moderate improvement to Level of Service and highest improvement for system operations	• **Not Recommended:** Highest system risk for watermain breaks due to high pressures needed to achieve Level of Service across entire Pressure Zone

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

6.2.3 LHPWSS Shut Down Resiliency

The Municipality of South Huron's water system is wholly supplied by the Lake Huron Primary Water Supply System, via the LHPWSS WTP pumps. The pumps deliver water directly to five connections within the Municipality's system as outlined in **Section 4.1**. The boundaries along the pressure zones consist of a series of closed valves and pipes, and pressure reducing valves. To assess the impacts of the LHPWSS shutdown, the entire Municipality's water system was reviewed, beginning with the available storage within the Municipality.

An assessment was completed to determine the impacts of a shutdown based on the existing ADD and MDD as identified in **Section 4.3**. **Table 25** summarizes the existing storage volumes for the Municipality, separated by the pressure zones supplied in Stephen and Exeter. The fire storage calculations were estimated using the less stringent land use/FUS-lite approach (50 L/s for 2 hours) to increase the availability of water supply.

Based on an initial review of the system's storage, it was determined that:

- There is sufficient storage in the Exeter Pressure Zones and Huron Park Pressure Zone under a WTP shutdown under both Existing and Existing + Growth scenarios.
- There is sufficient storage in the Stephen Pressure Zones (excluding Huron Park Pressure Zone) under a WTP shutdown under the Existing Scenario; however, this storage becomes insufficient under the proposed Existing + Growth scenario.

Table 25: Existing and Growth Storage Requirements

<table>
<tr><th rowspan="2">Pressure Zones</th><th rowspan="2">Storage Capacity (ML)</th><th colspan="4">Existing Capacity Required (ML)</th><th rowspan="2">Existing Surplus / Deficit (ML)[3]</th><th colspan="4">Existing + Growth Capacity Requirement (ML)</th><th rowspan="2">Existing + Growth Surplus / Deficit (ML)[3]</th></tr>
<tr><th>Equalization</th><th>Fire[1]</th><th>Emergency</th><th>Total</th><th>Equalization</th><th>Fire</th><th>Emergency</th><th>Total</th></tr>
<tr><td>South Exeter
Exeter ET</td><td>1.5</td><td>0.5</td><td>0.4</td><td>0.2</td><td>1.0</td><td>0.5</td><td>1.1</td><td>0.4</td><td>0.4</td><td>1.8</td><td>-0.3</td></tr>
<tr><td>South Exeter, North Exeter
Exeter ET
MacNaughton Reservoirs</td><td>5.1</td><td rowspan="2">0.8</td><td rowspan="2">0.4</td><td rowspan="2">0.3</td><td rowspan="2">1.5</td><td>3.7</td><td rowspan="2">1.7</td><td rowspan="2">0.4</td><td rowspan="2">0.5</td><td rowspan="2">2.6</td><td>2.5</td></tr>
<tr><td>South Exeter, North Exeter
Exeter ET
MacNaughton Reservoirs
Airport Res</td><td>10.7[2]</td><td>9.2</td><td>8.1</td></tr>
<tr><td>Huron Park
Huron Park ET</td><td>2.7</td><td>0.2</td><td>0.4</td><td>0.1</td><td>0.7</td><td>2.0</td><td>0.4</td><td>0.4</td><td>0.2</td><td>0.8</td><td>1.9</td></tr>
<tr><td>Huron Park, Lower West, West, Shipka, Dashwood, West Crediton
Huron Park ET</td><td>2.7</td><td rowspan="2">1.0</td><td rowspan="2">0.4</td><td rowspan="2">0.3</td><td rowspan="2">1.7</td><td>1.0</td><td rowspan="2">2.3</td><td rowspan="2">0.4</td><td rowspan="2">0.7</td><td rowspan="2">3.3</td><td>-0.6</td></tr>
<tr><td>Huron Park, Lower West, West, Shipka, Dashwood, West Crediton
Huron Park ET
Airport Reservoir</td><td>8.3[2]</td><td>6.6</td><td>5.0</td></tr>
</table>

[1]Fire storage based on 50 L/s for 2 hours for emergency conditions
[2]Airport Reservoir capacity only includes South Huron portion of storage (69.81%)
[3]Storage facility capacity utilization colour based on available capacity (capacity surplus, capacity deficit)

As the shut-down of the LHPWSS essentially isolates the system from the supply source, there is limited time available prior to the loss of storage due to depletion of existing water storage in the ETs and reservoirs. A desktop storage analysis was completed to determine the amount of time that the system has without the LHPWSS WTP supply points.

Under current system operations, there are valves between Pressure Zones that do not typically operate on a regular basis; however, are utilized during emergency conditions. These valves supplement flow to the following pressure zones under emergency conditions:

- **Lower West/West Pressure Zones:** Normally closed gate valve on the 300mm watemain located on Highway #21 at the municipal boundary with Lambton Shores can provide emergency backup feed from Lambton Shores.
- **Shipka Pressure Zone:** The chamber located on Highway #83, west of Dashwood is equipped with a Pressure Sustaining Valve (PSV) that will provide emergency backup feed from the Dashwood Pressure Zone to the Shipka Pressure Zone.
- **West Crediton Pressure Zone:** The chamber located on Bronson Line, south of Huron Street has a PSV that can provide emergency backup feed from the Dashwood Pressure Zone.
- **Dashwood Pressure Zone:** Two emergency backup feeds. The chamber on Bronson Line and Huron Street has a PSV from the West Crediton Zone and the chamber on Highway #81, west of Dashwood has a PSV from the Shipka Pressure Zone.
- **Huron Park Pressure Zone:** The control chamber on Airport Line and Huron Street has a normally closed chamber that can be opened remotely to provide emergency backup feed from the Exeter South Pressure Zone. In addition, the Exeter ET can be operated as backup to the Huron Park ET.
- **Exeter South Pressure Zone:** Backup is provided by the MacNaughton BPS and additional redundancy from the Exeter North Pressure Zone.
- **Exeter North Pressure Zone:** Backup is provided by the MacNaughton BPS and a PRV from the Exeter South Pressure Zone.

Table 26 presents the number of hours of storage available, with or without fire storage under both ADD and MDD for various storage and pressure zone configurations under the following assumptions:

- Assume storage is 100% full
- Fire Storage is based on 50 L/s for 2 hours
- For the Airport Reservoir, only the dedicated South Huron storage is available (69.81%)

Table 26: Hours of Storage Available

Demand Scenario Description	**South Exeter, North Exeter** *Exeter ET* *MacNaughton Reservoirs*		**South Exeter, North Exeter** *Exeter ET* *MacNaughton Reservoirs* *Airport Reservoirs*		**Lower West, West, Shipka, Dashwood, West Crediton, Huron Park** *Huron Park ET*		**Lower West, West, Shipka, Dashwood, West Crediton, Huron Park** *Huron Park ET* *Airport Reservoirs*		**Huron Park** *Exeter ET*		**Lower West, West, Shipka, Dashwood, West Crediton** *Huron Park ET*		**Lower West, West, Shipka, Dashwood, West Crediton** *Huron Park ET* *Airport Reservoirs*	
	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
Total Available Storage (ML)	5.1		10.7		2.7		8.3		1.5		2.7		8.3	
Hours at ADD while maintaining Fire Storage	66	32	143	69	26	12	89	40	58	36	34	14	115	47
Hours at ADD without maintaining Fire Storage	71	34	147	71	30	14	93	42	76	47	39	16	120	50
Hours at MDD while maintaining Fire Storage	35	17	75	36	14	6	47	21	31	19	18	7	60	25
Hours at MDD without maintaining Fire Storage	37	18	78	37	16	7	49	22	40	25	21	9	63	26

Based on the desktop analysis, and under the current configuration, the Stephen Pressure Zones only have 26 hours under ADD, without maintaining fire storage. This assumes that the Huron Park ET will supply the Huron Park Pressure Zone and backfeed all remaining water storage into the Stephen Pressure Zones. In comparison, the Exeter Pressure Zones have 66 hours under ADD, without maintaining fire storage and not accounting for the additional storage at the Airport Reservoir. This assumes that the Exeter ET and MacNaughton Reservoirs will supply all of Exeter.

Based on the desktop analysis presented above and details observed through modelling, the Municipality's system resiliency during this emergency condition was evaluated. As a part of the analysis, four alternatives, including one sub-alternative were identified and outlined in the following section. These alternatives were assessed under both ADD and MDD conditions and include:

- Alternative 1 – Backfeed from the Huron Park ET
- Alternative 2 – Install a new ET in a Stephen Pressure Zone
- Alternative 3A – Backfeed to the Stephen Pressure Zones from the Airport Reservoir: No additional storage upgrades
- Alternative 3B – Backfeed to the Stephen Pressure Zones from the Airport Reservoir: Double existing reservoir capacity
- Alternative 4 – Rely on New Storage at the LHPWSS WTP

Alternative 1: Backfeed from Huron Park ET

Under Alternative 1, the Huron Park ET will backfeed all of the Stephen Pressure Zones, either including or excluding the Huron Park Pressure Zone, as it has the opportunity to be supplied by the Exeter South Pressure Zone. Water will be conveyed from the Huron Park ET along Airport Line and then Crediton Road, bypassing the Crediton BPS to get to the remaining Stephen Pressure Zones.

This alternative focuses on minimizing the total system upgrades which also place minimal focus on security of supply. A new watermain will be installed between the Shipka Pressure Zone and West Pressure Zone to reduce the conveyance distance and provide increased system resiliency for the existing West and Lower West Pressure Zones.

The key projects required to service Alternative 1 include:

- New watermain from Corbett Line to Grand Bend Line along South Road
- Automate Crediton BPS valve for backfeeding

Alternative 2: Install new ET in Stephen Pressure Zone

Under Alternative 2, a new ET will be installed in a Stephen Pressure Zone to provide the benefit of floating storage and to increase operational flexibility. Installing a new ET in a Stephen Pressure Zone will reduce the risk during a fire or emergency by providing additional redundancy. The Stephen water system will still be heavily dependent on conveyance; however, the storage will be increased with the opportunity to greatly reduce the conveyance distance.

The key projects required to service Alternative 2 include:

- New ET with location subject to a separate EA
- New watermain from Corbett Line to Grand Bend Line along South Road

Alternative 3A: Utilize Existing Airport Storage

Under Alternative 3A, the Airport Reservoir and BPS storage will be used in combination with the Huron Park ET to backfeed the Stephen Pressure Zones. The Airport Reservoir is owned and operated by the LHPWSS and is used to store water for both the Municipality of South Huron and Municipality of Bluewater. The reservoir consists of one 8 ML storage reservoir, with the space to add a second storage reservoir to increase the size to 16 ML. The Municipality has an agreement with LHPWSS and Bluewater stating that 69.81% of this volume will be available to South Huron. As the Airport Reservoir and BPS is currently used as backup storage for the Exeter water system, pump upgrades and system piping reconfiguration will be required to backfeed the Stephen Pressure Zones.

The key projects required to service Alternative 3A include:

- New watermain from Corbett Line to Grand Bend Line along South Road
- Automate Crediton BPS valve for backfeeding
- Pump and piping upgrades at the Airport Reservoir and BPS
- Potential watermain replacement along Airport Line, between Crediton Road and Huron Street, based on inspection results

Alternative 3B: Utilize Airport Storage, Double Storage Size

Similar to Alternative 3A, under Alternative 3B, the Airport Reservoir and BPS storage will be used in combination with the Huron Park ET to backfeed the Stephen Pressure Zones. The existing Airport Reservoir consists of 8,000 m^3 of storage, with 69.81% of this volume available to South Huron. At the existing site, the reservoir can be expanded to the west, doubling the storage size to 16,000 m^3. As the Airport Reservoir and BPS is currently used as backup storage for the Exeter system, pump upgrades and system piping reconfiguration will be required at the Airport Reservoir and BPS to backfeed the Stephen Pressure Zones.

The key projects required to service Alternative 3B include:

- New watermain from Corbett Line to Grand Bend Line along South Road
- Automate Crediton BPS valve for backfeeding
- Pump and piping upgrades at the Airport Reservoir and BPS
- New reservoir cells at existing Airport Reservoir site to double existing storage size
- Potential watermain replacement along Airport Line, between Crediton Road and Huron Street, based on inspection results

Alternative 4: Rely on New Storage at LHPWSS WTP

Under Alternative 4, the Stephen Pressure Zones would be supplied by the new storage facility being constructed at the LHPWSS under emergency conditions. Under existing conditions, the LHPWSS cannot supply water to customers that are upstream of the existing LHPWSS facilities during plant shutdowns. This alternative would require the WTP pumps to remain in operation.

The key projects required to service Alternative 4 include:

- New watermain from Corbett Line to Grand Bend Line along South Road

The overview, system impacts, advantages, disadvantages, and evaluation are summarized in **Figure 10** and **Table 27**.

The full evaluation is included in **Appendix D**. Alternative 3A (Backfeed to Stephen Pressure Zones from the Airport Reservoir: No additional storage upgrades) provides the greatest amount of system redundancy while utilizing the system's existing infrastructure. Alternative 3A was selected as the preferred alternative.

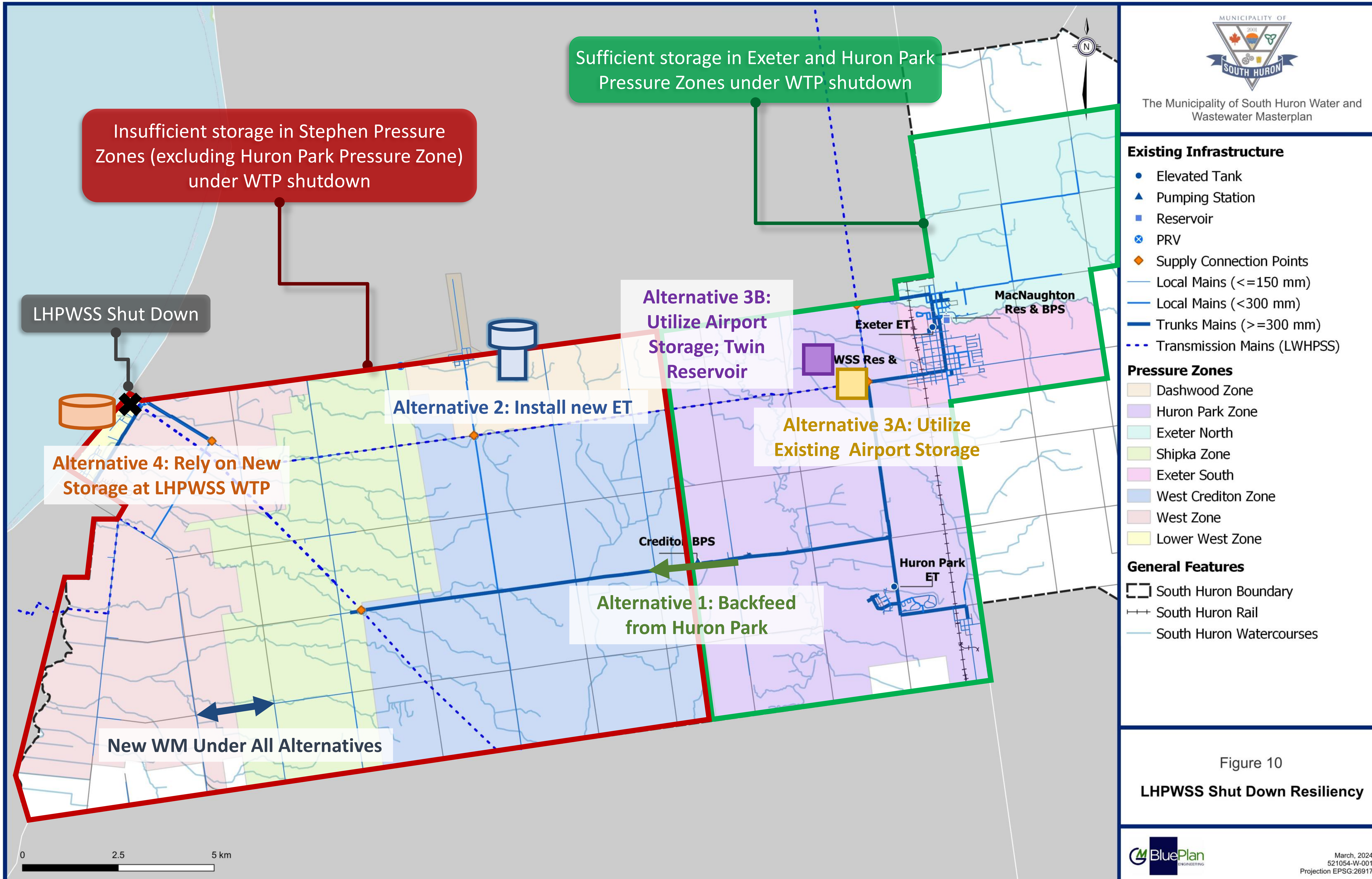


Figure 10

LHPWSS Shut Down Resiliency

Table 27: LHPWSS Shut Down Resiliency Alternatives and Evaluation

LHPWSS Shut Down Resiliency Alternatives	**Alternative 1:** Backfeed from Huron Park ET	**Alternative 2:** Install a new ET in Stephen Pressure Zone	**Alternative 3A:** Backfeed to Stephen Pressure Zones from the Airport Reservoir: No additional storage upgrades	**Alternative 3B:** Backfeed to Stephen Pressure Zones from the Airport Reservoir: Double existing reservoir capacity	**Alternative 4:** Rely on New Storage at the LHPWSS WTP
Overview	• Backfeed from Huron Park ET to all of the Stephen Pressure Zones (including or excluding Huron Park Pressure Zone) • Install new watermain along South Road from Corbett Line to Grand Bend Line • Automate Crediton BPS for backfeeding	• No existing floating storage in Stephen Pressure Zones (excluding Huron Park Pressure Zone) • Location of new ET subject to a separate EA • Install new watermain along South Road from Corbett Line to Grand Bend Line	• Airport Reservoir and BPS used in combination with the Huron Park ET to backfeed the Stephen Pressure Zones • Pump upgrades and system piping reconfiguration required at the Airport Reservoir and BPS to backfeed to Stephen Pressure Zones • Install new watermain along South Road from Corbett Line to Grand Bend Line	• Airport Reservoir and BPS used in combination with the Huron Park ET to backfeed the Stephen Pressure Zones • Construct new reservoir cells at existing Airport Reservoir site to double existing storage • Pump upgrades and system piping reconfiguration required at the Airport Res and BPS to backfeed to Stephen pressure zones • Install new watermain along South Road from Corbett Line to Grand Bend Line	• Utilize new storage at LHPWSS • Install new watermain along South Road from Corbett Line to Grand Bend Line
Advantages	• No major infrastructure required • No substantial changes to current operations • Increased system resiliency with new watermain from Shipka Pressure Zone to West Pressure Zone • Reduces conveyance distance to West and Lower West Pressure Zones under backfeeding event (currently being conveyed along Blackbush Line)	• ET location can be optimized to reduce infrastructure requirements • Provides benefit of floating storage and increases operational flexibility • Reduces risk during a fire or emergency • Provides redundancy as supply system ages and becomes more vulnerable • Reduces dependency on conveyance watermains for Stephen Pressure Zones	• Utilize existing storage facilities • Pump upgrades and system piping reconfiguration construction impacts localized to existing facility site • System has 89 hours under existing ADD without maintaining fire storage • Provides additional redundancy and security of supply during a fire or emergency for Stephen Pressure Zones	• Space is available for expansion at the existing Airport Reservoir and BPS • Potential for reservoir expansion within existing site without need for property acquisition • Increased redundancy with additional 63 hours of storage, as compared to Alternative 3A • Minor impacts during construction	• No infrastructure required • No substantial changes to current operations
Disadvantages	• System only has 34 hours under existing ADD without maintaining fire storage (excluding Huron Park Pressure Zone) • Stephen Pressure Zones are heavily reliant on conveyance • Greater importance on watermain conveyance for fire or emergency • Minimal focus on security of supply as supply system ages and becomes more vulnerable	• Potential negative public perception with new ET • High financial cost • An EA will be required • Will require land acquisition to site a new ET	• Dependence on pumps at Airport Reservoir and BPS has higher energy usage and reduced system resiliency • Pump upgrades and system reconfiguration at the Airport BPS required to accommodate peak demands within Stephen Pressure Zones • High importance on watermain conveyance, specifically the Airport Line waterman which has historical break issues	• Additional in-ground reservoir cell needed • Dependence on pumps at Airport Reservoir and BPS has higher energy usage and reduced system resiliency • Pump upgrades and system reconfiguration at the Airport BPS required to accommodate peak demands within Stephen pressure zones • High importance on watermain conveyance, specifically the Airport Line waterman which has historical break issues	• Storage is shared between all municipalities supplied by the LHPWSS. Amount of water available would be based on an agreement and may fluctuate making it hard to determine system Level of Service available. • Increased communications and partnership with LHPWSS. • Will not work under high-lift pump shutdown, unless backup pumps are installed • No system redundancy under high-lift pump shutdown
Cost	• South Road Watermain: $4.2 M • Crediton BPS Bypass Valve: $0.5M • **Total: $4.7 M**	• South Road Watermain: $4.2 M • New Stephen ET: $5 M • **Total: $9.3 M**	• South Road Watermain: $4.2 M • Crediton BPS Bypass Valve: $0.5 M • Airport Reservoir and BPS Pump and Pipe Upgrades: $1.0 M • Airport Line Watermain Inspection: $0.25 M • **Total: $6.0 M**	• South Road Watermain: $4.2 M • Crediton BPS Bypass Valve: $0.5 M • Airport Reservoir and BPS Pump and Pipe Upgrades: $1.0 M • Airport Res Expansion: $ 5.0 M • Airport Line Watermain Inspection: $0.25 M • **Total: $11.0 M**	• South Road Watermain: $4.2 M • **Total: $4.2 M**
Four-Point Criteria Evaluation	🔴 Tech-nical 🟢 Environ-mental 🟡 Social & Cultural 🟢 Finan-cial	🟡 Tech-nical 🟢 Environ-mental 🟡 Social & Cultural 🔴 Financial	🟢 Technical 🟡 Environ-mental 🟢 Social & Cultural 🟢 Financial	🟢 Technical 🟡 Environ-mental 🟢 Social & Cultural 🟢 Financial	🔴 Technical 🟢 Environ-mental 🟢 Social & Cultural 🟢 Financial
Recommended Alternative	**Not Recommended:** Does not provide highest system resiliency with existing infrastructure	**Not Recommended:** High costs and oversized storage infrastructure	**Recommended:** Provides greatest redundancy while utilizing existing infrastructure	**Not Recommended:** High costs and oversized storage infrastructure	**Not Recommended:** Not a reliable solution; dependent on extent of LHPWSS shutdown

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

6.3 Localized Upgrades

In addition to the system wide and pressure zone servicing strategies, the following local servicing needs were identified.

6.3.1 Fire Flow

Fire flow deficiencies were identified using a land-use based approach, where the governing land-use, at the closest fire hydrant, determined the fire flow target identified in **Section 2.2.2**. The resolution of these fire flow deficiencies was done methodically such that the resulting capital projects could be prioritized. This process is detailed through the following steps:

1. Creating loops through proposed development where feasible
2. Replacement of watermains at the same time of any planned road reconstruction
3. Replacement of aging or small diameter watermains

The fire flow deficiencies for the towns and villages and justification for their resolution is outlined in the following section with Capital Program projects and maps detailed in **Section 7**.

6.3.1.1 Exeter Fire Flow

Future growth within Exeter requires accommodating growth while maintaining the current Level of Service. **Figure 9** presents the fire flow deficiencies under existing conditions and with the additional growth.

The existing deficiencies are typically at dead ends, along cast iron watermains, or for higher fire flow criteria areas. Growth development deficiencies are typically at existing system dead ends. These areas can be addressed as growth occurs and can be funded by development charges. There are opportunities to provide additional system looping to help with security of supply and greater system flexibility.

6.3.1.2 Grand Bend Fire Flow

Under the existing fire flow scenario, there are fire flow deficiencies along the rural watermains on B-Line and Grand Bend Line. The existing deficiencies are typically at dead ends or for higher fire flow criteria areas. These areas can be addressed by upgrading existing watermains or by providing additional system looping through proposed development. Installing a loop from Highway #21 through Sol Haven Phase II and the future Turnbull development lands to Grand Bend Line would resolve all of the existing fire flow deficiencies for Grand Bend. Municipal staff have noted that the northwest end of the development parcel, where the extension of watermain would occur, is not a municipal right-of-way; however, constructing a watermain would provide the benefit of system looping.

6.3.1.3 Dashwood Fire Flow

Under the existing fire flow scenario, the rural fire flow of 50 L/s is not met throughout the village of Dashwood, with 35-40 L/s seen. Fire flows within the entire village can be addressed by upsizing the existing watermain along Bronson Line from the LHPWSS connection point at Huron Street to Boston Street and upsizing the watermain along Dashwood Road from Centre Street to approximately 335 m east of Lane Street.

6.3.1.4 Huron Park and Centralia

Under the existing fire flow scenario, there are fire flow deficiencies within the industrial area of Huron Park, west of Airport Line, as the ICI fire flow requirement of 150 L/s is not met in areas of existing small diameter watermains. A watermain loop from Alberta Street to Airport Line, just south of the Huron Park ET is recommended to improve system looping. The deficiencies south of the 300 mm watermain along Canada Avenue will require local watermain upgrades, which are recommended to be completed if development occurs in these areas.

Under existing conditions, fire flow is not provided along Victoria Drive, south of the Centralia SAB. If fire flow is required at the potential industrial block, south of the village, the watermain along Victoria Drive will need to be upgraded from the existing 300 mm to the property. To achieve a fire flow marginally below 100 L/s, a 250 mm diameter watermain is sufficient and to achieve a fire flow above 100 L/s, a 300 mm watermain extension is required.

6.3.2 Lower West and West Pressure Zone Merging

The West Pressure Zone was previously split into an additional Pressure Zone (Lower West Pressure Zone) by installing a PRV along Highway #21 at Waterworks Road. It is recommended that the remaining West Pressure Zone become a part of the Lower West Pressure Zone based on the following:

- High water pressure in the West Pressure Zone due to the high pressures currently used to supply the Municipality of Bluewater from the LHPWSS.
- Installing a new separate feed to Bluewater will reduce water pressure within South Huron and also reduce costs associated with potential water loss due to these high pressures
- Entire West Pressure Zone to be a part of the Lower West Pressure Zone
- Will eliminate need for current water deduct meter system with Bluewater
- Will have a PRV in the water meter and Bluewater will have their own meter
- Keep emergency backup feed for Bluewater

6.3.3 Operation and Condition Programs

The following section details the studies and operational changes as they relate to the existing and future water system.

6.3.3.1 Non-Revenue Water Reduction Program

The Municipality should implement a targeted NRW reduction program to address existing high NRW rates. While NRW reduction should be completed across the entire system, areas experiencing NRW greater than 25% will be specifically targeted with additional focus reducing NRW. The NRW was calculated for the system and was presented in **Section 2.1.1**. Based on the results presented in **Table 2**, the NRW in the Lower West and West Pressure Zones accounts for more than 50% and a specific focus should be placed on this pressure zone, specifically areas where water leakage has historically been an issue.

To better manage NRW, it is important to understand the components of NRW, and the factors which influence these components. The Municipality should calculate their NRW each year on a more refined scale, such that ongoing tracking can estimate key areas of improvement. These categories can be broken down into the following categories which align with the American Water Works Association (AWWA) methodology for evaluating NRW:

- Billed unmetered consumption (i.e. public works hydrants)
- Authorized consumption (i.e. municipal facilities)
- Unbilled unmetered authorized consumption (i.e. fire training, fire fighting, hydrant flushing, watermain flushing, water theft)
- Real water losses (i.e. leakage on watermains, leakage on water services)

Noting that a number of these categories requires estimation as a placeholder (i.e. fire department use, flushing, etc.).

To reduce the NRW, it is recommended that the Municipality implement the following key activities:

- Leak detection program for watermains;
- Watermain replacement program;
- Improved tracking of unbilled authorized users and development of demand reduction strategies:
    - Fire department
    - Watermain flushing
    - Facility usage
- Development of bulk water user strategy;
- Improved monitoring and enforcement of new construction water uses.

The South Huron system has several private/semi private water systems located which are located within high NRW areas. These private/semi private water systems are characterized as a water system servicing condo development and/or large sites where the watermains are not located within existing municipal right-of-way limiting typical operations and maintenance activities. There is an opportunity to better monitor and address potential NRW sources within these private/semi private water system through the implementation of boundary water metering program of private and semi-private water systems.

6.3.3.2 Boundary Water Meter Program

In combination with the proposed NRW program, it is recommended that the Municipality implement enhancements to its of boundary water metering program of private and semi-private water systems, with a step-by-step targeted approach, including a list of priority areas where bulk meters will be installed such as large private subdivisions. The boundary water metering program should be initiated immediately.

6.3.3.3 Watermain Condition

The Municipality has an ongoing State of Good Repair (SOGR) program that focuses on replacing aging watermains, where breaks and higher leakage can occur more frequently due to structural defects. All watermains that are flagged in the Capital Program should be monitored when completing any repairs or replacements.

6.3.3.4 Planned Road Reconstruction Works

The Municipality has planned road reconstruction works for the next 15 years. The watermains in line with these planned works have been additionally flagged for upgrade or replacement to limit future construction needs in the same right-of-way.

6.3.3.5 Water Meter Replacement Program

There is opportunity for the Municipality to develop a water meter replacement program to replace aging water meters. These aging water meters rely on labour intensive methods of collecting water meter reads including manual reads. Through the strategic replacement of these water meters, the Municipality will be able to more effectively collect data.

6.3.3.6 SCADA Master Plan

The current South Huron SCADA system is aging which may lead to constraints in effectively operating the existing and future water distribution system and may lead to operational vulnerabilities. A SCADA Master Plan should be conducted to evaluate the current state of the Municipality’s SCADA system such that recommendations and upgrades to current operation can be undertaken.

6.3.3.7 Corrosion Protection

A previous study was conducted by BM Ross (Cathodic Protection Investigation in Grand Bend and Exeter for two 350 mm Diameter Watermains, 2013) which indicated that key ductile iron watermains no longer had cathodic protection which subjects them to corrosion, reducing their service life. As such, anode banks should be installed at strategic locations along both the 350 mm watermains on Main Street in Exeter and along Highway #21 in Stephen. Following the installation of these anodes, confirmation testing of their effectiveness should be performed to ensure that they are functioning as intended.

6.3.3.8 Abandon Connections

Through the extension of South Huron water servicing to existing customers currently serviced by North Middlesex, two connections can be abandoned. This benefits the overall management of the water system as customer billing to South Huron is reduced.

The watermain extension along Mollard Line to Eagleson Line allow for the community of Greenway to serviced by South Huron allowing for the abandonment of the following connections:

- Bullock Line and Greenway Road North Middlesex Connection
- Eagleson Line and Greenway Road North Middlesex Connection

7 PREFERRED WATER SERVICING STRATEGY

The recommended water servicing strategy can be broken down into various components that have different aims, but each contribute to the overall improvement of the existing system and service the projected growth.

The preferred servicing strategy was developed to ensure that any programs or upgrades to the existing water distribution system are supportive of the existing and growth system and follows an integrated approach with the Municipality's existing and development plans.

7.1 Preferred Water Servicing Strategy Overview

The overall preferred water servicing strategy is outlined in the following section for both the Exeter and Stephen water systems.

7.1.1 Exeter

In general, the preferred water servicing strategy for Exeter consists of:

- Aligning growth strategy and watermain looping with the ongoing road reconstruction projects to improve fire flows for existing and growth demand.
- Installing a new ET in North Exeter and operating Exeter at one Pressure Zone at a higher HGL.
- New trunk watermain along Morrison Line from North Exeter to southeast Exeter for additional system flexibility and looping and improved pressures.

Key capital projects required to achieve this strategy include:

- North Exeter ET
- Morrison Line Watermain

In addition to the key capital projects, several other projects and upgrades are included within the water servicing strategy to address existing and growth capacity needs within the distribution system.

It should be noted that upgrades to the Airport Reservoir and BPS, as outlined in the LHPWSS Shutdown Resiliency Evaluation in **Section 6.2.3**, have not been included within the Capital Program. This project relies on upgraded infrastructure owned and operated by the LHPWSS; as such, communication with the LHPWSS will need to be undertaken to coordinate these upgrades.

7.1.2 Stephen

In general, the preferred water servicing strategy for Stephen consists of:

- Completing moderate alterations to the existing Stephen Pressure Zones including expanding the Lower West Pressure Zone to capture the West Pressure Zone and expanding the West Crediton Pressure Zone to capture the Dashwood Pressure Zone.
- Maximizing existing storage infrastructure in the Municipality's system.
- Increasing system resiliency and water transfer in the Stephen southwest rural lands by installing a new watermain along South Road between Corbett Line and Grand Bend Line.
- Investigation of the Airport Line watermain in order to determine existing condition and cause for frequent breaks. Improving this watermain will help to efficiently convey water between the Municipality's storage infrastructure including the Exeter ET, Airport Reservoir, and Huron Park ET, allowing the Stephen and Exeter zones to securely transfer water.
- Ensuring logical watermain looping occurs in line with development pressures to address fire flow deficiencies.
- Upsizing conveyance watermain to Dashwood to achieve fire flow requirements throughout village.
- Extend servicing to customers currently being serviced by North Middlesex and abandon current North Middlesex connections to reduce reliance on North Middlesex system.
- Targeted NRW reduction program including:
    - Implement implementation of boundary water metering program of private and semi-private water systems.
    - Leak detection program.

Key capital projects required to achieve this strategy include:

- Gore Road Watermain
- South Road Watermain
- Airport Line Watermain Inspection
- Bronson Line Watermain (Huron Street to Main Street)
- Crediton BPS and Airport Res and BPS Valving
- Water Meter Program

7.2 System Wide Servicing Needs

7.2.1 Pumping Stations

The following details the recommended upgrades at existing pumping stations:

- **E-W-P-01 – MacNaughton BPS Upgrades:** Upgrades needed at the MacNaughton BPS to accommodate HGL change due to Exeter Pressure Zone consolidation.
- **S-W-P-01 – Crediton BPS:** Installation of a bypass valve for to backfeed into the Stephen Pressure Zones.

7.2.2 Storage

The following details the recommended storage projects:

- **E-W-ET-02 – Exeter Elevated Tank Ladder:** Evaluate the ladder at the existing Exeter ET to ensure that it meets current safety standards and undertake upgrades or replacement if necessary.
- **E-W-ET-03 – Exeter Elevated Tank:** New 3.5 ML ET in northeast Exeter, sized to service both the existing North and South Exeter Pressure Zones.
- **E-W-D-01 – Decommission Existing Exeter Elevated Tank:** Decommissioning of the existing Exeter ET as it will be replaced by the new North Exeter ET.

7.2.3 Exeter Watermain Upgrades

The watermain projects to service the Exeter water system are outlined in the following sections.

7.2.3.1 Aging Infrastructure

The following watermains have been identified for replacement due to their age and material and/or are along identified road reconstruction project.

- **E-W-M-04 – Gidley Street East Watermain (Main Street to Andrew Street):** Replace existing 150 mm watermain on Gidley Street East from Main Street to Andrew Street.
- **E-W-M-05 – Hardy Street Watermain (Senior Street to east end):** Replace existing 150 mm watermain on Hardy Street from Senior Street to east end.
- **E-W-M-06 – Alexander Street West Watermain (McConnell Street to Francis Street):** Replace existing 200 mm watermain on Alexander Street West from McConnell Street to Francis Street.
- **E-W-M-07 – McConnell Street Watermain (Alexander Street to south end):** Replace existing 300 mm watermain on McConnell Street from Alexander Street to the south end.

- **E-W-M-09 – Thames Road West Watermain (GEXR to Main Street):** Replace existing 200 mm watermain on Thames Road West from GEXR to Main Street. Joint with Huron County.
- **E-W-M-10 – Hill Street Watermain (Andrew Street to east end):** Replace existing 150 mm watermain on Hill Street from Andrew Street to east end.
- **E-W-M-14 – Kingscourt Crescent Watermain (Pryde Boulevard to dead end):** Replace watermain on Kingscourt Crescent from Pryde Boulevard to the dead end.
- **E-W-M-15 – Waterloo Street Watermain (Acheson Street to Mary Street):** Replace existing 150 mm watermain on Waterloo Street from Acheson Street to Mary Street.
- **E-W-M-16 – Willis Way Watermain (West end to east end):** Replace existing 150 mm watermain on Willis Way from west end to east end.
- **E-W-M-17 – Church Street Watermain (William Street to Main Street):** Replace watermain on Church Street between William Street and Main Street.
- **E-W-M-18 – William Street Watermain (Wellington Street to north end):** Replace watermain on William Street from Wellington Street to the north end.
- **E-W-M-19 – Huron Street Watermain (Town Limit to Marlborough Street):** Abandon existing 150 mm watermain and transfer services, hydrants, and street connections to existing 300 mm watermain.
- **E-W-M-20 – William Street Watermain (Sanders Street to Wellington Street):** Replace existing 150 mm watermain on William Street from Sanders Street to Wellington Street.
- **E-W-M-22 – Simcoe Street Watermain (dead end to Edward Street):** Replace existing watermain on Simcoe Street from dead end to Edward Street..
- **E-W-M-23 – Andrew Street Watermain (Sanders Street to John Street East):** Replace existing watermain on Andrew Street from Sanders Street to John Street East.
- **E-W-M-24 – Wellington Street West Watermain (Marlborough Street to William Street):** Replace existing watermain on Wellington Street West from Marlborough Street to William Street.
- **E-W-M-25 – Gidley Street West Watermain (Main Street to William Street):** Replace existing watermain on Gidley Street West from Main Street to William Street.
- **E-W-M-26 – Sanders Street West Watermain (Main Street to William Street):** Replace existing watermain on Sanders Street West from Main Street to William Street.
- **E-W-M-27 – Alexander Street East Watermain (Main Street to Orchard Street):** Replace existing watermain on Alexander Street East from Main Street to Orchard Street.

- **E-W-M-28 – Andrew Street Watermain (MacNaughton Drive to Wellington Street East):** Replace existing watermain on Andrew Street from MacNaughton Drive to Wellington Street East.
- **E-W-M-29 – Wellington Street West Watermain (dead end to Marlborough Street):** Replace existing watermain on Wellington Street West from dead end to Marlborough Street.
- **E-W-M-30 – Victoria Street West Watermain (William Street to Carling Street):** Replace existing watermain on Victoria Street West from William Street to Carling Street.
- **E-W-M-31 – Wellington Street East Watermain (Main Street to Andrew Street):** Replace existing watermain on Wellington Street East from Main Street to Andrew Street.
- **E-W-M-32 – John Street West Watermain (Marlborough Street to William Street):** Replace existing watermain on John Street West from Marlborough Street to William Street.
- **E-W-M-33 – John Street East Watermain (Edward Street to Pryde Boulevard):** Replace existing watermain on John Street East from Edward Street to Pryde Boulevard.
- **E-W-M-34 – Devon Drive Watermain (George Street to dead end):** Replace existing watermain on Devon Drive from George Street to dead end.
- **E-W-M-35 – Hillcrest Drive Watermain (George Street to Riverside Drive):** Replace existing watermain on Hillcrest Drive from George Street to Riverside Drive.
- **E-W-M-36 – Abby Lane Watermain (Pinewood Avenue to Pinewood Avenue):** Replace existing watermain on Abby Lane from Pinewood Avenue to Pinewood Avenue.
- **E-W-M-37 – Pinewood Avenue Watermain (Huron Street East to Abbey Lane south leg):** Replace existing watermain on Pinewood Avenue from Huron Street East to Abbey Lane south leg.
- **E-W-M-38 – Devon Drive Watermain (Alexander Street East to George Street):** Replace existing watermain on Devon Drive from Alexander Street East to George Street.
- **E-W-M-39 – Main Street Watermain (Huron Street to MacNaughton Drive):** Replace watermain on Main Street between Huron Street and MacNaughton Drive, as part of a future MTO Connecting Link Project when funding is available.

7.2.3.2 Fire Flow

Fire flow watermain upgrades have been outlined to include the replacement or upsizing of existing watermains with planned road reconstruction projects, replacing small or flagged deficient watermains, and looping to strengthen local trunk network to improve existing and future system fire flows. All watermains that are flagged to be replaced or upsized have been provided to the Municipality and should be monitored when completing local work or identified as local development occurs.

- **E-W-M-03 – Victoria Street Watermain (Main Street to Pryde Blvd):** Upsize watermain on Victoria Street from Main Street to Pryde Boulevard.
- **E-W-M-11 – Thomas Street Watermain (Marlborough Street to William Street):** Replace watermain on Thomas Street between Marlborough Street and William Street.
- **E-W-M-12 – Carling Street Watermain (Huron Street to Waterloo Street):** Carling Street Watermain: Replace watermain connected to the hydrant on Carling Street between Huron Street and Waterloo Street.
- **E-W-M-13 – Mill Street Watermain (Market Street to William Street):** Replace watermain on Mill Street between Market Street and William Street.
- **E-W-M-21 – Marlborough Street Watermain (Wellington Street to Sanders Street):** Replace 150 mm CI watermain on Marlborough Street from Wellington Street to Sanders Street with 150 mm PVC.
- **E-W-M-40 – Wellington Street West Watermain (Railway to approximately 100 m east):** Upgrade existing watermain from 150 mm CI 19 mm copper water service to 150 mm PVC.
- **E-W-M-41 – John Street East Watermain (Exeter Villa to Pryde Boulevard):** Upsize existing watermain on John Street East from 150 mm to 200 mm.
- **E-W-M-52 – Victoria Street West Watermain (Marlborough Street to approximately 100 m west):** Upgrade existing watermain from 150 mm CI to 150 mm PVC.

7.2.3.3 Infrastructure Improvements

New watermains are recommended as infrastructure improvements as no existing watermain exists along an alignment that has a planned road reconstruction.

- **E-W-M-08 – Baldwin Street Watermain (Main Street to Andrew Street):** Install new watermain on Baldwin Street from Main Street to Andrew Street.

7.2.3.4 Growth Related Watermain Upgrades:

New watermains or watermain upgrades that are required to accommodate growth include the following:

- **E-W-M-42 – Thames Road East Watermain (McConnell Street to new North Exeter ET):** Upsize watermain to 350 mm to support new North Exeter ET.
- **E-W-M-43 – Morrison Line Watermain (Thames Road East to Huron Street):** New Watermain from Thames Road East to Huron Street to complete loop for southeast Exeter growth.
- **E-W-M-44 – CVD Subdivision Watermain Looping (Walper Street to Pickard Road):** New watermain through CVD Subdivision development connecting Walper Street to Pickard Road.
- **E-W-M-45 – Rasenberg Watermain Looping (Rosemount Avenue to Hazelton Lane):** New watermain through Rasenberg parcel connecting Rosemount Avenue to Hazelton Lane.
- **E-W-M-46 – Stoney Ridge Watermain Looping (Taylor Blvd and Eastern Avenue):** New watermain through Stoney Ridge development on Taylor Blvd and Eastern Avenue.
- **E-W-M-47 – Pooley Watermain Looping (Simcoe Street to Abbey Lane):** New watermain through proposed Pooley development connecting Simcoe Street to Abbey Lane.
- **E-W-M-48 – Ondrejicka Lower Watermain Looping (Sanders Street to Ondrejicka Looping - Upper):** New watermain through Ondrejicka development to loop watermain with connection to Sanders Street and Ondrejicka Upper Looping.
- **E-W-M-49 – Ondrejicka Upper Watermain Looping (Wellington Street, Victoria Street and Ondrejicka Lower Watermain Looping):** New watermain through Ondrejicka development to loop watermain with connection to Wellington Street, Victoria Street, and Ondrejicka Looping (Lower).
- **E-W-M-50 – HDC Lands Watermain Looping (Church Street to Nelson Street):** Watermain through HDC Lands parcel connecting Church Street to Nelson Street.

7.2.3.5 Corrosion Protection on Watermains

Corrosion protection is to be installed on the following existing DI watermains:

- **E-W-M-51 – Main Street Anode Banks:** Install anode banks at strategic locations along Main Street to provide cathodic protection.

7.2.4 Stephen Watermain Upgrades

The watermain projects to service the Stephen water system are outlined in the following sections.

7.2.4.1 Aging Infrastructure

The following watermains have been identified for replacement due to their age and material and/or are along identified road reconstruction project.

- **S-W-M-07 – Mollard Line Watermain (Grand Bend Line to South Road):** Replace existing 100 mm watermain on Mollard Line from Grand Bend Line to South Road.
- **S-W-M-08 – Grand Bend Line Watermain (POG to Greenway Road):** Replace existing 100 mm watermain on Grand Bend Line from POG to Greenway Road.
- **S-W-M-09 – Corbett Line Watermain (Huron Street to Gore Road):** Replace existing 100 mm watermain on Corbett Line from Huron Street to Gore Road.
- **S-W-M-11 – Goshen Line Watermain (Dashwood Road to Crediton Road):** Replace existing 100 mm watermain on Goshen Line from Dashwood Road to Crediton Road.
- **S-W-M-12 – Babylon Line Watermain (Crediton Road to Dashwood Road):** Replace existing 100 mm watermain on Babylon Line from Crediton Road to Dashwood Road.
- **S-W-M-13 – Bronson Line Watermain (Crediton Road to Huron Street):** Replace existing 200 mm Bronson Line watermain from Crediton Road to Huron Street (cost split with Bluewater).
- **S-W-M-14 – King Street North Watermain (Victoria Avenue East to approximately 410 m north):** Replace existing 150 mm watermain on King Street from Victoria Avenue to the south village limit.
- **S-W-M-15 – King Street South Watermain (Victoria Avenue to south village limit):** Replace existing 150 mm watermain on King Street from Victoria Avenue to the south village limit.
- **S-W-M-16 – Eilber Street Watermain (Victoria Avenue East to north limit):** Replace existing 50 mm watermain on Eilber Street from Victoria Avenue East to north end.
- **S-W-M-17 – Middle Street Watermain (Eilber Street to east end):** Replace existing 50 mm watermain on Middle Street from Eilber to east end).
- **S-W-M-18 – Guettinger Street Watermain (Victoria to north end):** Replace existing 50 mm watermain on William Street from Victoria Avenue East to north end).
- **S-W-M-19 – William Drive Watermain (Victoria Avenue West to north end):** Replace existing 150 mm watermain on William Drive from Victoria Avenue East to north end).

- **S-W-M-20 – Prince Leopold Street Watermain (Huron Park Road to Melbourne Street):** Replace existing 150 mm watermain on Prince Leopold Street from Huron Park Road to Melbourne Street.
- **S-W-M-21 – Melborne Street Watermain (Prince Leopold Street to Victoria Drive):** Replace existing 150 mm watermain on Melborne Street from Prince Leopold Street to Victoria Drive.
- **S-W-M-22 – York Street Watermain (Victoria Drive to Prince Albert Street):** Replace existing 150 mm watermain on York Street from Victoria Drive to Prince Albert Street.
- **S-W-M-23 – Prince Arthur Street Watermain (Melbourne Street to Portland Street):** Replace existing 150 mm watermain on Prince Arthur Street from Melbourne Street to Portland Street.
- **S-W-M-24 – Prince Alfred Street Watermain (Melbourne Street to Portland Street):** Replace existing 150 mm watermain on Prince Alfred Street from Melbourne Street to Portland Street.
- **S-W-M-25 – Prince Albert Street Watermain (York Street to Elgin Street):** Replace existing 150 mm watermain on Prince Albert Street from York Street to Elgin Street.
- **S-W-M-27 – Richmond Street Watermain (Prince Arthur Street to Victoria Drive):** Replace existing 150 mm watermain on Richmond Street from Prince Arthur Street to Victoria Drive.
- **S-W-M-28 – Portland Street Watermain (Prince Arthur Street to Victoria Drive):** Replace existing 150 mm watermain on Portland Street from Prince Arthur Street to Victoria Drive.
- **S-W-M-29 – Emla Street Watermain (Roland Street to Milton Street):** Replace existing 50 mm watermain on Emla Street from Roland Street to Milton Street.
- **S-W-M-30 – Milton Street Watermain (Emla Street to William Avenue):** Replace existing 50 mm watermain on Milton Street from Emla Street to William Avenue.
- **S-W-M-31 – William Avenue Watermain (Main Street Dashwood to Milton Street):** Replace existing 50 mm watermain on William Avenue from Main Street Dashwood to Milton Street.
- **S-W-M-32 – Boston Street Watermain (Centre Street to Fried Street):** Replace existing 50 mm watermain on Boston Street from Centre Street to Fried Street.
- **S-W-M-33 – Fried Street Watermain (Main Street Dashwood to Boston Street):** Replace existing 50 mm watermain on Fried Street from Main Street Dashwood to Boston Street.

- **S-W-M-35 – Airport Line Watermain Inspection (Crediton Road to Huron Street):** Inspect condition of existing 300 mm diameter watermain along Airport Line to see if any repairs or replacements are needed.
- **S-W-M-45 – Dashwood Road Watermain (Goshen Line to Black Creek):** Replace existing 100 mm watermain on Dashwood Road from Goshen Line to approximately 840 m east of Babylon Line.

7.2.4.2 Fire Flow

Fire flow watermain upgrades have been outlined to include the replacement or upsizing of existing watermains with planned road reconstruction projects, replacing small or flagged deficient watermains, and looping to strengthen local trunk network to improve existing and future system fire flows. All watermains that are flagged to be replaced or upsized have been provided to the Municipality and should be monitored when completing local work or identified as local development occurs.

- **S-W-M-01 – Dashwood Road (Centre Street to 335 m east of Lane Street):** Upsize existing 150 mm watermain on Dashwood Road to 200 mm from Centre Street to approximately 335 m east of Lane Street to address fire flow.
- **S-W-M-26 – Elgin Street Watermain (Victoria Drive to Highway #4):** Replace existing 50 mm watermain on Elgin Street from Victoria Drive to Highway #4.
- **S-W-M-34 – Huron Park Industrial Watermain Looping (North leg of Canada Avenue to Airport Line):** Loop 300 mm watermain from existing 300 mm watermain on North leg of Canada Avenue to Airport Line just south of the Huron Park ET as part of a future Plan of Subdivision when there is opportunity.
- **S-W-M-37 – Bronson Line Watermain (Crediton Road to Mount Carmel Drive):** Upsize existing 100 mm watermain to 200 mm on Bronson Line from Crediton Road to Mount Carmel Drive during proposed Bronson Line road reconstruction to address fire flow in Mount Carmel.
- **S-W-M-38 – Bronson Line Watermain (Huron Street to Boston Street):** Upsize existing 200 mm watermain on Bronson Line from Huron Street (LHPWSS Supply Point) to Boston Street (Dashwood southern extent) with 250 mm.

7.2.4.3 Infrastructure Improvements

Some areas where the infrastructure originally installed was of poor quality material and construction. Replacing poor quality infrastructure can greatly reduce the amount of water lost through leaks in pipes and valves; thus reducing operating costs. It can also reduce the risk that a failure will occur.

- **S-W-M-04 – Gore Road Watermain (B-Line to Highway 21):** Replace existing 150 mm watermain on Gore Road with a 300 mm. Entire West Pressure Zone to become part of the new Grand Bend Pressure Zone.
- **S-W-M-05 – South Road Watermain (Corbett Line to Grand end Line):** New 150 mm watermain from Corbett Line to Grand Bend Line along South Road. Secondary watermain feed from Shipka Pressure Zone to West Pressure Zone.
- **S-W-M-06 – Highway 21 Watermain (Gore Road to Indian Road):** Replace Highway 21 watermain with a smaller diameter watermain from Gore Road to Indian Road.
- **S-W-M-10 – Blackbush Line Watermain (Crediton Road to Mount Carmel Drive):** Install new 100 mm watermain on Blackbush Line from Crediton Road to Mount Carmel Drive.
- **S-W-M-46 – Eagleson Line and Mollard Line Watermain Looping:** Loop watermain from Mollard Line to Eagleson Line to extend servicing to customers currently being serviced by North Middlesex. Abandon current North Middlesex connection.
- **S-W-M-47 – Airport Line Watermain Extension:** Extend watermain from Huron Park Road to approximately 535 m north of Mount Carmel Drive to extend servicing to customer currently being serviced by North Middlesex.

7.2.4.4 Growth Related Watermain Upgrades

New watermains or watermain upgrades that are required to accommodate growth include the following:

- **S-W-M-36 – Victoria Drive Watermain (Melbourne Street to Exi-Plast Custom Moulding / former Dashwood Industries):** Upsize existing watermain from 100 mm / 150 mm to 250 mm along Victoria Drive from the existing 300 mm at Melbourne Street to Exi-Plast Custom Moulding/Dashwood Industries.
- **S-W-M-39 – Highway 21 to Grand Bend Line Watermain Looping:** Loop watermain from Highway 21 to Grand Bend Line with 200 mm watermain through Sol Haven Phase II parcel and Turnbull farm future development lands.
- **S-W-M-40 – Grand Bend Line Watermain (B-Line to POG):** Upsize existing watermain from 100 mm to 250 mm on Grand Bend line from B-Line to Bendtech property for new development.

- **S-W-M-41 – Grand Bend Line Watermain (B-Line to Mollard Line):** Upsize existing watermain from 100 mm to 200 mm on Grand Bend Line to support future growth (Turnbull Farm future development lands).
- **S-W-M-42 – Victoria Avenue East to Parr Line Watermain Loop:** Loop watermain from Victoria Avenue East to King Street with 150 mm watermain through Crediton Village Centre Subdivision.

7.2.4.5 Corrosion Protection on Watermains

Corrosion protection is to be installed on the following existing DI watermains:

- **S-W-M-43 – Highway 21 Anode Banks:** Install anode banks and corrosion monitoring coupons at strategic locations along Highway 21.

7.2.4.6 Redundant and Unutilized Infrastructure

There is infrastructure in the Municipality's system that is no longer in use. These watermains can be disconnected from the system and properly decommissioned.

- **S-W-D-02 – Abandon Bullock Line and Greenway Road North Middlesex Connection:** Water is supplied to the communities of Greenway and Corbett by the North Middlesex system. Abandon Connection.

7.2.5 Studies and Strategies

A number of studies and strategies to support the ongoing management and performance of the water system. These include the following:

- **S-W-ST-01 – Non-Revenue Water:** Water loss program.
- **S-W-ST-03 – SCADA Master Plan:** SCADA Master Plan and Associated Upgrades.

7.3 Capital Program

The preferred water servicing strategy has been developed to support the servicing needs of the existing and future growth areas within the Municipality of South Huron. The capital costs for each project of the Preferred Strategy were estimated according to the costing methodology within **Volume I**. These projects are listed according to their project number. Detailed project sheets are included in **Appendix E**.

7.3.1 Implementation Plan

As outlined in **Volume I**, the 2023 MPU sets out to satisfy the Class EA Master Plan Approach 1 requirements according to the MEA Class EA document. The Preferred Water Servicing Strategy will support the servicing needs of the Municipality of South Huron's future growth to buildout. This strategy will be implemented in accordance with each project Class EA schedule.

The Class EA requirements for each project have been identified in the Capital Program. Schedule A and A+ projects may move forward to design and construction, with A+ projects requiring public notification prior to implementation. Schedule B or equivalent projects that have been identified within the Preferred Water Servicing Strategy will be part of a developer-led local servicing plan and approved through the Planning Act Municipal development review process or will be satisfied through separate Class EA studies prior to design and construction. The Preferred Water Strategy did not identify any Schedule C projects.

All necessary studies (environmental impact, cultural heritage resource, and archeological resource, etc.) should be undertaken by an appropriate professional as early as possible during the planning process for all Schedule B projects identified within the Preferred Servicing Strategy.

During the next steps of the implementation program, primarily during detailed design of the projects, the following requirements should be considered:

- Finalization of property requirements;
- Refinement of infrastructure alignment;
- Identification of preferred construction methodologies;
- Completion of additional supporting investigations as required (e.g. geotechnical, hydrogeological, etc.);
- Review and mitigation of potential construction related impacts; and,
- Satisfying all provincial, municipal and conservation authority approval requirements.

With respect to the Municipality’s planning and budgeting, this program will be used as a high-level baseline estimate for the Municipality’s capital budget. These costs will be further developed and refined during the implementation phases as detailed information becomes available.

The anticipated timing of each project within the Preferred Strategy has been established based on the projected population and employment growth within the Municipality, as well as ongoing reconstruction projects. The water program’s projected scheduling has also been cross referenced with the wastewater programs to ensure project coordination along common alignments.

Given the growth-related nature of the servicing strategies, the water capital program forms the foundation for the water component of the Municipality of South Huron’s Development Charged (DC) By-Law.

7.3.2 Project Timing and Triggers

To support the Municipality's long-term budgeting and water rates, a preliminary project timeline for each water Capital Program project has been identified. Project timing has been identified in the following increments:

- 0-5 Years
- 5-10 Years
- 10-15 Years

The estimated project timeline was based on the Municipality's Capital Program schedule.

7.3.3 Operational and Maintenance Impacts

The proposed water system upgrades represent an increase in the Municipality's watermain network and replacement of one storage facility. It is anticipated that the above system expansions will increase the network operational and maintenance costs by an equivalent amount. As such, these additional operational costs, and supporting staff increases, will need to be factored into the Municipality's long-term water system financial planning and operational needs.

7.3.4 Capital Program Summary

Summary maps and tables of the recommended upgrades for the Capital Program are included in **Table 28** to **Table 29** and **Figure 11** to **Figure 15**.

Table 28: Water Capital Program Summary – Exeter

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
E-W-M-03	Victoria Street Watermain (Main Street to Pryde Blvd)	Exeter	A	Watermain	Aging Infrastructure / Fire Flow	200 mm	$ 1,461,000	0-5 Years
E-W-M-04	Gidley Street East Watermain (Main Street to Andrew Street)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 305,000	0-5 Years
E-W-M-05	Hardy Street Watermain (Senior Street to east end)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 350,000	0-5 Years
E-W-M-06	Alexander Street West Watermain (McConnell Street to Francis Street)	Exeter	A	Watermain	Aging Infrastructure	200 mm	$ 353,000	0-5 Years
E-W-M-07	McConnell Street Watermain (Alexander Street to south end)	Exeter	A	Watermain	Aging Infrastructure	300 mm	$ 393,000	0-5 Years
E-W-M-08	Baldwin Street Watermain (Main Street to Andrew Street)	Exeter	A	Watermain	Infrastructure Improvements	150 mm	$ 328,000	0-5 Years
E-W-M-09	Thames Road West Watermain (GEXR to Main Street)	Exeter	A	Watermain	Aging Infrastructure	200 mm	$ 1,975,000	0-5 Years
E-W-M-10	Hill Street Watermain (Andrew Street to east end)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 236,000	0-5 Years
E-W-M-11	Thomas Street Watermain (Marlborough Street to William Street)	Exeter	A	Watermain	Aging Infrastructure / Fire Flow	150 mm	$ 1,137,000	0-5 Years
E-W-M-12	Carling Street Watermain (Huron Street to Waterloo Street)	Exeter	A	Watermain	Aging Infrastructure / Fire Flow	150 mm	$ 1,186,000	0-5 Years
E-W-M-13	Mill Street Watermain (Market Street to William Street)	Exeter	A	Watermain	Aging Infrastructure / Fire Flow	100 mm	$ 952,000	0-5 Years
E-W-M-14	Kingscourt Crescent Watermain (Pryde Boulevard to dead-end)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 696,000	5-10 Years
E-W-M-15	Waterloo Street Watermain (Acheson Street to Mary Street)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 665,000	5-10 Years
E-W-M-16	Willis Way Watermain (West end to east end)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 861,000	5-10 Years
E-W-M-17	Church Street Watermain (William Street to Main Street)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 350,000	5-10 Years
E-W-M-18	William Street Watermain (Wellington Street to north end)	Exeter	A	Watermain	Aging Infrastructure	300 mm	$ 1,898,000	5-10 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
E-W-M-19	Huron Street Watermain (Town Limit to Marlborough Street)	Exeter	A	Watermain	Aging Infrastructure	300 mm	$ 250,000	5-10 Years
E-W-M-20	William Street Watermain (Sanders Street to Wellington Street)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 1,894,000	5-10 Years
E-W-M-21	Marlborough Street Watermain (Wellington Street to Sanders Street)	Exeter	A	Watermain	Aging Infrastructure / Fire Flow	150 mm	$ 1,894,000	5-10 Years
E-W-M-22	Simcoe Street Watermain (dead end to Edward Street)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 466,000	10-15 Years
E-W-M-23	Andrew Street Watermain (Sanders Street to John Street East)	Exeter	A	Watermain	Aging Infrastructure	150 mm	$ 328,000	10-15 Years
E-W-M-24	Wellington Street West Watermain (Marlborough Street to William Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 1,137,000	10-15 Years
E-W-M-25	Gidley Street West Watermain (Main Street to William Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 328,000	10-15 Years
E-W-M-26	Sanders Street West Watermain (Main Street to William Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 328,000	10-15 Years
E-W-M-27	Alexander Street East Watermain (Main Street to Orchard Street)	Exeter	A	Watermain	Aging Infrastructure	300 ML	$ 370,000	10-15 Years
E-W-M-28	Andrew Street Watermain (MacNaughton Drive to Wellington Street East)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 1,137,000	10-15 Years
E-W-M-29	Wellington Street West Watermain (dead end to Marlborough Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 696,000	10-15 Years
E-W-M-30	Victoria Street West Watermain (William Street to Carling Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 466,000	10-15 Years
E-W-M-31	Wellington Street East Watermain (Main Street to Andrew Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 328,000	10-15 Years
E-W-M-32	John Street West Watermain (Marlborough Street to William Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 1,137,000	10-15 Years
E-W-M-33	John Street East Watermain (Edward Street to Pryde Boulevard)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 650,000	10-15 Years
E-W-M-34	Devon Drive Watermain (George Street to dead end)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 213,000	10-15 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
E-W-M-35	Hillcrest Drive Watermain (George Street to Riverside Drive)	Exeter	A	Watermain	Aging Infrastructure	100 ML	$ 350,000	10-15 Years
E-W-M-36	Abby Lane Watermain (Pinewood Avenue to Pinewood Avenue)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 535,000	10-15 Years
E-W-M-37	Pinewood Avenue Watermain (Huron Street East to Abbey Lane south leg)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 459,000	10-15 Years
E-W-M-38	Devon Drive Watermain (Alexander Street East to George Street)	Exeter	A	Watermain	Aging Infrastructure	150 ML	$ 512,000	10-15 Years
E-W-M-39	Main Street Watermain (Huron Street to MacNaughton Drive)	Exeter	A	Watermain	Aging Infrastructure	350 ML	$ 4,593,000	0-5 Years
E-W-M-40	Wellington Street West Watermain (Railway to approximately 100 m east)	Exeter	A	Watermain	Fire Flow	150 ML	$ 282,000	5-10 Years
E-W-M-41	John Street East Watermain (Exeter Villa to Pryde Boulevard)	Exeter	A	Watermain	Fire Flow	200 ML	$ 330,000	5-10 Years
E-W-M-42	Thames Road East Watermain (McConnell Street to new North Exeter ET)	Exeter	A	Watermain	Growth	350 ML	$ 2,589,000	10-15 Years
E-W-M-43	Morrison Line Watermain (Thames Road East to Huron Street)	Exeter	A	Watermain	Growth	250 ML	$ 4,791,000	10-15 Years
E-W-M-44	CVD Subdivision Watermain Looping (Walper Street to Pickard Road)	Exeter	A	Watermain	Growth	200 ML	$ 1,208,000	0-5 Years
E-W-M-45	Rasenberg Watermain Looping (Rosemount Avenue to Hazelton Lane)	Exeter	A	Watermain	Growth	200 ML	$ 477,000	5-10 Years
E-W-M-46	Stoney Ridge Watermain Looping (Taylor Blvd and Eastern Avenue)	Exeter	A	Watermain	Growth	150 ML	$ 571,000	0-5 Years
E-W-M-47	Pooley Watermain Looping (Simcoe Street to Abbey Lane)	Exeter	A	Watermain	Growth	150 ML	$ 763,000	5-10 Years
E-W-M-48	Ondrejicka Lower Watermain Looping (Sanders Street to Ondrejicka Looping - Upper)	Exeter	A	Watermain	Growth	200 ML	$ 1,385,000	5-10 Years
E-W-M-49	Ondrejicka Upper Watermain Looping (Wellington Street, Victoria Street and Ondrejicka Lower Watermain Looping)	Exeter	A	Watermain	Growth	200 ML	$ 1,021,000	5-10 Years
E-W-M-50	HDC Lands Watermain Looping (Church Street to Nelson Street)	Exeter	A	Watermain	Growth	150 ML	$ 1,014,000	5-10 Years

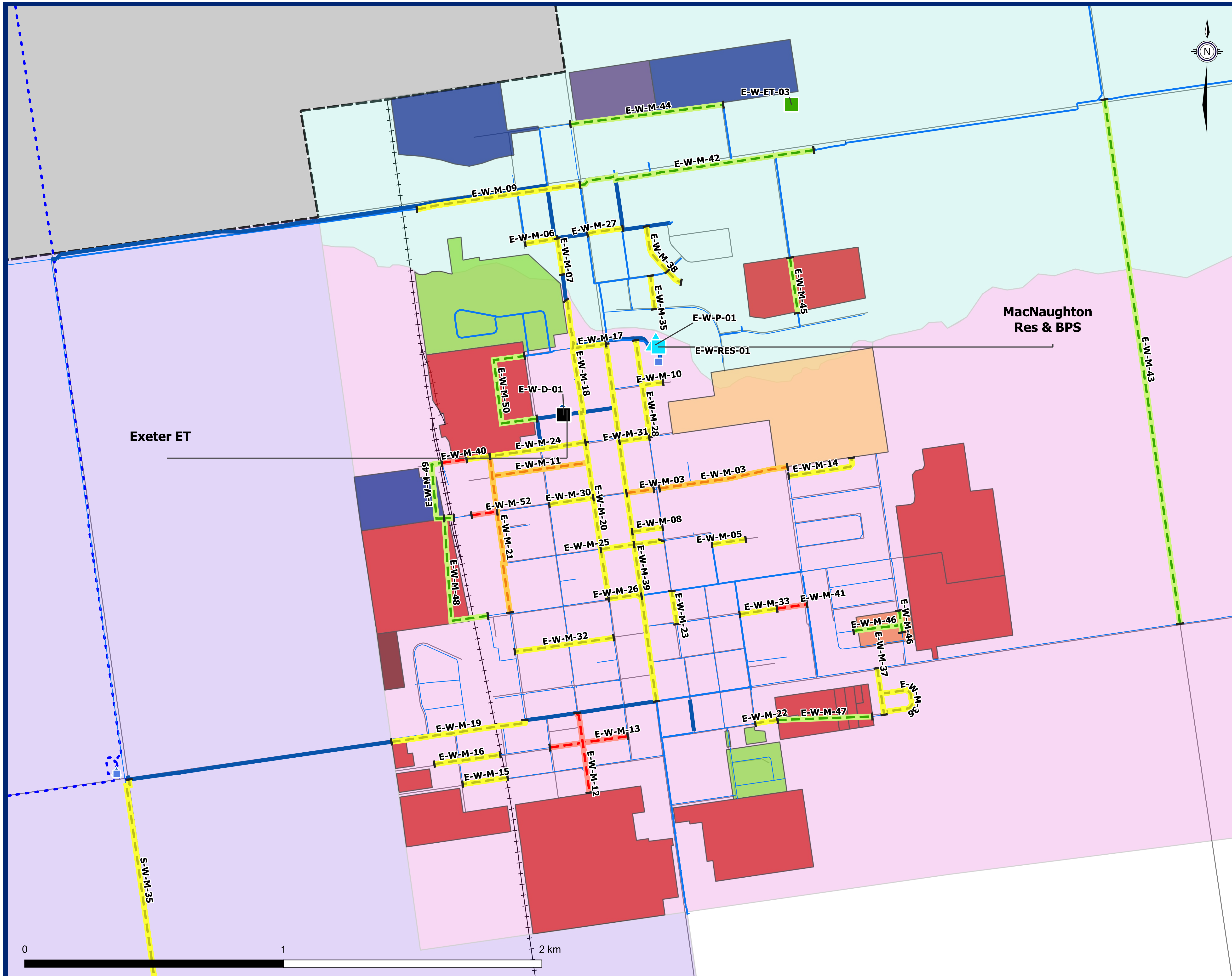
Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
E-W-M-51	Main Street Anode Banks	Exeter	A	Watermain	Corrosion Protection	N/A	$ 137,000	0-5 Years
E-W-M-52	Victoria Street West Watermain (Marlborough Street to approximately 100 m west)	Exeter	A	Watermain	Fire Flow	150 ML	$ 282,000	5-10 Years
E-W-ET-02	Exeter Elevated Tank Ladder	Exeter	A	Storage	Infrastructure Improvements	N/A	$ 60,000	0-5 Years
E-W-ET-03	North Exeter Elevated Tank	Exeter	B	Storage	Growth	4 ML	$ 8,768,000	10-15 Years
E-W-RES-01	Repairs to MacNaughton Reservoirs	Exeter	A	Storage	Aging Infrastructure	N/A	$ 1,500,000	0-5 Years
E-W-P-01	MacNaughton BPS Upgrades	Exeter	N/A	Pumping	Infrastructure Improvements	N/A	$ 500,000	10-15 Years
E-W-D-01	Decommission Existing Exeter Elevated Tank	Exeter	A	Decommission	Redundant and Unutilized Infrastructure	N/A	$ 823,000	10-15 Years
						Exeter Capital Program Total:	**$ 57,718,000**	

Table 29: Water Capital Program Summary – Stephen

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
S-W-M-01	Dashwood Road (Centre Street to 335 m east of Lane Street)	Stephen	A	Watermain	Fire Flow	200 mm	$ 1,634,000	0-5 Years
S-W-M-04	Gore Road Watermain (B-Line to Highway 21)	Stephen	A	Watermain	Infrastructure Improvements	250 mm	$ 4,096,000	0-5 Years
S-W-M-05	South Road Watermain (Corbett Line to Grand Bend Line)	Stephen	A	Watermain	Infrastructure Improvements	150 mm	$ 4,226,000	0-5 Years
S-W-M-06	Highway 21 Watermain (Gore Road to Indian Road)	Stephen	A	Watermain	Infrastructure Improvements	300 mm	$ 5,247,000	0-5 Years
S-W-M-07	Mollard Line Watermain (Grand Bend Line to South Road)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 10,590,000	0-5 Years
S-W-M-08	Grand Bend Line Watermain (POG to Greenway Road)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 11,225,000	5-10 Years
S-W-M-09	Corbett Line Watermain (Huron Street to Gore Road)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 610,000	5-10 Years
S-W-M-10	Blackbush Line Watermain (Crediton Road to Mount Carmel Drive)	Stephen	A	Watermain	Infrastructure Improvements	100 mm	$ 8,328,000	5-10 Years
S-W-M-11	Goshen Line Watermain (Dashwood Road to Crediton Road)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 12,472,000	5-10 Years
S-W-M-12	Babylon Line Watermain (Crediton Road to Dashwood Road)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 12,538,000	5-10 Years
S-W-M-13	Bronson Line Watermain (Crediton Road to Huron Street)	Stephen	A	Watermain	Aging Infrastructure	200 mm	$ 8,391,000	5-10 Years
S-W-M-14	King Street North Watermain (Victoria Avenue East to approximately 410 m north)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 840,000	10-15 Years
S-W-M-15	King Street South Watermain (Victoria Avenue to south village limit)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 860,000	10-15 Years
S-W-M-16	Eilber Street Watermain (Victoria Avenue East to north limit)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 197,000	10-15 Years
S-W-M-17	Middle Street Watermain (Eilber Street to east end)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 197,000	10-15 Years
S-W-M-18	Guettinger Street Watermain (Victoria to north end)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 197,000	10-15 Years
S-W-M-19	William Drive Watermain (Victoria Avenue West to north end)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 417,000	10-15 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
S-W-M-20	Prince Leopold Street Watermain (Huron Park Road to Melbourne Street)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 857,000	10-15 Years
S-W-M-21	Melborne Street Watermain (Prince Leopold Street to Victoria Drive)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 857,000	10-15 Years
S-W-M-22	York Street Watermain (Victoria Drive to Prince Albert Street)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 270,000	10-15 Years
S-W-M-23	Prince Arthur Street Watermain (Melbourne Street to Portland Street)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 704,000	10-15 Years
S-W-M-24	Prince Alfred Street Watermain (Melbourne Street to Portland Street)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 907,000	10-15 Years
S-W-M-25	Prince Albert Street Watermain (York Street to Elgin Street)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 443,000	10-15 Years
S-W-M-26	Elgin Street Watermain (Victoria Drive to Highway #4)	Stephen	A	Watermain	Aging Infrastructure/Fire Protection	150 mm	$ 727,000	10-15 Years
S-W-M-27	Richmond Street Watermain (Prince Arthur Street to Victoria Drive)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 566,000	10-15 Years
S-W-M-28	Portland Street Watermain (Prince Arthur Street to Victoria Drive)	Stephen	A	Watermain	Aging Infrastructure	150 mm	$ 543,000	10-15 Years
S-W-M-29	Emla Street Watermain (Roland Street to Milton Street)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 282,000	10-15 Years
S-W-M-30	Milton Street Watermain (Emla Street to William Avenue)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 350,000	10-15 Years
S-W-M-31	William Avenue Watermain (Main Street Dashwood to Milton Street)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 700,000	10-15 Years
S-W-M-32	Boston Street Watermain (Centre Street to Fried Street)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 535,000	10-15 Years
S-W-M-33	Fried Street Watermain (Main Street Dashwood to Boston Street)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 470,000	10-15 Years
S-W-M-34	Huron Park Industrial Watermain Looping (North leg of Canada Avenue to Airport Line)	Stephen	A	Watermain	Fire Flow / Infrastructure Improvements / Growth	300 mm	$ 1,306,000	5-10 Years
S-W-M-35	Airport Line Watermain Inspection (Crediton Road to Huron Street)	Stephen	A	Watermain	Aging Infrastructure	N/A	$ 250,000	0-5 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/ Capacity	Total Component Estimated Cost	Timeline
S-W-M-36	Victoria Drive Watermain (Melbourne Street to Exi-Plast Custom Moulding / former Dashwood Industries)	Stephen	A	Watermain	Fire Flow / Growth	250 mm	$ 2,144,000	5-10 Years
S-W-M-37	Bronson Line Watermain (Crediton Road to Mount Carmel Drive)	Stephen	A	Watermain	Fire Flow	200 mm	$ 8,458,000	10-15 Years
S-W-M-38	Bronson Line Watermain (Huron Street to Boston Street)	Stephen	A	Watermain	Fire Flow	250 mm	$ 3,858,000	0-5 Years
S-W-M-39	Highway 21 to Grand Bend Line Watermain Looping	Stephen	A	Watermain	Growth	200 mm	$ 3,921,000	10-15 Years
S-W-M-40	Grand Bend Line Watermain (B-Line to POG)	Stephen	A	Watermain	Growth	250 mm	$ 3,112,000	0-5 Years
S-W-M-41	Grand Bend Line Watermain (B-Line to Mollard Line)	Stephen	A	Watermain	Growth	200 mm	$ 2,104,000	5-10 Years
S-W-M-42	Victoria Avenue East to Parr Line Watermain Loop	Stephen	A	Watermain	Growth	150 mm	$ 1,263,000	5-10 Years
S-W-M-43	Highway 21 Anode Banks	Stephen	A	Watermain	Corrosion Protection	N/A	$ 200,000	0-5 Years
S-W-M-45	Dashwood Road Watermain (Goshen Line to Black Creek)	Stephen	A	Watermain	Aging Infrastructure	100 mm	$ 7,864,000	10-15 Years
S-W-M-46	Eagleson Line and Mollard Line Watermain Looping	Stephen	A	Watermain	Reduced billing / dependency on North Middlesex system	100 mm	$ 2,872,000	10-15 Years
S-W-M-47	Airport Line Watermain Extension	Stephen	A	Watermain	Reduced Billing / Dependency on North Middlesex System	100 mm	$ 3,058,000	10-15 Years
S-W-P-01	Crediton BPS Bypass Valve	Stephen	N/A	Pumping	Infrastructure Improvements	N/A	$ 500,000	0-5 Years
S-W-D-02	Abandon Bullock Line and Greenway Road North Middlesex Connection	Stephen	A	Decommission	Infrastructure Improvements	N/A	$ 50,000	10-15 Years
S-W-ST-01	Non-Revenue Water	Stephen	N/A	Study	Aging Infrastructure and Increased Revenue	N/A	$ 250,000	0-5 Years
S-W-ST-03	SCADA Master Plan	Stephen	N/A	Study	Aging SCADA System	N/A	$ 100,000	0-5 Years
						Total:	**$ 131,586,000**	



MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure
- Elevated Tank
- Reservoir
- Pumping Station
- PRV
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Main (LHPWSS)

Pressure Zones
- Exeter North
- Exeter South

Growth Parcels
- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/ Commercial Area
- Potential Commercial Area
- Potential Industrial Area

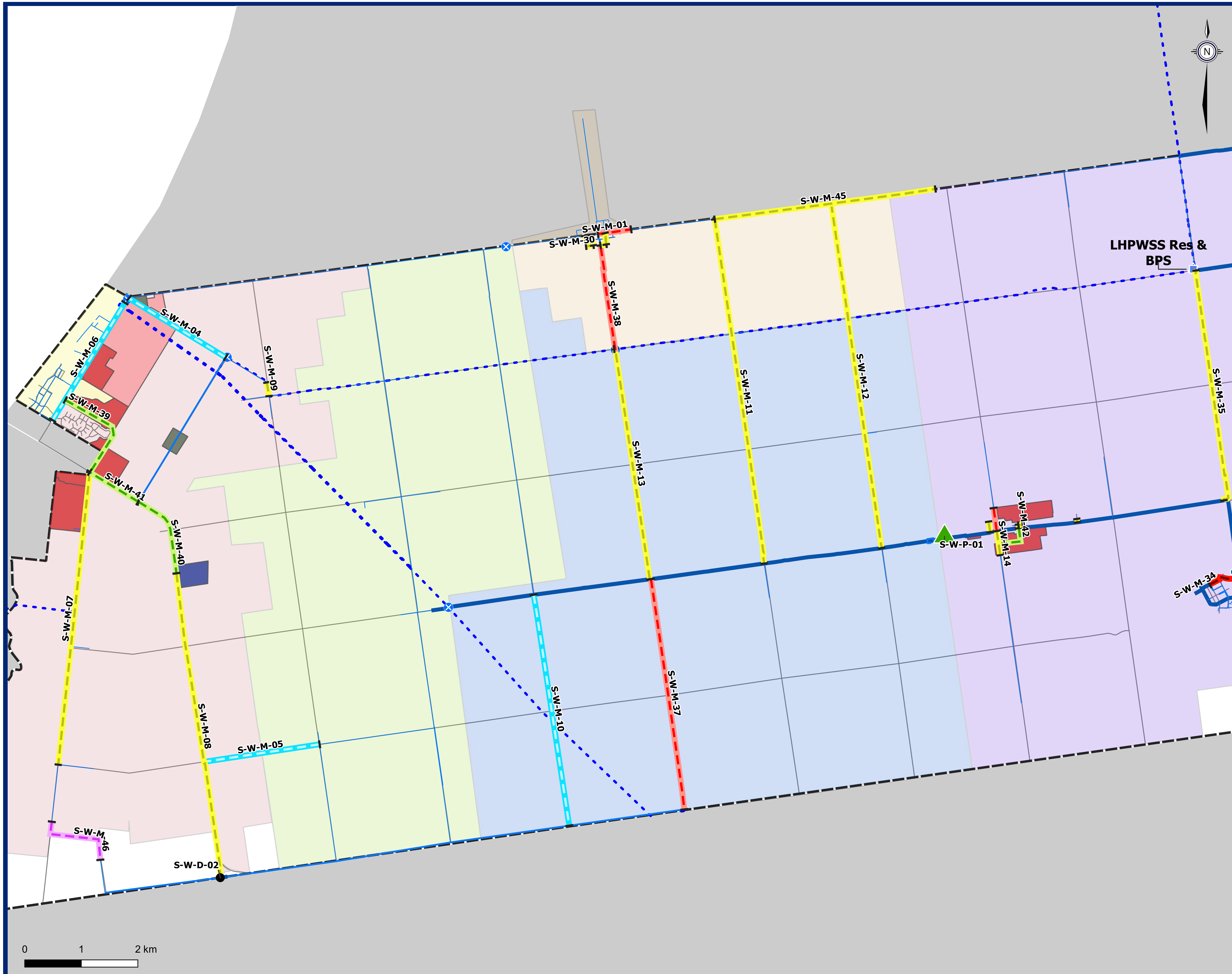
Capital Program
- Growth
- Infrastructure Improvements
- Aging Infrastructure
- Fire Flow
- Fire Flow / Infrastructure Improvements
- Aging Infrastructure / Fire Flow
- Reduced Billing / Dependency on North Middlesex
- Decommission Watermain
- New Pumping Station
- Upgrade Pumping Station
- Upgraded Storage
- New Elevated Tank
- Decommission Elevated Tank
- Decommission Connection

Figure 11

Exeter - Capital Program

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917



MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure

- Elevated Tank
- Reservoir
- Pumping Station
- PRV
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Main (LHPWSS)

Pressure Zones

- Dashwood Zone
- West Crediton Zone
- Huron Park Zone
- West Zone
- Shipka Zone
- Lower West Zone

Growth Parcels

- Developed
- Future Residential
- Partially Developed
- Potential Residential/ Commercial Area
- Draft Plan Approved
- Potential Commercial Area
- Pre-Servicing Agreement
- Potential Industrial Area
- Long Term Care Facility
- Potential Residential Area

Capital Program

- Growth
- New Pumping Station
- Infrastructure Improvements
- Upgrade Pumping Station
- Aging Infrastructure
- Upgraded Storage
- Fire Flow
- New Elevated Tank
- Fire Flow / Infrastructure Improvements
- Decommission Elevated Tank
- Aging Infrastructure / Fire Flow
- Decommission Connection
- Reduced Billing / Dependency on North Middlesex
- Decommission Watermain

Figure 12

Stephen - Capital Program

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

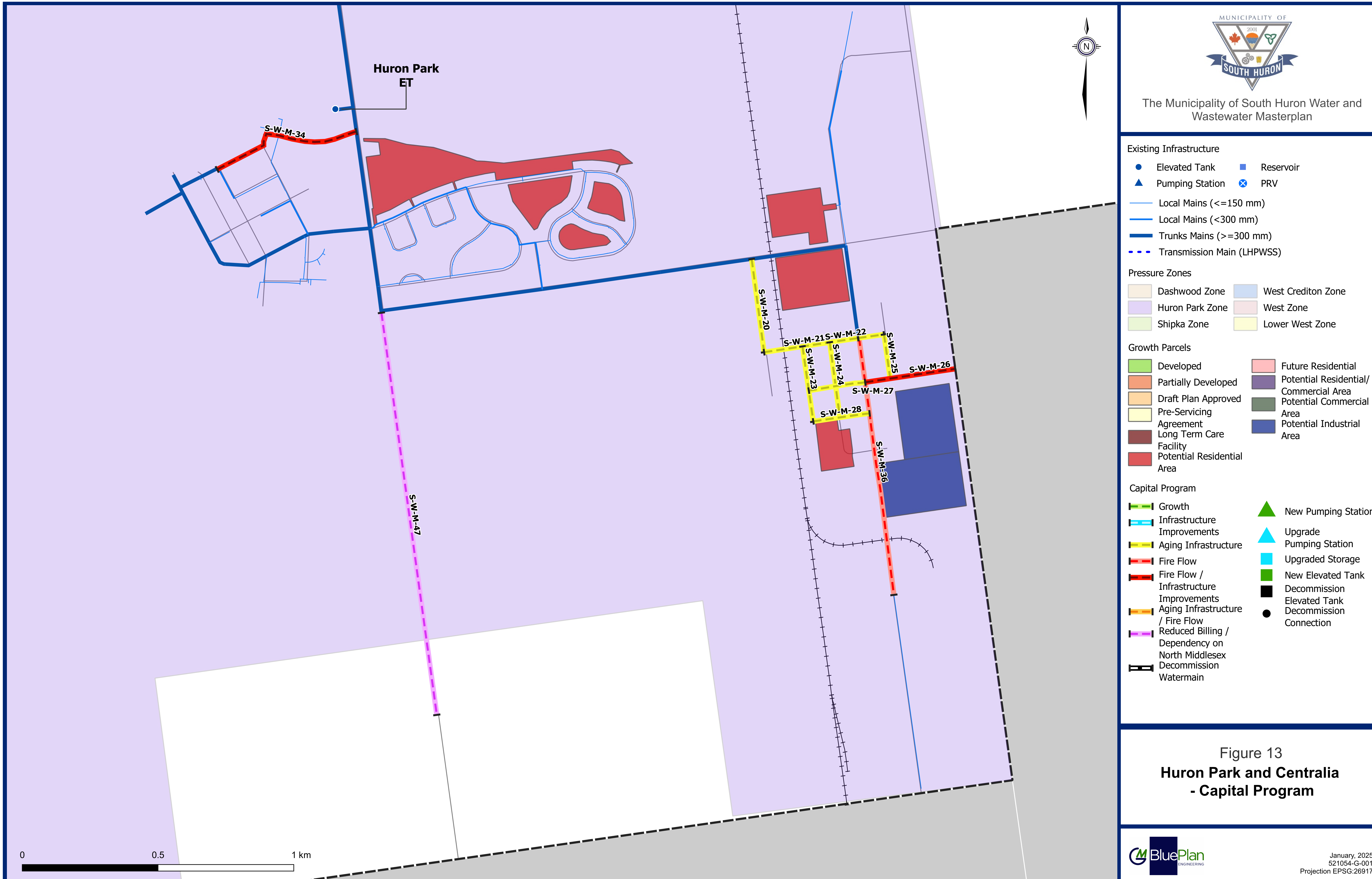
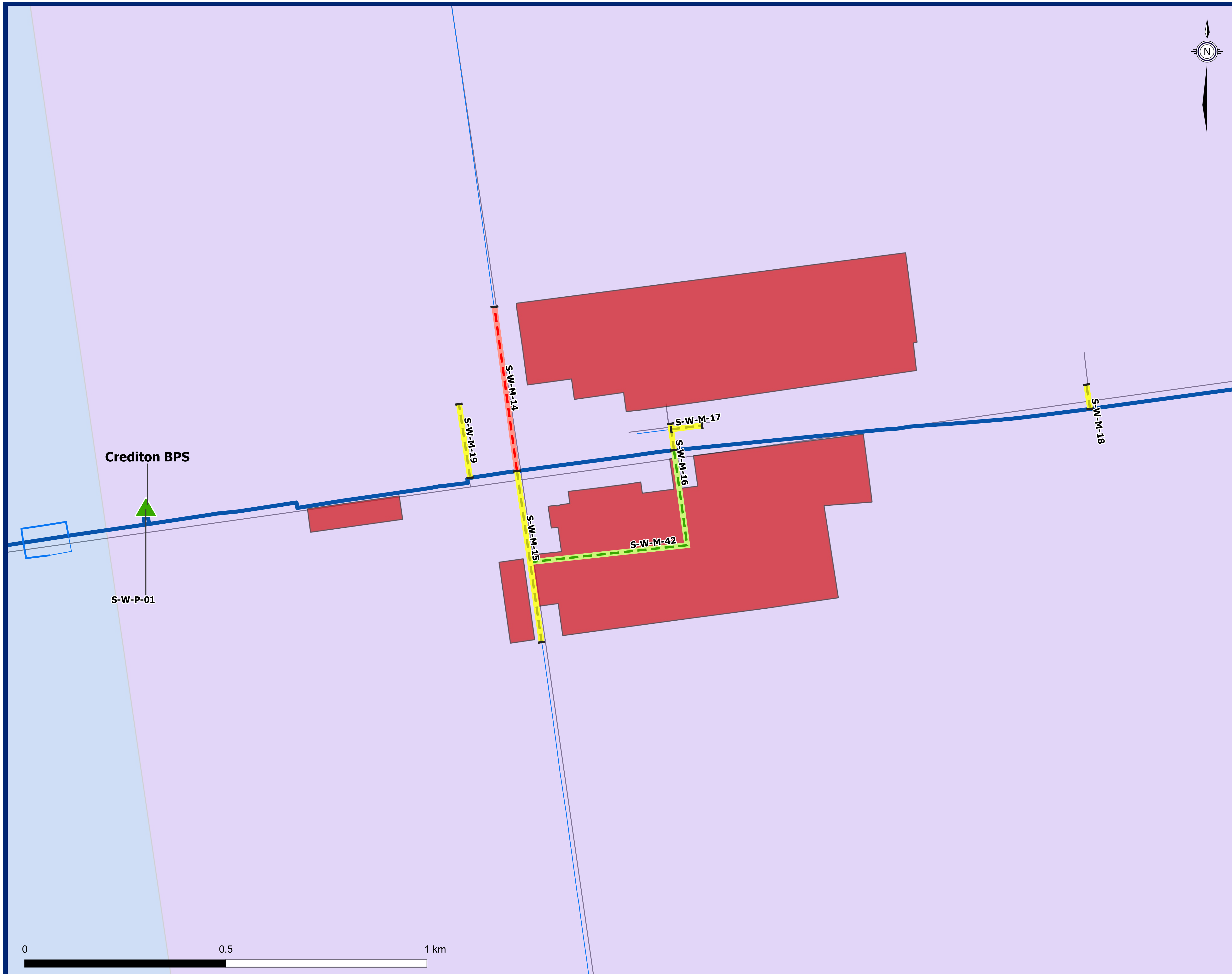


Figure 13
Huron Park and Centralia - Capital Program



The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure

- Elevated Tank
- Reservoir
- Pumping Station
- PRV
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Main (LHPWSS)

Pressure Zones

- Dashwood Zone
- West Crediton Zone
- Huron Park Zone
- West Zone
- Shipka Zone
- Lower West Zone

Growth Parcels

- Developed
- Future Residential
- Partially Developed
- Potential Residential/ Commercial Area
- Draft Plan Approved
- Potential Commercial Area
- Pre-Servicing Agreement
- Potential Industrial Area
- Long Term Care Facility
- Potential Residential Area

Capital Program

- Growth
- New Pumping Station
- Infrastructure Improvements
- Upgrade Pumping Station
- Aging Infrastructure
- Upgraded Storage
- Fire Flow
- New Elevated Tank
- Fire Flow / Infrastructure Improvements
- Decommission Elevated Tank
- Aging Infrastructure / Fire Flow
- Decommission Connection
- Reduced Billing / Dependency on North Middlesex
- Decommission Watermain

Figure 14

Crediton - Capital Program

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

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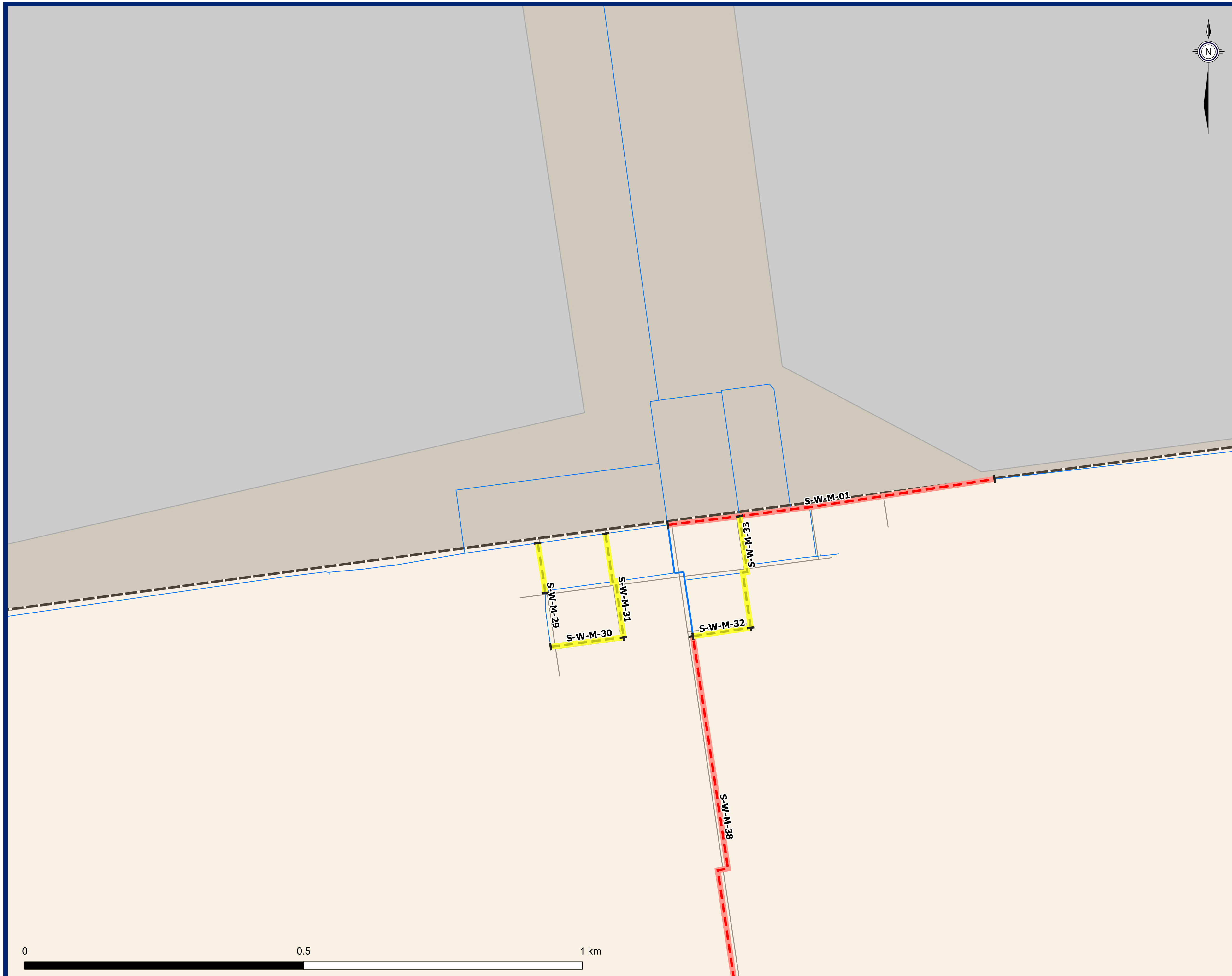

MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water and Wastewater Masterplan

Existing Infrastructure

- Elevated Tank
- Reservoir
- Pumping Station
- PRV
- Local Mains (<=150 mm)
- Local Mains (<300 mm)
- Trunks Mains (>=300 mm)
- Transmission Main (LHPWSS)

Pressure Zones

- Dashwood Zone
- West Crediton Zone
- Huron Park Zone
- West Zone
- Shipka Zone
- Lower West Zone

Growth Parcels

- Developed
- Future Residential
- Partially Developed
- Potential Residential/ Commercial Area
- Draft Plan Approved
- Potential Commercial Area
- Pre-Servicing Agreement
- Potential Industrial Area
- Long Term Care Facility
- Potential Residential Area

Capital Program

- Growth
- New Pumping Station
- Infrastructure Improvements
- Upgrade Pumping Station
- Aging Infrastructure
- Upgraded Storage
- Fire Flow
- New Elevated Tank
- Fire Flow / Infrastructure Improvements
- Decommission Elevated Tank
- Aging Infrastructure / Fire Flow
- Decommission Connection
- Reduced Billing / Dependency on North Middlesex
- Decommission Watermain

Figure 15

Dashwood - Capital Program

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January, 2025
521054-G-001
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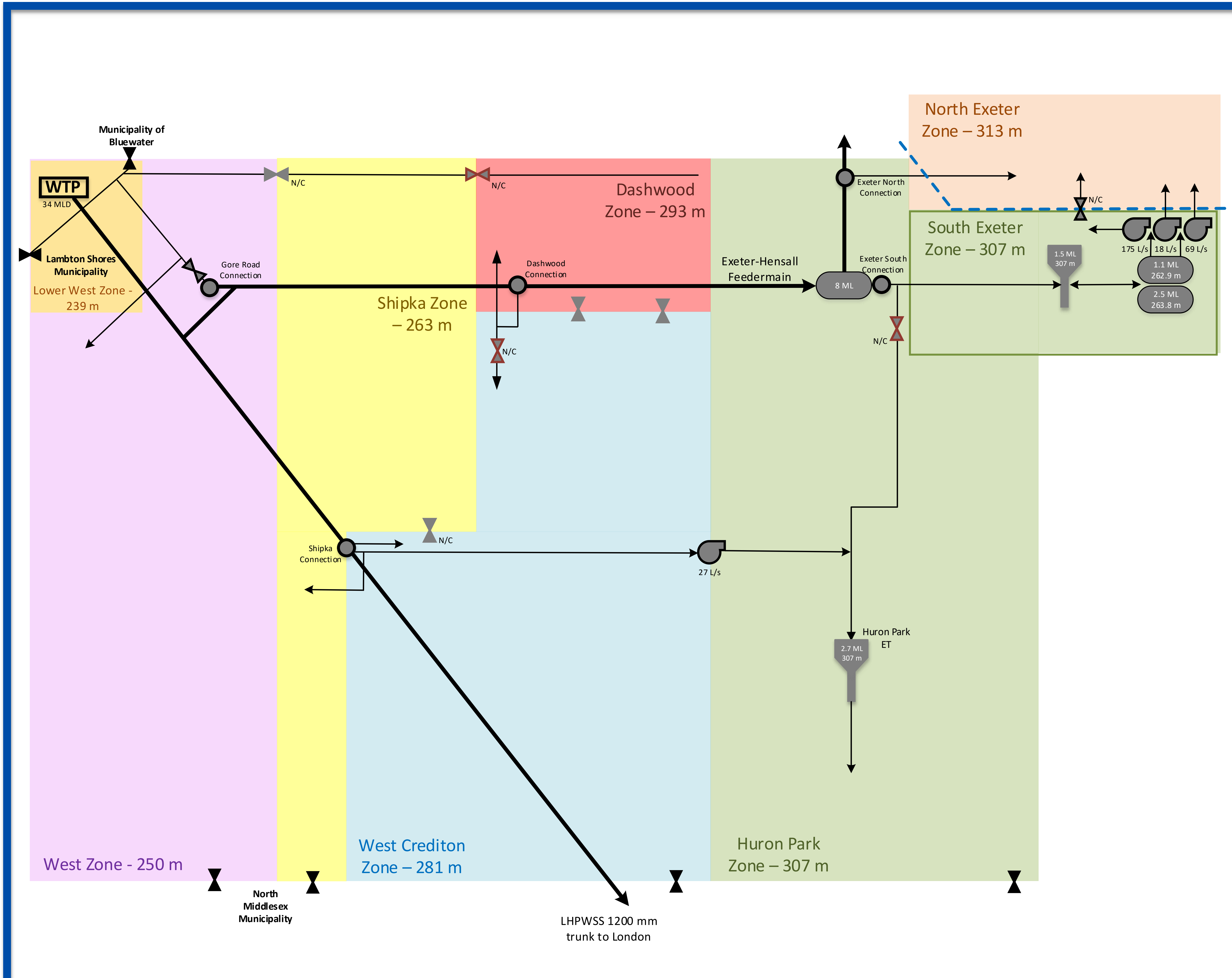
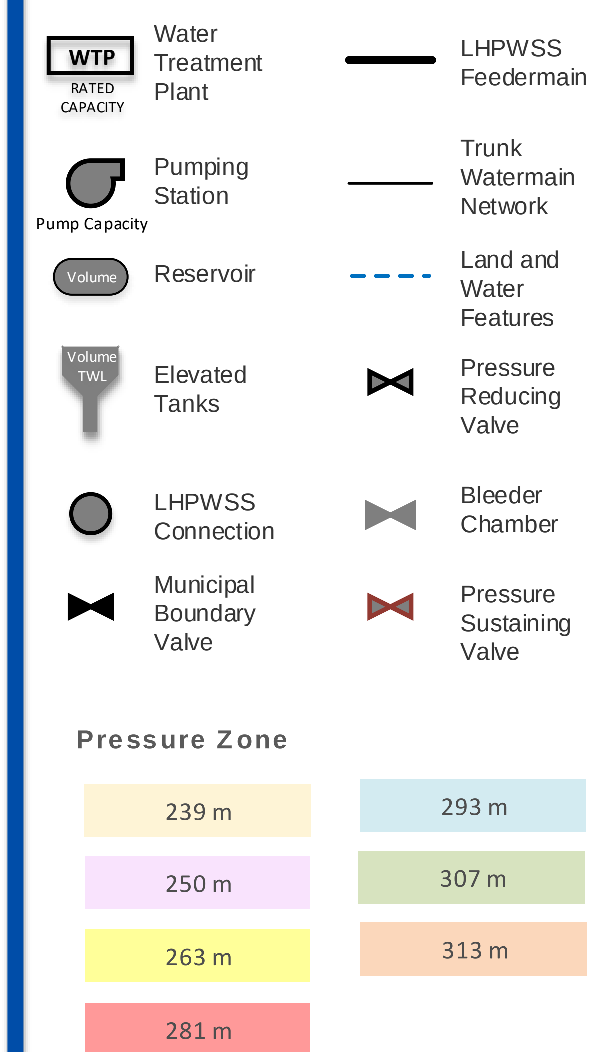
APPENDIX A:
WATER SYSTEM SCHEMATIC



The Municipality of South Huron Water & Wastewater Masterplan

EXISTING DISTRIBUTION SCHEMATIC



October 2023
Figure XX
Not to Scale

APPENDIX B:
WATER CONDITION ASSESSMENT

1 WATER FACILITY CONDITION ASSESSMENT APPROACH

1.1 Asset Condition and Risk Scoring

The condition of each asset is recorded by assigning a condition score on a scale of one (1) to five (5). Table 1 below provides the details of each condition score. Table 2 below provides the details of the performance condition score. Each asset is scored based on physical condition and performance condition (if applicable).

Table 1: Physical Condition Rating

Score	Condition	Remaining Useful Life	Description
NE	Non-Existent	0%	• Asset abandoned or does not exist.
NO	Not observed	Unknown	• Asset exists, but was not able to be inspected.
1	Excellent	80% - 100%	**Fit for the Future:** The assets in the system are generally in very good condition, typically new or recently rehabilitated.
2	Good	60% - 79%	**Adequate for Now:** Some asset elements show general signs of deterioration that require attention. A few elements exhibit deficiencies. May require some minor maintenance.
3	Fair	40% - 59%	**Requires Attention:** The assets in the system show general signs of deterioration and require attention, with some elements exhibiting significant deficiencies. May require immediate maintenance.
4	Poor	20% - 39%	**At Risk:** The assets in the system are in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. May require on-going monitoring and major maintenance or rehabilitation.
5	Very Poor	<20%	**Unfit for Sustained Service** The assets in the system are below standard condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which may be affecting service or increasing risks. Condition may be critical. May require extensive monitoring, rehabilitation and/or replacement.

Table 2: Performance Condition Ratings

Score	Condition	Description
NI	No input available	• No operational input gathered or obtained.
1	Excellent	• No performance concerns observed or communicated by operations • Meets all current and projected service levels effectively and efficiently • Sufficient capacity to meet projected needs • Does not experience operational issues • Cost of operating and maintaining justifies retention
2	Good	• Generally meets current service levels effectively and efficiently • Minor utilization issues at peak/trough demands • Rarely experiences operational issues • Cost of operating and maintaining justifies retention
3	Fair	• Meets only some service levels, regularly experiences issues • Fair capacity - periodical utilization issues at peak/trough demands • Regularly experiences operational issues • Cost of operating and maintaining is equal to the economic return necessary to justify retention
4	Poor	• Frequently does not meet services levels • Frequent utilization issues at peak/trough demands • Some deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention
5	Very Poor	• Does not meet current or projected service levels • Always experiences issues at peak/trough demands • Many deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention

1.2 Consequence of Failure

Each asset in the facilities is assigned a consequence of failure (CoF) score that ranges from 1-5 (refer to Table 3). The rating scale outlined in Table 3 is generally based on industry standard approaches tailored to a rural sewage pumping station facility.

Table 3: Consequence of Failure Rating

Score	Condition	Description
1	Minimal	Negligible Impact to Operations
2	Minor	Low Impact to Operations; work around solution can be readily implemented in less than 4 hours. No bypass recorded.
3	Moderate	Medium Impact to Operations; work-around solutions will require time to implement (up to 24 hours). Potential for small overflow bypass to environment expected prior to Operations mobilization to site. May require onsite manual operation of pumps.
4	Major	High Impact to Operations and Customer; work around solutions will required multiple days to implement and have a high cost to the Municipality. Hauling truck likely to maintain service. Overflow bypass to environment is expected.
5	Extreme	High Impact to Operations; ability to collect and convey wastewater in a safe & reliable manner is compromised. Significant overflow bypass occurring, upstream basement surcharging possible.

1.3 Risk Calculation and Priority Score

The risk of an asset failing is calculated as follows:

$$Risk = RP\ x\ RI$$

This calculation will yield Risk Scores ranging from 1 to 25. The following figure illustrates the combinations of Risk Probability (RP) and Risk Impact (RI) ratings and their corresponding risk scores.

		Condition of Asset				
		1	2	3	4	5
Consequence of Failure (CoF)	1	1	2	3	3	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

2 WATER FACILITY CONDITION ASSESSMENT APPROACH

2.1 Asset Condition and Risk Scoring

The condition of each asset is recorded by assigning a condition score on a scale of one (1) to five (5). **Table 4** below provides the details of each condition score. **Table 5** below provides the details of the performance condition score. Each asset is scored based on physical condition and performance condition (if applicable).

Table 4: Physical Condition Rating

Score	Condition	Remaining Useful Life	Description
NE	Non-Existent	0%	• Asset abandoned or does not exist.
NO	Not observed	Unknown	• Asset exists, but was not able to be inspected.
1	Excellent	80% - 100%	**Fit for the Future:** The assets in the system are generally in very good condition, typically new or recently rehabilitated.
2	Good	60% - 79%	**Adequate for Now:** Some asset elements show general signs of deterioration that require attention. A few elements exhibit deficiencies. May require some minor maintenance.
3	Fair	40% - 59%	**Requires Attention:** The assets in the system show general signs of deterioration and require attention, with some elements exhibiting significant deficiencies. May require immediate maintenance.
4	Poor	20% - 39%	**At Risk:** The assets in the system are in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. May require on-going monitoring and major maintenance or rehabilitation.
5	Very Poor	<20%	**Unfit for Sustained Service** The assets in the system are below standard condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which may be affecting service or increasing risks. Condition may be critical. May require extensive monitoring, rehabilitation and/or replacement.

Table 5: Performance Condition Ratings

Score	Condition	Description
NI	No input available	• No operational input gathered or obtained.
1	Excellent	• No performance concerns observed or communicated by operations • Meets all current and projected service levels effectively and efficiently • Sufficient capacity to meet projected needs • Does not experience operational issues • Cost of operating and maintaining justifies retention
2	Good	• Generally meets current service levels effectively and efficiently • Minor utilization issues at peak/trough demands • Rarely experiences operational issues • Cost of operating and maintaining justifies retention
3	Fair	• Meets only some service levels, regularly experiences issues • Fair capacity - periodical utilization issues at peak/trough demands • Regularly experiences operational issues • Cost of operating and maintaining is equal to the economic return necessary to justify retention
4	Poor	• Frequently does not meet services levels • Frequent utilization issues at peak/trough demands • Some deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention
5	Very Poor	• Does not meet current or projected service levels • Always experiences issues at peak/trough demands • Many deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention

2.2 Consequence of Failure

Each asset in the facilities is assigned a consequence of failure (CoF) score that ranges from 1-5 (refer to Table 6). The rating scale outlined in Table 6 is generally based on industry standard approaches tailored to a rural potable water facility.

Table 6: Consequence of Failure Rating

Score	Condition	Description
1	Minimal	Negligible Impact to Operations
2	Minor	Low Impact to Operations; work around solution can be readily implemented in less than 8 hours.
3	Moderate	Medium Impact to Operations; work-around solutions will require time to implement (up to 24 hours).
4	Major	High Impact to Operations and Customer; work around solutions will required multiple days to implement and have a high cost to the Municipality. Potential loss of service for 24+ hours.
5	Extreme	High Impact to Operations; ability to produce/ deliver Treated Water Supply in a safe & reliable manner is compromised.

2.3 Risk Calculation and Priority Score

The risk of an asset failing is calculated as follows:

$$Risk = RP \ x \ RI$$

This calculation will yield Risk Scores ranging from 1 to 25. The following figure illustrates the combinations of Risk Probability (RP) and Risk Impact (RI) ratings and their corresponding risk scores.

		Condition of Asset				
		1	2	3	4	5
Consequence of Failure (CoF)	1	1	2	3	3	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Condition Assessment Register - Airport Line and Huron Street Control Chamber

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Condition Assessment: Performance Condition Rating (Based on Operation's Input)	Condition Assessment: Consequence of Failure (1-5)	Condition Assessment: Risk Score	Estimated Service Life	Remaining Service Life
AHCC1	Precast Chamber	D2 - Structure	1800x2400mm precast chamber with cast in ladder, cast iron lid and frame and fiberglass sump pit	Generally good condition.	2010	Good Condition	2	2	3	6	75	63
AHCC2	Actuated Butterfly Valve (1)	D3 - Mechanical	300mm diameter epoxy coated butterfly valve c/w Rotork FA14 actuator	Corrosion noted on valve body and fasteners	2010	Fair Condition	3	2	2	6	25	13
AHCC3	Process piping	D3 - Mechanical	300mm diameter epoxy coated ductile iron and 2 - Victaulic couplings	Minor corrosion noted	2010	Fair Condition	3	2	3	9	50	38
AHCC4	Sump Pump	D3 - Mechanical	Not observed.	Assumed based on age	2010	Good Condition	2	2	1	2	25	13
AHCC5	Ball Valve (4)	D3 - Mechanical	13-25mm SS valves		2010	Good Condition	2	2	2	4	20	8
AHCC6	Pressure Gauges (2)	D3 - Mechanical	100mm diameter oil filled gauge c/w isolation ball valve.		2010	Good Condition	2	2	1	2	20	8
AHCC7	PLC Cabinet	D4 - Electrical	Insulated painted steel cabinet housing PLC controller. Equipped with space heater, surge protection, breaker panel and battery backup power		2010	Fair Condition	3	2	1	3	25	13
AHCC8	Primary Electrical, Conduits and Wiring	D4 - Electrical	Misc. electrical, lighting, sockets and conduit. Fed from Huron Park ET	Mixed condition, average good	2010	Good Condition	2	2	1	2	25	13
						Average Condition	2.4	2.0	1.8	4.3		

Condition Assessment Register - Airport Line Flow Monitoring Chamber

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Installation Year	Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
AFMC1	Precast Chamber	D2 - Structure	1800x2400mm precast chamber with cast in ladder, cast iron lid and frame and fiberglass sump pit	Generally good condition. Spalling on chamber base near sump pit	2010	Good Condition	2	2	3	6		75	63
AFMC2	Gate Valves (1)	D3 - Mechanical	100mm diameter gate valve wrapped in dense	Minor corrosion noted	2010	Fair Condition	3	2	1	3		25	13
AFMC3	Flowmeter	D3 - Mechanical	250mm diameter Siemens SITRANS FM Mag 5100W electromagentic flow meter	Minor corrosion noted	2010	Fair Condition	3	2	2	6		20	8
AFMC4	Process piping	D3 - Mechanical	250mm diameter epoxy coated ductile iron	Minor corrosion noted	2010	Fair Condition	3	2	3	9		50	38
AFMC5	Sump Pump	D3 - Mechanical	Not observed.	Assumed based on age	2010	Fair Condition	3	2	1	3		25	13
AFMC6	Ball Valve (4)	D3 - Mechanical	25mm SS valves		2010	Good Condition	2	2	1	2		20	8
AFMC7	Primary Electrical, Conduits and Wiring	D4 - Electrical	Misc. eletrical, lighting, sockets and conduit. Fed from Huron Park ET	Mixed condition, average good	2010	Good Condition	2	2	1	2		25	13
						Average Condition	2.6	2.0	1.7	4.4			

Condition Assessment Register - Babylon Line S of Huron Street Chamber
Dashwood Area Control Zone Chamber #4

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment					Installation Year	Estimated Service Life	Remaining Service Life
						Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
BSHC1	Precast Chamber	D2 - Structure	1800mm diameter precast chamber with cast in ladder, cast iron lid and frame and sump pump	Generally good condition. Insulation panel broken	2010	Good Condition	2	1	2	4		75	63
BSHC2	Gate Valves (1)	D3 - Mechanical	100mm diameter gate valve wrapped in dense	Good condition	2010	Good Condition	2	1	3	6		25	13
BSHC3	Flowmeter	D3 - Mechanical	5/8" Sensus water service meter with remove read wiring	Recently replaced	2021	Excellent	2	1	2	4		20	19
BSHC4	Process piping	D3 - Mechanical	100mm ductile iron (assumed) wrapped in dense		2010	Good Condition	2	1	3	6		50	38
BSHC5	Solenoid Ball Valve (2)	D3 - Mechanical	Hunter plastic solenoid 23-372 and Node100 controller c/w drain lines to surface		2010	Good Condition	2	1	2	4		25	13
BSHC6	Ball Valves (4)	D3 - Mechanical	25mm SS ball valve		2010	Good Condition	2	1	2	4		25	13
						Average Condition	2.0	1.0	2.3	4.7			

Condition Assessment Register - Blackbush Line N of Crediton Road Chamber
Skipa Area Control Zone Chamber #1

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment					Installation Year	Estimated Service Life	Remaining Service Life
						Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
BNCC1	Precast Chamber	D2 - Structure	1800mm diameter precast chamber with cast in ladder, cast iron lid and frame and sump pump	Generally good condition. Water staining noted	2010	Good Condition	2	1	2	4		75	63
BNCC2	Gate Valves (2)	D3 - Mechanical	100mm diamter gate valve wrapped in Denso. 25mm gate valve on bypass		2010	Good Condition	2	1	3	6		25	13
BNCC3	Flowmeter	D3 - Mechanical	5/8" Sensus water service meter with remove read wiring		2010	Good Condition	2	1	2	4		20	8
BNCC4	Process piping	D3 - Mechanical	100mm ductile iron (assumed) wrapped in denso		2010	Good Condition	2	1	3	6		50	38
BNCC5	Ball Valves (3)	D3 - Mechanical	25mm SS ball valve		2010	Good Condition	2	1	2	4		25	13
						Average Condition	2.0	1.0	2.4	4.8			

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Condition Assessment Register - Bronson Line S of Huron Street Chamber
Dashwood Area Control Zone Chamber #1

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Condition Assessment: Performance Condition Rating (Based on Operation's Input)	Condition Assessment: Consequence of Failure (1-5)	Condition Assessment: Risk Score	Installation Year	Estimated Service Life	Remaining Service Life
BLSH1	Precast Chamber	D2 - Structure	1800x2440mm precast chamber with cast in ladder, cast iron lid and frame and sump pump	Generally good condition. Insulation panel broken	2010	Good Condition	2	2	3	6		75	63
BLSH2	Gate Valves (1)	D3 - Mechanical	100mm diameter gate valve wrapped in dense	Good condition	2010	Good Condition	2	2	3	6		25	13
BLSH3	Flowmeter	D3 - Mechanical	5/8" Sensus water service meter with analog readout	Recently replaced	2010	Fair Condition	2	2	2	4		20	8
BLSH4	Process piping	D3 - Mechanical	100mm ductile iron wrapped in Denso, 100mm 304 SS, 50mm threaded SCH40 SS		2010	Good Condition	2	2	3	6		50	38
BLSH5	Pressure Reducing/Sustaining Valve (1)	D3 - Mechanical	50mm Cla-Val pressure reducing sustaining valve		2010	Good Condition	2	2	4	8		25	13
BLSH5	Pressure Gauge (2)	D3 - Mechanical	100mm glycerine filled pressure gauge and 50mm gauge	50mm gauge appears to be leaking	2010	Fair Condition	3	3	1	3		20	8
BLSH6	Ball Valves (5)	D3 - Mechanical	25mm - 50mm SS ball valves		2010	Good Condition	2	2	2	4		25	13
						Average Condition	2.1	2.1	2.6	5.3			

Condition Assessment Register - Church and William Control Zone Chamber

Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment: Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Condition Assessment: Performance Condition Rating (Based on Operation's Input)	Condition Assessment: Consequence of Failure (1-5)	Condition Assessment: Risk Score	Estimated Service Life	Remaining Service Life
Precast Chamber	D2 - Structure	2.6m x 3.6m precast chamber. Monobase, riser, roof cap, SS vent, and cast in ladder	Good condition. Concrete spalling around hatch pedestal	2010	Good Condition	2	1	4	8	75	63
Hatch	D2 - Structure	SS lockable access hatch complete with grab bar	Hatch mechanism broken and seals gone	2010	Poor Condition.	4	1	3	12	40	28
Gate Valves (2)	D3 - Mechanical	300mm diameter Mueller gate valve		2010	Good Condition	2	1	2	4	25	13
Ball Valves (4)	D3 - Mechanical	13-25mm SS ball valve	Does not include ball valve associated with PRV	2010	Good Condition	2	1	2	4	25	13
Pressure Reducing Valve (1)	D3 - Mechanical	200mm dia. Cla-Val D 90-48-1481G pressure reducing/sustaining valve. SS pilots	Operations has indicated PRV has never function properly. Doesn't open/close when commanded	2010	Good Condition (Visually) Poor Condition Operationally	2	4	4	16	25	13
Air Release Valve	D3 - Mechanical	Cla-Val 3475-AR18 air release valve	Base of valve beginning to corrode	2010	Fair Condition	3	1	2	6	25	13
Process Piping	D3 - Mechanical	250-300 mm diameter 304SS		2010	Good Condition	2	1	4	8	50	38
Actuated Butterfly Valve (1)	D3 - Mechanical	Pratt FL butterfly valve c/w Auma SQ12.2-FA12 actuator		2020	Good Condition	2	1	2	4	25	23
Pressure Transducer (1)	D4 - Electrical	ABB 256HSHPSBA7 pressure transducer with local display c/w isolation diaphragm		2010	Good Condition	2	1	1	2	10	-2
Space Heater	D4 - Electrical	1.25kW Ouellet OCEB1250-TH wall mounted convection heater		2020	Excellent Condition	1	1	1	1	20	18
Control Panel	D4 - Electrical	Painted insulated steel cabinet housing PLC controller. Equipped with space heater, temperature switch, fan, and lighting	Operations indicated program requires update	2010	Fair Condition	3	1	3	9	30	18
Temperature Switch (2)	D4 - Electrical	Honeywell wall mounted temperature switch		2010	Good Condition	2	1	3	6	20	8
Primary Electrical, Conduits and Wiring	D4 - Electrical	Miscellaneous conduit, switches, and plugs		2010	Good Condition	2	1	2	4	30	18
Lighting	D4 - Electrical	Single fluorescent wall mount		2010	Good Condition	2	1	1	2	30	18

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Condition Assessment Register - Crediton Booster Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
CBPS1	Site Works (Parking, Grading, Vegetatio	D1 - Site	Gravel parking area attached to the Crediton Public Works Yard. Concrete pads at entrances. Turfstone at pressure relief outlet.	Parking in fair condition, concrete in good condition, turfstone eroded due to high velocity water.	1995	Fair Condition	3	3	1	3	50	23
CBPS2	Interior Walls	D2 - Structure	Painted CMUs,	Good condition, minor paint scuffs.	1995	Good Condition	2	2	2	4	75	48
CBPS3	Interior Walls (addition)	D2 - Structure	CMU with acoustic panels	Good condition, minor paint scuffs.	2009	Good Condition	2	2	2	4	75	62
CBPS4	Exterior Walls	D2 - Structure	150mm CMU, 75mm rigid insulation, 25mm air gap and 100mm decorative block.	Good condition, minor weathering	1995	Good Condition	2	2	2	4	75	48
CBPS5	Exterior Walls (addition)	D2 - Structure	150mm CMU, 75mm rigid insulation, 25mm air gap and 100mm decorative block.		2009	Good Condition	2	2	2	4	75	62
CBPS6	Roofing	D2 - Structure	Steel sheet roof, with snow guards and gutters		2009	Good Condition	2	2	1	2	75	62
CBPS7	Doors	D2 - Structure	One - Two leafed door (taped) and One - single leafed door	Good, minor denting, paint damage. Double leaf door taped shut presumably due to failing weather sealing	1995	Good Condition	2	2	1	2	75	48
CBPS8	Doors (addition)	D2 - Structure	One - Two leafed door	Good, minor denting, paint damage	2009	Good Condition	2	2	1	2	75	62
CBPS9	Interior Lighting	D2 - Structure	Four (4) ceiling mounted fluorescence fixtures	Fair condition (age)	1995	Fair Condition	3	3	1	3	30	3
CBPS10	Interior Lighting (addition)	D2 - Structure	Four (4) ceiling mounted fluorescence fixtures	Good condition	2009	Good Condition	2	2	1	2	30	17
CBPS11	Exterior Lighting	D2 - Structure	Two (2) - wall mounted fluorescence wall packs	Fair condition (age)	1995	Good Condition	3	3	1	3	30	3
CBPS12	Exterior Lighting (addition)	D2 - Structure	Two (2) - wall mounted fluorescence wall packs	Good condition	2009	Good Condition	2	2	1	2	30	17
CBPS13	Building	D2 - Structure	Misc. Building components	Good condition	1995	Good Condition	2	2	1	2	75	48
CBPS14	Booster Pump 1	D3 - Mechanical	Fairbank Morse - Pentair 40kW US Motor	Serviced January 2021. Suction cans coating has failed. Recoating recommended	1995	Fair Condition	3	3	3	9	30	3
CBPS15	Booster Pump 2	D3 - Mechanical	Fairbank Morse - Pentair 40kW GE Motor	Serviced January 2021. Suction cans coating has failed. Recoating recommended	1995	Fair Condition	3	3	3	9	30	3
CBPS16	Booster Pump 3	D3 - Mechanical	Fairbank Morse - Pentair 40kW GE Motor	Serviced January 2021.	2009	Good Condition	2	2	3	6	30	17
CBPS17	Check Valves (3)	D3 - Mechanical	150mm diameter Valmatic Swing-Flex rubber disk check valve	150 mm diameter	2009	Good Condition	3	3	4	12	30	17
CBPS18	Gate Valves (4)	D3 - Mechanical		300 mm diameter	1995	Fair Condition	3	3	4	12	30	3
CBPS19	Air Release Valves (4)	D3 - Mechanical	Three (3) Valmatic 15A air release valves	25 - 50 mm diameter	1995	Good Condition	2	2	2	4	30	3
CBPS20	Butterfly Valves (5)	D3 - Mechanical	Five (5) butterfly valves	150 - 200 mm diameter	1995	Fair Condition	2	2	4	8	30	3
CBPS21	Buried Gate Valve (1)	D3 - Mechanical	One (1) buried gate valve	300 mm diameter (assumed)	1995	Good Condition	2	2	4	8	30	3
CBPS22	Pressure Relief Valve (1)	D3 - Mechanical	One (1) pressure relief valve	100 mm diameter	2009	Good Condition	2	2	5	10	30	17
CBPS23	Surge Anticipation Relief Valve (1)	D3 - Mechanical	Singer 106RPS0RR	100 mm diameter	2009	Good Condition	2	2	5	10	30	17

Condition Assessment Register - Crediton Booster Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
CBPS24	Rubber Check Valve (1)	D3 - Mechanical	One (1) rubber check valve	100 mm diameter	2009	Good condition	2	2	2	4	30	17
CBPS25	Piping	D3 - Mechanical		150 - 300 mm diameter	1995	Good Condition	2	2	3	6	30	3
CBPS26	Piping (addition)	D3 - Mechanical		100 - 200 mm diameter	2009	Good Condition	1	1	3	3	25	12
CBPS27	HVAC	D3 - Mechanical	Electric Heat - No A/C		1995	Good Condition	2	2	1	2	30	3
CBPS28	Generator	D4 - Electrical	Diesel generator		1995	Good Condition	2	2	3	6	30	3
CBPS29	Control Panels, Primary Electrical, Conduits and Wiring	D4 - Electrical		All controls are scheduled to be replaced	1995	Good Condition	3	3	5	15	30	3
CBPS30	Stairs	D4 - Electrical		Exterior latter to roof observed	1995	Good Condition	2	2	1	2	40	13
						Average Condition	2.2	2.2	2.4	5.4		

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Condition Assessment Register - Dashwood Road W of Dashwood Chamber
Dashwood Area Control Zone Chamber #2

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Installation Year	Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
DWDC1	Precast Chamber	D2 - Structure	1800x2440mm precast chamber with cast in ladder, cast iron lid and frame and sump pump	Generally good condition. Insulation panel broken	2010	Good Condition	2	2	3	6		75	63
DWDC2	Gate Valves (1)	D3 - Mechanical	100mm diameter gate valve wrapped in dense	Good condition	2010	Good Condition	2	2	3	6		25	13
DWDC3	Flowmeter	D3 - Mechanical	5/8" Sensus water service meter with analog readout	Recently replaced	2010	Good Condition	2	2	2	4		20	8
DWDC4	Process piping	D3 - Mechanical	100mm ductile iron wrapped in Denso, 100mm 304 SS, 50mm threaded SCH40 SS		2010	Good Condition	2	2	3	6		50	38
DWDC5	Pressure Reducing/Sustaining Valve (1)	D3 - Mechanical	50mm Singer pressure reducing sustaining valve		2010	Good Condition	2	2	4	8		25	13
DWDC6	Pressure Gauge (2)	D3 - Mechanical	100mm glycerine filled pressure gauge and 50mm gauge	50mm gauge appears to be leaking	2010	Fair Condition	3	3	1	3		20	8
DWDC7	Ball Valves (5)	D3 - Mechanical	25mm - 50mm SS ball valves		2010	Good Condition	2	2	2	4		25	13
						Average Condition	2.1	2.1	2.6	5.3			

Condition Assessment Register - Dashwood Road W of Shipka Line Chamber

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Condition Assessment: Performance Condition Rating (Based on Operation's Input)	Condition Assessment: Consequence of Failure (1-5)	Condition Assessment: Risk Score	Installation Year	Estimated Service Life	Remaining Service Life
DWSC1	Precast Chamber	D2 - Structure	1800mm diameter precast chamber with cast in ladder, cast iron lid and frame and sump pump	Generally good condition.	2010	Good Condition	2	1	2	4		75	63
DWSC2	Gate Valves (1)	D3 - Mechanical	100mm diameter gate valve wrapped in denso	Good condition	2010	Good Condition	2	1	3	6		25	13
DWSC3	Flowmeter	D3 - Mechanical	5/8" Sensus water service meter with remove read wiring	Good condition	2010	Good Condition	2	1	2	4		20	8
DWSC4	Process piping	D3 - Mechanical	100mm ductile iron (assumed) wrapped in denso		2010	Good Condition	2	1	3	6		50	38
DWSC5	Ball Valves (3)	D3 - Mechanical	25mm SS ball valve		2010	Good Condition	2	1	2	4		25	13
						Average Condition	2.0	1.0	2.4	4.8			

Condition Assessment Register - Environmental Services Operations Centre

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comments	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
ESOC1	Site Works	D1 - Site	Seven (7) concrete/painted steel bollards, asphalt parking area and access, 1.2m tall galvanized chain linke fences.	Bollards showing signs of paint fading. Asphalt parking lot has severe aligator cracking throughout. Fence has minor bends occuring around the perimeter of the yard. Site grading appears to be draining properly with no standing water	1975	Poor Condition	4	1	1	4	50	3
ESOC2	Interior Walls	D2 - Structure	Timber framed interior with painted drywall.		1975	Good Condition	2	1	3	6	75	28
ESOC3	Exterior Walls	D2 - Structure	Timber framed (suspected) with interior and exterior painted metal siding.	Minor rusting noted on façade.	1975	Good Condition	2	1	4	8	75	28
ESOC4	Roofing system	D2 - Structure	Prefinished steel standing seam roof, prefinished metal fascia and gutter, eavestrough, downspouts, gable roof structure.	Replaced in the past 10 years. (Operations)	2012	Good Condition	2	1	2	4	75	65
ESOC5	Concrete foundations	D2 - Structure	Poured in place concrete foundation extending approximately 900mm above grade.	Fair condition. Minor cracking noted along west wall.	1975	Fair Condition	3	3	3	9	75	28
ESOC6	Standard Slab on Grade	D2 - Structure	Concrete slab on grade.	Considered to be in fair condition based on age. Minor cracks and staining. Area near garage opening damaged due to salt.	1975	Fair Condition	3	3	3	9	75	28
ESOC7	Exterior Lighting	D4 - Electrical	Three (3) flush mounted lights. Two (2) streetlight style wall mounted lights.	Operations staff stated all exterior lights are working properly. Install date unknown.	1990	Good Condition	2	3	1	2	30	-2
ESOC8	Exterior Windows	D2 - Structure		Seals and caulking in good condition.	1975	Good Condition	2	3	1	2	30	-17
ESOC9	Interior Windows	D2 - Structure		Seals and caulking in good condition.	1975	Good Condition	2	3	1	2	30	-17
ESOC10	Overhead Doors	D2 - Structure	Five (5) overhead doors complete with automatic opening system.	All garage doors replaced in 2016	2016	Good Condition	2	3	1	2	40	34
ESOC11	Exterior Doors	D2 - Structure	Two (2) single leaf painted steel door.	Paint is fading and doorframe is showing signs of rust and corrosion on south entrance.	1975	Poor Condition	4	3	1	4	40	-7
ESOC12	Interior Doors	D2 - Structure	Seven (7) wooden interior doors.		1975	Fair Condition	3	3	1	3	40	-7
ESOC13	Plumbing Fixtures	D2 - Structure	Two bathrooms including sink, toilet, vanity. Shower in upstairs wastroom. Age unknown for washroom located on ground floor.		1990	Good Condition	2	3	4	8	50	18
ESOC14	Interior Stairs	D2 - Structure	Wooden stairs, platform and columns.	Replaced platform and columns in 2021.	2021	Excellent Condition	1	3	4	4	50	49
ESOC15	HVAC system	D3 - Mechanical	Two (2) Split system 19000 BTU/h heat pump/AC units installed (Mitsubishi Electric). Four (4) Garage heaters (Schwank)	Replaced in 2017.	2017	Good Condition	2	3	2	4	40	35
ESOC16	Electrical system	D4 - Electrical	Wall Mounted 120/240V lighting panel, metal conduit.		1975	Misc.	3	3	4	12	40	-7
ESOC17	Hot water heater	D3 - Mechanical	Electric tankless water heater. Process piping connected to water heater.	Unknown installation date.	1990	Fair Condition	3	3	2	6	20	-12
ESOC18	Plumbing	D3 - Mechanical	ABS drain pipe.		1975	Fair Condition	3	3	3	9	30	-17
ESOC19	Interior Lighting	D4 - Electrical	Four (4) LED shop lights installed within garage area and mezzanine office. Fluorescent lights in main floor office, lunchroom and bathroom.	LED shop lights upgraded in 2017.	2017	Good Condition	2	3	2	4	30	25

Condition Assessment Register - Environmental Services Operations Centre

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comments	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
ESOC20	Emergency Generator	D3 - Mechanical	Detroit Diesel emergency genset and ATS automatic transfer swtich.		2017	Good Condition	2	3	1	2	30	25
ESOC21	Flooring Upstairs	D2 - Structure	Vinyl plank flooring installed in upstairs office area and washroom.	Installed in 2021.	2021	Excellent Condition	1	3	1	1	50	49
ESOC22	Exterior Overhang	D2 - Structure	Steel column and beam exterior overhang with steel roofing system with prefinished metal fascia and gutter, eavestrough and downspout.		2012	Good Condition	2	3	1	2	75	65
						Average Condition	2.5	2.6	2.3	5.6		

Condition Assessment Register - Exeter Elevated Water Tower

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score	Estimated Service Life	Remaining Service Life
						Condition Assessment						
EEWT1	Bollards, paving, grading, vegetation	D1 - Site	Grassed and treed lot. No paving or bollards.	Generally good condition. Visually could not confirm due to snow cover.	2010	Good Condition	2	1	1	2	50	38
EEWT2	Roofing, exterior pedestal and interior pede	D2 - Structure	Spheroid elevated water tank. OCS-6 Exterior Coating System (Epoxy-Epoxy-Polyurethane) and suspected epoxy coating system interior (ICS system unknown)	Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. The roof is in generally good condition. Some chalking was noted. The interior coatings was in fair condition. There was some rust striations and blisters observed. There is also rust at weld lines. The bottom of the tank bowl had a large amount of sediment and large material.	1974	Fair Condition	3	3	5	15	75	27
EEWT3	Doors	D2 - Structure	Welded steel door as part of the superstructure complete with plaque		1974	Good Condition	2	1	1	2	75	27
EEWT4	Platforms	D2 - Structure		Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. Good conditions	2010	Good Condition	2	2	3	6	50	38
EEWT5	Ladders	D2 - Structure		Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. Good conditions. Ladder fall arrest is recommended to be replaced	2010	Good Condition	2	2	3	6	50	38
EEWT6	Hatch Covers	D2 - Structure		Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. Good conditions	2010	Good Condition	2	2	3	6	50	38
EEWT7	Actuated Gate Valve	D3 - Mechanical	350mm Mueller flanged gate valve c/w disassembly coupling and Auma SA 10.2FA10 actuator	Good condition	2017	Good Condition	2	3	3	9	25	20
EEWT8	Piping	D3 - Mechanical	150 - 350mm diameter painted steel pipe	Fair/Poor Condition based on age. Visually appears to be fair condition. Unable to visually inspect riser pipe due to insulation wrap.	1974	Fair Condition	3	3	4	12	50	2
EEWT9	Heater	D3 - Mechanical			1974	Fair Condition	3	3	1	3	25	-23
EEWT10	Control Panels	D4 - Electrical	Wall mounted PLC cabinet c/w battery backup	Fair condition. Evidence of corrosion due to moisture. Component may be aging	1974	Fair Condition	3	3	4	12	25	-23
EEWT11	Primary Electrical	D4 - Electrical	Breaker Panel (Original, conduit, switches, plugs.	Aged based poor condition. Various condition upon visual inspection.	1974	Poor Condition	4	4	2	8	30	-18
EEWT12	ATS	D4 - Electrical	ASCO automatic transfer switch D00300A20030B1XC		2013	Good Condition	2	1	2	4	30	21
EEWT13	Conduits and Wiring	D4 - Electrical		Aging, in need of repair.	1974	Fair Condition	3	3	2	6	30	-18
EEWT14	Lighting	D4 - Electrical	Various internal/external lighting	Operator has indicated exterior roof lighting has failed and seized. In need of replacement.	1974	Poor Condition	4	5	1	5	30	-18
EEWT15	Server	D4 - Electrical	Modem and network switches housed in server rack	Good condition. Aged equipment	1974	Good Condition	3	1	1	3	10	-38
EEWT16	Pressure Gauge (2)	D4 - Electrical	Analog wall mounted pressure gauges	Installation date unknown. Not original	2010	Good Condition	2	1	2	4	20	8
EEWT17	Pressure Transmitter (2)	D4 - Electrical	Rosemount pressure transducer	Not original. Appears to be in good condition.	2018	Good Condition	2	1	2	4	20	16
EEWT18	Chlorine Analyzer	D4 - Electrical	Evoqua Depolox 3 Plus chlorine analyzer		1974	Good Condition	2	2	2	4	20	-28
						Average Condition	2.6	2.3	2.3	6.2		

Condition Assessment Register - Goshen Line S of Huron Street Chamber
Dashwood Area Control Zone Chamber #3

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Installation Year	Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
GLC1	Precast Chamber	D2 - Structure	1500mm diameter precast chamber with cast in ladder and cast iron lid and frame	Generally good condition.	2010	Good Condition	2	1	2	4		75	63
GLC2	Gate Valves (1)	D3 - Mechanical	100mm diameter gate valve wrapped in Denso	Good condition	2010	Good Condition	2	1	3	6		25	13
GLC3	Flowmeter	D3 - Mechanical	25mm water service meter with remove read wiring		2010	Good Condition	2	1	2	4		20	8
GLC4	Process piping	D3 - Mechanical	100mm ductile iron (assumed) wrapped in Denso		2010	Good Condition	2	1	3	6		50	38
GLC5	Ball Valves (2)	D3 - Mechanical	25mm SS ball valve		2010	Good Condition	2	1	2	4		25	13
						Average Condition	2.0	1.0	2.4	4.8			

Condition Assessment Register - Highway 21 and Waterworks Road Control Chamber

Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment: Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Condition Assessment: Performance Condition Rating (Based on Operation's Input)	Condition Assessment: Consequence of Failure (1-5)	Condition Assessment: Risk Score	Estimated Service Life	Remaining Service Life
Precast Chamber	D2 - Structure	3.6m x 2.1m precast chamber. Monobase, riser and roof cap and cast in ladder	Good condition, minor evidence of ground water ingress	2021	Good Condition	2	1	4	8	75	74
Hatch	D2 - Structure	SS lockable access hatch complete with grab bar		2021	Excellent Condition	1	1	3	3	40	39
Gate Valves (3)	D3 - Mechanical	200mm diameter Mueller gate valve	Excellent condition	2021	Excellent Condition	1	1	2	2	25	24
Ball Valves (4)	D3 - Mechanical	2 - 50mm diameter SS ball valve 2 - 25mm diameter SS ball valve	Excellent condition	2021	Excellent Condition	1	1	1	1	25	24
Pressure Reducing Valve (1)	D3 - Mechanical	200mm dia. Cla-Val D 90-48-1481G pressure reducing/sustaining valve. SS pilots	Excellent condition	2021	Excellent Condition	1	1	4	4	25	24
Sump Pump	D3 - Mechanical	Liberty Pump Model 237 sump pump c/w PVC check valve, ball valve and piping	Excellent condition	2021	Excellent Condition	1	1	2	2	25	24
Process Piping	D3 - Mechanical	200mm diameter 304SS	Excellent condition	2021	Excellent Condition	1	1	4	4	50	49
Flowmeter	D4 - Electrical	Siemens Mag 600 - 200mm dia. electromagnetic flowmeter	Excellent condition	2021	Excellent Condition	1	1	1	1	10	9
Pressure Transducer (2)	D4 - Electrical	Siemens SITRANSP320 pressure transducer with local display	Excellent condition	2021	Excellent Condition	1	1	1	1	20	19
Space Heater	D4 - Electrical	7.5kW Dimplex ceiling mounted electric heater	Excellent condition	2021	Excellent Condition	1	1	1	1	20	19
Control Panel	D4 - Electrical	Painted insulated steel cabinet housing PLC controller. Equipped with space heater, temperature switch, fan, and lighting	Excellent condition	2021	Excellent Condition	1	1	3	3	20	19
Primary Electrical, Conduits and Wiring	D4 - Electrical	Miscellaneous conduit, switches, and plugs	Excellent condition	2021	Excellent Condition	1	1	2	2	30	29
Lighting	D4 - Electrical	Single fluorescent wall mount	Excellent condition	2021	Excellent Condition	1	1	1	1	30	29

Condition Assessment Register - Huron Park Water Tower

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
HPEWT1	Bollards, paving, grading, vegetation	D1 - Site	5 bollards, paved laneway and parking lot, treed lot	Bollard in good condition, minor paint chipping/corrosion. Asphalt driveway in good condition. Grading in good condition, no obvious ponding	2010	Good Condition	2	2	1	2	50	38
HPEWT2	Roofing, exterior pedestal and interior pedestal	D2 - Structure	2.7ML composite elevated steel tank. Exterior Coating System (Epoxy-Epoxy-Polyurethane) and 100% solid polyurethane interior coating (IC4)	Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. The roof, exterior coating and interior coating is in generally good condition. Some chalking was noted.	2010	Good Condition	2	2	5	10	75	63
HPEWT3	Exterior Doors	D2 - Structure	1 - two leaf entrance door and 1 - single leaf door. Painted steel door with kick plates and hardware		2010	Good Condition	2	2	1	2	30	18
HPEWT4	Booster Pump	D3 - Mechanical	3/4 HP Bell and Gosset 3x3x7B Series 80S-BF In-Line Centrifugal Pump	Recently painted	2010	Good Condition	2	2	2	4	50	38
HPEWT5	Check Valves (3)	D3 - Mechanical	Three (3) Valmatic Swing-Flex check valves	Range in size from 100mm to 300mm diameter. Corrosion noted on some flange connections	2010	Fair Condition	3	3	3	9	25	13
HPEWT6	Butterfly Valves (7)	D3 - Mechanical	Seven (7) Pratt butterfly valves	Range in size from 100mm to 300mm diameter Corrosion noted on some flange connections. Appear to have been repainted	2010	Fair Condition	3	3	3	9	25	13
HPEWT7	Ball Valve (10)	D3 - Mechanical	Ten (10) SS ball valves various sizes. Does not include chemical dosing panel.	13mm - 50mm diameter	2010	Good Condition	2	2	2	4	25	13
HPEWT8	Rubber Duckbill Check Valve	D3 - Mechanical	One (1) Tideflex duckbill check valve for overflow. Not including mixing system	200mm diameter	2010	Good Condition	2	2	1	2	25	13
HPEWT9	Chlorine Dosing System	D3 - Mechanical	Panel mounted chlorine dosing board complete with one peristaltic dosing pump, one diaphragm dosing pump, 14 ball valves, pressure gauges, controller and flow switch	Pumps have been problematic resulting in frequent failures. Recommend alternative piping connections	2020	Poor Condition.	4	4	4	16	25	23
HPEWT10	Piping	D3 - Mechanical	304SS piping ranging from 13mm - 300mm diameter. SCH10 for welded pipes, SCH40 for threaded	Rust spotting throughout process piping likely due to humidity.	2010	Good Condition	2	2	4	8	50	38
HPEWT11	Sodium Hypochlorite Storage Equipment	D3 - Mechanical	Floor skid containment systems		2020	Good Condition	2	2	5	10	20	18
HPEWT12	Heater, Louvres and Fans	D3 - Mechanical	Four (4) at grade painted steel louvers and One (1) at base of tank		2010	Good Condition	2	2	1	2	25	13
HPEWT13	Control Panels	D4 - Electrical	Double door PLC cabinet	Controls upgraded in 2016	2016	Good Condition	2	2	5	10	20	14
HPEWT14	Primary Electrical	D4 - Electrical	Main disconnect, lighting panel		2010	Good Condition	1	1	5	5	30	18
HPEWT15	Emergency Power Generator	D4 - Electrical	55 kW Cummins natural gas generator with sound enclosure c/w automatic transfer switch.	Minor operational alarm issues	2010	Good Condition	2	3	5	15	30	18
HPEWT16	Conduits and Wiring	D4 - Electrical	PVC conduit	Good condition, not all components can be inspected	2010	Good Condition	2	2	3	6	30	18
HPEWT17	Lighting	D4 - Electrical	Various internal/external lighting	Good condition, not all components can be inspected	2010	Good Condition	2	2	1	2	30	18
HPEWT18	Flow Meter	D4 - Electrical	McCrometer V2 flowmeter		2010	Good Condition	2	2	3	6	20	8
HPEWT19	Pressure Transmitter (2)	D4 - Electrical	Rosemount pressure transmitter complete with diaphragm and needle valve		2010	Good Condition	2	2	5	10	20	8
HPEWT20	Chlorine Analyzer (2)	D4 - Electrical	Wallace & Tiernan Depolox 3 Plus wall mounted		2010	Good condition	2	2	5	10	20	8
HPEWT21	Eye Wash / Shower Station	D3 - Mechanical	Two (2) eyewash stations. Foot/hand operated		2010	Good Condition	2	2	3	6	20	8
HPEWT22	Platforms	D2 - Structure		Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. Good conditions	2010	Good Condition	2	2	3	6	50	38

Condition Assessment Register - Huron Park Water Tower

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score	Estimated Service Life	Remaining Service Life
HPEWT23	Ladders	D2 - Structure		Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. Good conditions. Ladder fall arrest is recommended to be replaced	2010	Good Condition	2	2	3	6	50	38
HPEWT24	Hatch Covers	D2 - Structure		Not visually assessed. Noted in the Facility Inspection done in 2020 by WATECH SERVICES INC. Good conditions	2010	Good Condition	2	2	3	6	40	28
HPEWT25	Reservoir Mixing System	D3 - Mechanical	Three (3) Tideflex duckbill check valve on 200mm diameter inlet pipe.	200mm diameter	2010	Good Condition	2	2	2	4	30	18
HPEWT26	Pump Panel Starter (MCC)	D4 - Electrical	Cabinet attached to PLC cabinet. Houses exhaust fan starters, pump starters		2010	Good Condition	2	2	3	6	30	18
						Average Condition	2.1	2.2	3.1	6.8		

Condition Assessment Register - Huron Street Monitoring Chamber

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score	Estimated Service Life	Remaining Service Life
HSMC1	1800mm Diameter Precast Valve Cham	D2 - Structure	1.8m diameter precast chamber c/w stainless steel lockable hatch and insulation insert	Heavy staining noted due to grounwater, minor corrosion in rebar. Cracking observed along chamber wall with water ingress	1995	Fair Condition	2	2	2	4	75	48
HSMC2	Flow Meter (1)	D4 - Electrical	150mm ABB Flow meter c/w disassembly Hymax Grip flanged coupling. Remote transmitter located in sampling cabinet	Good condition, some fastenerd corroded	2019	Good Condition	2	2	1	2	10	7
HSMC3	Pressure Gauges (2	D3 - Mechanical	100mm diameter oil filled gauge c/w isolation ball valve. One located in chamber other in montoring cabinet	Fair condition. Functional	1995	Fair Condition	3	3	1	3	20	-7
HSMC4	Sump Pump (1)	D3 - Mechanical	Sump pump with integrated float (vendor unknown) c/w ABS discharge piping, PVC ball valve and fernco style coupling	Good condition (assumed 2019 installation)	2019	Good Condition	2	2	1	2	20	17
HSMC5	Floats (2)	D4 - Electrical	Flygt float and unknown vendor	Fair condition. Appears to be original	1995	Fair Condition	3	3	1	3	20	-7
HSMC6	Pressure Transducer (1)	D4 - Electrical	Rosemount pressure transducer c/w needle valve isolation		2003	Fair Condition	2	2	1	2	10	-9
HSMC7	Chlorine Analyzer	D3 - Mechanical	Hach CL17 chlorine analyzer mounted within monitoring cabinet		2010	Good Condition	2	2	1	2	10	-2
HSMC8	Monitoring Cabinet	D4 - Electrical	Insulated painted steel cabinet housing instrumentation equipment. Equipped with space heater	Fair condition. Evidence of wate damange and rusting.	1995	Fair Condition	3	3	1	3	30	3
HSMC9	PLC Cabiner	D4 - Electrical	Insulated painted steel cabinet housing PLC controller. Equipped with space heater	Fair condition. Evidence of corrosion	1995	Fair Condition	3	3	1	3	30	3
HSMC10	Piping	D3 - Mechanical	Ductile iron piping and bypass	Good condition based on age	1995	Good Condition	2	2	3	6	50	23
HSMC11	Control Panels, Primary Electrical, Conduits and Wiring	D4 - Electrical	Electrical service, misc. conduit	Mixed condition, average fair	1995	Fair Condition	3	3	1	3	30	3
						Average Condition	2.5	2.5	1.3	3.0		

Condition Assessment Register - MacNaughton Booster Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score	Estimated Service Life	Remaining Service Life
MBPS1	Bollards, paving, grading, vegetation	D1 - Site	Concrete sidewalk, asphalt road, gravel parking lot	Hard surfaces in good condition. No exterior drainage issues observed during the site visit. Overgrowth hedges and some minor concrete sidewalk spalling/salt damage	2010	Good Condition	1	1	1	1	50	38
MBPS2	Interior Walls	D2 - Structure	Cast concrete interior wall within basement and brick on upper level.	Fair condition, some minor motor and concrete damage. Leaking shared wall with reservoir due to bad link seal. Operations is aware	1938	Fair Condition	3	3	2	6	75	-9
MBPS3	Exterior Walls	D2 - Structure	Brick façade	Good condition, minor step cracking and damaged brick	1938	Good Condition	2	2	2	4	75	-9
MBPS4	Roofing	D2 - Structure	Metal roof system.	Not original. Likely 2012 replacement.	2012	Good Condition	2	2	2	4	75	65
MBPS5	Exterior Doors	D2 - Structure	Two leaf metal door with original wooden door behind	Minor denting, paint peeling. Door assumed to be installed in 2010	2012	Fair Condition	3	3	2	6	75	65
MBPS6	Interior Lighting	D4 - Electrical	Ceiling mounting fluorescence bulbs	Assumed 2012 installation	2012	Good Condition	3	3	1	3	30	20
MBPS7	Exterior Lighting	D4 - Electrical	Exterior mounted door lighting	Assumed 2012 installation	2012	Good Condition	3	3	1	3	30	20
MBPS8	Pump Clear Well	D2 - Structure	Concrete pump clear well with cast iron lid and ladder	Not visually inspected due to ladder failure. Assumed poor condition based on reservoir condition	1938	Poor condition	4	4	4	16	30	-54
MBPS9	Stairs	D2 - Structure	Painted steel stairs with railing and gating	Minor dents and paint corrosion, fair condition.	1938	Fair Condition	3	3	1	3	75	-9
MBPS10	Interior Doors	D2 - Structure	Single painted steel door	Installed 2022	2022	Excellent Condition	1	1	1	1	75	75
MBPS11	Booster Pump 211	D3 - Mechanical	200HP vertical turbine fire pump	Serviced in 2016	1995	Fair Condition	3	3	4	12	25	-2
MBPS12	Booster Pump 221	D3 - Mechanical	25HP vertical turbine duty pump for North Exeter Pressure Zone	Serviced in 2016	2012	Fair Condition	2	2	4	8	25	15
MBPS13	Booster Pump 111	D3 - Mechanical	60HP vertical turbine pump for South Exeter	Serviced in 2016. Significant vibration noted in 2022. Evidence of packing wear	2012	Fair Condition	2	2	4	8	25	15
MBPS14	Recirculation Pump	D3 - Mechanical	7.5HP Gould VIT-10DHLC - 1 Stage Vertical Turbine Pump	Newly installed during MacNaughton Upgrades	2021	Excellent Condition	1	1	3	3	25	24
MBPS15	Ball Valves (11)	D3 - Mechanical	Eleven (11) ball valves various sizes	Typical age 2012	2012	Good Condition	1	1	2	2	25	15
MBPS16	Butterfly Valve (8)	D3 - Mechanical	100 - 300mm butterfly valves. Manual handwheel	Installation dates range. Majority in 2012	2012	Good Condition	2	2	2	4	25	15
MBPS17	Gate Valves (6)	D3 - Mechanical	Six (6) gate valves	200 - 300mm diameter Some valves were installed earlier and are older	2012	Good Condition	2	2	2	4	25	15
MBPS18	Knife Gate Valve	D3 - Mechanical	One (1) knife gate valve	300mm diameter	2012	Good Condition	2	2	2	4	25	15
MBPS19	Check Valves (5)	D3 - Mechanical	Four (4) weight disc check valve One (1) tilted rubber check valve	150 - 300mm diameter	2012	Good Condition	2	2	2	4	25	15
MBPS20	Air Release Valve (4)	D3 - Mechanical	Four (4) air release valves	3 - 2010 installation , 1 - 2022 installation Functional	2012	Good Condition	2	2	2	4	25	15

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
MBPS21	Pressure Gauge (4)	D3 - Mechanical	Four (4) pressure gauge		2012	Good Condition	1	1	2	2	25	15
MBPS22	Pressure Relief Valve (2)	D3 - Mechanical	Two (2) Cla-Val 50-01BV pressure relief valve	100 - 200 mm diameter	2010	Good Condition	1	1	5	5	25	13
MBPS23	Flow Control Valve / Back Pressure Valve	D3 - Mechanical	200mm Singer S106-SC-C-NC Flow Control/Pressure Reducing Valve		1995	Good Condition	2	2	5	10	25	-2
MBPS24	Piping	D3 - Mechanical	100-300mm 304 SS piping	100-300 mm diameter. Age Varies. Wall penetration leak for pressure relief line for South Exeter	1995	Good Condition	2	2	3	6	25	-2
MBPS25	Chlorine Dosing System	D3 - Mechanical	Duplex Watson Marlow Qudos 20 Pump with teflon material and chemline valves	Newly installed during 2021 upgrades	2021	Excellent Condition	1	1	3	3	25	24
MBPS26	Flow Meter (3)	D4 - Electrical	Three (3) ABB MF/F15 flow meters	150 - 250mm diameter	2012	Good Condition	2	2	3	6	10	0
MBPS27	Reservoir Level Indicator (2)	D4 - Electrical	Two (2) Milltronic MicroRanger II reservoir level indicator	Could not be visually assessed	2010	Good Condition	2	2	4	8	20	8
MBPS28	PLC Control Panel	D4 - Electrical	Legacy PLC from well system days	Number of abandoned equipment. No verification of wiring, legacy equipment	1995	Poor condition	4	4	4	16	20	-7
MBPS29	MCC #1	D4 - Electrical	MCC for recirculation pump, HLP111, breaker panel and heater		2022	Good Condition	2	2	4	8	30	30
MBPS30	MCC #2	D4 - Electrical	MCC for North Exeter Pumps, Generator ATS, PLC,		2012	Good Condition	2	2	4	8	30	20
MBPS31	Control Panels, Primary Electrical, Conduits and Wiring	D4 - Electrical	Conduits, primary wiring, switches	Majority Replaced in 2012/2022	2022	Good Condition	2	2	3	6	30	30
						Average Condition	2.1	2.1	2.7	5.7		

Condition Assessment Register - MacNaughton Drive Generator Building

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
MDGB1	Bollards, paving, grading, vegetation	D1 - Site	Concrete sidewalk, asphalt road	Hard surfaces in good condition. No exterior drainage issues observed during the site visit. minor concrete sidewalk spalling/salt damage. Entrance to bay door heavily damaged	2010	Fair Condition	3	3	1	3	50	38
MDGB2	Interior Walls	D2 - Structure	Unpainted MBU	Good condition. Assumed installed in 1995	1995	Good Condition	2	2	2	4	75	48
MDGB3	Exterior Walls	D2 - Structure	Exact makeup unknown. Suspected MBU with brick façade. Metal frame reinforced glass windows. Spray foamed interior	Fair condition, minor step cracking and damaged brick at wind/sun exposed corners. Heavy corrosion around windows.	1938	Fair Condition	3	3	2	6	75	-9
MDGB4	Roofing	D2 - Structure	Asphalt shingle roof. Steel webbing with wall reinforcements and spray foamed.	Roof estimated to be 2012 installation, roof truss has been structurally reinforced 10-20 years ago	1938	Good Condition	2	2	2	4	30	-54
MDGB5	Exterior Doors	D2 - Structure	Two - single leaf steel doors. One garage bay door	Minor denting, paint peeling. Door assumed to be installed in 2012. Bay door frame requires paint, new weather stripping. Sill needs to be repoured. Heavily damaged	2012	Poor Condition	4	4	2	8	75	65
MDGB6	Interior Lighting	D4 - Electrical	Ceiling mounting fluorescence fixtured	Assumed 2012 installation	2012	Good Condition	2	2	1	2	30	20
MDGB7	Exterior Lighting	D4 - Electrical	Exterior wall mounted door lighting	Assumed 2012 installation	2012	Good Condition	2	2	1	2	30	20
MDGB9	Retaining Wall	D2 - Structure	1.0-1.5m tall pour concrete retaining wall around southern perimeter.	Large cracking suspected to be settlement related.	1938	Poor Condition	4	4	2	8	75	-9
MDGB10	Interior Doors	D2 - Structure	Double leaf insulated painted steel door		2012	Good Condition	2	2	1	2	30	20
MDGB11	Generator	D3 - Mechanical	462kW Perkins diesel generator		2012	Good Condition	2	2	3	6	30	20
MDGB12	Fuel System	D3 - Mechanical	Double wall containment tank, black threaded fuel piping and associated alarms.	Routinely inspected by Gencare.	2012	Good Condition	2	2	3	6	30	20
MDGB13	HVAC	D3 - Mechanical	Actuated dampers and wall louvers.		2012	Good Condition	2	2	3	6	30	20
MDGB14	Control Panels, Primary Electrical, Conduits and Wiring	D4 - Electrical	Conduits, breaker panel, local disconnect, 120V contactor		2012	Good Condition	2	2	3	6	30	20
						Average Condition	2.5	2.5	2.0	4.8		

Condition Assessment Register - MacNaughton Drive Reservoirs

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score	Estimated Service Life	Remaining Service Life
MDR1	Vegetation	D1 - Site	Hedge around access hatches		1996	Good Condition	2	1	1	2	50	24
MDR2	Access Hatches (3)	D1 - Site	Cell #1 - 1 painted steel lockable hatches Cell #2 - 3 painted steel lockable hatches	Exterior hatches paint heavily worn. Internal hatch components rusted. Operations indicated issues with latches.	1996	Poor Condition	4	4	3	12	40	14
MDR3	Cell #1 Walls	D2 - Structure	Pour reinforced concrete walls	Minimal to no concrete surface wear/softening. Minor areas of corrosion of the encased rebar noted. Upper portion of the concrete walls were noted to have dark staining around the entire perimeter which appears to be above the typical operating level	1938	Fair Condition	3	1	5	15	75	-9
MDR3	Cell #2 Walls	D2 - Structure	Pour reinforced concrete walls	Minimal to no concrete surface wear.	1996	Good condition	2	1	5	10	75	49
MDR4	Cell #1 Floors	D2 - Structure	Pour reinforced concrete floors	Generally in fair condition, minor concrete surface wear and aggregate exposure	1938	Fair - Assumed based on wall condition. Could not inspected due to standing water	3	1	5	15	75	-9
MDR5	Cell #2 Floors	D2 - Structure	Pour reinforced concrete floors	Minimal to no concrete surface wear.	1996	Good condition	2	1	5	10	75	49
MDR6	Cell #1 Columns/supports	D2 - Structure	Pour reinforced concrete columns. 9 Total	Minor wear, concrete aggregate exposed in area. Areas of rebar corrosion noted. Large Aggregate exposed	1938	Fair Condition	3	1	5	15	75	-9
MDR7	Cell #2 Columns/supports	D2 - Structure	Pour reinforced concrete columns. 9 Total	Little to no concrete wear. Minor areas of rebar corrosion	1996	Good condition	2	1	5	10	75	49
MDR8	Cell #1 Roof	D2 - Structure	Pour reinforced concrete roof	Number of areas of spalled concrete and exposed corroded rebar. Concrete missing in locations. Spot repairs required	1938	Poor condition	4	1	5	20	75	-9
MDR9	Valve Chamber Process Piping	D2 - Structure	150mm 304L SS inlet pipe 150mm 304L SS overflow pipe 300mm 304L SS outflow pipe	minor staining/corrosion	1996	Fair Condition	3	1	2	6	75	49
MDR10	Mixing Header and duck bill check valve	D3 - Mechanical	150mm 304L SS header with 4 tideflex duck bill check valves	Installed during 2021 upgrades. New condition	2021	Excellent Condition	3	1	1	3	40	39
MDR11	Check Valve (1)	D3 - Mechanical	200mm diameter check valve	minor corrosion on epoxy coating.	1996	Fair Condition	3	1	2	6	40	14

Condition Assessment Register - MacNaughton Drive Reservoirs

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment: Condition Comment	Condition Assessment: Physical Condition Rating (1-5)	Condition Assessment: Performance Condition Rating (Based on Operation's Input)	Condition Assessment: Consequence of Failure (1-5)	Condition Assessment: Risk Score	Estimated Service Life	Remaining Service Life
MDR11	Gate Valve (1)	D3 - Mechanical	150mm gate valve	minor corrosion on epoxy coating.	1996	Could not be assessed visually	2	1	5	10	75	49
MDR12	Motorized Butterfly Valve (1)	D3 - Mechanical	300mm motorized butterfly valve	minor corrosion on epoxy coating. Operations has indicated entry to operate motorized valve	1996	Could not be assessed visually	2	1	5	10	75	49
MDR13	Butterfly Valve (1)	D3 - Mechanical	150mm butterfly valve	minor corrosion on epoxy coating.	1996	Could not be assessed visually	2	1	5	10	75	49
						Average Condition	2.4	1.0	3.6	7.8		

APPENDIX C:
GROWTH DEMAND

Growth Details									Water Demand Details				
ID	Status	Name	Town	Type	Area (ha)	Units	Population (2.3 ppu or 40 ppha)	ppha	Pressure Zone	ADD - Res (L/s)	ADD - Emp (L/s)	ADD - Total (L/s)	MDD (L/s)
1A	Developed	Buckingham Estates	Exeter	Res	18.8	120	276	15	South Exeter	0.96		0.96	1.82
8	Developed	Southpoint Subdivision	Exeter	Res	1.8	38	87	48	South Exeter	0.30		0.30	0.58
10	Partially Developed	Stoney Ridge	Exeter	Res	3.7	32	74	20	South Exeter	0.26		0.26	0.49
1B	Potential Residential Area	HDC Lands	Exeter	Res	11.4	328	754	66	South Exeter	2.62		2.62	4.98
2	Potential Commercial/ Industrial/ Residential Area	Ondrejicka	Exeter	Res/Emp	13.8	-	552	40	South Exeter	1.92		1.92	3.64
3	Long Term Care Facility	Southbridge	Exeter	Res	1.7	99	228	134	South Exeter	0.79		0.79	1.50
4	Potential Residential Area	Willis Way	Exeter	Res	1.6	6	14	9	South Exeter	0.05		0.05	0.09
5	Potential Residential Area	Shapton	Exeter	Res	2.2	38	87	39	South Exeter	0.30		0.30	0.58
6	Potential Residential Area	McBride	Exeter	Res	26.5	-	1,060	40	South Exeter	3.68		3.68	7.00
7	Potential Residential Area	Hamather	Exeter	Res	12.1	120	276	23	South Exeter	0.96		0.96	1.82
9	Potential Residential Area	Pooley	Exeter	Res	5.8	100	230	40	South Exeter	0.80		0.80	1.52
11	Potential Residential Area	Hamather/McBride	Exeter (Outside SAB)	Res	19.0	178	409	22	South Exeter	1.42		1.42	2.70
12	Draft Plan Approved	Windermere Subdivision	Exeter	Res	23.6	160	368	16	South Exeter	1.28		1.28	2.43
13	Potential Residential Area	Rasenberg	Exeter	Res	9.4	163	375	40	North Exeter	1.30		1.30	2.47
14	Potential Residential Area	CVD Subdivision	Exeter	Res/Emp	17.5	238	916	52	North Exeter	1.90	1.49	3.39	6.45
33	Potential Commercial/ Industrial Area	Exeter Produce	Exeter	Emp	11.9	-	475	40	North Exeter	1.65		1.65	3.13
17B	Pre-Servicing Agreement	Sol Haven Phase I	Grand Bend	Res	12.2	182	490	40	Pressure Zone 1 (West Zone)	1.70		1.70	3.23
15	Potential Residential Area	South of Pollock Farms	Grand Bend (Outside SAB)	Res	10.7	127	292	27	Pressure Zone 1 (West Zone)	1.01		1.01	1.93
16	Potential Residential Area	Turnbull Lands	Grand Bend (Outside SAB)	Res	41.1	456	1,049	26	Pressure Zone 1 (West Zone)	3.64		3.64	6.92
17A	Potential Residential Area	Sol Haven Phase II	Grand Bend	Res	40.4	241	554	14	Pressure Zone 1 (West Zone)	1.92		1.92	3.66
18	Potential Residential Area	Zone 2 Future Development	Grand Bend	Res	164.9	1088	2,502	15	Pressure Zone 1 (West Zone)	8.69		8.69	16.51
19	Potential Residential Area	Grand Cove Estates Phase 5	Grand Bend	Res	4.0	34	78	20	Pressure Zone 1 (West Zone)	0.27		0.27	0.52
28	Potential Commercial/ Industrial Area	Bendtech	Grand Bend (Outside SAB)	Emp	21.2	-	850	40	Pressure Zone 1 (West Zone)	2.95		2.95	5.61
31	Potential Commercial Area	Watson	Grand Bend	Emp	3.5	-	141	40	Pressure Zone 1 (West Zone)	0.49		0.49	0.93
35	Potential Residential Area	Hotson	Grand Bend	Res	8.4	-	336	40	Pressure Zone 1 (West Zone)	1.17		1.17	2.22
36	Potential Commercial Area	Grand Bend Proposed Commercial	Grand Bend (Outside SAB)	Emp	11.1	-	444	40	Pressure Zone 1 (West Zone)		1.80	1.80	3.42
20	Potential Residential Area	Crediton Village Centre	Crediton	Res	33.6	337	775	23	Pressure Zone 3 (West Crediton Zone)	2.69		2.69	5.11
21	Potential Residential Area	Morrisey	Crediton	Res	1.3	8	18	15	Pressure Zone 3 (West Crediton Zone)	0.06		0.06	0.12
22	Potential Residential Area	Stephan	Crediton	Res	7.4	-	298	40	Pressure Zone 3 (West Crediton Zone)	1.03		1.03	1.97
23	Potential Residential Area	Huron Park Proposed 1	Huron Park	Res	4.1	48	110	27	Pressure Zone 5 (Huron Park Zone)	0.38		0.38	0.73
24	Potential Residential Area	Huron Park Proposed 2	Huron Park	Res	9.5	98	225	24	Pressure Zone 5 (Huron Park Zone)	0.78		0.78	1.49
29	Potential Residential Area	Huron Park Proposed 3	Huron Park	Res	1.3	-	51	40	Pressure Zone 5 (Huron Park Zone)	0.18		0.18	0.34
30	Potential Residential Area	Huron Park Proposed 4	Huron Park	Res	1.5	-	58	40	Pressure Zone 5 (Huron Park Zone)	0.20		0.20	0.39
25	Potential Residential Area	Pavkeje Subdivision	Centralia	Res	3.4	13	30	9	Pressure Zone 5 (Huron Park Zone)	0.10		0.10	0.20
26	Potential Residential Area	Hodgins	Centralia	Res	4.8	-	194	40	Pressure Zone 5 (Huron Park Zone)	0.67		0.67	1.28
27	Potential Residential Area	Centralia Proposed 1	Centralia	Res	2.0	-	81	40	Pressure Zone 5 (Huron Park Zone)	0.28		0.28	0.54
34	Potential Industrial Area	Centralia Proposed 2	Centralia	Emp	5.1	-	204	40	Pressure Zone 5 (Huron Park Zone)		0.83	0.83	1.57
37	Potential Industrial Area	Centralia Proposed 3	Centralia (Outside SAB)	Emp	18.2	-	244	40	Pressure Zone 5 (Huron Park Zone)		0.99	0.99	1.88
			Centralia	**-**	**21.5**	**13**	**753**		**South Exeter**	**15.3**	**0.0**	**15.3**	**29.1**
			Exeter	**-**	**180.7**	**1620**	**6,181**		**North Exeter**	**4.9**	**1.5**	**6.3**	**12.1**
			Grand Bend	**-**	**317.5**	**2128**	**6,737**		**Pressure Zone 1 (West Zone)**	**21.9**	**1.8**	**23.6**	**44.9**
			Crediton	**-**	**42.3**	**345**	**1,091**		**Pressure Zone 3 (West Crediton Zone)**	**3.8**	**0.0**	**3.8**	**7.2**
			Huron Park	**-**	**16.3**	**146**	**445**		**Pressure Zone 5 (Huron Park Zone)**	**2.6**	**1.8**	**4.4**	**8.4**
			Total	**-**	**578.4**	**4252**	**15,208**		**Total**	**48.4**	**5.1**	**53.5**	**101.7**

APPENDIX D: EVALUATION TABLES

Table 1: Exeter Pressure Zone Evaluation

Category	Criteria	Alternative 1 – Maintain Two Pressure Zones		Alternative 2 – Operate as One Pressure Zone at a Higher HGL	
Technical Impacts	**Meets existing and future servicing needs**	High	• Yes	High	• Yes
	Provides a reliable service	Medium	• Reliance on supply source and additional pumped storage; less efficient	High	• ET provides reliable service
	Minimizes and manages construction risk	Medium	• Upgrades needed at existing ET; minimal impacts during construction	Low	• Potential construction delays related to land acquisition
	Supports phased expansion of the system	Medium	• Future upgrades required to service all of the proposed boundary expansion area • Maximizes use of existing pumping and storage facilities	High	• Existing Exeter ET can be decommissioned • Moderate modifications to facilities & current operations • Opportunity to oversize storage to accommodate all of Exeter's proposed growth
	Operational Complexity	High	• - Minimal changes to existing operations	High	• More hydraulically beneficial
	Resiliency to climate change	Medium	• Reliant on supply connection, existing ET storage and pumped storage and emergency power • No additional measures to improve system resiliency	High	• ET to reduce energy consumption and operations in event of a power failure
Environmental Impacts	**Protects environment features**	High	• ET upgrades and watermain construction to avoid	High	• ET site location and watermain construction to avoid
	Protects wildlife and species at risk	High	• ET upgrades and watermain construction to avoid	High	• ET site location and watermain construction to avoid
	Minimizes climate change impacts	Medium	• Minimal to no change in GHG production	High	• Reduced GHG production due to operational efficiency
Social and Cultural Impacts	**Protects resident quality of life**	High	• Minimal to no impacts to existing residents	Medium	• Some impacts to existing residents and businesses
	Manages and minimizes construction impacts	Medium	• Construction impacts at existing ET facility and watermain construction outside of existing urban residential and business area along Morrison Line	Medium	• Increased construction impacts with construction of new ET; however, opportunity for new ET to be within vacant employment lands
	Protects cultural heritage and archeological features	High	• Unknown impacts to Cultural Heritage and Archeological	High	• Unknown impacts to Cultural Heritage and Archeological
Financial Impacts	**Capital and life-cycle costs**	Low	• $$	Low	• $$$$
	Operation and maintenance costs	Low	• Additional O&M to operate two pressure zones and maintain reliability of existing Exeter ET	High	• Reduced O&M costs due to new ET
	Aligns with approval and permitting process	High	• Exeter ET upgrades at existing site	High	• Opportunity for new ET to be within north Exeter employment lands

Evaluation Scoring Legend: High Medium Low

Table 2: Stephen Pressure Zone Boundary Evaluation

Category	Criteria		Alternative 1 – Do Nothing		Alternative 2 – Status Quo		Alternative 3 – Moderate Alterations		Alternative 4 – Pressure Zone Reconfiguration
Technical Impacts	**Meets existing and future servicing needs**	🔴	• -No. Does not meet LoS Criteria in all pressure zones	🟡	• Yes. Meets LoS Criteria; however, nearing both high- and low-pressure limits	🔴	• No. Does not meet LoS Criteria in all pressure zones	🔴	• No. Does not meet LoS Criteria in all pressure zones
	Provides a reliable service	🟡	• Reliance on supply source	🟡	• Reliance on supply source	🟡	• Reliance on supply source	🟡	• Reliance on supply source
	Minimizes and manages construction risk	🟢	• No construction required	🟢	• No construction required	🟡	• Moderate construction required including valving, connections and new watermain	🔴	• Most complex implementation of boundary change including valving, connections & watermain
	Supports phased expansion of the system	🔴	• No additional flexibility from existing system	🔴	• No increased flexibility for growth	🟢	• Some increased flexibility for proposed growth	🟢	• Some increased flexibility for proposed growth
	Operational Complexity	🟢	• No changes to existing operations	🟢	• Minimal changes to existing operations	🟢	• Moderate changes to existing operations	🟡	• Greatest changes to existing pressure zone operations
	Resiliency to climate change	🟡	• No additional measures to improve system resiliency	🟡	• No additional measures to improve system resiliency	🟢	• Some additional measures to improve system resiliency	🟢	• Some additional measures to improve system resiliency
Environmental Impacts	**Protects environment features**	🟢	• Yes, no changes to existing system	🟡	• System modifications to avoid	🟡	• System modifications to avoid	🟡	• System modifications to avoid
	Protects wildlife and species at risk	🟢	• Yes, no changes to existing system	🟢	• System modifications to avoid	🟢	• System modifications to avoid	🟢	• System modifications to avoid
	Minimizes climate change impacts	🟢	• No changes to existing GHG production	🟢	• Minimal to no changes to existing GHG production	🟢	• Minimally reduced GHG production due to operational efficiency	🟢	• Minimally reduced GHG production due to operational efficiency
Social and Cultural Impacts	**Protects resident quality of life**	🟢	• No impacts to existing residents anticipated	🟡	• Some impacts to existing residents	🟡	• Some impacts to existing residents	🟡	• Some impacts to existing residents
	Manages and minimizes construction impacts	🟢	• No construction impacts	🟢	• Minimal to no construction impacts; only at existing valves	🟢	• Moderate construction impacts	🔴	• Highest construction impacts
	Protects cultural heritage and archeological features	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological
Financial Impacts	**Capital and life-cycle costs**	🟢	• N/A	🟢	• $	🟢	• $$	🟡	• $$$
	Operation and maintenance costs	🟢	• No change to O&M costs	🟢	• Minimal to no change in O&M costs	🟢	• Minimal reduction to O&M costs	🟡	• O&M costs may increase due to issues with high pressures
	Aligns with approval and permitting process	🟢	• No permitting required	🟢	• Valving changes at existing site	🟢	• Valving changes at existing site, new watermain in ROW	🟡	• Land acquisition may be required for any additional valves, new watermain in ROW

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

Table 3: LHPWSS Shut Down Resiliency Evaluation

Category	Criteria	Alternative 1 – Backfeed from Huron Park ET	Alternative 2 – Install a new ET in Stephen Pressure Zone	Alternative 3A – Backfeed to Stephen Pressure Zones from the Airport Reservoir: No additional storage upgrades	Alternative 3B – Backfeed to Stephen Pressure Zones from the Airport Reservoir: Double existing reservoir capacity	Alternative 4 – Rely on New Storage at the LHPWSS WTP
Technical Impacts	Meets existing and future servicing needs	🟢 • Yes	🟢 • Yes	🟢 • Yes	🟢 • Yes	🟢 • Yes
	Provides a reliable service	🔴 • Supports system for the least number of hours	🟡 • Supports system for a moderate number of hours • Reduces risk during fire or emergency	🟡 • Supports system for a moderate number of hours • Dependence on pumps reduces system resiliency • Reduces risk during fire or emergency	🟡 • Supports system for the most number of hours • Dependence on pumps and watermain reduces system resiliency	🔴 • No system redundancy under HLP shutdown
	Minimizes and manages construction risk	🟢 • Moderate construction primarily for new watermain and facility upgrades	🟡 • Major construction for new ET	🟢 • Moderate construction primarily for new watermain and facility upgrades	🟢 • Moderate construction primarily for new watermain and facility upgrades	🟢 • Moderate construction primarily for new watermain
	Supports phased expansion of the system	🟢 • Improves resiliency in existing and future water systems	🟢 • Improves resiliency in existing and future water systems	🟢 • Improves resiliency in existing and future water systems	🟢 • Improves resiliency in existing and future water systems	🟢 • Improves resiliency in existing and future water systems
	Operational Complexity	🟢 • Similar operations to existing, modifications during emergency	🟢 • ET to allow for reduced dependence on pumping	🟢 • Similar operations to existing, modifications during emergency	🟢 • Similar operations to existing, modifications during emergency	🟢 •
	Resiliency to climate change	🟢 • Some additional measures to improve system resiliency	🟢 Some additional measures to improve system resiliency	🟢 • Some additional measures to improve system resiliency	🟢 • Some additional measures to improve system resiliency	🟢 • Some additional measures to improve system resiliency
Environmental Impacts	Protects environment features	🟢 • System modifications to avoid	🟢 • System modifications to avoid	🟢 • System modifications to avoid	🟢 • System modifications to avoid	🟢 • System modifications to avoid
	Protects wildlife and species at risk	🟢 • System modifications to avoid	🟢 • System modifications to avoid	🟢 • System modifications to avoid	🟢 • System modifications to avoid	🟢 • System modifications to avoid
	Minimizes climate change impacts	🟢 • Reliance on storage over pumping	🟢 • Reliance on storage over pumping	🟡 • Reliance on both storage and pumping	🟡 • Reliance on both storage and pumping	🟢 • Reliance on storage over pumping
Social and Cultural Impacts	Protects resident quality of life	🟡 • Some impacts to existing residents and businesses	🟡 • Some impacts to existing residents and businesses	🟡 • Some impacts to existing residents and businesses	🟡 • Some impacts to existing residents and businesses	🟡 • Some impacts to existing residents and businesses
	Manages and minimizes construction impacts	🟢 • Construction at existing facilities and new watermain	🟡 • Increased construction impacts with construction of new ET	🟢 • Construction at existing facilities and new watermain	🟢 • Construction at existing facilities and new watermain	🟢 • Construction at existing facilities and new watermain
	Protects cultural heritage and archeological features	🟢 • Unknown impacts to cultural heritage and archeological	🟢 • Unknown impacts to cultural heritage and archeological	🟢 • Unknown impacts to cultural heritage and archeological	🟢 • Unknown impacts to cultural heritage and archeological	🟢 • Unknown impacts to cultural heritage and archeological
Financial Impacts	Capital and life-cycle costs	🟢 • $	🟢 • $$	🟢 • $$	🟢 • $$	🟢 • $
	Operation and maintenance costs	🟢 • Minimal change in O&M costs	🔴 • Increased cost in O&M due to new ET	🟢 • Minimal change in O&M costs	🟢 • Minimal change in O&M costs	🟢 • Minimal change in O&M costs

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

APPENDIX E:
CAPITAL PROGRAM PROJECT SHEETS

Wastewater Master Plan

Water and Wastewater Master Plan Update

January 2025

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London, ON N5X 4E7

519-672-9403

Municipality of South Huron

GMBP Project: 521054

Table of Contents

APPENDICES

1 INTRODUCTION AND BACKGROUND

1.1 Municipality of South Huron Background

The Municipality of South Huron (Municipality) is located in southwest Ontario, along the southern border of Huron County, approximately 45 km north of the City of London. The Municipality consists of predominantly agricultural land and includes the town of Exeter and the greater Grand Bend area, the small rural communities of Centralia, Crediton, Dashwood, Huron Park, and Kirkton, plus the hamlets of Corbett, Elimville, Greenway, Mount Carmel, Winchelsea and Woodham. The Municipality of South Huron is a single tier municipality, which owns and is responsible for the planning, construction, and management of municipal water and wastewater infrastructure.

The Municipality owns and operates its wastewater system, which includes wastewater treatment, pumping stations, and collection and trunk sewers. The Municipality's wastewater from the villages of Crediton, Huron Park and Centralia as well as the town of Exeter is collected and conveyed to the Exeter Wastewater Treatment Facility (WWTF), that treats the Municipality's wastewater before discharging to the Ausable River.

The Grand Bend wastewater system operates independently of the Exeter wastewater system. The Municipality owns and operates pumping stations, and collection and trunk sewers in and around Grand Bend. The wastewater is conveyed to the Grand Bend WWTF, that is jointly owned and administered by Lambton Shores and operated by Jacobs Engineering Group.

Readily available and accessible public infrastructure is essential to the viability of existing and growing communities. Infrastructure planning, land use planning, and infrastructure investment require close integration to ensure efficient, safe, and economically achievable solutions to provide the required water and wastewater infrastructure.

To balance the needs of growth with the protection and preservation of natural, environmental, and heritage resources, the Municipality of South Huron initiated the 2023 Master Plan Update (MPU) for water and wastewater under the Municipal Engineers Association (MEA) Master Plan Class Environmental Assessment process.

1.2 Master Plan Update

The Master Plan Update comprehensively documents the development of the preferred water and wastewater servicing strategies for the Municipality of South Huron to meet the servicing needs of existing users and future development.

The Master Plan Update evaluates the ability of existing and planned water and wastewater infrastructure within the Municipality of South Huron to service the Municipality's existing population, service the forecasted growth, and evaluate/develop recommended servicing strategies efficiently and effectively.

The 2023 Master Plan Update is a critical component of the Municipality's planning for growth and will provide the framework for the management, expansion and funding of the water and wastewater systems for the Municipality.

1.3 Master Plan Update Objectives

The key objectives of the Master Plan Update are as follows:

- Review potential residential and employment areas and determine the impacts on servicing needs for the Municipality's water and wastewater infrastructure;
- Review and integrate the water and wastewater system renewal and replacement needs;
- Evaluate the ability of existing and planned water and wastewater infrastructure to efficiently and effectively service the Municipality's existing users and potential growth;
- Undertake a comprehensive review and analysis for the water and wastewater servicing requirements;
- Address key servicing considerations as part of the development and evaluation of servicing strategies including:
    - Level of Service to existing users and anticipated growth
    - Operational flexibility and security of supply
    - Mitigation of impacts to natural, social, and economic environments
    - Opportunity to meet policy, policy statements, regulations and technical criteria
    - Opportunity to optimize existing infrastructure and servicing strategies
    - Ensuring the strategies are cost effective
- Consider and develop sustainable servicing solutions;
- Utilize recently completed and on-going projects to update infrastructure status, capacity and cost estimates;
- Utilize the newly developed water and wastewater hydraulic models for the analysis of servicing alternatives;
- Establish a complete and implementable water and wastewater capital program;
- Extensive consultation with the public and stakeholders; and
- Complete the Master Plan in accordance with the MEA Class EA process for Master Plans (further described in **Volume I**).

1.4 Master Plan Update Documentation Layout

The Master Plan Update Report, including all supporting volumes, is the documentation placed on public record for the prescribed review period. This documentation, in its entirety, describes all required phases of the planning process and incorporates the procedure considered essential for the compliance with the **Environmental Assessment Act**.

The MPU Report is organized into three volumes as described below.

Volume I – Water and Wastewater Master Plan Update

Volume I provides a brief overview of the Master Plan Update. It details the problem statement, purpose of the study, significant planning, environmental and technical considerations, master planning process, population and employment growth forecasts, existing environmental and servicing conditions, evaluation methodology, and future considerations.

This volume will also detail all relevant documentation of the public consultation process including notices, comments and responses, and distribution information. Presentation material from the Public Information Centre (PIC) held during this process is included. Other presentation material and discussion information from workshops held during this process is included. Other discussion information with relevant agencies, approval bodies and other stakeholders are also included within the appendices:

- Appendix A – Study Stakeholder List
- Appendix B – Study Commencement
- Appendix C – Public Information Centre
- Appendix D – Comments Received
- Appendix E – Study Completion

Volume II – Water Master Plan

Volume II consists of the principal document summarizing the study objectives, approach, methodologies, technical analyses, evaluation and selection of the preferred water servicing strategy. This volume outlines the water policies, design criteria and Level of Service needed to be achieved by the water network. In addition, **Volume II** identifies the existing water network and describes the hydraulic modelling tool used for the analysis. Further **Volume II** outlines the detailed evaluation and decision-making process as well as the preferred servicing strategy and associated capital program and implementation plan.

A significant amount of technical background information has been compiled, which is critical to the development of the Water Master Plan Update. This information is included as appendices in **Volume II**. The technical appendices contain relevant project, implementation, and technical analysis information including:

- Appendix A – Water System Schematic
- Appendix B – Water Condition Assessments
- Appendix C – Growth Demand
- Appendix D – Evaluation Tables
- Appendix E – Capital Program Project Sheets

Volume III – Wastewater Master Plan

Volume III consists of the principal document summarizing the study objectives, approach, methodologies, technical analyses, evaluation and selection of the preferred wastewater servicing strategy. This volume outlines the wastewater policies, design criteria and Level of Service needed to be achieved by the wastewater network. In addition, **Volume III** identifies the existing wastewater network and describes the hydraulic modelling tool used for the analysis. Further in **Volume III** is the detailed evaluation and decision-making as well as the preferred servicing strategy and associated capital program and implementation plan.

A significant amount of technical background information has been compiled, which is critical to the development of the Wastewater Master Plan Update. This information is included in appendices in **Volume III**.

The technical appendices contain relevant project, implementation, and technical analysis information including:

- Appendix A – F-5-1 Effluent Design Objectives
- Appendix B – Wastewater Condition Assessments
- Appendix C – Wastewater System Schematic
- Appendix D – Growth Flows
- Appendix E – Evaluation Tables
- Appendix F – Capital Program Project Sheets

2 WASTEWATER DESIGN CRITERIA AND HYDRAULIC PERFORMANCE CRITERIA

A guiding principle of design criteria is to ensure that the flow projections are adequately predicted with an appropriate factor of safety and risk management. This overall principle also ensures that infrastructure has sufficient capacity to meet the growing needs of the Municipality and does not impede the approved/planned growth.

The design criteria were reviewed as part of this MPU to ensure wastewater flows are accurate and will support the sizing and timing of future infrastructure such as sanitary sewers and facilities.

The development of design criteria utilized historical flow data in combination with Ontario Ministry of Environment, Conservation, and Parks (MECP) Design Standards and Guidelines. Level of Service and wastewater policies were discussed and established at the outlet of the project. The following sections outline the background information used to form the wastewater design and Level of Service criteria.

2.1 Wastewater Flow Design Criteria

Wastewater flows are assessed by means of dry weather flows and peak wet weather flow with growth design flows calculated using the following formula:

Peak Design Flow = Dry Weather Flow × Peaking Factor + Infiltration Allowance

To estimate the growth flow per capita rates, extraneous flow allowance and peaking factors must be defined. Development of the wastewater flow criteria is detailed further in the sections below.

2.1.1 Historic Wastewater Flows

Flow records at the Exeter WWTF were received from the Municipality from 2019 to 2022 including monthly total flow data from 2019 to 2022 and average and max day flow data from 2020 to 2022. A summary of historic wastewater flows is detailed in **Table 1**.

Table 1: Historic Wastewater Flows

Year	Total Raw Flow (m^3)	Average Day Flow (L/s)	Max Day Flow (L/s)
2019	1,172,712	-	-
2020	1,084,999	34.5	286.7
2021	1,216,942	37.4	240.2
2022	1,210,896	38.5	223.2

2.1.2 Per Capita Rate

To determine the recommended per capita average dry weather flows (ADWF) for the MPU, the MECP criteria as well as past Municipality and Master Plan criteria were compared against the observed per capita flow. These criteria guidelines are shown in **Table 2**.

Table 2: Per Capita Average Dry Weather Flow Guidelines

Description	MECP	South Huron Design Criteria (2017)	2008 Exeter Water Master Plan
Residential	225-450 L/c/d	230 L/c/d	No criteria
Employment	28 m^3/ha/d (Commercial/ Institutional) No Industrial Standard	25 m^3/ha/d	No criteria

Per capita ADWF, detailed in **Table 3**, was calculated using the combined observed ADWF from the 2019 to 2022 SCADA data at the two Sanitary Pumping Station's (SPS) in Exeter and using an estimate of the serviced population in Exeter. This calculation was based on the Town of Exeter, due to having the most reliable data as compared to the other communities serviced in the Municipality.

The per capita rates indicate that typical residential and employment per capita rates are generally lower than existing design criteria; however, based on the observed extraneous flows presented in **Section 2.1.4** and the recommended water per capita demand outlined in **Volume II**, a per capita rate higher than the Municipality's existing rate is recommended.

Table 3: Historic Wastewater Per Capita Rates

Catchment	Total Observed ADWF (L/s)	Per Capita ADWF (L/c/d)	Per Area ADWF (m^3/ha/d)
Exeter	16.6	205[1]	3.9

[1]Calculated using a population of 5,000 people and 2,000 jobs for the Town of Exeter

The recommended design criteria to be utilized for per capita ADWF is as follows:

- Growth related residential per capita rate of 240 L/c/d and employment rate of 12.5 m^3/ha/day
    - This represents an increase in the existing design criteria per capita rates of ~5%; however, is in line with the recommended water per capita rates.
    - The recommended per capita rate remains above the observed historic per capita rate; providing reasonable flexibility in the criteria to accommodate potential changes in future usage rates.
    - While there is an observed decreasing trend in both water and wastewater per capita rates, a stepped approach to lowering per capita rates is recommended with the next MPU to ensure water conservation measures are maintained as wastewater flows are directly correlated with water consumption.

2.1.3 Peaking Factor

Similar to the per capita rate, historic values as well as the MECP criteria were compared against the calculated peaking factor to provide a recommendation for the Municipality. The MECP and past criteria peaking factor are outlined below in **Table 4**.

Table 4: Peaking Factor Guidelines

Description	MECP	South Huron Design Guidelines (2017)	Previous MPU
Residential	Harmon or Babbitt	Harmon	No Criteria
Employment			

Using 2019 to 2022 SCADA for the two SPS's in Exeter and using an estimate of the population serviced in Exeter, observed and design guideline peaking factors were compared, as detailed in **Table 5**. The resulting comparison indicated that the observed peaking factor was lower than the peaking factor calculated using design guideline methodology.

Table 5: Observed and Harmon's Peaking Factors

Catchment	Observed Peaking Factor	Calculated Using Design Guidelines
Exeter	2.0	3.1[1]

[1]Includes a combined land use Harmon's Peaking Factor. Harmon's considers a minimum value of 2.0 and maximum value of 4.0.

The Municipality presently uses the Harmon's peaking factor approach in their current design guidelines, and it is recommended that this approach be maintained. Harmon's peaking factor will be used to estimate growth related peak dry weather flows as it provides an additional safety factor in the evaluation of the local system.

2.1.4 Extraneous Flow Allowance

The extraneous flow allowance for the municipality compared historic values and MECP criteria against the observed data. The MECP and past criteria extraneous flow allowance values are outlined below in **Table 6**.

Table 6: Extraneous Flow Guidelines

	MECP	South Huron Design Guidelines (2017)	Snider Crescent SPS Design
Inflow and Infiltration	0.2-0.8 L/s/ha (Historic)	0.2 L/s/ha (Growth)	0.75 L/s/ha

Extraneous wet weather flows, by means of extraneous flows entering the wastewater system, were evaluated based on the 2019 to 2022 SCADA data for the two SPS's in Exeter. This process extrapolated observed extraneous flows to design storms, as detailed in **Table 7** and **Figure 1**, such that the performance of the existing wastewater system could be assessed.

Table 7: Observed Extraneous Flows

Catchment	Modelled Inflow and Infiltration (L/s/ha)		
	2-Year Design Storm	5-Year Design Storm	10-Year Design Storm
Snider SPS	2.52	2.97	3.05
William SPS	1.65	2.20	2.46
Exeter System Total	**1.96**	**2.47**	**2.67**

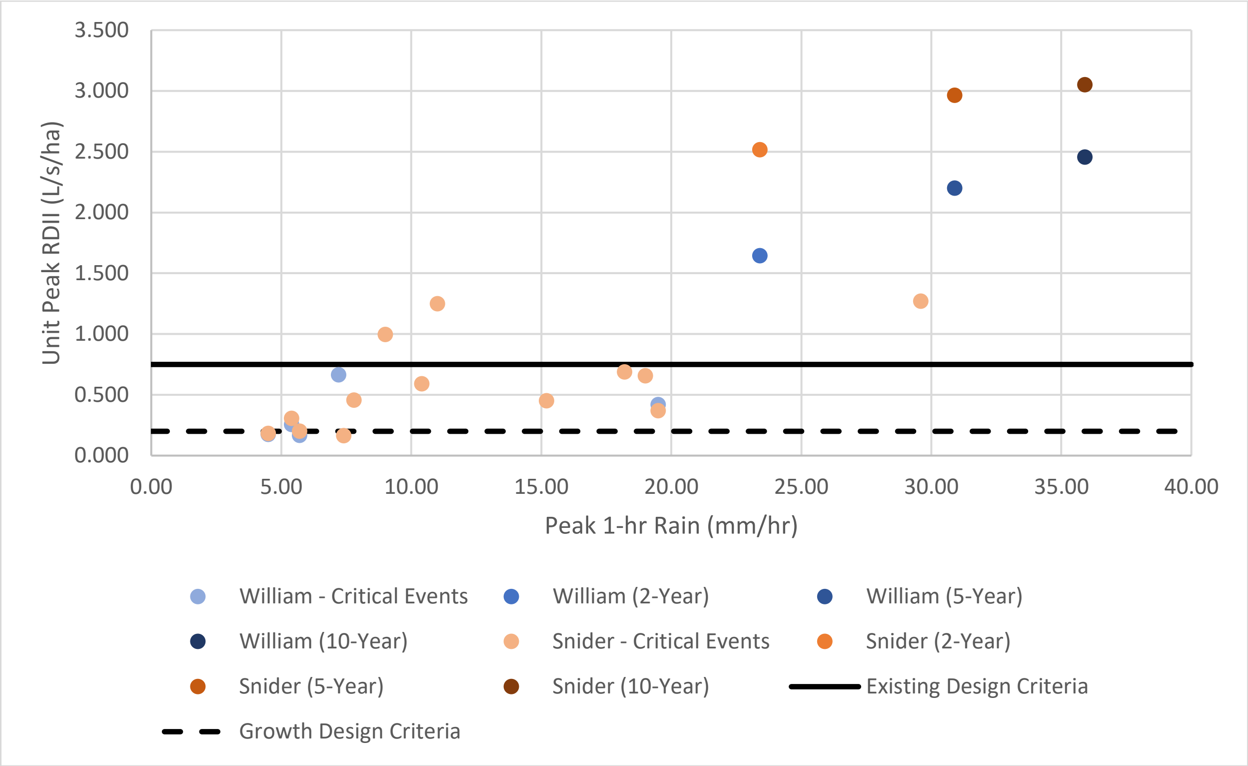


Figure 1: Design RDII by SPS in Exeter

Based on the observed extraneous flows, Exeter is performing at a level that is significantly worse than the design criteria of 0.2 or 0.75 L/s/ha. The recommended extraneous flow allowance are as follows:

- Recommended extraneous flow allowance for new development to remain at 0.2 L/s/ha and for existing areas to be 1.0 L/s/ha if there are no flow monitoring records.
- Capacity assessment for existing infrastructure to use actual existing peak wet weather flow based on hydraulic model results.

2.1.5 Wastewater Design Criteria

The wastewater design criteria updated as part of the 2023 MPU are summarized in **Table 8**.

Table 8: Wastewater Design Criteria

Description		Criteria
Wastewater Flows	Residential Per Capita Rate	240 Liters/capita/day
	Industrial / Commercial / Institutional	12.5 m^3/ha/day
Peaking Factor		Harmon's Peaking Factor (min 2.0, max 4.0)
Inflow and Infiltration	Existing (if no Flow Monitoring records)	1.0 Liters/second/hectare
	Existing (with Flow Monitoring records)	Estimated 10-year design storm flow rate
	Growth	0.2 Liters/second/hectare

2.1.6 Starting Point Methodology

Existing system flows were defined using the "starting point" methodology. The 2023 starting point was calculated based on the 2019 to 2022 flows received from the Municipality.

2.1.6.1 Average Dry Weather Flow

Allocation of existing ADWF was estimated using 80% of billing + allocation of groundwater infiltration based on observed SCADA data at each SPS. Growth related flows were calculated using population projections and the Municipality's wastewater design per capita rates as summarized in **Table 8**.

Existing observed peaking factors were used for the "starting point" peak flows; as observed through the SCADA data, while growth related flows were peaked using the Harmon peaking factor as per the Municipality's design guidelines.

2.1.6.2 Wet Weather Flow

The existing system wet weather flows (WWF) were estimated using the PCSWMM model and SPS SCADA results. Growth related WWF were estimated using the Municipality design criteria of 0.2 L/s/ha.

2.1.7 Growth Flow Projections

Future system flows were developed using the starting point methodology, the standard approach within Southern Ontario for projecting future growth flows. Expected flows due to growth were added to the starting point flow using the population projection and the Municipality's ADWF rates.

2.1 Wastewater Infrastructure Capacity

Evaluation of facility capacities and future needs were assessed by first using peak wet weather flows (PWWF) under historic conditions and further growth flows utilizing the per capita rate, peaking factor, and extraneous flow allowance outlined in **Table 8**. Level of Service targets used to evaluate wastewater infrastructure capacities are defined in the following sections.

2.1.1 Facility Upgrade Triggers

Industry best practice, and recommended methodology, for treatment and sanitary pumping stations facility upgrade triggers are as follows:

- At 80% utilization of a facility's capacity the planning process will begin to assess upgrade capacity needs.
- At 90% utilization of a facility's capacity the construction process begins through either an upgrade to an existing facility or construction of a new facility.

2.1.2 Sanitary Pumping Station Capacity

The evaluation of pumping needs considered the inflow to each pumping station for each design storm using either the hydraulic wastewater model or hand calculations. The recommended approach in determination of pumping capacities is as follows:

- Firm capacity is defined as the largest pump out of service, using pump performance data where available, and largest forcemain out of service where there are dual forcemains.
- 10-year Level of Service for existing and new sanitary pumping facilities – capable of conveying peak 10-year design storm flows.
- 10-year Level of Service for new facilities and upgraded facilities – capable of providing 1-hour of onsite storage for the 10-year design storm flows.

2.1.3 Sizing of Forcemains

Forcemain capacity is sized based on the firm capacity of the pumping station. The following criteria is used to assess when a forcemain requires expansion:

- As outlined by the MECP, the maximum velocity shall not exceed 3.0 m/s and capacity expansion should be triggered once the forcemain design velocity exceeds 2.5 m/s.

Sizing of new forcemains will target the following criteria:

- Design velocity exceeds 0.8 m/s with an ideal target of 1.0 m/s.
- Where presently feasible, capacity requirements will be achieved by twinning of existing forcemain with same size as existing.

2.1.4 Sanitary Sewer Overflows

The MECP F-5-1 Procedure, Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works Discharging to Surface Waters, is the basis for the performance objectives for overflows.

The MECP Procedure F-5-1 states that: "All sewage treatment works shall provide secondary treatment or equivalent as the "normal" level of treatment, unless individual receiving water assessment studies indicate the need for higher levels of treatment". The procedure also contains recommendations for sewage by-pass from nominally separate systems.

The feasibility of meeting the requirements of MECP Procedure F-5-1 in the MPU will be considered; as such, the MPU Capital Program will need to take out an equivalent volume of wet weather flows as new development is added, in advance of system upgrades. A detailed list of F-5-1 effluent design objectives, as per the MECP, is outlined in **Appendix A**.

2.1.5 Hydraulic Performance Criteria

A new hydraulic wastewater model was utilized in the analysis of the Exeter wastewater system performance. This process detailed existing system performance without the application of growth flows and could be used as a guideline for potential system upgrades.

2.1.5.1 Gravity Sewer System Capacity

Sewer surcharging was defined and assessed when peak system hydraulic grade line (HGL) within a pipe satisfies the following conditions under the 10-year design storm:

- Existing infrastructure
  - The HGL in the pipe if the pipe obvert is more than 2.1 meters below grade; or
  - The depth of flow in the pipe is equal to or less than the obvert elevation ($d/D \leq 1$)[1];
- New/Upgraded Infrastructure
  - Gravity sewers will achieve a d/D target of 0.7.

2.1.6 Level of Service Summary

As presented in the above sections, the Level of Service criteria is summarized below in **Table 9**.

[1] Depth of flow in pipe (d) is equal to or less than the obvert elevation (D)

Table 9: Wastewater Level of Service

Description		Criteria
Facility Capacity	Facility Triggers	80% Planning and Design 90% Construction
	Pumping	Firm capacity = • Largest pump out of service (pump capacity); and, • Largest forcemain out of service (when multiple forcemains are present) Sanitary Pumping Station (SPS) to convey peak 10-year flows
System Performance	Peak Wet Weather Design Flows	10-Year Design Storm
	Existing Infrastructure	Hydraulic Grade Line Target 2.1 meters below ground level or depth/Diameter (d/D) ≤1.0
	New/Upgraded Infrastructure	depth/Diameter of pipe (d/D) ≤ 0.7
Extraneous Flow Program		Requirement of the flow monitoring of new developments to ensure development is achieving design flows.

2.2 Capital Cost Projections

A capital cost is provided for all projects proposed as part of this MPU. For the majority of the wastewater system projects, a base construction cost was obtained using either a unit rate construction cost, based on pipe diameter, or unique project analysis. The base construction cost considers several factors specific to each project such as creek crossings, railway crossings, and highway crossings, tunneling requirements, and location of construction (rural, urban, suburban). Design, administration, contingency, and non-recoverable HST costs were added to arrive at a final project cost. Detailed costing sheets were developed to support the financial evaluation for each capital project. Details on the capital cost methodology are outlined in **Volume I**.

3 PLANNING AND GROWTH PROJECTIONS

This section summarizes the growth scenario considered under the MPU and the rational for the preferred growth scenario utilized to develop the recommended water and wastewater upgrade alternatives.

Due to the general uncertainty in the long-term growth rate within the Municipality of South Huron Settlement Area Boundary (SAB), as well as, the phasing and timing of individual development blocks; the basis of the MPU is to identify the long-term servicing requirement to support the full buildout of the SAB with consideration of potential future SAB expansions where such expansions are reasonably feasible and do not result in excessive infrastructure oversizing and do not negatively impact the operation of existing systems. Further to the SAB buildout, a number of potential rural development areas outside the SAB were also identified and appropriate servicing solutions were also identified.

Growth projections outlined within this MPU are based on best available planning information as provided by the Municipality. It is understood that identified development areas including development status, unit counts, and growth projections may be adjusted. Further, it is understood that this MPU is intended to serve as a guiding document and that the Municipality will review individual applications based on their own merit and may adjust the identified capacity project timing and/or capacity requirements based on development applications received.

3.1.1 Existing Population

Existing population data was taken from both the 2021 census and 2020 Development Charges Background Study and compared against the total number of addresses at 2.37 people per unit (PPU) which was the average from the 2020 Development Charges Background Study. The existing population of South Huron is detailed in **Table 11**.

Table 10: Municipality of South Huron Existing Population

Description	Development Charges Background Study	Statistics Canada – Municipality of South Huron	South Huron Billing Data
Year	2020	2021	2022
Population	10,303	10,063	9,560
Total Households	4,344	4,339	4,034
PPU	2.37	2.32	2.37[1]
Employment	3,992	-	-
Total Population + Employment	14,295	-	-

[1]Development Charges Background Study, 2020 PPU average

The South Huron billing data is based on the properties serviced by water infrastructure noting that the serviced wastewater population is lower than the serviced water population. Based on the comparison, the calculated population is in line with the population in the Municipality.

3.2 Growth Areas

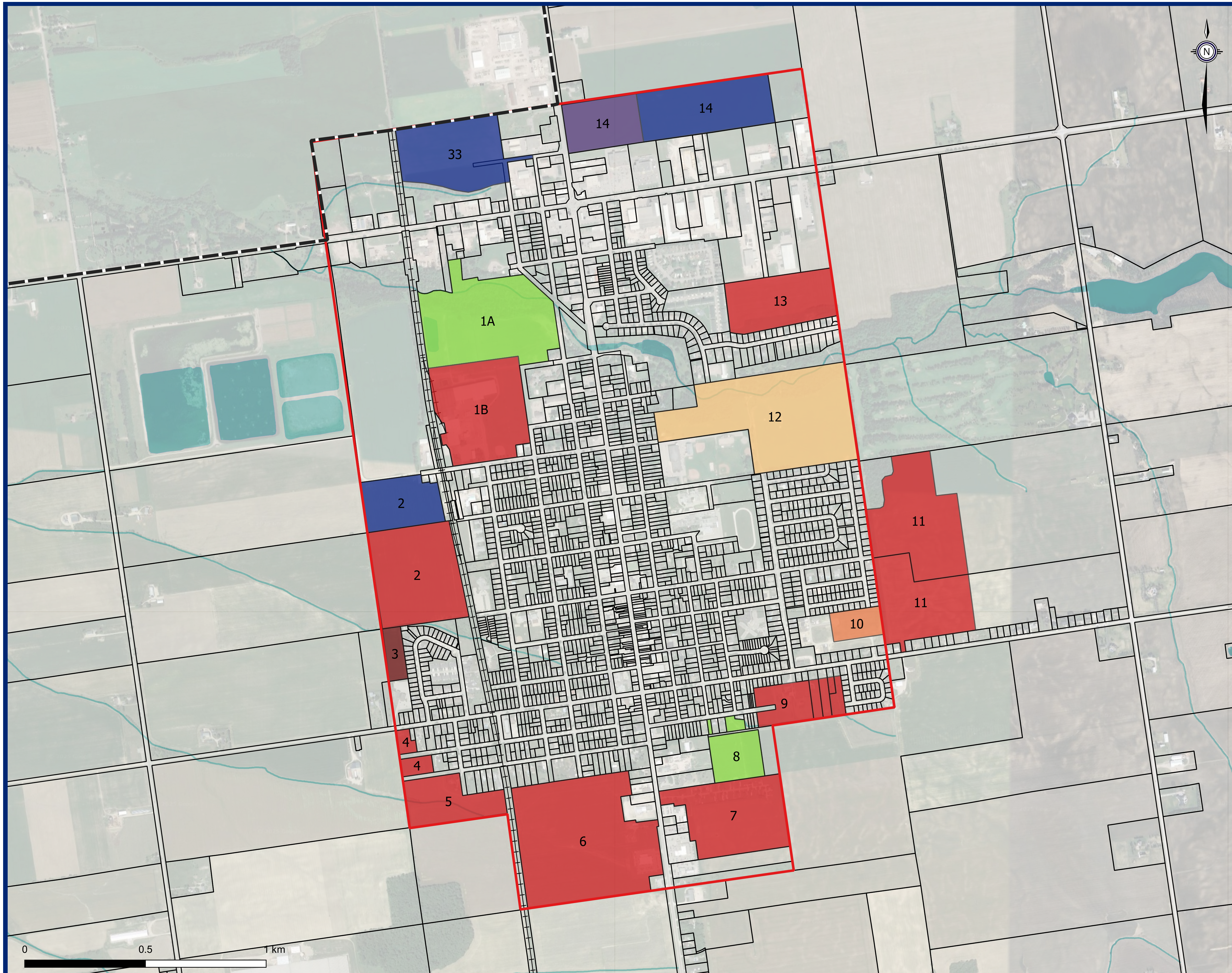
Growth projections were derived using the development and planning information provided by the Municipality. These growth populations were estimated using the design criteria listed below:

- Where the number of development units were known: 2.3 people per unit
- Where the number of development units were unknown: 40 people per hectare

Figures 2 through **5** and **Table 11** highlight the development blocks and their corresponding status and population. Some of the development blocks have corresponding population and employment projections while other blocks are based on the growth projection assumptions.

Table 11: Growth Estimates

#	Status	Name	Town	Type	Area (ha)	Units	Potential Population
1A	Developed	Buckingham Estates	Exeter	Res	18.8	120	276
8	Developed	Southpoint Subdivision	Exeter	Res	1.8	38	87
10	Partially Developed	Stoney Ridge	Exeter	Res	3.7	32	74
1B	Potential Residential Area	HDC Lands	Exeter	Res	11.4	328	754
2	Potential Commercial/ Industrial/ Residential Area	Ondrejicka	Exeter	Res/Emp	13.8	-	552
3	Long Term Care Facility	Southbridge	Exeter	Res	1.7	99	228
4	Potential Residential Area	Willis Way	Exeter	Res	1.6	6	14
5	Potential Residential Area	Shapton	Exeter	Res	2.2	38	87
6	Potential Residential Area	McBride	Exeter	Res	26.5	-	1,060
7	Potential Residential Area	Hamather	Exeter	Res	12.1	120	276
9	Potential Residential Area	Pooley	Exeter	Res	5.8	100	230
11	Potential Residential Area	Hamather/McBride	Exeter (Outside SAB)	Res	19.0	178	409
12	Draft Plan Approved	Windermere Subdivision	Exeter	Res	23.6	160	368
13	Potential Residential Area	Rasenberg	Exeter	Res	9.4	163	375
14	Potential Residential Area	CVD Subdivision	Exeter	Res/Emp	17.5	238	916
33	Potential Commercial/ Industrial Area	Exeter Produce	Exeter	Emp	11.9	-	475
17B	Pre-Servicing Agreement	Sol Haven Phase I	Grand Bend	Res	12.2	182	490
15	Potential Residential Area	South of Pollock Farms	Grand Bend (Outside SAB)	Res	10.7	127	292
16	Potential Residential Area	Turnbull Lands	Grand Bend (Outside SAB)	Res	41.1	456	1,049
17A	Potential Residential Area	Sol Haven Phase II	Grand Bend	Res	40.4	241	501
18	Potential Residential Area	Zone 2 Future Development	Grand Bend	Res	164.9	1,088	2,502
19	Potential Residential Area	Grand Cove Estates Phase 5	Grand Bend	Res	4.0	34	78
28	Potential Commercial/ Industrial Area	Bendtech	Grand Bend (Outside SAB)	Emp	21.2	-	850
31	Potential Commercial Area	Watson	Grand Bend	Emp	3.5	-	141
35	Potential Residential Area	Hotson	Grand Bend	Res	8.4	-	336
36	Potential Commercial Area	Grand Bend Proposed Commercial	Grand Bend (Outside SAB)	Emp	11.1	-	444
20	Potential Residential Area	Crediton Village Centre	Crediton	Res	33.6	337	775
21	Potential Residential Area	Morrisey	Crediton	Res	1.3	8	18
22	Potential Residential Area	Stephan	Crediton	Res	7.4	-	298
23	Potential Residential Area	Huron Park Proposed 1	Huron Park	Res	4.1	48	110
24	Potential Residential Area	Huron Park Proposed 2	Huron Park	Res	9.5	98	225
29	Potential Residential Area	Huron Park Proposed 3	Huron Park	Res	1.3	-	51
30	Potential Residential Area	Huron Park Proposed 4	Huron Park	Res	1.5	-	58
25	Potential Residential Area	Pavkeje Subdivision	Centralia	Res	3.4	13	30
26	Potential Residential Area	Hodgins	Centralia	Res	4.8	-	194
27	Potential Residential Area	Centralia Proposed 1	Centralia	Res	2.0	-	81
34	Potential Industrial Area	Centralia Proposed 2	Centralia	Emp	5.1	-	204
37	Potential Industrial Area	Centralia Proposed 3	Centralia (Outside SAB)	Emp	6.1	-	244
				Centralia	**21.5**	**13**	**753**
				Exeter	**180.7**	**1,620**	**6,181**
				Grand Bend	**317.5**	**2,128**	**6,737**
				Crediton	**42.3**	**345**	**1,091**
				Huron Park	**16.3**	**146**	**445**
				Total	**578.4**	**4,252**	**15,208**



MUNICIPALITY OF SOUTH HURON 2001

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 2

Exeter Proposed Growth

BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

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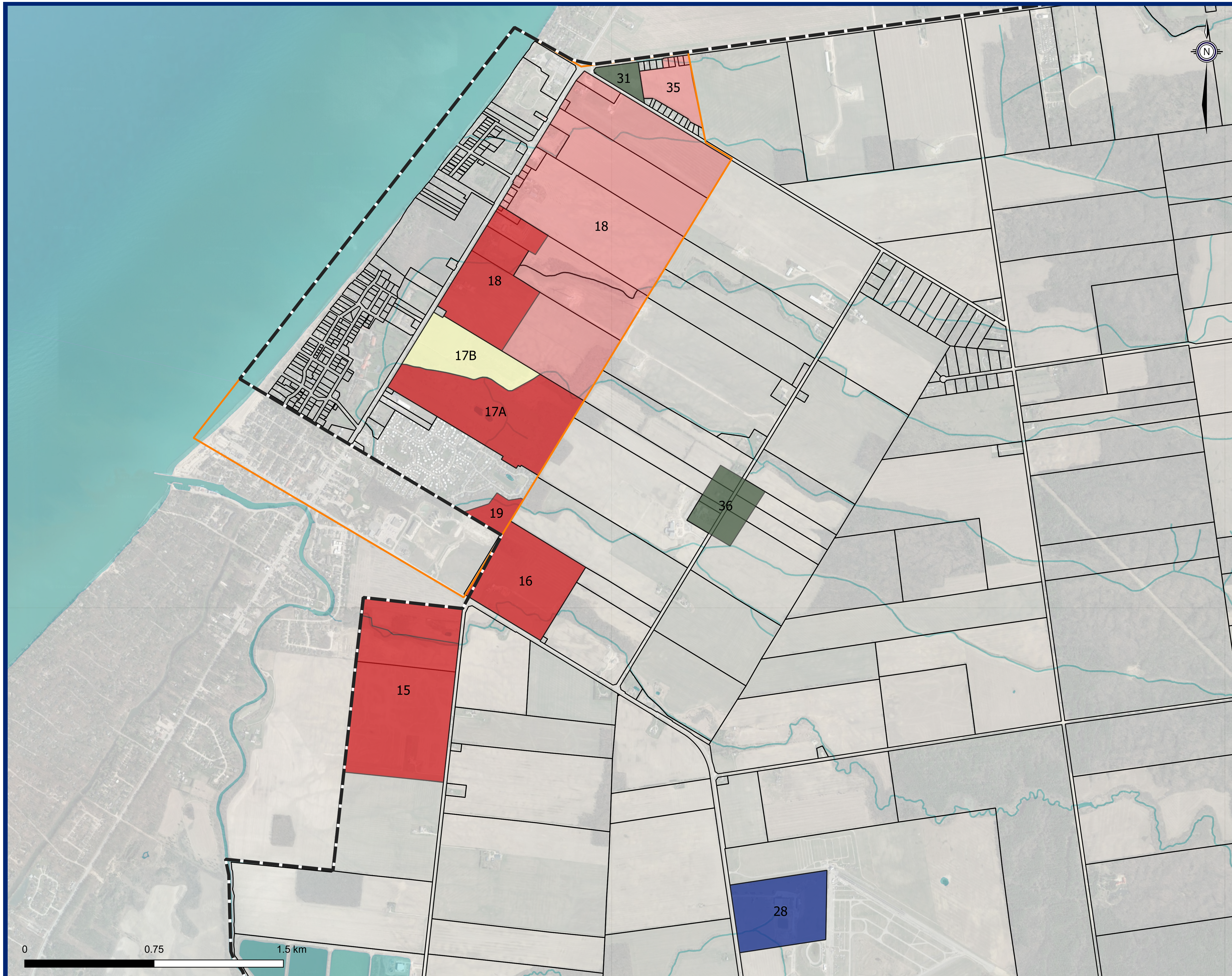


MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Port Blake Planning Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 3

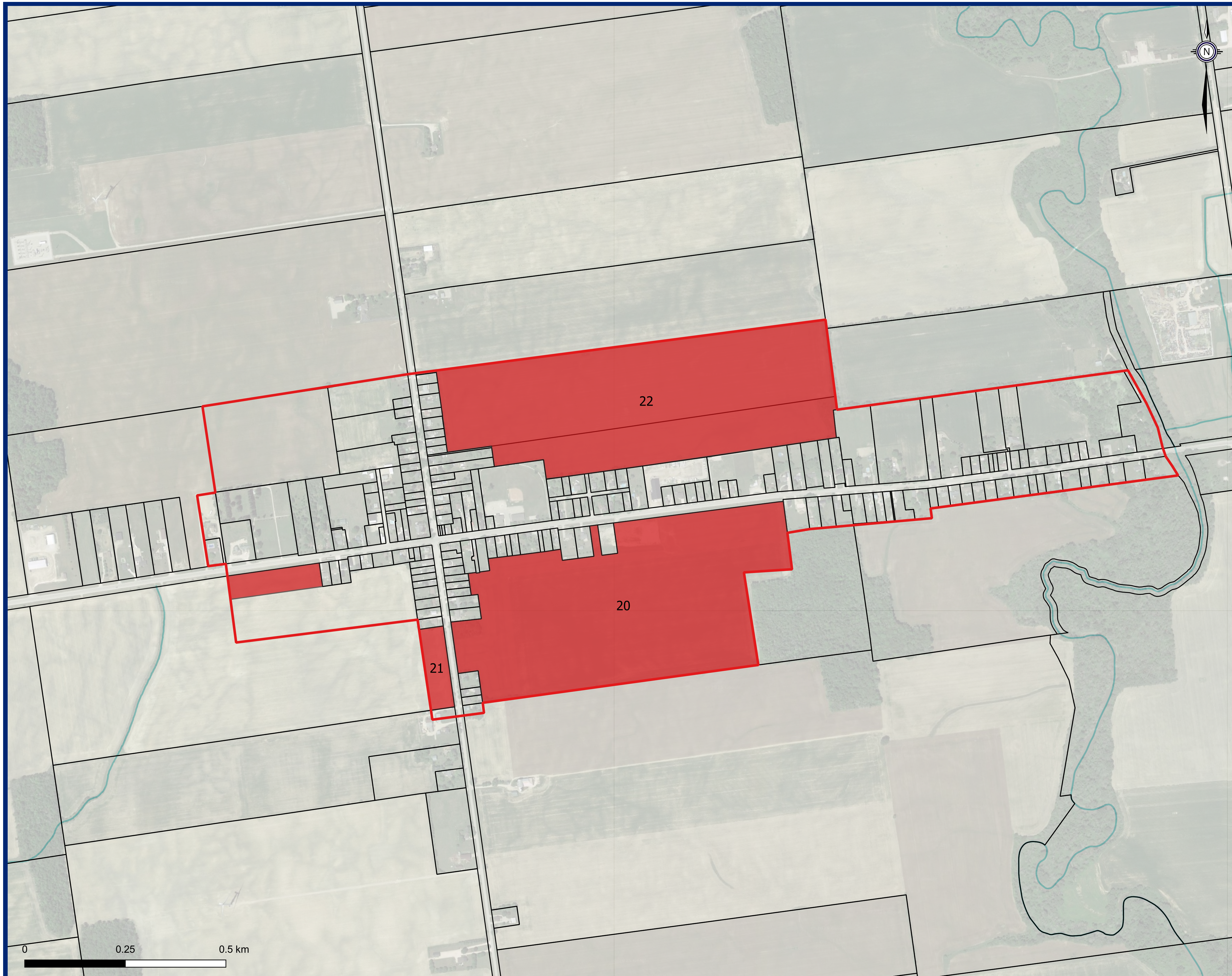
Grand Bend Proposed Growth

GM BluePlan ENGINEERING

January, 2025
521054-G-001
Projection EPSG:26917

MUNICIPALITY OF
2001
SOUTH HURON

The Municipality of South Huron Water and Wastewater Masterplan



General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 4

Crediton Proposed Growth

GM BluePlan ENGINEERING

January, 2025
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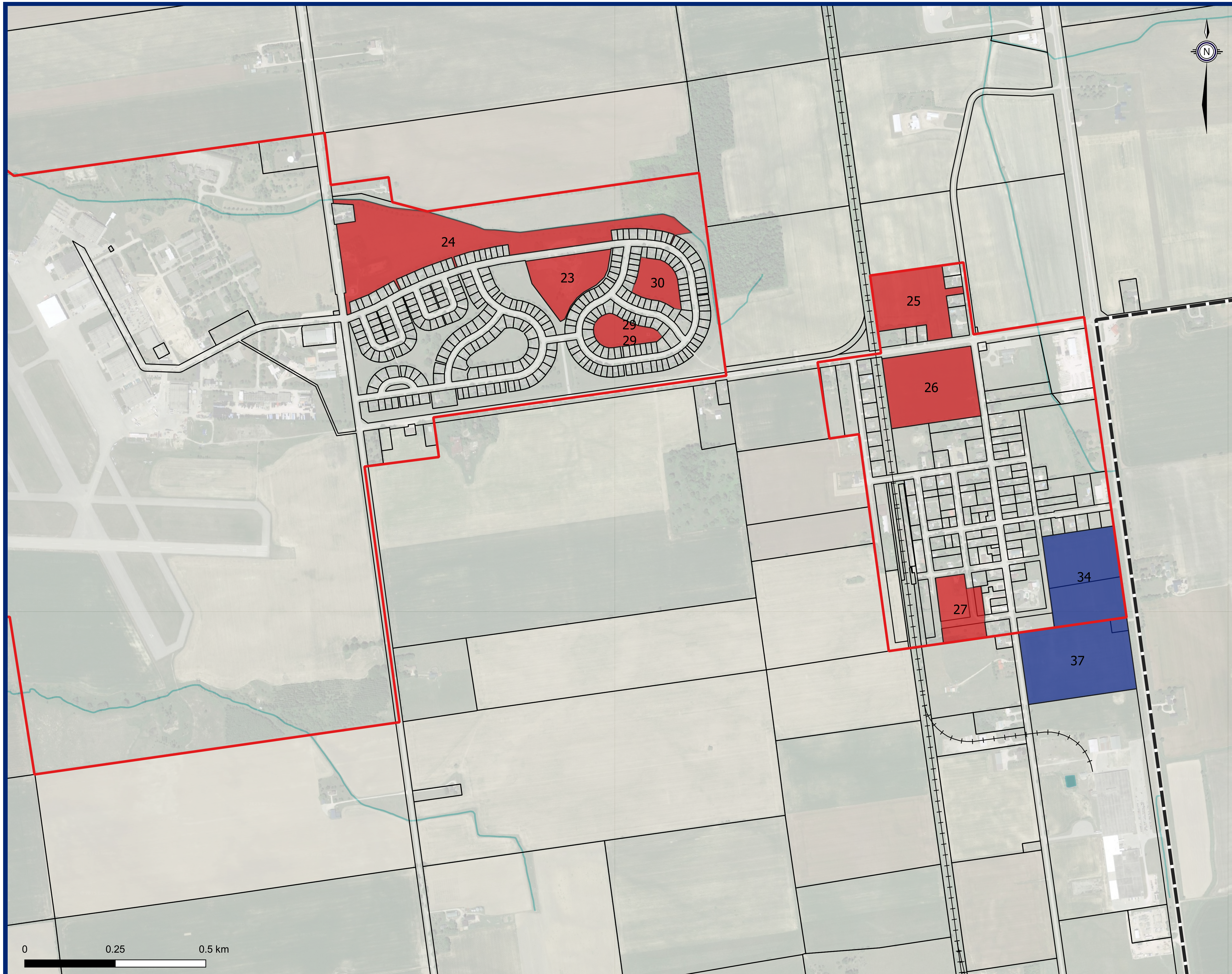

The Municipality of South Huron Water and Wastewater Masterplan

General

- Settlement Area
- Parcels
- South Huron Boundary
- South Huron Watercourses
- South Huron Railway

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Figure 5

Huron Park / Centralia Proposed Growth

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January, 2025
521054-G-001
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3.2.1 Growth by Sanitary Pumping Station Catchment

Table 12 summarizes growth needs by both sanitary pumping station catchment and treatment facility.

Table 12: SPS and WWTF Population and Employment Growth

WWTF	SPS	Potential Population (Residential & Employment)
Exeter	William Street SPS	3,647
	Snider Crescent SPS	2,535
	Crediton SPS	1,091
	Huron Park SPS	1,198
Exeter WWTF Total		**8,471**
Grand Bend	Grand Bend Main PS2	5,887[1]
	POG SPS	850
Grand Bend WWTF Total		**6737**

[1]Inclusive of properties along the east side of Highway #21, refer to **Section 3.3.2** for details

3.3 Post Period Considerations

The servicing analysis focuses on servicing the proposed development, mostly within the existing SAB; however, in the development of the recommended servicing strategy and infrastructure sizing, consideration for the buildout of the expansion of the Municipality's SAB was considered assuming similar population and employment densities. Where applicable, identification of future facility expansion needs and/or strategic upsizing of linear infrastructure was identified and incorporated into the final recommended servicing plan.

3.3.1 Exeter

In the future, the SAB may be expanded to capture lands east to Morrison Line, south to Kirkton Road, west to Airport Line and north of Thames Road. This expansion will be reviewed under the Municipality's new Official Plan which will determine if and to what extent to which the SAB is to be expanded. The proposed land use designations for the expansion areas will also be determined at that time. The possibility of these additional lands was considered when reviewing the Municipality's existing infrastructure as well as new infrastructure and upgrades.

3.3.2 Grand Bend

The Grand Bend SAB, also referred to as the Port Blake Planning Area includes the properties along the east side of Highway #21, currently designated as Agricultural Lands. As these lands are within the Planning Area and have potential for development in the future, it has been included in the strategic sizing of linear infrastructure within the Grand Bend system. This population has been included in **Table 11** and **Table 12** and the corresponding flow outlined in the following sections is not reflective of near-term servicing needs; however, has been included in the buildout potential to determine how to service the full buildout capacity.

There are also lands outside of the Planning Area, such as surrounding the Darkhorse Winery and Huron County Playhouse, as well as the POG property. These lands have also been assessed when reviewing the recommended servicing strategy and infrastructure sizing.

4 EXISTING WASTEWATER SYSTEM

4.1 Existing Wastewater Infrastructure

The Municipality of South Huron employs a gravity-based wastewater collection and treatment system in Exeter, Huron Park, Centralia, and Crediton with wastewater flows sent to the Exeter WWTF, located northeast of the Town of Exeter.

The Municipality also employs a gravity-based wastewater collection system in Grand Bend, with wastewater flows sent to the Grand Bend WWTF, which is located in the Municipality and south of the Town of Grand Bend. The Grand Bend WWTF is jointly owned and administered by Lambton Shores and operated by Jacobs Engineering Group.

The existing wastewater infrastructure is highlighted in **Figure 6** with a detailed wastewater system schematic is provided in **Appendix B**.

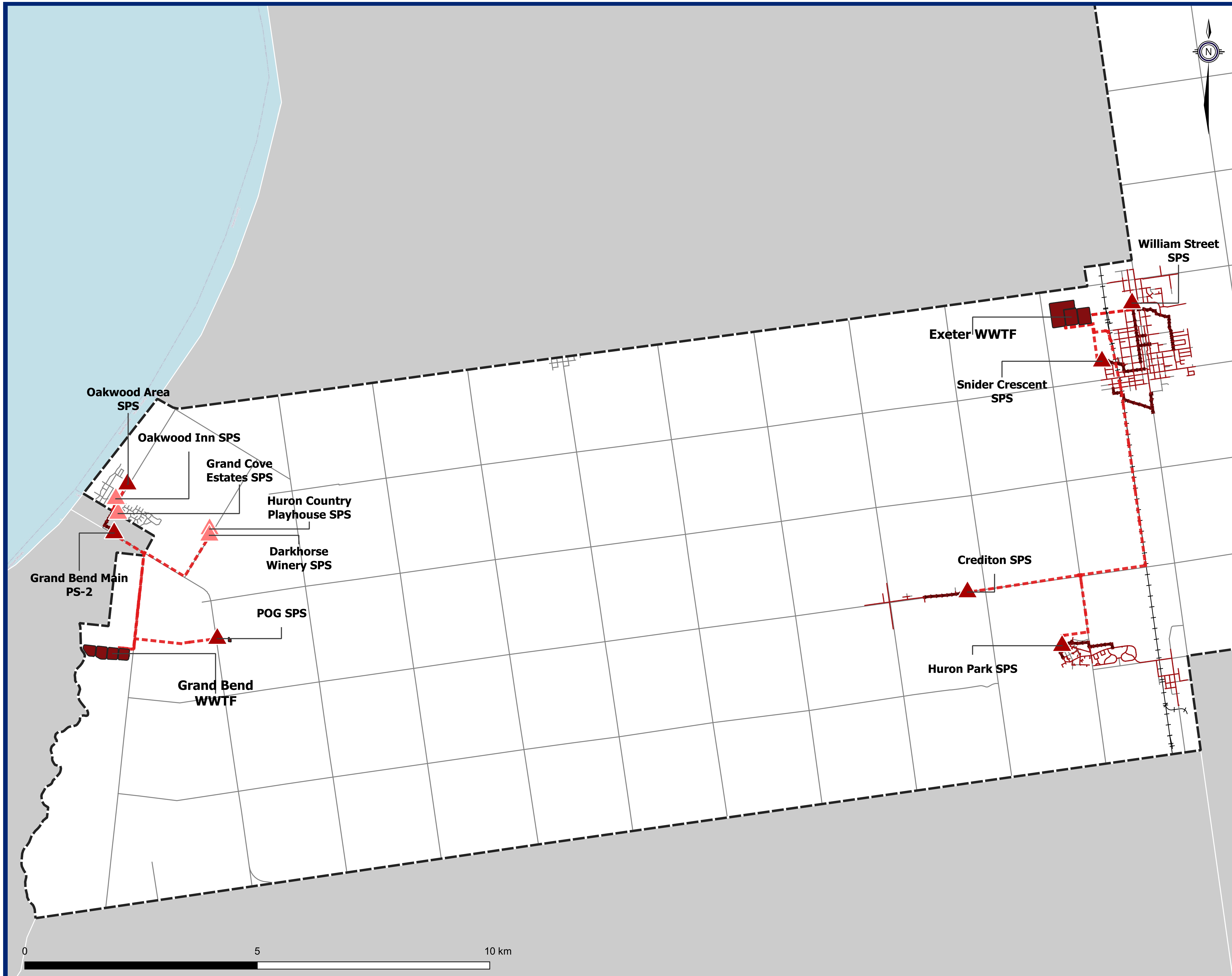
4.2 Exeter

The Exeter wastewater system consists of the Exeter WWTF and four SPSs including the William Street SPS, Snider Crescent SPS, Huron Park SPS, and Crediton SPS, that all pump wastewater to the Exeter WWTF.

The collection system in Exeter generally drains from east to west to the two SPS's; William Street SPS and Snider Crescent SPS. Sewage is pumped from each SPS through forcemains to the Exeter WWTF.

The collection system in Centralia and Huron Park generally drain by gravity from south to north in Centralia and from east to west in Huron Park to the Huron Park SPS. Sewage is pumped through a forcemain from the Huron Park SPS to the Exeter WWTF. The forcemain follows an easement to Airport Line, north of Airport Line to Crediton Road; east on Crediton Road to the Goderich-Exeter Railway (GEXR), then along the GEXR to the WWTF.

Sewage in Crediton is conveyed by gravity from west to east to the Crediton SPS and then pumped from the Crediton SPS along Crediton Road and connects to the Huron Park forcemain at the intersection of Crediton Road and Airport Line.



MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water & Wastewater Masterplan

Existing Infrastructure

- Sanitary Mains (<=300 mm)
- Sanitary Trunks (>300 mm)
- Sanitary WWTF
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

General Features

- South Huron Boundary
- South Huron Railway
- South Huron Watercourses

Figure 6
Existing Wastewater System

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4.2.1 Exeter Wastewater Treatment Facility

The Exeter WWTF is located at 71042 Airport Line in the northwest area of Exeter. The WWTF is a sewage lagoon, with an aeration system, intermittent sand filters and has a rated capacity of 2,573,718 m^3 per year. The WWTF consists of a 3-cell lagoon system with phosphorus removal. Raw sewage flows into the first cell with assisted aeration and an effective storage volume of 313,000 m^3. The second cell is for additional storage (pre or post treatment) with an effective volume of 343,500 m^3. The third cell is "L-shaped" and has a total storage volume of 751,000 m^3. Effluent from the third cell is directed to a 4-bed, intermittent sand filtration system with a hydraulic loading rate of 475 L/s. Continuous liquid aluminum sulfate (alum) is used for phosphorus removal. Treated effluent is discharged to the Ausable River.

Effluent can be discharged from the lagoon system to the receiving water course from April 1st to November 31st providing the effluent meets the criteria for "warm weather" discharge. Effluent can be discharged directly from the lagoon system to the receiving water course from December 1st to March 31st providing the effluent meets the criteria for "cold weather" discharge.

Table 13 includes the WWTF processes and corresponding capacities.

Table 13: Exeter WWTF Treatment System Components

Process	Description	Rated Capacity
Overall Treatment Plant	Lagoons with tertiary filtration	2,573,718 m^3/year total 7,051 m^3/day average
Aeration	One positive displacement blower (Backup)	800 L/s
	Two positive displacement blowers	435 L/s each
Chemical Feed	Alum dosing system for phosphorus removal	Chemical storage tank and metering pumps
Lagoon Cell 1	340 m × 260 m × 3.7 m deep	313,000 m^3 effective volume
Lagoon Cell 2	N/A	No longer exists. Was combined with Cell 1 when sand filters were constructed in 2001.
Lagoon Cell 3	330 m × 260 m × 4.15 m deep aerated cell	343,500 m^3 effective volume
Lagoon Cell 4	270 m x 550 m x 4.3 m deep and 250 m x 160 m x 4.3 m deep	751,000 m^3 effective volume
Filter Pumping Station	Three dry pit submersible pumps	Two at 237 L/s at 13.5 m TDH each One at 120 L/s at 13.5 m TDH
Sand Filters	Four cells 102 m x63 m each	23,400 m^3, Average Hydraulic Loading of 475 L/s

4.2.2 Exeter Sanitary Pumping Stations

There are currently four SPS's of varying capacities that are owned by the Municipality within the Exeter wastewater system. **Table 14** summarizes the flow capacities at each SPS.

Table 14: Exeter Sanitary Pumping Station Capacities

Pumping Facility	Installed Capacity (L/s)[1]	Firm Capacity (L/s)[2]	Pumps			Wet Well Operative Volume (m^3)
			Flow (L/s)	Type	Total Dynamic Head (m)	
William Street SPS	534.0	170.0	80.0	Fixed Speed	14.7	35.1
			168.0	Fixed Speed	25.6	
			286.0	Fixed Speed	53.4	
Snider Crescent SPS	339.0	155.0	113.0	Fixed Speed	31.0	34.8
			113.0	Fixed Speed	31.0	
			113.0	Fixed Speed	31.0	
Huron Park SPS	130.9	65.45	65.45	VFD	61.2	12.88
			65.45	VFD	61.2	
Crediton SPS	27.8	13.86	13.86	Fixed Speed	65.8	7.2
			13.86	Fixed Speed	65.8	

[1]The installed capacity is the total installed capacity of all pumps at the facility based on pump specifications.
[2]The firm capacity is the actual operating capacity of the SPS.

4.3 Grand Bend

The Grand Bend wastewater system consists of the Grand Bend WWTF, three Municipal owned SPSs including the Oakwood Area SPS, POG SPS, and Grand Bend Main PS2 and an additional four private SPSs including the Oakwood Inn SPS, Darkhorse Winery SPS, Huron County Playhouse SPS, and Grand Cove Estates SPS. Similar to the Grand Bend WWTF, the Grand Bend Main PS2 is jointly owned by the Municipality of South Huron and Municipality of Lambton Shores.

The capacity allocation for PS-2 per the Joint Agreement is 50% Lambton Shores and 50% South Huron.

The collection system generally drains from north to south, with the Oakwood Area SPS, Oakwood Inn SPS, Grand Cove Estates outletting to the Grand Bend Main PS2. Sewage is pumped from the Grand Bend Main PS2 to the Grand Bend WWTF through a forcemain along Main Street East and Mollard Line.

The Darkhorse Winery SPS and Huron County Playhouse SPS are located east of Grand Bend. The Huron County Playhouse has a private forcemain on B-Line, Grand Bend Line and Mollard Line that pumps directly to the Grand Bend WWTF. The Darkhorse Winery is connected to the Huron County Playhouse forcemain and is designed with priority pumping from the Playhouse and has additional storage while offline.

The POG SPS is located southeast of Grand Bend and sewage is pumped via a forcemain westerly in an easement to Mollard Line directly to the Grand Bend WWTF.

4.3.1 Grand Bend Wastewater Treatment Facility

The Grand Bend Wastewater Treatment Facility is located at 70001 Mollard Line, south of the Town of Grand Bend. The Grand Bend WWTF is a mechanical treatment plant consisting of a 3-cell lagoon system for sludge storage and emergency bypass storage, headworks screening/de-gritting system, two bioreactor cells complete with common wall circular aeration and secondary clarifiers, tertiary filtration, and UV disinfection. The WWTF has a peak hour flow of 7,500 m^3/d and an average daily flow of 2,473 m^3/d, with the capability of expanding to an average daily flow of 4,659 m^3/d. The facility discharges to wetlands and then outlets to the Parkhill Creek.

The Grand Bend WWTF is jointly owned and administered by Lambton Shores and operated by Jacobs Engineering Group. The WWTF capacity is split between the municipalities of Lambton Shores and South Huron, with South Huron allocated 35.3% of the plant capacity.

4.3.2 Grand Bend Sanitary Pumping Stations

There are currently three SPS of varying capacity that are owned by the Municipality and four SPS owned privately within the Municipality's Grand Bend wastewater system. **Table 15** summarizes the flow capacities at each Municipality owned SPS.

Table 15: Exeter Sanitary Pumping Station Capacities

Pumping Facility	Installed Capacity (L/s)[1]	Firm Capacity (L/s)[2]	Pumps			Wet Well Operative Volume (m^3)
			Flow (L/s)	Type	Total Dynamic Head (m)	
Oakwood Area SPS	21.0	10.5	10.5	VFD	19.7	6.48
			10.5	VFD	19.7	
POG SPS	13.0	6.48	6.48	Fixed Speed	27.0	1.58
			6.48	Fixed Speed	27.0	
Grand Bend Main PS2	196.7	145.0	82.0	VFD	31.0	191.1
			82.0	VFD	31.0	
			10.0	VFD	16.0	

[1]The installed capacity is the total installed capacity of all pumps at the facility based on pump specifications.
[2]The firm capacity is the actual operating capacity of the SPS.

4.4 Condition Assessment

An assessment of the condition of the existing facilities and associated infrastructure was undertaken to inform the evaluation of alternatives involving rehabilitation of the existing works where required. The Condition Assessment assigned a condition score to each asset based on physical condition and performance condition (if applicable) as well as consequence of failure. The results of this Condition Assessment are outlined in **Appendix C** and were reviewed in line with the proposed Capital Program projects.

4.5 Existing System Flows

4.5.1 Existing System Flows

The existing system observed average daily flows for the Exeter WWTF were reviewed from 2020 to 2022 and are included in **Table 16**. These flows were observed at the Exeter WWTF and do not include the Grand Bend system.

Table 16: Existing, Observed Exeter WWTF System Flows

Year	Average Day Flow (L/s)
2020	34.5
2021	37.4
2022	38.5
3-Year Average	**36.8**

4.5.1.1 Starting Point Methodology

The 3-year rolling average of average day flows was used to establish a baseline system average daily flows in the Exeter wastewater system.

4.5.2 Projected System Flows

The population projections presented in **Table 11** and Design Criteria presented in **Table 8** were used to calculate the ADWF presented in **Table 17** further detailed in **Appendix D**. Future system flows were developed using a starting point methodology, the standard approach within Southern Ontario for projecting future growth flows. Expected flows due to growth were added to the starting point flow to establish future flows.

Table 17: Wastewater System Flows

WWTF	SPS	Average Dry Weather Flow (L/s)	
		Existing	Existing + Growth
Exeter	William Street SPS	10.3	19.4
	Snider Crescent SPS	6.4	13.4
	Crediton SPS	9.1	14.4
	Huron Park SPS	3.6	5.6
Exeter WWTF Total		**36.8**	**52.8**
Grand Bend	Grand Bend Main PS2	8.6	23.7
	POG SPS	No existing data	2.4
	Huron Country Playhouse (Private SPS) & Dark Horse Winery (Private SPS)	0.1	N/A
Grand Bend WWTF Total		**8.7[1]**	**26.1**

[1]Based on the flow from Grand Bend Main PS2 only. The Grand Bend WWTF also receives flow from Lambton Shores which was not accounted for.

4.5.3 Settlement Area Boundary Expansion

The servicing analysis focuses on servicing the proposed growth; however, in the development of the recommended servicing strategy and infrastructure sizing, consideration for the expansion of the SAB Lands was considered, assuming similar population and employment densities. Where applicable, identification of future facility expansion needs and/or strategic upsizing or extension of linear infrastructure was identified and incorporated into the final servicing plan.

4.6 Hydraulic Wastewater Model

A hydraulic model was developed for the Town of Exeter using PCSWMM as part of the MPU to analyze current and future system capacity.

The model was created through the following procedure:

- System development through facilities drawings, SCADA and GIS data.
- Direct GIS to model link for pipes, manholes and facilities.
- Dry Weather Flow (DWF) and allocation estimated based on billing data versus sanitary flow at the William Street SPS and Snider Crescent SPS.
- WWF scenarios comprising of the dynamic RTK unit hydrograph approach, calibrated against historic SCADA records.

4.6.1 Network Development

The system pipes were imported directly into the model using the Municipality's existing GIS wastewater system infrastructure data; however, the Municipality did not have detailed accounting of the sewer system inverts within their GIS. As part of the model development, GMBP completed a manhole survey of the systems 710 manholes to update the sewer network GIS to allow for integration into the proposed wastewater model.

System network elevations for each model node were based on the Municipality's ground surface contours.

4.6.2 Facility Development

Each facility was manually reviewed and updated in the model based on available facility site plan drawings, and process flow diagrams, pump curves, and other available information. The scope of the facility development included:

- Reviewing and updating the network configuration around each facility.
- Updating the system pumps and pump curves.
- Reviewing wet well elements and defining geometry.

4.6.3 Sanitary Flow Characterization

For the purpose of modelling sanitary flows, typical flows were characterized based on the time of day and the weather. As shown in Figure 7Figure 1, sewer flows can be characterized into DWF for flows not influenced by rainfall, and WWF for flows throughout the course of a rainfall event. The total sanitary flow at any time is composed of the elements that make up the DWF and, when there is precipitation, WWF.

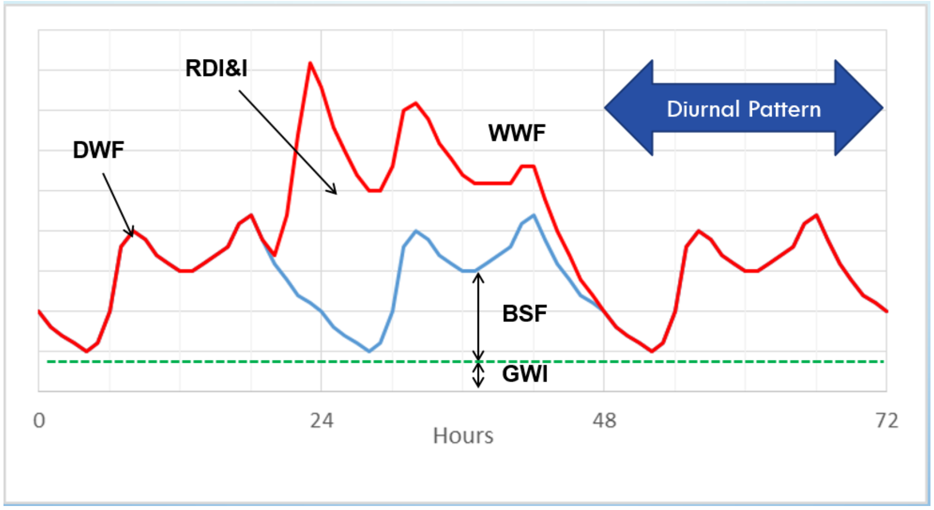


Figure 7: Sample Sanitary Flow Components

4.6.4 System Dry Weather Flows

Dry weather flow is defined as the flow in the sewer system during periods where the system is experiencing no influence from rainfall. The DWF is comprised of base sanitary flow (BSF) and groundwater infiltration (GWI). The BSF is closely tied to water use and exhibits a diurnal pattern that reflects the zoning use of the catchment. GWI is groundwater which has entered the sewer system through defects such as cracks in the pipe network.

The systems DWFs were evaluated based on SCADA information provided. This process supports determination of:

- ADWF including determination of base sanitary flows and groundwater inflows.
- Spatial allocation of system flows.
- Temporal variation of system flows and peaking factors.

4.6.4.1 Diurnal Profile

The base sanitary flow of a catchment typically has two distinct diurnal profiles that reflect water use patterns on weekdays and weekends. For each SPS catchment, DWF periods were identified, defined as days with no precipitation and usually preceded by at least a day without a rain event, preferably more. A selection of five representative dry weather flow days were averaged to provide typical diurnal patterns.

4.6.4.2 Water Billing

The Municipality's water billing records allocated by parcel was used as the basis for the spatial allocation of sanitary baseflow. For each parcel with water billing data, the data across the four years (2019 to 2022) was consolidated into a representative average water use rate considered to be applicable to the analysis years.

The resulting water billing records were then cross-referenced against available SCADA data for representative dry weather flow days to determine the appropriate BSF and GWI allocations as follows:

- BSF was generally assumed to be 80% of average billing records.
- GWI was calculated as the net difference between the observed average DWF and calculated BSF.

4.6.5 System Wet Weather Flow

Wet weather flow is composed of the DWF components (BSF and GWI) and the rainfall-derived inflow and infiltration (RDII) that occurs as a result of a precipitation event. The RDII is precipitation that enters the sanitary system through openings in the system such as manhole covers (inflow), and cracks and loose joints in the pipe network (infiltration). It is dependent on the landscape characteristics of each catchment, the condition of the sewer system, and the type and severity of the storm.

For WWF analysis, it is necessary to identify critical rainfall events with enough intensity and volume that can typically generate a rainfall-derived flow response in the sanitary sewer system as a result of Inflow and Infiltration (I&I) processes. Rainfall data was analyzed in terms of event duration, total depth, and peak intensity for the selection of wet weather flow events. These rainfall events were used to support the model calibration.

The RDII was modelled using the RTK Unit Hydrograph (RTK) approach since it allows for the identification of extraneous flow contributors based on their response times. This approach employs three triangular unit hydrographs representing a slow, medium, and fast response, each characterized by the parameters R, T, and K, where:

- R is the fraction of rainfall volume entering the sewer system (volume under the hydrograph);
- T is the time from the start of rainfall to the unit hydrograph's peak, in hours; and,
- K is the ratio between the recession time and the time to unit hydrograph peak (T).

The system's wet weather flows were evaluated based on SCADA information provided. This process supports determination of:

- System response to a wet weather event (rainfall/snowmelt).
- RDII based on catchment area.

The data from one rain gauge located at the Exeter Public Cemetery was used to support the required data analysis and model calibration activities.

4.6.6 Model Calibration and Validation

The above-mentioned data sources were assembled to model the DWF and WWF and observed flow data was used for calibration and validation. It is recognized that the data and assumptions used to build the hydraulic pipe model, and to estimate sanitary flow components, have a significant amount of uncertainty associated to them. The model was validated for accuracy using the average day flows at the SPSs supplied by the Municipality. DWF in the model was measured against the average daily flows to ensure that flow was realistic.

5 ASSESSMENT OF EXISTING WASTEWATER INFRASTRUCTURE

A critical step in the master planning process is the assessment of the existing infrastructure to establish the wastewater system baseline conditions. These baseline conditions will become the basis of the future recommendations of the MPU; therefore, it was important to ensure that they were determined through a comprehensive detailed analysis of the system. Once the existing system conditions were established, the potential impacts of the future growth flows on the wastewater system were analyzed to develop and recommend future servicing strategies.

The following sections describe current opportunities and constraints within the existing wastewater system and assess the system's ability to accommodate growing flows.

5.1 2018 Master Plan Recommendations

The Municipality of South Huron Water and Wastewater Master Plan completed by Stantec Consulting Ltd. in 2018 has been reviewed and considered throughout the master planning process and selection of preferred servicing strategies. The recommendations including Capital Program projects not yet been completed were carried forward in this MPU and help to make up the final preferred servicing strategy.

5.2 Grand Bend Area Sewage Collection System Class Environmental Assessment

Gamsby and Mannerow Limited prepared an Environmental Study Report to document and summarize the entire process leading to the selection of the preferred alternative for South Huron's Grand Bend Area Sewage Collection System. The Class Environmental Assessment (EA) focused on routing options for the sanitary trunk sewer along Highway #21 and upgrades to the Grand Bend Main PS2. The preferred solution identified the installation of a trunk sanitary sewer on the west side of Highway #21 right-of-way from Grand Bend Main PS2 to Highway #83. The identified sewer was proposed in two phases, with Phase 1 extending immediately north of the intersection of Indian Road and Highway #21 and Phase 2 as the northern continuation of Phase 1.

The recommendations from this Class EA have been partially implemented with the existing sewer connection up to Indian Road having been installed, with the remaining alignment to be installed as needed to support servicing along Highway #21. As the Class EA has been completed and the project is in process of being implemented, the Class EA recommendations were carried forward in this MPU to the final preferred servicing strategy and Capital Program.

5.3 Opportunities and Constraints

Existing and future wastewater opportunities and constraints were identified through discussions with Municipal staff, as well as through hydraulic analyses and review of infrastructure data (i.e., GIS, design reports, as-built information, etc.). The PCSWMM hydraulic model was used to assess the performance of Exeter's existing and future system under dry weather and wet weather flow conditions.

Figure 8 highlights some of the key opportunities and constraints within the Municipality's existing wastewater system which include:

Treatment

- Optimization and upgrades are needed at the Exeter WWTF to support existing and future users.
- Major long-term facility upgrades are needed at the Exeter WWTF to accommodate all growth with opportunity to implement upgrades in phases.

Pumping

- Short- and long-term strategies are needed to manage pumping station capacity.
- Opportunities to decommission the privately owned Oakwood Inn & Resort SPS and Grand Cove Estates SPS in Grand Bend and connect to gravity with completion of Grand Bend Trunk Sanitary Sewer to Indian Road.
- Opportunity to decommission municipal owned Oakwood Area SPS with completion of Grand Bend Trunk Sanitary Sewer (Phase 2) to Sol Haven Subdivision.
- Potential opportunity for the Municipality to take ownership of the Darkhorse SPS in Grand Bend in the future to support development.

Sanitary Sewer

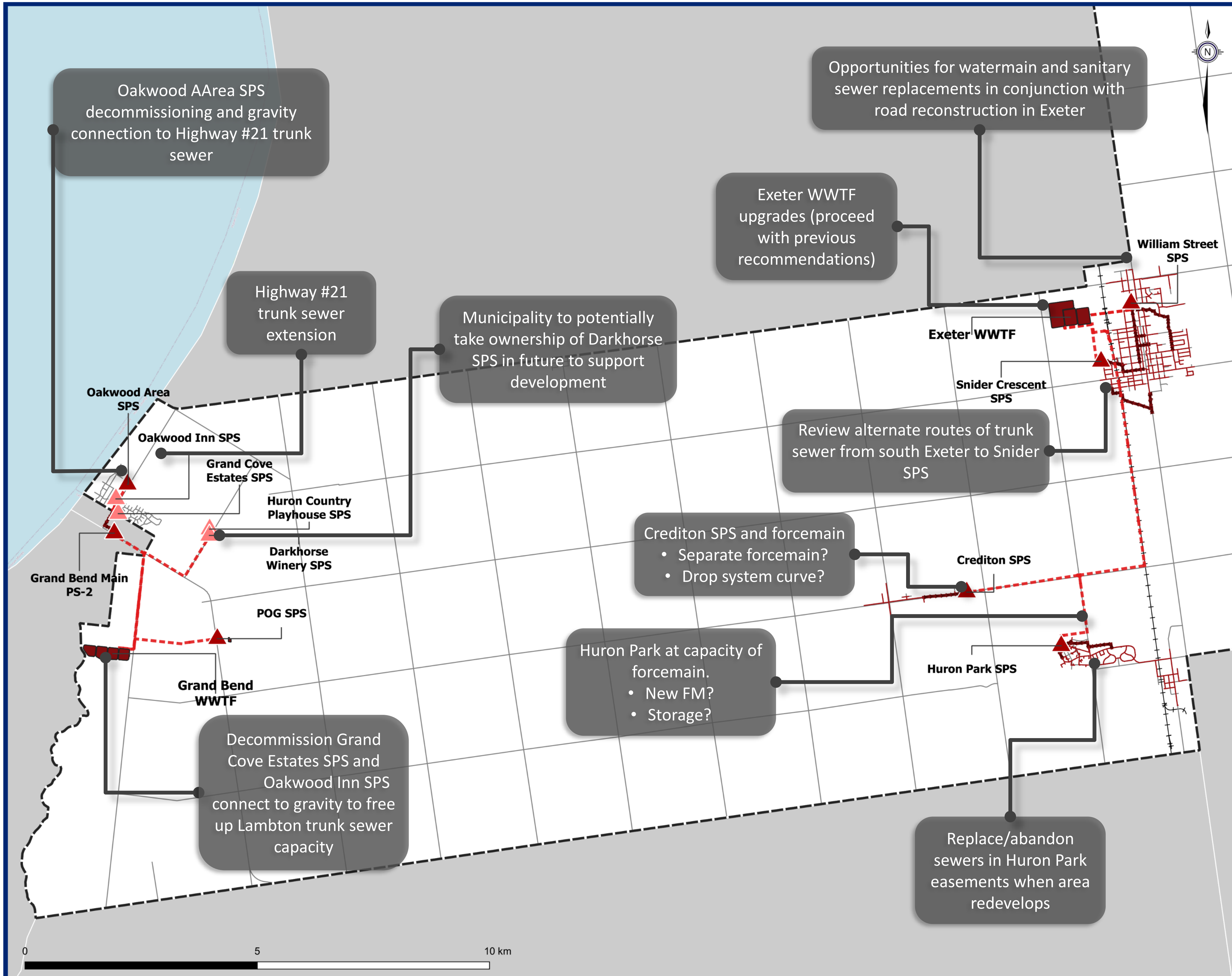
- A number of existing sewers are at capacity within Exeter and upgrades are necessary.
- Opportunity for strategic sizing and extension of the Highway #21 trunk sewer to support Grand Bend growth areas.
- Trunk capacity needs in south Exeter to support existing flows and south Exeter growth areas.

Inflow and Infiltration

- Wet weather management is needed; specifically for the Town of Exeter and villages of Centralia and Huron Park.

Aging Infrastructure

- Municipality to continue to complete ongoing replacement of aging sewers, in line with planned road reconstruction projects.



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The Municipality of South Huron Water & Wastewater Masterplan

Existing Infrastructure
- Sanitary Mains (<=300 mm)
- Sanitary Trunks (>300 mm)
- Sanitary WWTF
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

General Features
- South Huron Boundary
- South Huron Railway
- South Huron Watercourses

Figure 8
Wastewater Opportunities and Constraints

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5.4 Facility Capacity

Future facility capacity utilization for treatment, pumping, and conveyance are presented in the following section.

5.4.1 Exeter Wastewater Treatment Facility

The 2023 MPU assessed the projected growth flows at the Exeter WWTF to ensure that the facility has adequate capacity to service the proposed growth.

The starting point methodology identified in **Section 4.5.1** was used to calculate the projected flows for the Exeter WWTF. With the planned growth, the WWTF will nearly reach 80% capacity.

Although the WWTF has a rated capacity of 81.6 L/s, based on discussions with Municipal staff, not all processes within the treatment facility can accommodate this capacity and thus the WWTF processes were further reviewed to determine limiting capacities and potential opportunities at the existing facility.

A number of existing issues at the Exeter WWTF were identified to include:

- Gradual long-term reduction in hydraulic capacity of the sand filters during summer month operation due filter clogging.
- Sludge buildup reducing the available storage capacity.
- Inability to drain the lagoons in the summer months prior to the winter season.
- During winter months, lagoons continue to fill and approach capacity, resulting in winter discharge to the Ausable River.
- Winter discharging is resulting in MECP water quality exceedances.

The WWTF capacity is limited by the cold weather operations. Currently under cold weather operations, the Municipality is generally unable to effectively discharge through the sand filter requiring all/majority of the cold water flows to be stored and discharged during the warm weather month.

For the purposes of the MPU, the sustainable annual capacity of the Exeter WWTF, as currently configured, has been assumed to be 54.4 L/s. There is potential that the actual sustainable annual capacity of the Exeter WWTF to be ±15% depending on capacity/ performance of the filters, sludge buildup, weather conditions, and operational intervention. **Table 18** presents the Exeter WWTF needs including growth.

Table 18: Exeter WWTF Capacity

Facility	Capacity (L/s)	Existing		Existing + Growth	
		ADWF (L/s)	Surplus / Deficit (L/s)	ADWF (L/s)	Surplus / Deficit (L/s)
Exeter WWTF	81.6[1]	36.8	**44.8**[3]	61.0	**20.6**
	54.4[2]		**+17.6**		**-6.6**

[1]Max Annual Discharge
[2]Lagoon Storage Capacity based on 6-month storage balancing window.
[3]WWTF capacity utilization colour based on capacity (<80% capacity, 80-100% capacity, >100% capacity).

5.4.2 Grand Bend Wastewater Treatment Facility

The Grand Bend WWTF capacity is split between the municipalities of Lambton Shores and South Huron, with South Huron allocated to 35.3% of the plant capacity. **Table 19** outlines the capacity dedicated to South Huron and the projected growth flows that will be sent to the WWTF.

The projected growth flows for Grand Bend are based on the long-term potential buildout, with timing unknown.

Table 19: Grand Bend WWTF Capacity

Facility	Capacity (L/s)	South Huron Capacity (L/s)	Existing			Existing + Growth	
			ADWF (L/s)	South Huron ADWF (L/s)	Surplus / Deficit (L/s)	South Huron ADWF (L/s)	Surplus / Deficit (L/s)
Grand Bend WWTF	28.6	10.1	8.6[1]	3.3	**6.8**	22.2	**-12.1**

[1]Existing ADWF from the Grand Bend Main PS2. Based on historical average, 30% is from South Huron and 70% is from Lambton Shores
[2]Pumping facility capacity utilization colour based on available capacity (capacity surplus, capacity deficit)

The existing ADWF from South Huron is based on an estimate, using the existing ADWF at the Grand Bend Main PS2; however, based on the proposed growth flow of 18.9 L/s from Grand Bend, South Huron will eventually exceed its portion of treatment capacity at the Grand Bend WWTF. As outlined in **Section 4.3.1**, the WWTF has the capability of expanding to an ADWF capacity of 53.9 L/s based on the current design. To service the long-term proposed growth from the Municipality, South Huron's share of the WWTF capacity will be required to be increased.

Re-rating is the most cost-effective way to increase the rated capacity of the WWTF, as this is an engineering review of the existing facility. Unused/un-committed capacity could be reallocated from Lambton Shores to South Huron at a cost, or temporary borrowed, as per the terms of the GBSTF Joint Agreement. South Huron’s excess capacity at PS-2 could also be re-allocated to Lambton Shores in return for a re-allocation to South Huron of equivalent value of WWTF treatment capacity.

Ultimately as the Greater Grand Bend area grows and develops, the Grand Bend Area Wastewater Treatment Facility will be required to be physically expanded. The current design is based on an expandable model, with no modifications required to the main building; site works; and the majority of the equipment. It essentially involves adding treatment equipment within the existing building and two outside clarifier tanks behind the existing tanks.

5.4.3 Exeter and Grand Bend Sanitary Pumping Station Capacity

Assessment of pumping capacity was based on the ability of the SPS to provide firm capacity to meet the projected PWWF for the corresponding SPS catchments. **Table 20** highlights the SPS projected capacity utilization under existing and existing + growth flows. The capacity surplus and deficits were based on the operational firm capacity of the SPS.

Table 20: Exeter and Grand Bend SPS Capacity and Wet Weather Flow

Facility	Firm Capacity	Existing				Existing + Growth		
		Catchment Area (ha)	ADWF (L/s)	10-Year Storm PWWF (L/s)	Surplus / Deficit (L/s)	ADWF (L/s)	PWWF (L/s)	Surplus / Deficit (L/s)
William Street SPS	170.0	238.9	10.3	605.3[1]	**-435.3**	19.4	663.5	**-493.5**
Snider Crescent SPS	155.0	131.1	6.4	416.0[1]	**-261.0**	13.4	453.8	**-298.8**
Huron Park SPS	65.5[2]	102.7	3.6	61.4	**-24.6**	5.7	82.8	**-17.3**
Crediton SPS	13.9[2]	38.1	9.1	62.7	**-48.8**	12.1	82.6	**-68.7**
Grand Bend Main PS2	145.0	-	8.6	96.6	**48.4**	23.7	209.0	**-64.0**

[1]Snider Crescent SPS and William Street SPS 10-year storm based on modelled system. Other SPSs are based on a desktop critical event assessment.
[2]Capacity impacted by joint station operations.
[3]SPS capacity utilization colour based on firm capacity (<80% capacity, 80-100% capacity, >100% capacity).

The results of the pumping capacity review are as follows:

- **William Street SPS:** Due to the existing high wet weather flows within the William Street SPS catchment, under current conditions the station's firm capacity is exceeded during the 10-year storm. Growth pressures within the catchment are anticipated to further increase the capacity deficit.
- **Snider Crescent SPS:** Similar to the William Street SPS, due to the existing high wet weather flows within the Snider Crescent SPS catchment, under current conditions the station's firm capacity is exceeded during the 10-year storm. Growth pressures within the catchment are anticipated to further increase the capacity deficit.
- **Huron Park SPS:** Due to the existing high wet weather flows within the Huron Park SPS catchment, the station's firm capacity is exceeded during the 10-year storm. The station's operational capacity is also impacted by the joint station operation with the Crediton SPS, reducing the capacity by approximately 5 L/s when the Crediton SPS is operating. Growth pressures within the catchment are anticipated to further increase the capacity deficit.
- **Crediton SPS**: The station's existing hydraulic and operational capacity is impacted by the joint station operation with the Huron Park SPS. When the Huron Park SPS is running, capacity is greatly restricted due to the significant differences in duty points between the two stations; competing when both are operating at full speed. Growth pressures within the catchment are anticipated to further increase the capacity deficit.
- **Grand Bend Main PS2**: The Grand Bend Main PS2 has sufficient capacity under existing flows; however, experiences a deficit under buildout growth conditions. Due to the uncertainty in buildout timing, upgrades to Grand Bend Main PS2 will not be included in the MPU capital program.

Servicing strategies related to pumping needs are further described in **Section 7.4**.

5.5 Collection System

The Municipality's Exeter wastewater model was used to support the assessment of sewer capacity. **Table 21** details the existing gravity sewer performance in terms of depth/Diameter (d/D) which indicates the fullness of a pipe as the proportional depth of the pipe. A d/D less than 0.5 indicates that the pipe is half full; however, a d/D greater than 1 indicates that the pipe is surcharging.

Table 21: Exeter Gravity Sewer Performance

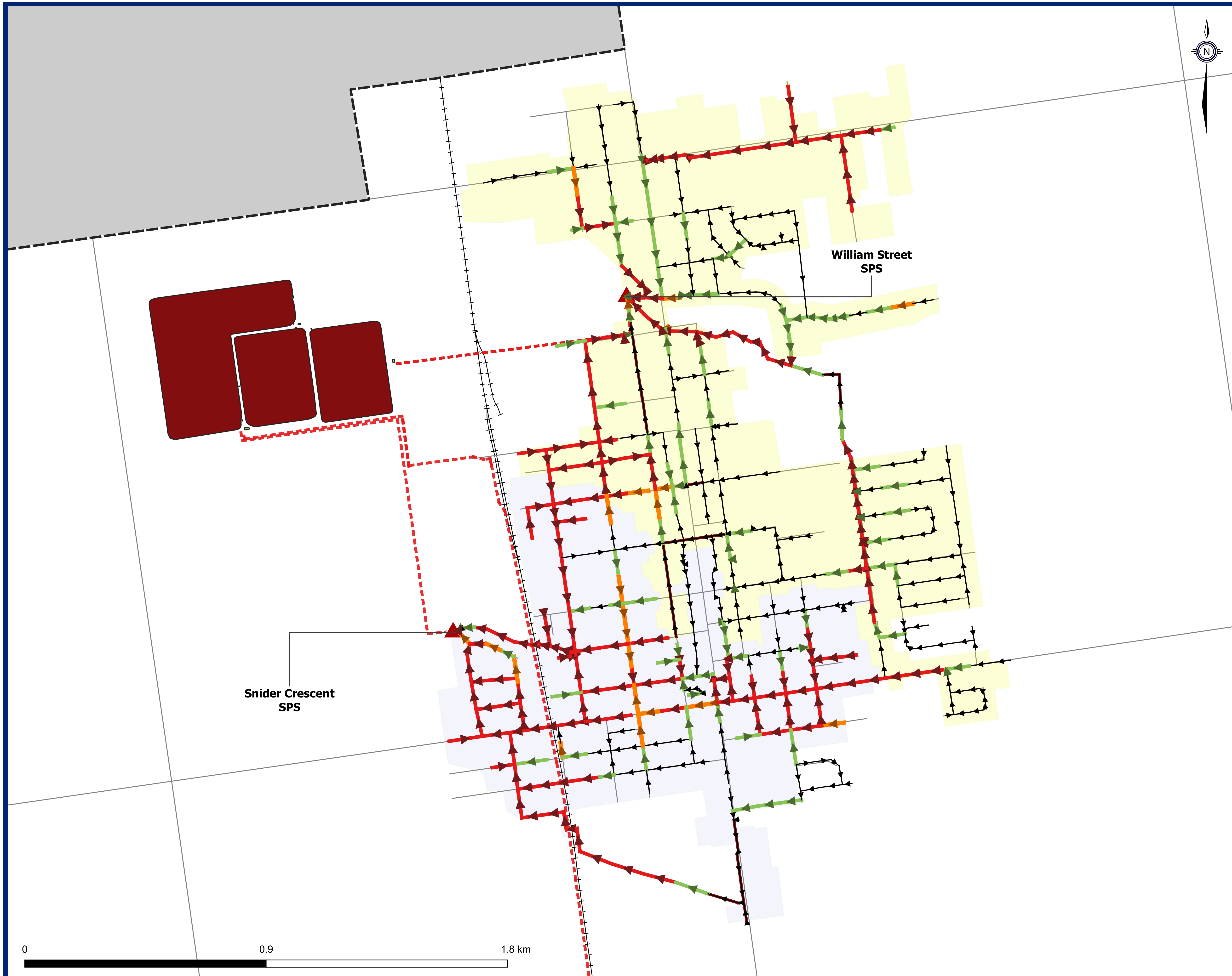
Design Storm	depth/Diameter (d/D)[1]		Surcharging <2.1 m Below Surface
	<1	>1	
Dry Weather Flow	100%	0%	0%
2-Year	83%	17%	8%
5-Year	70%	30%	18%
10-Year	63%	37%	24%

[1]Based on non-ideal model results. Surcharging slightly higher due to SPS capacity restrictions and sewer backups.

Based on the hydraulic modelling results the system has existing areas of concern as shown in **Table 21**, **Figure 9**, and **Figure 10**. Similarly, the system was assessed under the growth 10-year design storm, as shown in **Figure 11** and **Figure 12**, with the same concerns presented, this includes:

- 200 mm sewer along Thames Road from Main Street to the eastern extent is undersized. Downstream 300 mm along Main Street is sufficient.
- Surcharging due to marginally undersized sewers along Alexander Street West, from Francis Street to McConnell Street; however, HGL is sufficient.
- Pipe capacity restrictions in the 300 mm sewer upstream of the William Street SPS causing additional upstream surcharging both north and south, including overflows from the 600 mm trunk sewer at the MacNaughton Drive overflow.
- The 250 mm sewer along Church Street and Carling Street from Wellington Street West to William Street is at capacity and is causing upstream issues.
- Marginally undersized sewer along Pryde Boulevard; however, HGL is sufficient.
- Bottleneck at Huron Street and Main Street due to sewer size and flow splits causing upstream surcharging in pipes outletting to Huron Street.
- Capacity restrictions in 450 mm sewer at Marlborough Street and John Street causing north and east upstream surcharging and overflows at the John Street West overflow.
- Capacity restrictions upstream of Snider Crescent SPS along Snider Crescent causing surcharging along Huron Street and Mary Street as well as restricting any growth in south Exeter.

No significant differences in the system with the additional growth flow with the exception for an increased overflow volume at both the MacNaughton Drive and John Street overflows.



The Municipality of South Huron Water & Wastewater Masterplan

Existing Infrastructure

- Sanitary WWTF
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

Sanitary Catchments

- William Street SPS
- Snider Crescent SPS

Sewer Capacity

- d/D <0.5
- 0.5 >= d/D <0.8
- 0.8 >= d/D <1.0
- d/D >=1.0

General Features

- South Huron Boundary
- South Huron Railway
- South Huron Watercourses

Figure 9

Existing System Capacity - 10-Year Storm

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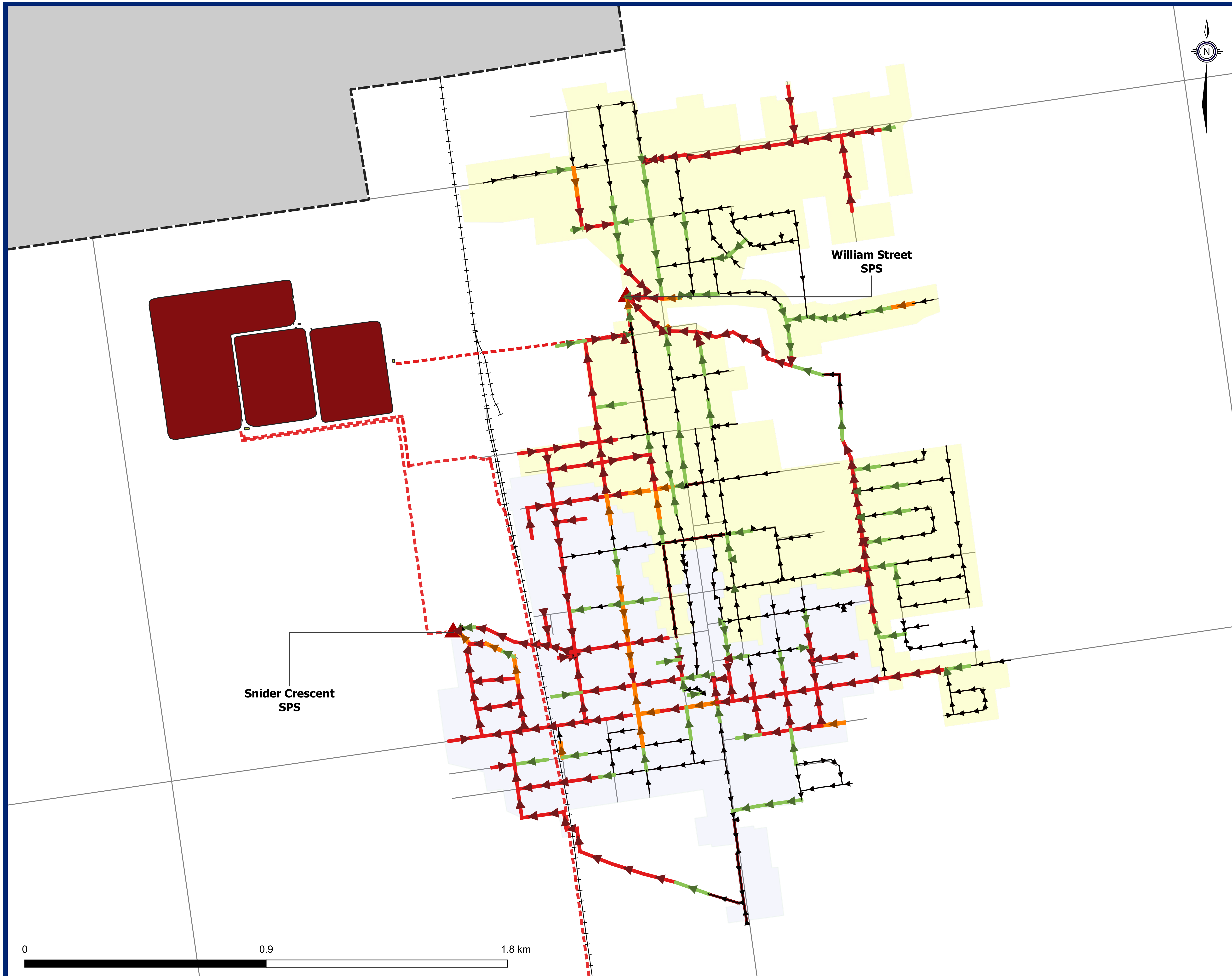
January, 2025
521054-WW-001
Projection EPSG:26917



The Municipality of South Huron Water & Wastewater Masterplan

Existing Infrastructure

- Sanitary WWTF
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

Sanitary Catchments

- William Street SPS
- Snider Crescent SPS

Sewer Capacity

- d/D <0.5
- 0.5 >= d/D <0.8
- 0.8 >= d/D <1.0
- d/D >=1.0

General Features

- South Huron Boundary
- South Huron Railway
- South Huron Watercourses

Figure 10

Existing System Capacity - 10-Year Storm Ideal Pumps

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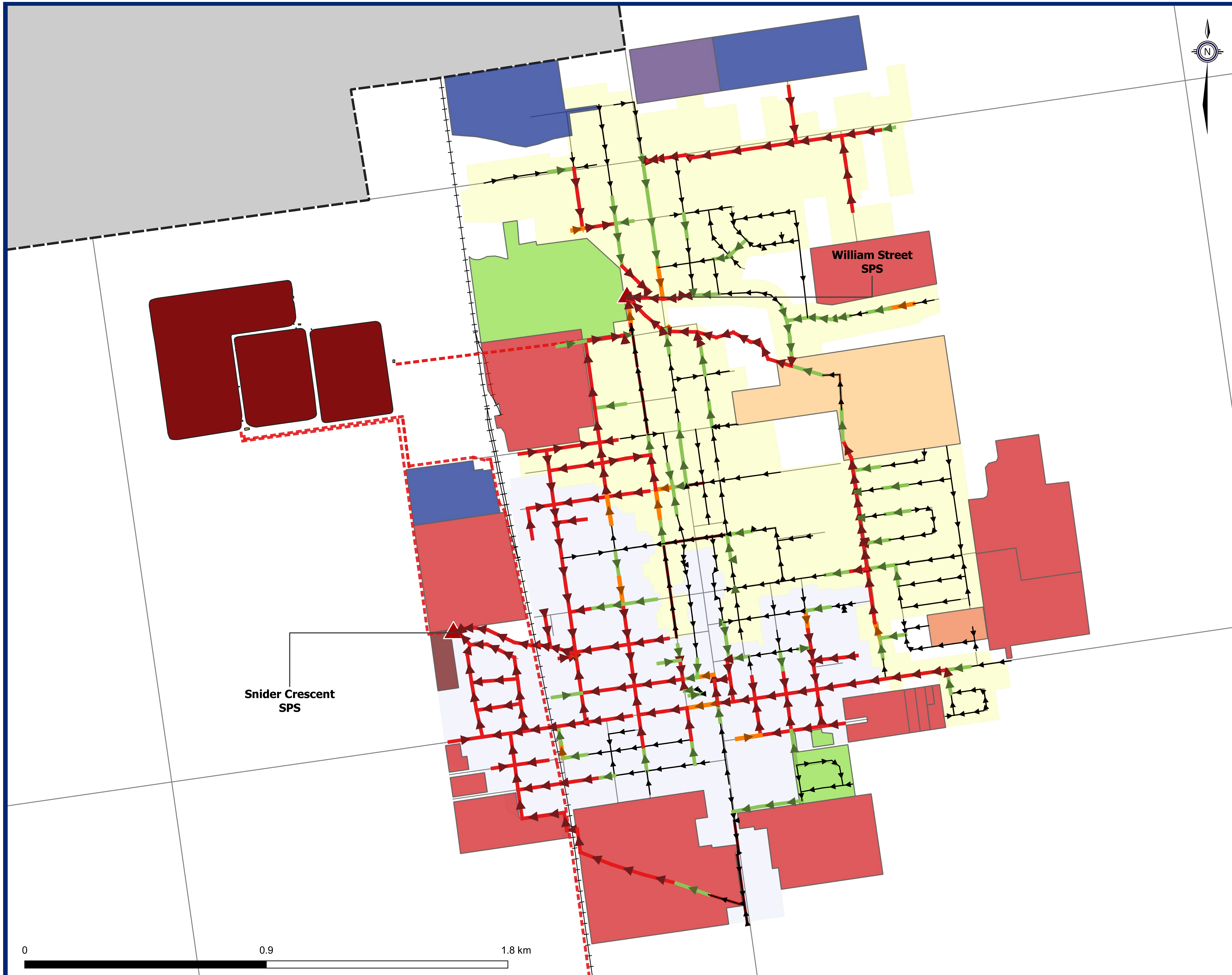

MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water & Wastewater Masterplan

Existing Infrastructure

- Sanitary WWTF
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

Sanitary Catchments

- William Street SPS
- Snider Crescent SPS

Sewer Capacity

- d/D <0.5
- 0.5 >= d/D <0.8
- 0.8 >= d/D <1.0
- d/D >=1.0

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Industrial Area
- Potential Residential Area

General Features

- South Huron Boundary
- South Huron Railway
- South Huron Watercourses

Figure 11

Existing + Growth System Capacity - 10-Year Storm

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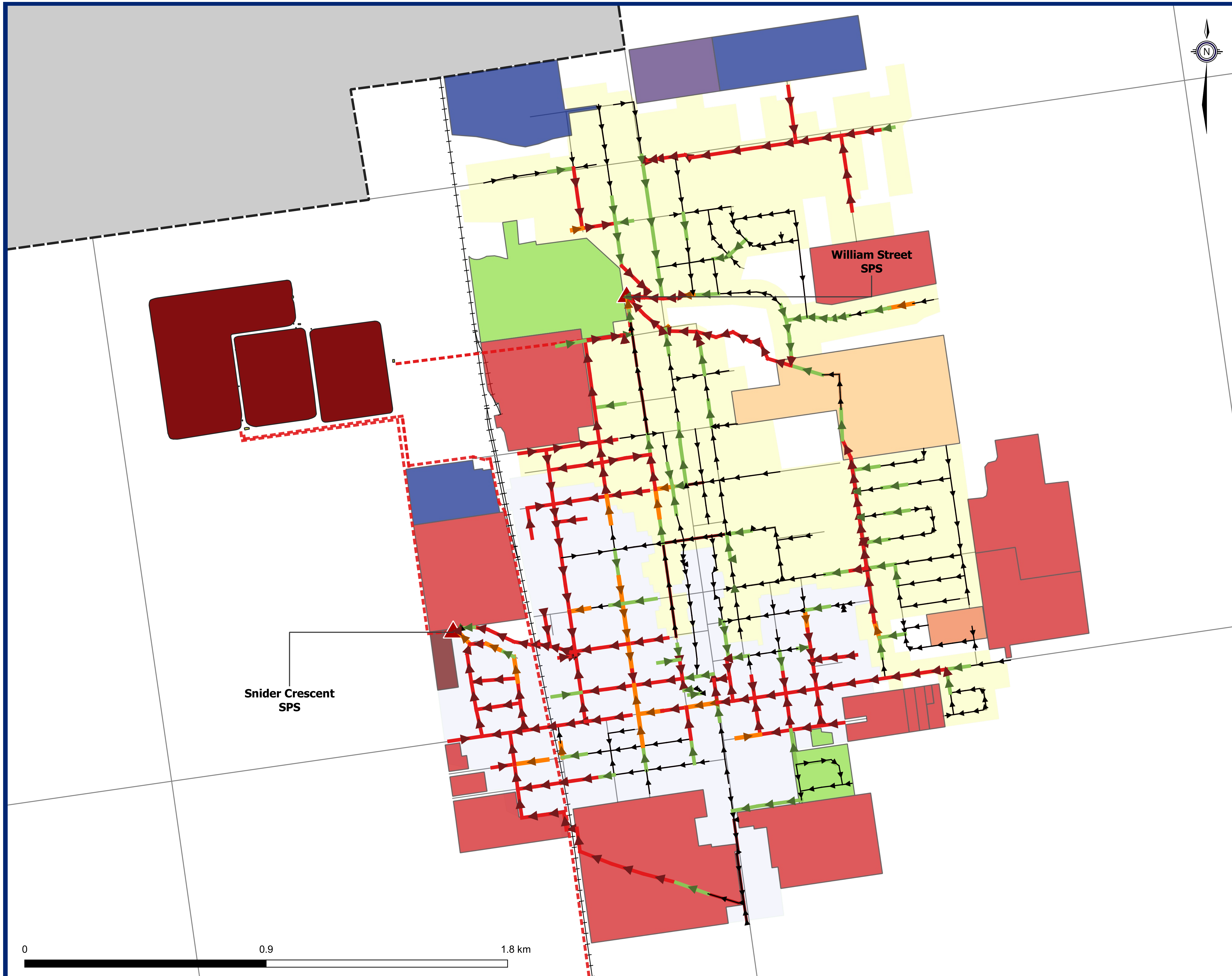

MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water & Wastewater Masterplan

Existing Infrastructure

- Sanitary WWTF
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

Sanitary Catchments

- William Street SPS
- Snider Crescent SPS

Sewer Capacity

- d/D <0.5
- 0.5 >= d/D <0.8
- 0.8 >= d/D <1.0
- d/D >=1.0

Growth Parcels

- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Industrial Area
- Potential Residential Area

General Features

- South Huron Boundary
- South Huron Railway
- South Huron Watercourses

Figure 12

Existing + Growth System Capacity - 10-Year Storm Ideal Pumps

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5.6 Wet Weather Flows

Areas within the Municipality's wastewater system are subject to extraneous wet weather flow rates exceeding the Municipality's design allowance for existing and growth conditions. **Table 22** outlines the extraneous flows based on the 10-year storm. The Snider Crescent and William Street SPS were based on the modelled system and the Huron Park and Crediton SPS were based on desktop critical event assessment, using the SPS's SCADA data.

These higher than designed wet weather flows are resulting in reduced sewer and pumping station capacity, and increased pumping station storage and wastewater treatment needs. Targeted wet weather flow strategies will be key to minimizing the scope of future system upgrades.

Table 22: 10-Year Storm Extraneous Flows

Catchment	10-Year Storm Inflow and Infiltration (L/s/ha)
William Street SPS	3.05
Snider Crescent SPS	2.46
Huron Park SPS	0.84
Crediton SPS	1.32

In addition to the high I&I rates presented above, the Municipality also experiences overflow events at both the SPSs and existing overflow outlets within the system. It is expected that there are overflows occurring at the MacNaughton Street overflow in the William Street SPS catchment and the John Street overflow in the Snider Crescent SPS catchment, which results in the Municipality exceeding the F-5-1 target for system overflows. Further, the high I&I rates reduce the available capacity at the WWTFs.

6 WASTEWATER SERVICING ALTERNATIVES AND EVALUATION

Wastewater servicing alternatives were developed under the context of identifying high level servicing solutions or alternatives to address both system wide and local opportunities and constraints. These alternatives focus on the existing wastewater system while still accommodating growth. Collectively, all the area specific servicing solutions will form the overall wastewater servicing strategy for the Municipality.

6.1 Servicing Strategy Development

As part of this MPU, wastewater alternative servicing strategies were reviewed for existing and future growth areas in order to select the servicing strategies that:

- Make best use of existing infrastructure to avoid new infrastructure where possible;
- Minimize cost of new infrastructure;
- Consider operation and maintenance costs to ensure financial sustainability;
- Ensure long term reliability and security of the wastewater system;
- Increase system resilience to climate change;
- Avoid/minimize environmental crossings and other disruptions to the environment where possible;
- Avoid disruptions to cultural heritage resources;
- Plan for future infrastructure in the existing roads right-of-way where possible;
- Avoid/reduce production of Greenhouse Gas Emissions; and,
- Avoid/minimize impact to areas where a disturbance could represent a significant drinking water threat.

The following sections summarize the development of the alternative servicing strategies for key areas within the Municipality.

6.2 Exeter Wastewater Treatment Facility

The operating capacity of all processes within the existing WWTF are marginally sufficient to accommodate existing flows and are insufficient to accommodate growth flows. As such, upgrades are required. Four alternatives were developed and reviewed to determine the preferred strategy including:

- Alternative 1 – No Upgrades
- Alternative 2 – Add Ultraviolet Disinfection (UV) Treatment
- Alternative 3 – Mechanical Filter
- Alternative 4 – Full Mechanical Plant

The Municipality has already initiated blower building upgrades and rehabilitation of the existing intermittent sand filters by replacement of the media. These measures are required to maintain the existing capacity of the WWTF and are not intended to increase the WWTF rated capacity. As such, it is assumed that these two projects are common to all alternatives presented below and will be implemented prior to the preferred servicing strategy outlined below.

Alternative 1: Do Nothing

This alternative requires no upgrades to existing processes. Based on the existing ADWF of 36.8 L/s and operating capacity of 44.6 L/s, this alternative would not be able to accommodate growth as existing flows are over 80% of existing plant capacity.

Alternative 2: Add Ultra-Violet Disinfection Treatment

Under Alternative 2, a disinfection system using Ultraviolet (UV) Disinfection irradiation will be incorporated into the existing treatment process for the effluent discharge line from the Exeter WWTF to address E. Coli. Although there are existing effluent quality criteria for E.coli, there currently is no dedicated disinfection system at the Exeter WWTF. The addition of UV Disinfection irradiation system will allow for additional cold weather discharges from the WWTF, providing a modest increase to the sustainable annual capacity of the Exeter WWTF.

The disinfection equipment will generally consist of a separate stand alone on grade building to address the equipment, small lift station and UV equipment, separate PLC controller and electrical servicing.

Alternative 3: Mechanical Filter

Under this alternative, the intermittent sand filters would be replaced with a mechanical filtration system. Significant upgrades would be required to the existing lagoon pumping station as the firm capacity of the existing pumps would likely exceed the capacities of the installed technologies. This is due to most of the mechanical technologies relying on a constant flow, whereas the existing pumping station was designed for large flow short duration. The addition of the mechanical filters will substantially increase feasible cold weather discharge rate from the WWTF, providing the potential capacity to increase to the sustainable annual capacity of the Exeter WWTF in line with the rated capacity of 81.6 L/s. However, as a lagoon based system the WWTF there will remain long-term risk of declining sustainable capacity due to sludge management and/or change in regulatory discharge requirements.

Alternative 4: Full Mechanical Plant

Under Alternative 4, the WWTF would transition to a conventional mechanical treatment plant upon the end of the useful life of the rehabilitated sand filters. The new mechanical treatment facility would replace the sewage lagoons. Under this approach there is capacity to expand the WWTF beyond the rated capacity of 81.6 L/s, and there is a reduced long-term risk of declining sustainable capacity.

The overview, advantages, disadvantages, and evaluation of the alternatives are summarized in **Table 23**.

Table 23: Exeter Wastewater Treatment Facility Alternatives and Evaluation

Exeter Wastewater Treatment Facility Alternatives	**Alternative 1:** Do Nothing	**Alternative 2:** Add UV Treatment	**Alternative 3:** Mechanical Filter	**Alternative 4:** Full Mechanical Plant
Overview	• No upgrades	• Add a disinfection system using UV irradiation to the treatment train to address E.coli • Currently no dedicated disinfection system although there are effluent quality criteria for E.coli	• Install a series of mechanical filtration units • Mechanical Filter to address ammonia and phosphorus (occasional exceedances for Total Ammonia Nitrogen tend to occur in winter months when sand filters are not in operation)	• Transition to a conventional mechanical treatment plant
Advantages	• No upgrades required	• Minimal upgrades required • Interim solution to support existing and growth flows and can support the phased expansion of the plant. Can consider future integration with a mechanical treatment plant as there are opportunities for combining facilities and processes at that time. • Summer discharge would be further improved, and winter season discharge could be disinfected	• Moderate process upgrades required • Supports phased expansion of the plant • Streamlines upgrades with Mechanical Filter supporting future Full Mechanical Plant • Provides more flexibility for processes to be taken offline for maintenance	• Provides redundancy for major processes • Allows growth flexibility • Phased upgrades including UV Treatment and Mechanical Filter support future new mechanical plant
Disadvantages	• Does not accommodate all growth flows • Existing flows are over 80% of plant capacity • No capacity redundancy to allow for regular maintenance • Maintenance remains an issue as sand filters have declining performance and are approaching maximum capacity • Hydraulic capacity will continue to decline • Effluent quality may deteriorate and result in more MECP exceedances	• Doesn't accommodate all growth • No additional capacity redundancy for regular maintenance • Constructability issues • Additional future O&M costs	• More extensive upgrades will be required for existing systems such as pumping station • Does not provide removal of bacteria within the mechanical system. UV filtration may be required. • More reliance on lagoon performance (upstream treatment processes). • Additional future O&M costs • Higher capital costs	• Requires major and costly process upgrades • System would be oversized for existing flows • Additional future O&M costs • Highest capital cost • EA required
Cost	• **$0**	• **$0.83 M**	• **$4.5 M**	• **$20 M**
Four-Point Criteria Evaluation	🔴 Technical 🟢 Environ-mental 🟢 Social & Cultural 🟢 Financial	🟡 Technical 🟢 Environ-mental 🟢 Social & Cultural 🟢 Financial	🟡 Technical 🟢 Environ-mental 🟢 Social & Cultural 🟡 Financial	🟢 Technical 🟡 Environ-mental 🟡 Social & Cultural 🔴 Financial
Recommended Alternative	• **Not Recommended:** Existing flows reaching over 80% capacity and does not accommodate growth flows	• **Recommended (Short-Term):** Improves existing effluent quality and can be implemented as phased approach as the first step.	• **Recommended (Intermediate Term):** To be implemented as part of phased approach, following UV treatment.	• **Recommended (Long-Term):** Long-term recommendation for the WWTF, as the Municipality works towards transitioning to a fully conventional mechanical treatment plant.

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

Three of the four alternatives are recommended for the Exeter WWTF, to be implemented in phases, starting with Alternative 2, and followed by Alternative 3 and Alternative 4. The full evaluation is included in **Appendix E**.

6.3 Exeter Sanitary Pumping Stations

Existing and future capacity constraints exist within both the Snider Crescent SPS catchment William Street SPS catchment in Exeter. Alternatives for addressing these constraints are outlined in the following sections for both the Snider Crescent SPS and William Street SPS.

6.3.1 South Exeter SPS Alternatives

Development within south Exeter has been identified but has not yet progressed, and this may be partly due to the existing wastewater constraints including both the Snider Crescent SPS and the south Exeter trunk sewer, as outlined below in **Section 6.3.2**. Wastewater infrastructure is required to be constructed and commissioned ahead of development proceeding.

Servicing alternatives were developed to address the capacity constraints in order to accommodate both the existing lands and proposed growth lands. Four alternatives were reviewed to determine the preferred south Exeter SPS strategy including:

- Alternative 1 – Upgrade existing Snider Crescent SPS (One SPS)
- Alternative 2 – One New SPS north of existing Snider Crescent SPS and Decommission Existing Snider Crescent SPS (One SPS)
- Alternative 3 – New SPS north of existing Snider Crescent SPS and utilize existing Snider Crescent SPS (Two SPS's)
- Alternative 4 – One New SPS northwest of Snider Crescent SPS in Boundary Expansion Lands and Decommission Existing Snider Crescent SPS (One SPS)

Alternative 1: Upgrade existing Snider Crescent SPS (One SPS)

Under Alternative 1, the capacity at the existing Snider Crescent SPS will be upgraded to accommodate existing flows and some growth flows. Based on past upgrades, it was determined that additional upsizing at the Snider Crescent SPS is very limited with no space on the existing property for expansion.

The parcels north of the Snider Crescent SPS cannot drain by gravity to the existing SPS and will require an individualized strategy, resulting in more infrastructure required to service south Exeter. The existing 300 mm forcemain from the Snider Crescent SPS will need to be twinned to address existing capacity issues.

The key projects required to service Alternative 1 are outlined in **Figure 13** and include:

- Existing upgrades at the Snider Crescent SPS
- Twin forcemain from the Snider Crescent SPS to the Exeter WWTF
- Sewage pumping infrastructure for parcels north of Snider Crescent SPS
- South Exeter trunk sewer upgrades (strategy presented in **Section 6.3.2**)

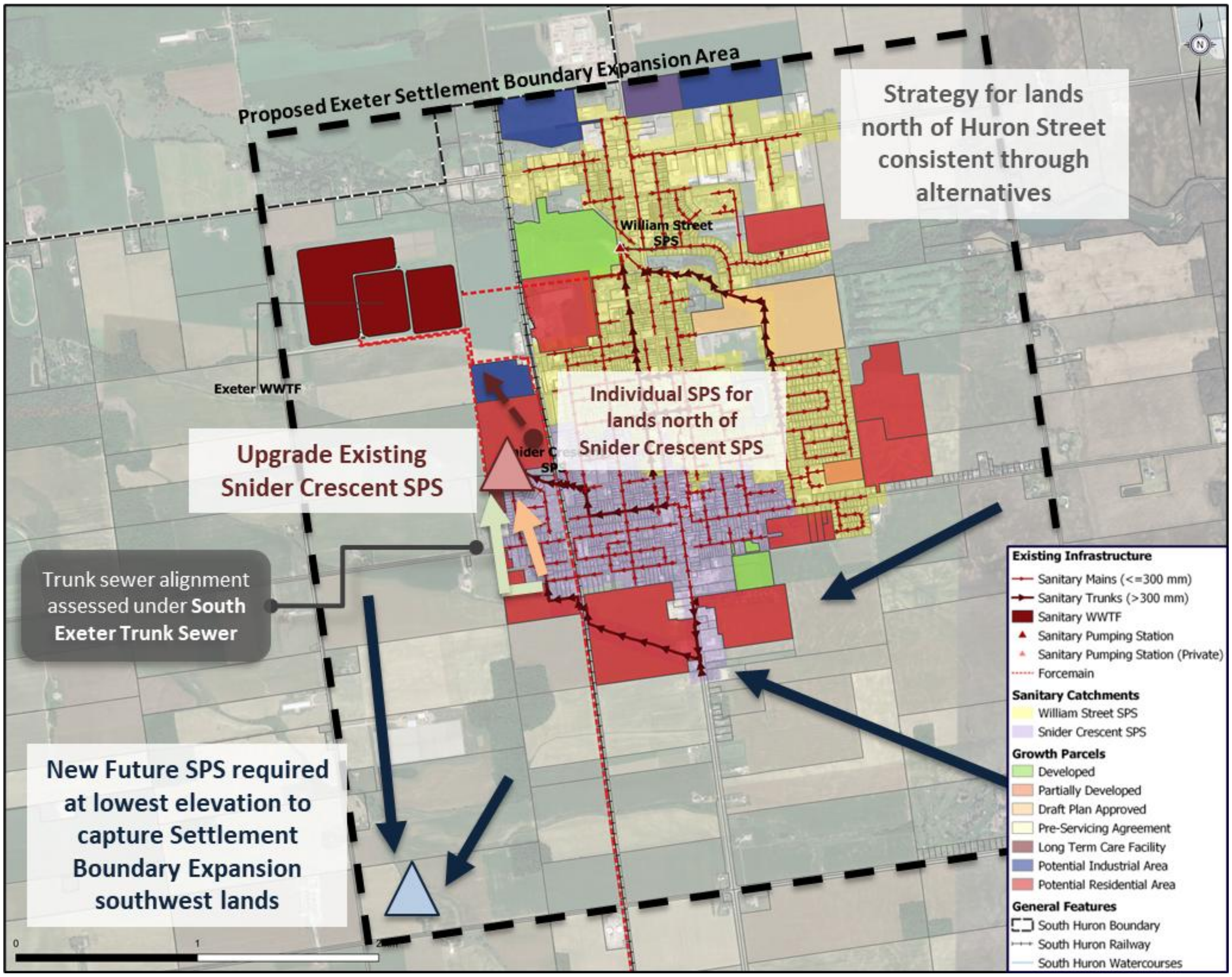


Figure 13: South Exeter SPS Alternative 1

Alternative 2: One New SPS north of existing Snider Crescent SPS and Decommission Existing Snider Crescent SPS (One SPS)

Under Alternative 2, a new SPS will be constructed north of the existing Snider Crescent SPS, in the proposed growth parcel. The existing Snider Crescent SPS will be decommissioned once this SPS is in operation, with flows from the existing Snider Crescent SPS directed to this new south Exeter SPS. The new SPS will be sized to accommodate the existing and proposed growth flows, with additional land acquired at the facility site to complete future expansion for potential expansion of the SAB.

Under this alternative, one SPS can service all of the currently proposed growth in south Exeter, including the lands east of Highway #4. The existing Snider Crescent SPS forcemain can be utilized with an additional new forcemain proposed from the new SPS to twin the existing forcemain capacity. The key projects required to service Alternative 2 are outlined in **Figure 14** and include:

- New South Exeter SPS
- Twin forcemain from new South Exeter SPS to the Exeter WWTF
- New gravity sewer connection from existing Snider Crescent SPS to new South Exeter SPS (opportunity to complete in-line with south Exeter trunk sewer upgrades)
- South Exeter trunk sewer upgrades (strategy presented in **Section 6.3.2**)
- Decommission Snider Crescent SPS

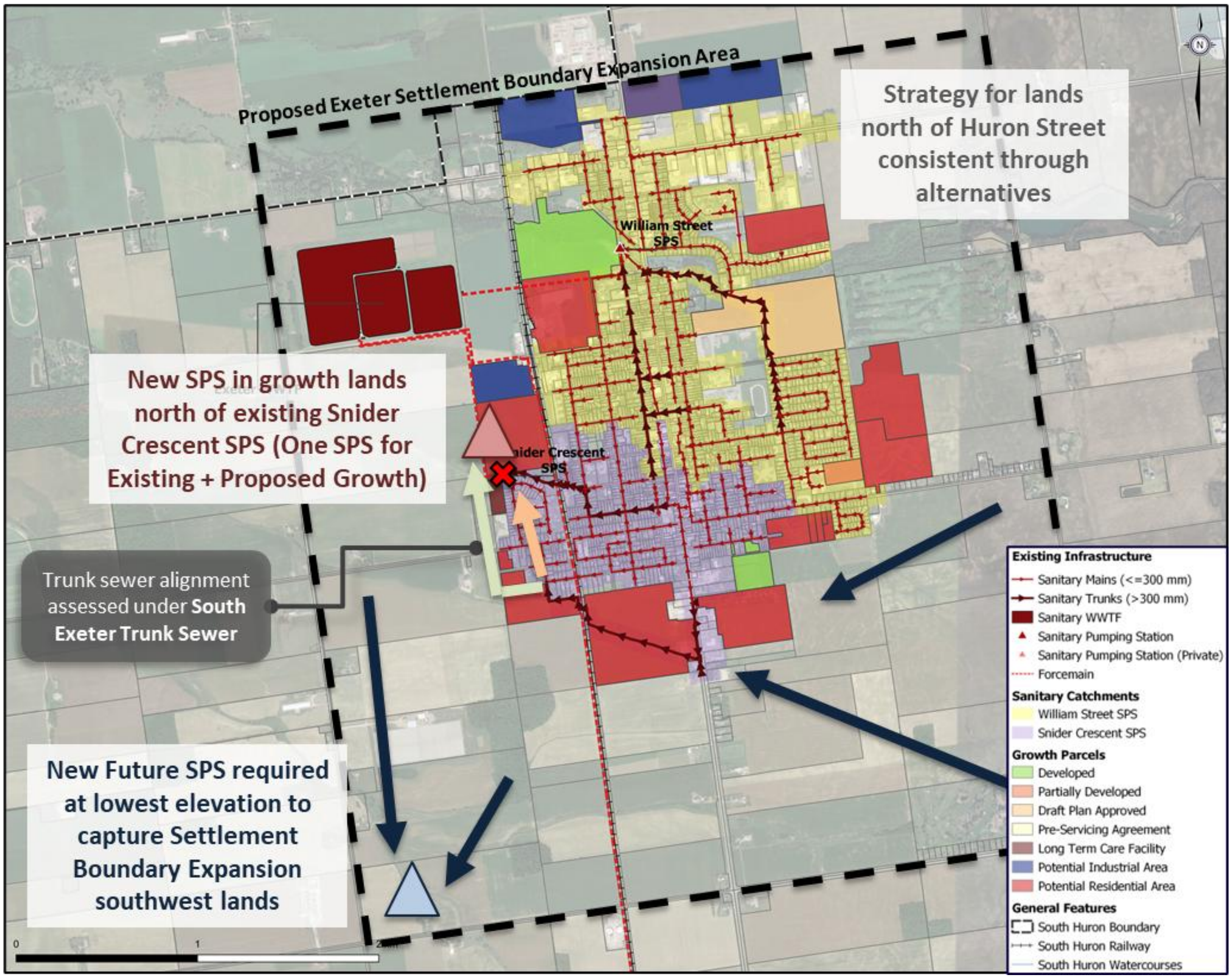


Figure 14: South Exeter SPS Alternative 2

Alternative 3: New SPS north of existing Snider Crescent SPS and utilize existing Snider Crescent SPS (Two SPS's)

Under this alternative, a new SPS will be constructed north of the existing Snider Crescent SPS, in the proposed growth parcel and the existing Snider Crescent SPS will remain in operation. The new SPS will accommodate flows in excess of the existing Snider Crescent SPS. A new forcemain will be installed from the new SPS to the WWTF.

The key projects required to service Alternative 3 are outlined in **Figure 15** and include:

- New South Exeter SPS
- Twin forcemain from new South Exeter SPS to the Exeter WWTF
- South Exeter trunk sewer upgrades (strategy presented in **Section 6.3.2**)

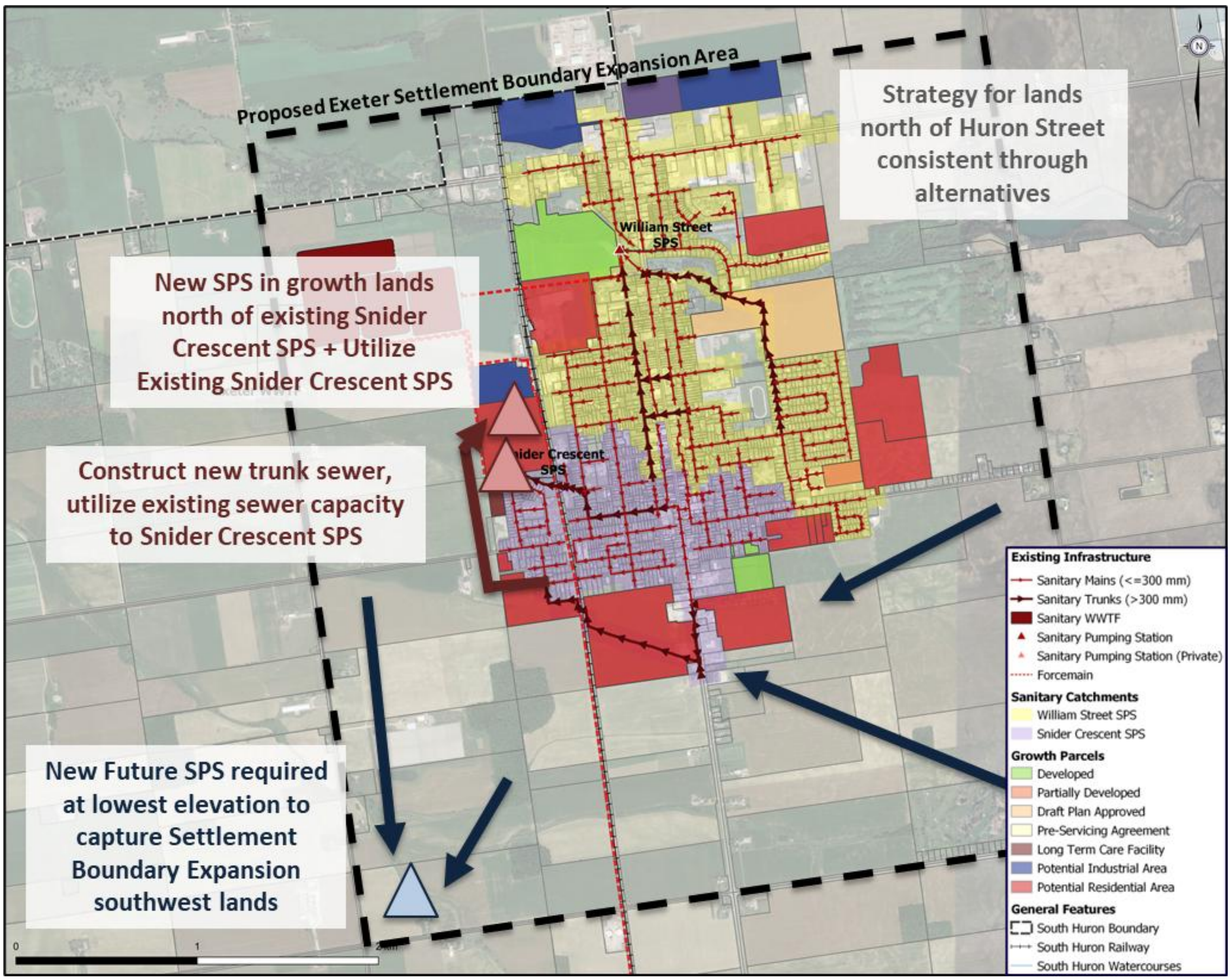


Figure 15: South Exeter SPS Alternative 3

Alternative 4: One New SPS northwest of Snider Crescent SPS in Boundary Expansion Lands and Decommission Existing Snider Crescent SPS (One SPS)

Under Alternative 4, a new SPS will be constructed northwest of the existing Snider Crescent SPS, in existing agricultural land, fronting Airport Line. The existing Snider Crescent SPS will be decommissioned once this SPS is in operation, with flows from the existing Snider Crescent SPS directed to this new SPS. The new SPS will be sized to accommodate the existing and proposed growth flows, with additional land acquired at the facility site to complete future expansion for potential expansion of the SAB.

Under this alternative, one SPS can service all the proposed growth in south Exeter, including the lands east of Highway #4. This alternative can also service all the lands currently outside of the SAB, west of the existing boundary and generally north of Huron Street. A new twinned forcemain will be required from this new SPS and the existing Snider Crescent SPS and forcemain will be decommissioned.

The key projects required to service Alternative 4 are outlined in **Figure 16** and include:

- New South Exeter SPS
- New twinned forcemains from new SPS to the Exeter WWTF
- South Exeter trunk sewer upgrades (strategy presented in **Section 6.3.2**); however, will require longer distance to get to the new SPS.
- Decommission Snider Crescent SPS

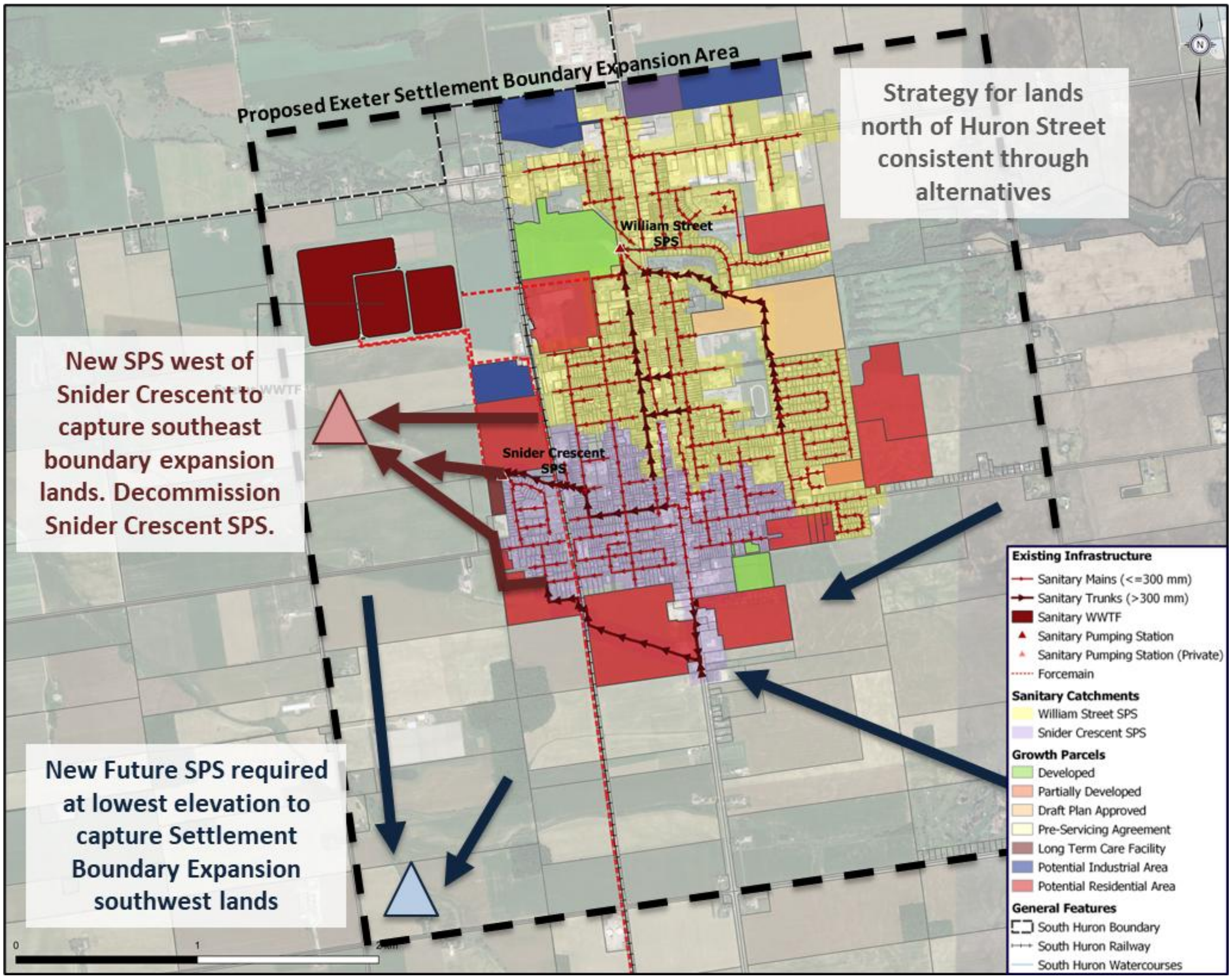


Figure 16: South Exeter SPS Alternative 4

The overview, advantages, disadvantages, and evaluation of the alternatives are summarized in **Table 24**.

The full evaluation is included in **Appendix E**. Alternative 2 was selected as the preferred alternative as it has the lowest long-term cost, requiring the least amount of infrastructure with one SPS servicing the existing and proposed growth and by utilizing the existing forcemain while accommodating all existing flows and planned growth.

Table 24: South Exeter SPS Alternatives and Evaluation

South Exeter SPS Alternatives	Alternative 1: Upgrade existing Snider Crescent SPS (One SPS)	Alternative 2: One new SPS north of existing Snider Crescent SPS (One SPS)	Alternative 3: New SPS north of existing Snider Crescent SPS and utilize existing Snider Crescent SPS (Two SPS's)	Alternative 4: One New SPS northwest of Snider Crescent SPS in Boundary Expansion Lands (One SPS)
Overview	• Upgrade capacity at Snider Crescent SPS to have one SPS for existing flows and some proposed growth • Upsize trunk sewer or new sewer from existing 600 mm sewer at Waterloo Street to Snider Crescent SPS • Lands east of London Road can drain by gravity to existing London Road trunk sewer connection • Additional SPS to service Boundary Expansion southwest lands and parcels north of Snider Crescent SPS	• One SPS for existing and proposed growth in southeast Exeter • Upsize trunk sewer or new sewer from existing 600 mm sewer at Waterloo Street to new SPS • Lands east of London Road can drain by gravity to existing London Road trunk sewer connection • Additional SPS to service Boundary Expansion southwest lands	• New sewer from existing 600 mm sewer at Waterloo Street south Exeter trunk to new SPS • Lands east of London Road can drain by gravity to existing London Road trunk sewer connection • Snider SPS to remain in service resulting in two SPS's for existing + proposed growth • Additional SPS still required to service Boundary Expansion southwest lands	• Lands east of London Road and existing flows conveyed to Snider Crescent SPS can drain by gravity to new SPS • SPS can also service lands outside of Settlement Area Boundary, west of existing boundary and generally north of Huron Street • New sewer from existing 600 mm sewer at Waterloo Street south Exeter trunk to new SPS • Decommission Snider SPS • Additional SPS still required to service Boundary Expansion southwest lands
Advantages	• Utilizes existing infrastructure • Operations and maintenance costs significantly less to operate one pump station	• Operations and maintenance costs significantly less to operate one pump station • New SPS in growth lands • Opportunity to size for additional settlement area boundary growth • Opportunity to utilize existing Snider SPS forcemain and twin with additional forcemain • Reduced forcemain length	• All costs for new SPS and sewers related to development • Minimizes construction to existing residents; however, new trunk sewer still required to service southeast growth lands • Utilizes existing infrastructure to full capacity; existing Snider Crescent sewer that is at capacity can be maintained • Allows for phased expansion of the system	• Focuses on servicing greater amount of boundary expansion lands, resulting in the least amount of future infrastructure • Operations and maintenance costs significantly less to operate one pump station • Minimal construction impacts to existing lands with majority of infrastructure in growth lands
Disadvantages	• Snider Crescent SPS at capacity with limited to no space on existing property for expansion • Only focuses on servicing proposed growth parcels southeast of existing SPS and does not account for all boundary expansion lands • Existing forcemain will need to be twinned; increased forcemain length in comparison to other alternatives • Growth parcels north of the Snider Crescent SPS cannot drain by gravity to the Snider Crescent SPS and will require an individualized strategy, resulting in more infrastructure to service south Exeter	• Does not utilize existing infrastructure (Snider Crescent SPS) • Only focuses on servicing proposed growth parcels southeast of proposed SPS and does not account for all boundary expansion lands	• Only focuses on servicing proposed growth parcels southeast of proposed SPS and does not account for all boundary expansion lands • Operations and maintenance costs significantly more to operate two pump stations • More infrastructure to maintain	• Land acquisition required • Location for new SPS further away from existing development and proposed growth resulting in longer lengths of sewers and forcemains • Location may not be ideal if settlement boundary growth doesn't happen
Cost	• Upgrades at the Snider Crescent SPS: $5.8 M • Twin forcemain: $3.6 M • Sewage pumping infrastructure for parcels north of Snider Crescent SPS: $1.0 M • South Exeter trunk sewer upgrades: $5.4 M • **Total:$15.8 M**	• New South Exeter SPS: $15.7 M • Twin forcemain: $3.6 M • South Exeter trunk sewer upgrades: $5.4 M • Decommission Snider Crescent SPS: $0.5 M • **Total: $25.2 M**	• New South Exeter SPS: $15.7 M • Twin forcemain: $3.6 M • South Exeter trunk sewer upgrades: $5.4 M • **Total: $24.7 M**	• New South Exeter SPS: $15.7 M • New twinned forcemains: $5.5 M • South Exeter trunk sewer upgrades: $5.4 M • Decommission Snider Crescent SPS: $0.5 M • **Total: $27.1 M**
Four-Point Criteria Evaluation	🟢 Technical 🟢 Environmental 🟡 Social & Cultural 🟢 Financial	🟢 Technical 🟢 Environmental 🟡 Social & Cultural 🟢 Financial	🟢 Technical 🟡 Environmental 🔴 Social & Cultural 🔴 Financial	🟡 Technical 🟢 Environmental 🟡 Social & Cultural 🟢 Financial
Recommended Alternative	• **Not Recommended:** Does not meet needs for planned growth	• **Recommended:** Lowers long-term cost for existing and proposed growth	• **Not Recommended:** High operations and maintenance costs to operate two SPS's	• **Not Recommended:** Uncertainty in long-term strategy of expansion of SAB may result in poor placement of infrastructure

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

6.3.2 William Street SPS Alternatives

The William Street SPS is experiencing flows in excess of its existing capacity which is contributing to the upstream sewer capacity as well as overflows in the catchment. Proposed growth that will outlet to the William Street SPS has been identified but not yet progressed, which is partly due to the constraints of the SPS.

Servicing alternatives were developed to address the capacity constraints in the William Street SPS catchment in order to accommodate both the existing lands and proposed growth lands. Two alternatives were reviewed to determine the preferred strategy including:

- Alternative 1 – William Street SPS Capacity Upgrades
- Alternative 2 – William Street SPS Catchment I&I Reduction

Alternative 1: William Street SPS Capacity Upgrades

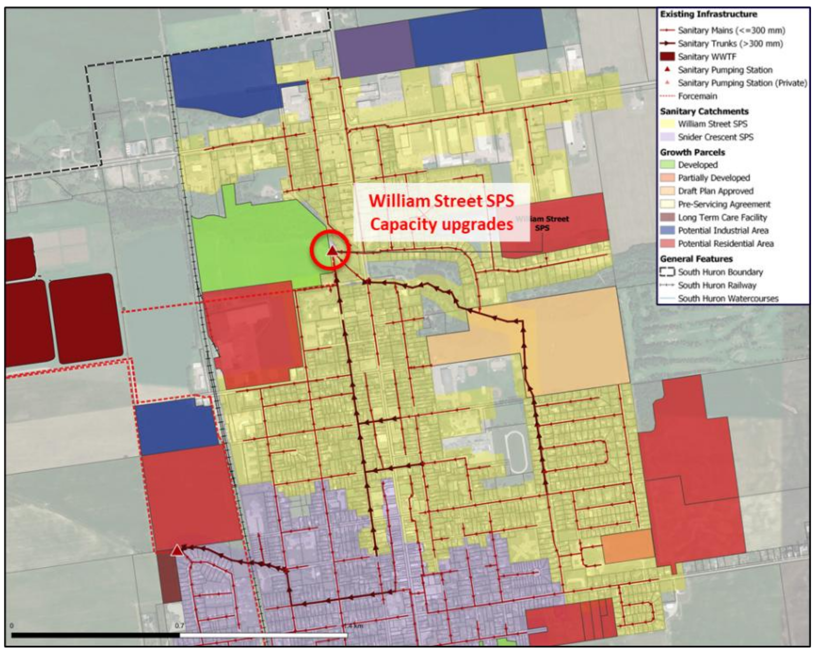
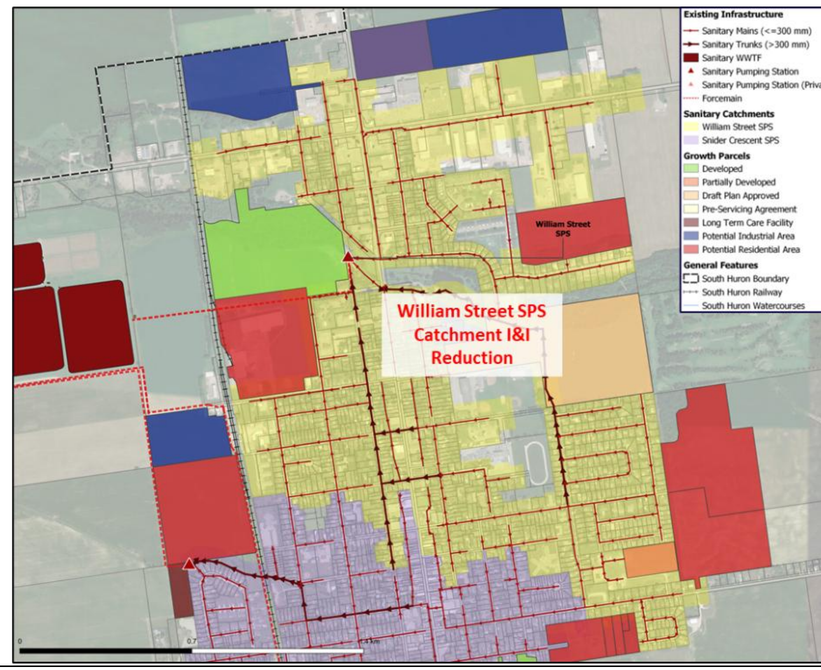
Under this alternative, the high flows in the William Street SPS catchment in Exeter will be addressed by upgrading the capacity at the William Street SPS. This alternative addresses the capacity issues at the station; however, does not address the issues related to the local sewers including high wet weather flows.

Alternative 2: William Street SPS Catchment I&I Reduction

The William Street SPS catchment is subject to very high RDII (2.46 L/s/ha under the 10-Year Design Storm). To avoid upgrades beyond the planned SPS rehabilitation, the high flows in the William Street SPS catchment in Exeter will be addressed through I&I reduction. This will help deal with the existing sewer capacity constraints and provide some growth related capacity without upgrading the SPS.

The overview, advantages, disadvantages, and evaluation of the alternatives are summarized in **Table 25**.

Table 25: William Street SPS Alternatives and Evaluation

William Street SPS		
	Alternative 1: William Street SPS Capacity Upgrades	**Alternative 2: William Street SPS Catchment I&I Reduction**
Map		
Overview	• Upgrades at the existing William Street SPS to accommodate high flows in catchment	• Address existing areas with high inflow and infiltration that result in system capacity restrictions or basement flooding risk • I&I priorities include: 1. Public cross connections 2. Private downspout disconnections 3. Lateral repairs • Deal with existing capacity constraints and provide growth related capacity without upsizing existing infrastructure, or by minimizing the required expansion/upgrade
Advantages	• Provides immediate growth related capacity • Reduces risks of overflows to the environment	• Reduces pumping and treatment costs • Least amount of new infrastructure • Provides resilience to local system and to reduce total system baseflows helping to manage available growth capacity at the WWTF • Lowest capital and O&M costs • Reduced risks of overflows to the environment
Disadvantages	• High risk of basement flooding as sewer constraints are not addressed • Increased pumping and treatment costs for continued wet weather flows • High O&M costs • Wet weather flows will continue to increase as sewers deteriorate and existing problem areas remain	• May be difficult to isolate and repair • Could be a long time before seeing benefits • Additional upgrades may be required if I&I reduction efforts are unsuccessful
Cost	• Upgrade to William Street SPS: $14.5 M • **Total: $14.8 M**	• I&I Reduction Program: $5.8 M • **Total: $5.8 M**
Four-Point Criteria Evaluation	Technical: High Environ-mental: Medium Social & Cultural: Low Financial: Low	Technical: High Environ-mental: High Social & Cultural: Medium Financial: High
Recommended Alternative	• **Not Recommended:** High capital costs and O&M costs by upsizing infrastructure as opposed to reducing existing flows. No resiliency in existing sewers.	• **Recommended:** Provides the greatest overall benefit with some capital costs while reducing wet weather flow. If I&I reduction efforts are unsuccessful, station upgrades at the William Street SPS may be required.

Evaluation Scoring Legend: High Medium Low

The full evaluation is included in **Appendix E**. Alternative 2 was selected as the preferred alternative as it provides the greatest overall benefit with lowest cost.

6.4 South Exeter Trunk Sewer

There is an existing trunk sewer in south Exeter, capturing flow along Highway #4, south of Waterloo Street and northwest through agricultural land which cross the GEXR and heads north to Mary Street at Waterloo Street. The sewer begins as a 200-375 mm diameter on Highway #4, transitioning to 450 mm through the agricultural lands and then 600 mm before crossing the GEXR. This trunk sewer ties into the existing smaller diameter, 250 mm sewer on Mary Street at Waterloo Street, which increases to a 300 mm along Snider Crescent, outletting at the Snider Crescent SPS.

The South Exeter trunk sewer will support growth in south Exeter, including existing and growth flows in the Snider Crescent SPS catchment and growth east of Highway #4; however, a capacity constraint exists north of Waterloo Street and continues as it crosses Huron Street to the Snider Crescent SPS, due to the reduction in sewer size as outlined above. The sewer from Waterloo Street to the Snider Crescent SPS requires upsizing to accommodate existing flows and growth flows.

Two servicing alternatives were reviewed to determine the preferred trunk sewer strategy including:

- Alternative 1 – Upsize Sewer Following Existing Alignment
- Alternative 2 – Construct New Trunk Sewer

Alternative 1: Upsize Sewer Following Existing Alignment

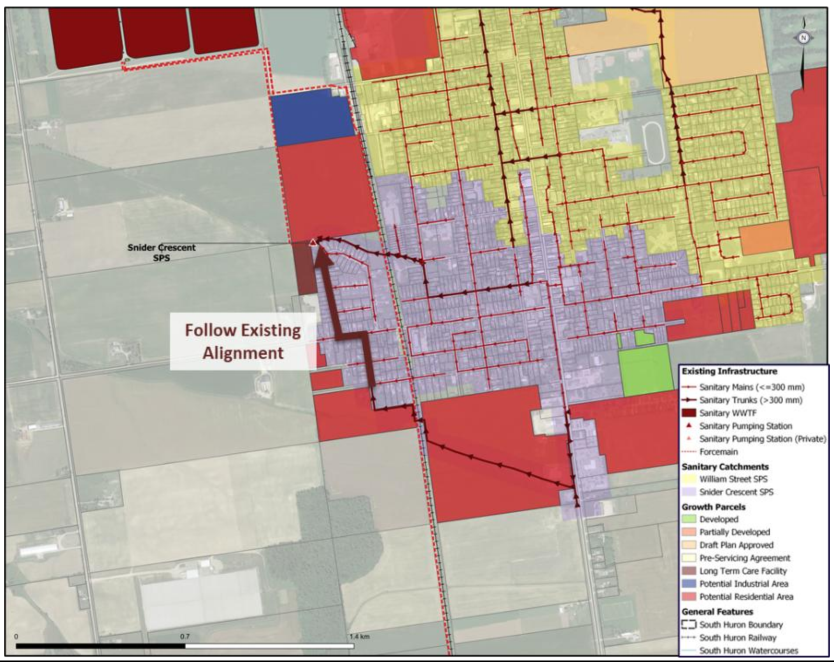
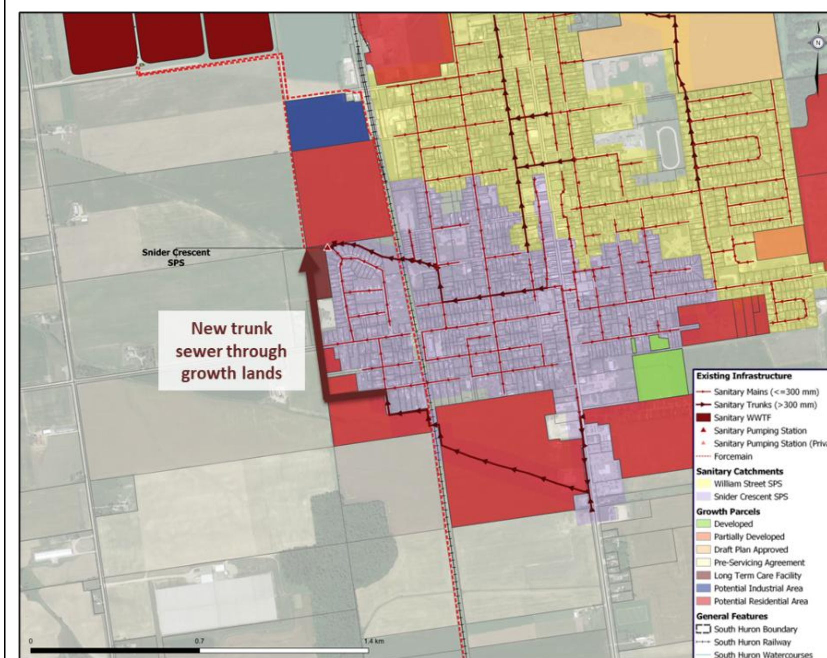
Under Alternative 1, the existing sewer along Mary Street from Waterloo Street to Huron Street West and along Snider Crescent from Huron Street West to the Snider Crescent SPS will be upsized to accommodate the existing and growth flows from south Exeter. This includes upsizing the sewer along the existing alignment which is within the existing road right-of-way.

Alternative 2: Construct New Trunk Sewer

Under Alternative 2, a new trunk sewer will be constructed heading west from the existing 600 mm sewer at Mary Street and Waterloo Street and then following north along the existing western extent of Exeter’s current development to the SPS. A separate Schedule ‘B’ EA will be required to determine the exact alignment of the sewer as it does not follow an existing road right-of-way and will require an easement.

The overview, advantages, disadvantages, and evaluation of the alternatives are summarized in **Table 26**.

Table 26: South Exeter Trunk Sewer Alternatives and Evaluation

<table>
<tr><th colspan="9">South Exeter Trunk Sewer</th></tr>
<tr><th></th><th colspan="4">Alternative 1: Upsize Sewer Following Existing Alignment</th><th colspan="4">Alternative 2: Construct New Trunk Sewer</th></tr>
<tr><td>Map</td><td colspan="4">
</td><td colspan="4">
</td></tr>
<tr><td>Overview</td><td colspan="4">• Existing sewer along Mary Street from Waterloo Street to Huron Street West and along Snider Crescent from Huron Street West to the Snider Crescent SPS will be upsized to accommodate the existing and growth flows from south Exeter.
• Construct sewer through the existing right-of-way.</td><td colspan="4">• New trunk sewer from Waterloo Street to SPS through growth lands on the western edge of existing Exeter
• Exact alignment of trunk sewer to be determined through separate EA (may be opportunity for alignment through Exeter Christian Reformed Church property)</td></tr>
<tr><td>Advantages</td><td colspan="4">• Optimize trunk sewer capacity with potential oversizing to support all southeast growth
• No land acquisition required; alignment to follow existing right-of-way
• No EA required
• Utilizes existing trunk sewer upstream of Mary Street at Waterloo Street</td><td colspan="4">• Optimize trunk sewer capacity with potential oversizing to support all southeast growth
• Minimal impact to local traffic with majority of construction to be in undeveloped/farmland
• May be opportunity to optimize alignment with development draft plans
• Utilizes existing trunk sewer upstream of Mary Street at Waterloo Street</td></tr>
<tr><td>Disadvantages</td><td colspan="4">• Increased construction impacts to existing residents
• Increased construction complexity in existing road right-of-way</td><td colspan="4">• Land acquisition required which may be difficult and costly
• Schedule 'B' EA required to determine the full extents of impacts
• Timing restrictions to complete EA and all associated studies, and acquire land if necessary</td></tr>
<tr><td>Cost</td><td colspan="4">• Sewer upgrades along existing alignment: $5.4 M
• Total: $5.4 M</td><td colspan="4">• Sewer upgrades through growth lands: $6.0 M
• Total: $6.0 M</td></tr>
<tr><td>Four-Point Criteria Evaluation</td><td>●
Technical</td><td>●
Environ-mental</td><td>●
Social & Cultural</td><td>●
Financial</td><td>●
Technical</td><td>●
Environ-mental</td><td>●
Social & Cultural</td><td>●
Financial</td></tr>
<tr><td>Recommended Alternative</td><td colspan="4">• Recommended: Can be initiated immediately as it does not require an EA or land acquisition</td><td colspan="4">• Not Recommended: Timing restriction of an EA puts limitation on potential growth servicing in south Exeter</td></tr>
</table>

Evaluation Scoring Legend: ● High ● Medium ● Low

The full evaluation is included in **Appendix E**. Alternative 1 was selected as the preferred alternative as it can be initiated immediately, relieving the existing capacity constraints in south Exeter and allowing growth to proceed.

6.5 Exeter Sewer System Upgrades

Within the Exeter wastewater system, existing and future capacity constraints exist within the local sewers, as shown in **Figures 9** through **12** in **Section 5.5**, with a large number of sewers flagged as surcharging. In addition, both of the SPSs are experiencing flows in excess of their existing capacities. Proposed growth will contribute additional flows to the pumping stations and sewers.

Three alternatives to address the sewer capacity issues in Exeter, detailed in **Table 27**, are outlined as follows:

- Alternative 1 – I&I Reduction Only
- Alternative 2 – Sewer Upgrades Only
- Alternative 3 – I&I Reduction and Sewer Upgrades

Alternative 1: I&I Reduction Only

Under Alternative 1, I&I will be addressed in the entire Exeter system. Reducing the existing flows via I&I reduction will help address the existing capacity constraints and provide growth related capacity without upsizing the existing infrastructure. Additionally, I&I reduction will aid in the management and reduction in overflow volumes during significant storm events.

The I&I priorities include:

1. Public cross connections
2. Private downspout disconnections
3. Lateral repairs

An extensive program will be developed for the Town of Exeter to implement the priorities listed above. Addressing I&I issues should help minimize the required sewer upgrades; however, there will still be some deteriorating sewers that cannot be addressed through I&I reduction.

Alternative 2: Sewer Upgrades Only

Under Alternative 2, sewer upgrades will be completed to address the existing sewer capacity constraints. This includes:

- The sewers, as identified through the sanitary model, will be upsized to address the capacity constraints.
- Upgrading sewers in-line with the Municipality's planned road reconstruction projects in Exeter.

This alternative does not address the existing high flows which will still be realized at the SPS and WWTF.

Alternative 3: I&I Reduction and Sewer Upgrades

Alternative 3 is a combination of Alternative 1 and 2, addressing I&I issues while also completing sewer upgrades identified from the model and in conjunction with planned road reconstruction projects.

The I&I priorities include:

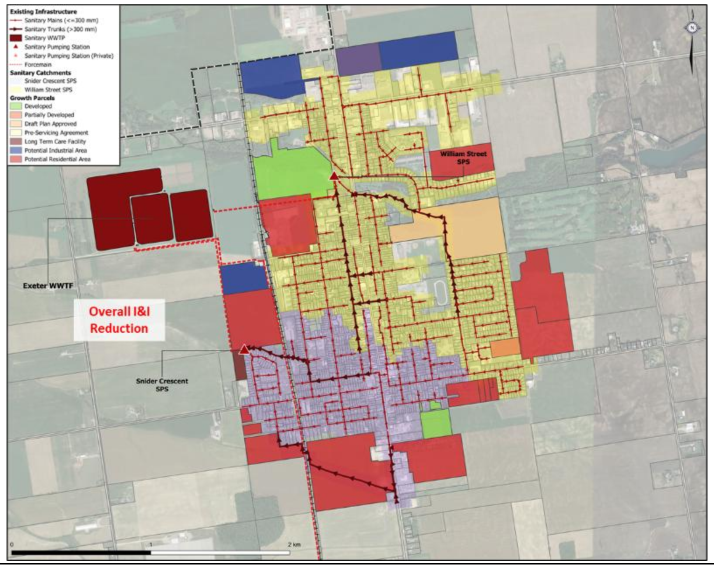
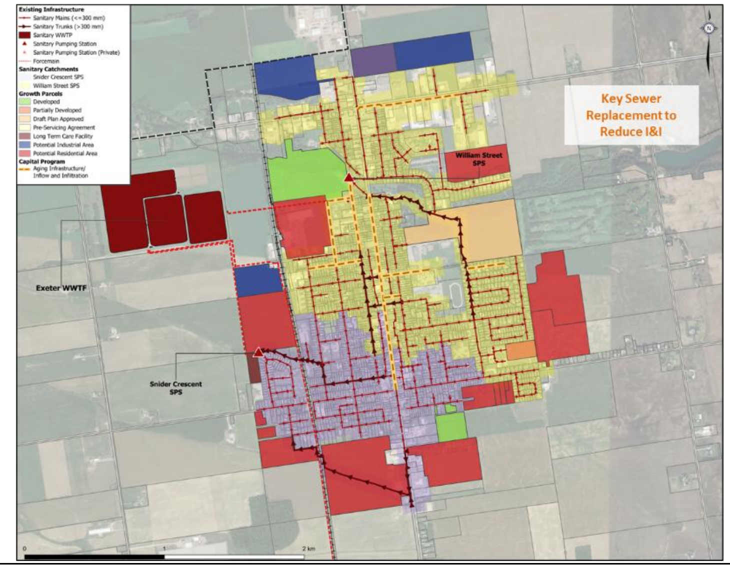
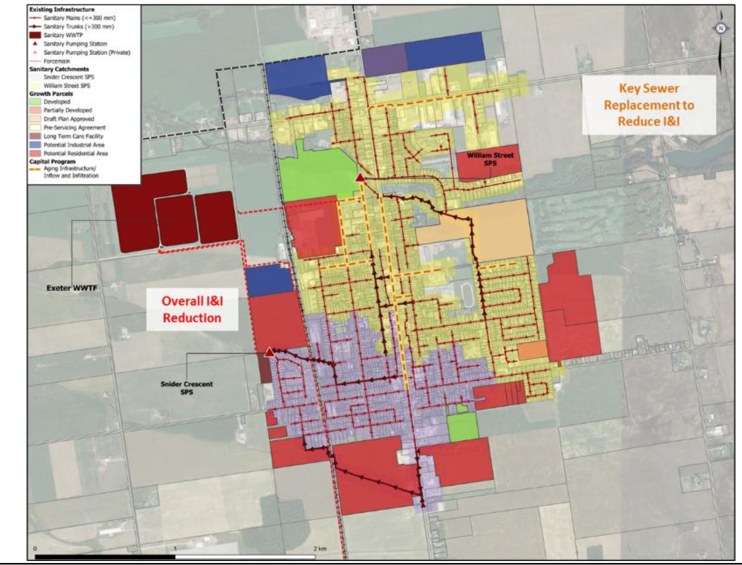
1. Public cross connections
2. Private downspout disconnections
3. Lateral repairs

Addressing I&I will help reduce the overall flows in the Exeter system and sewer upgrades will help address deteriorating sewers or areas of concern within the Exeter wastewater system. Additionally, I&I reduction will aid in the management and reduction in overflow volumes during significant storm events.

The overview, advantages, disadvantages, and evaluation of the alternatives are summarized in **Table 27**.

The full evaluation is included in **Appendix E**. Alternative 3 (I&I Reduction and Sewer Upgrades) is the most beneficial to the existing system as it addresses areas with high wet weather flow while also upgrading sewers where required and in conjunction with planned road reconstruction works.

Table 27: Exeter Sewer System Upgrades Alternatives and Evaluation

Exeter Sewer System Upgrades	**Alternative 1:** I&I Reduction Only	**Alternative 2:** Sewer Upgrades Only	**Alternative 3:** I&I Reduction and Sewer Upgrades
Map			
Overview	• Address existing areas with high inflow and infiltration that result in system capacity restrictions or basement flooding risk • I&I priorities include: 1. Public cross connections 2. Private downspout disconnections 3. Lateral repairs • Address existing capacity constraints and provide growth related capacity without upsizing existing infrastructure, or by minimizing the required expansion/upgrade	• Replace sewers as identified through the sanitary model • Replace sewers in conjunction with road reconstruction projects as part of the asset management program	• Address existing areas with high I&I while completing sewer upgrades as identified through sanitary model and in conjunction with road reconstruction • I&I priorities include: 1. Public cross connections 2. Private downspout disconnections 3. Lateral repairs
Advantages	• Reduces pumping and treatment costs • Least amount of new infrastructure • Provides resilience to local system and to reduce total system baseflows helping to manage available growth capacity at the WWTF • Lowest capital and O&M costs	• Immediately addresses capacity constraints and provides growth related capacity	• Reduces pumping and treatment costs • Minimizes new infrastructure sizing • Some immediate relief still achieved • Ability to deal with deteriorating sewers that cannot be addressed through I&I reduction
Disadvantages	• May be difficult to isolate and repair • Could be a long time before seeing benefits • Additional upgrades may be required if I&I reduction efforts are unsuccessful	• Increased capital costs for sewer replacements • Increased pumping and treatment costs for additional wet weather flows • Additional flow monitoring still required to improve accuracy of sanitary model and thus replacement sewers • No additional resilience to local system as total system baseflows remain high	• I&I may be difficult to isolate and repair • Increased capital costs for sewer replacements
Cost	• I&I Program: $5.8 M • **Total: $5.8 M**	• Sewer Upgrades: $11.5 M • **Total: $11.5 M**	• I&I Program: $5.8 M • Sewer Upgrades: $11.5 M • **Total: $17.3**
Four-Point Criteria Evaluation	Technical | Environmental | Social & Cultural | Financial	Technical | Environmental | Social & Cultural | Financial	Technical | Environmental | Social & Cultural | Financial
Recommended Alternative	• **Not Recommended:** Longer amount of time to see results and efforts may be unsuccessful	• **Not Recommended:** High capital costs and O&M costs by upsizing infrastructure as opposed to reducing existing flows	• **Recommended:** Provides the greatest overall benefit with some capital costs while also reducing wet weather flow

Evaluation Scoring Legend: High Medium Low

6.6 Crediton and Huron Park Pumping Stations

As identified in **Exeter and** Grand Bend Sanitary Pumping Station Capacity

Assessment of pumping capacity was based on the ability of the SPS to provide firm capacity to meet the projected PWWF for the corresponding SPS catchments. **Table 20** highlights the SPS projected capacity utilization under existing and existing + growth flows. The capacity surplus and deficits were based on the operational firm capacity of the SPS.

Table 20, the Crediton SPS and Huron Park SPS are both exceeding the existing station firm capacity under the 10-Year PWWF design storm. The two SPSs discharge to a shared forcemain starting at the intersection of Crediton Road and Airport Line to the Exeter WWTF. The Crediton SPS is currently competing with the Huron Park SPS when both stations are operating with the following results observed:

- Average flows of 60 L/s at the Huron Park SPS are typically reduced to 55 L/s while the Crediton SPS is operating.
- When Huron Park is running, Crediton is reduced from ~18-30 L/s to approximately 15 L/s.

This is due to significant differences in duty points between the two stations and competing when both stations are operating at full speed.

Four servicing alternatives were reviewed to determine the preferred strategy including:

- Alternative 1 – Separate Crediton and Huron Park Forcemains
- Alternative 2 – Drop Crediton SPS System Curve
- Alternative 3 – New Storage at Huron Park SPS
- Alternative 4 – Huron Park I&I Reduction

Alternative 1: Separate Crediton and Huron Park Forcemains

Under Alternative 1, the forcemains for the Crediton SPS and Huron Park SPS will be separated, as the forcemain is currently shared starting at the intersection of Crediton Road and Airport Line to the WWTF. The Huron Park forcemain is nearing capacity and this would allow for an opportunity to upgrade the capacity of the Huron Park forcemain. Separating the forcemains would also reduce the wear on the Crediton SPS pumps.

Alternative 2: Drop Crediton SPS System Curve

Under Alternative 2, the Crediton SPS system curve would be lowered. Under the current dual station operation, the Crediton pumps are operating at a much higher total dynamic head (TDH) and lower flow than the designed operating point, as shown in **Figure 17**. Flow matching/operating at a lower speed may alleviate some of the existing concerns.

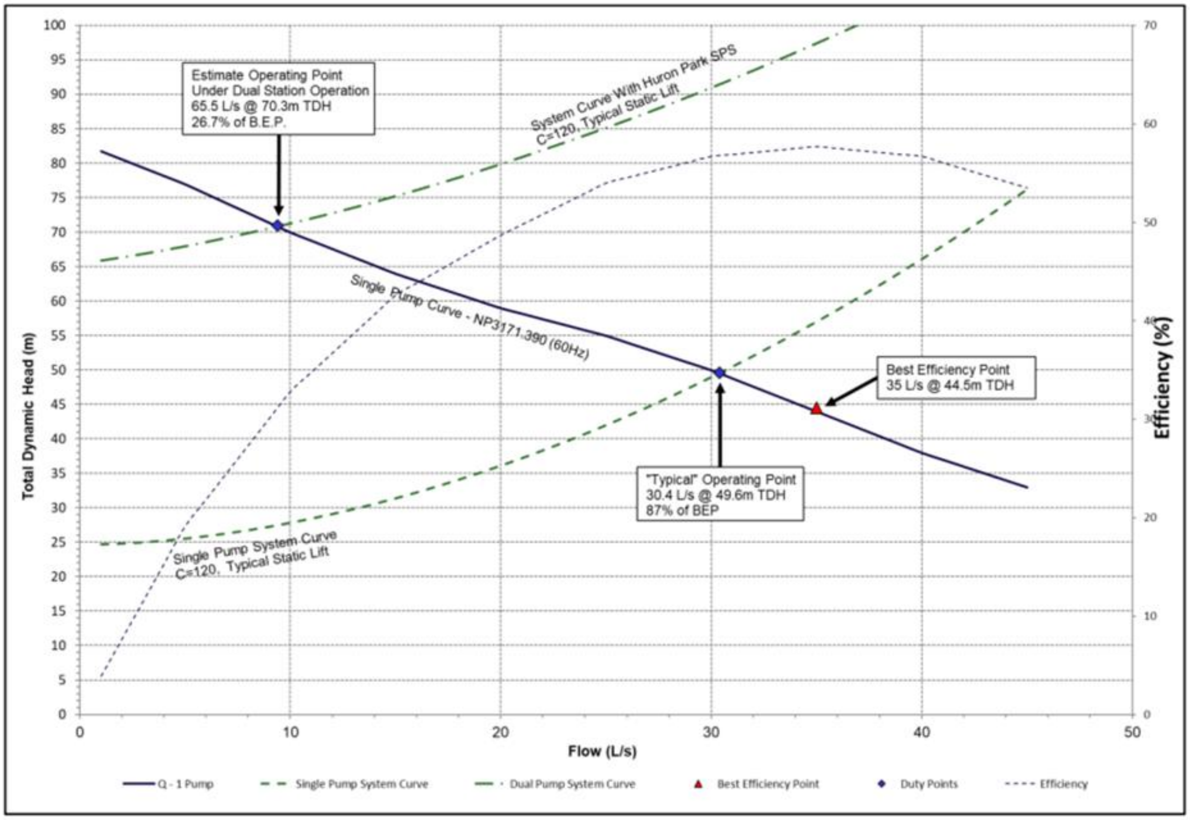


Figure 17: Crediton SPS Curve

Alternative 3: New Storage at Huron Park SPS

Under Alternative 3, a new equalization tank will be installed at the Huron Park SPS. This equalization tank will be connected to the existing wet well of the SPS for additional sewage storage during wet weather events to minimize sewage by-passes. This will provide storage for the Huron Park SPS during high flow periods and allow the Crediton SPS to operate independently to allow for the Crediton wet well to empty.

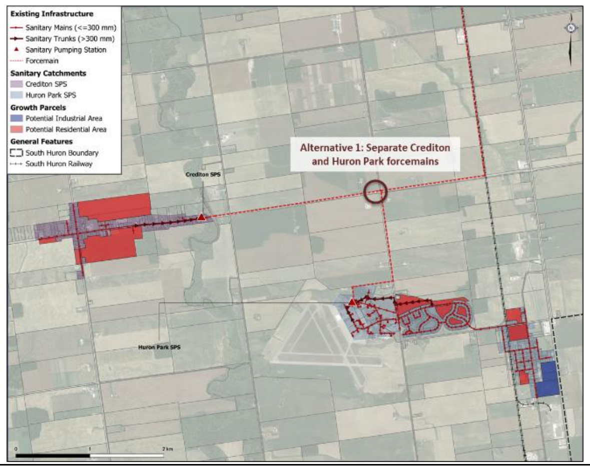
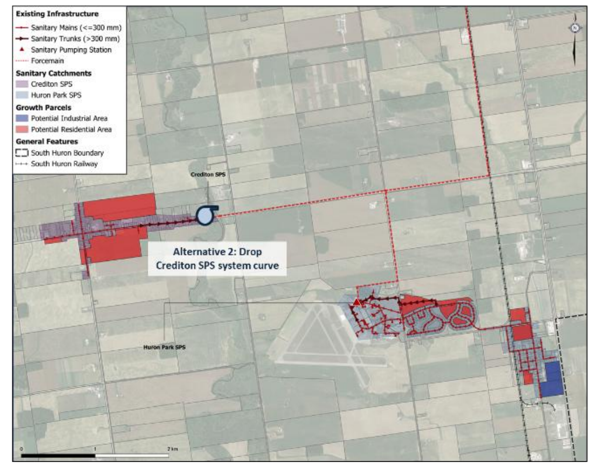
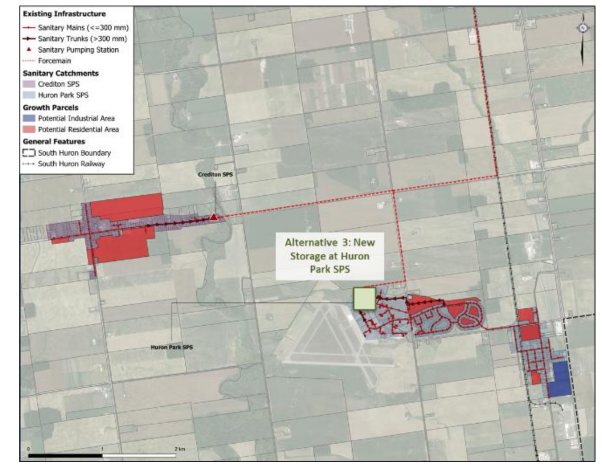
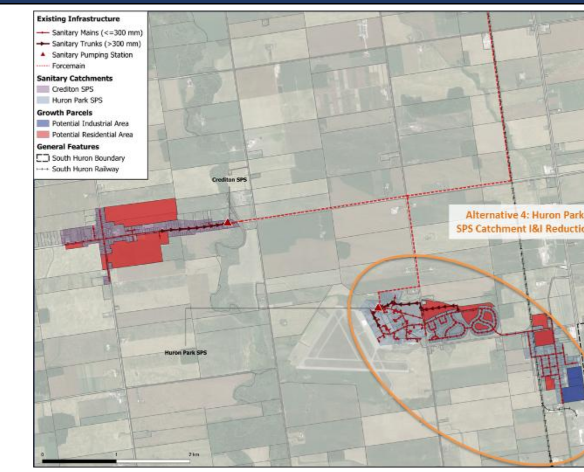
Alternative 4: Huron Park I&I Reduction

Under Alternative 4, I&I will be addressed in the Huron Park catchment. Reducing the existing flows via I&I reduction, with help deal with the existing capacity constraints and provide some relief for the Huron Park SPS. Additionally, I&I reduction will aid in the management and reduction in overflow volumes during significant storm events. This does not address issues related to the Crediton SPS.

The overview, advantages, disadvantages, and evaluation of the alternatives are summarized in **Table 28**.

The full evaluation is included in **Appendix E**. Alternative 3 and 4 are both recommended. Alternative 3 is a priority due to the increased number of sewage by-passes at this SPS during wet weather events, mainly due to high I&I from older sections of sewers in the Huron Park Industrial Area. The Huron Park SPS is particularly vulnerable due to the shallow wet well; short pump run times and lack of wet well emergency storage. The off-line tank will provide additional storage when the pumping station wet well is over capacity during wet weather events to minimize by-passes. This is also an immediate cost-effective measure to address the WWF which will allow for I&I reduction efforts to aid in the reduction of high flows over the long-term.

Table 28: Crediton and Huron Park Pumping Stations Alternatives and Evaluation

Crediton and Huron Park Pumping Stations	Alternative 1: Separate Crediton and Huron Park Forcemains	Alternative 2: Drop Crediton SPS System Curve	Alternative 3: New Storage at Huron Park SPS	Alternative 4: Huron Park I&I Reduction
Map				
Overview	• Construct new forcemain to have separate forcemains for the Crediton SPS and Huron Park SPS	• Crediton SPS is competing with Huron Park SPS when both stations operate due to differences in duty points • Avg flows of 60 L/s at Huron Park are typically reduced to 55 L/s while Crediton is operating • When Huron Park is running, Crediton is reduced from 18-30 L/s to 15 L/s (10 L/s under Growth Scenario) • Higher head sewage pumps are vulnerable to loss in performance and require ongoing maintenance	• The station's available storage capacity under design storm is insufficient to meet the desired emergency storage capacity • Overflows have occurred at station	• Due to existing high wet weather flows within Huron Park and Centralia, the station's capacity is exceeded during storm events • SPS's available storage capacity under design storm is insufficient to meet the desired emergency storage capacity • Ongoing issues with I&I resulting in bypass of the station to the environment
Advantages	• Opportunity to upgrade capacity of Huron Park forcemain at the same time • Reduced wear on Crediton pumps • Mitigate risks of bypasses during storm events	• Flow matching/operating at lower speeds will alleviate wear on pumps • Reduced maintenance	• A new wet well would permit more optimized pump run times and adequate emergency storage to mitigate risk of bypasses • More operating room in the wet well with increase operating band resulting in less frequent pump cycles	• Lower costs for greater benefit but addressing I&I issues prior to completing significant SPS upgrades • Reduces wastewater treatment and pumping costs
Disadvantages	• High capital costs for new forcemain • Doesn't address ongoing I&I issues • Doesn't increase storage at Huron Park or include buffer room to mitigate peaks during peak flows	• Reduced capacity at Huron Park SPS when operating at a lower speed to permit Crediton wet well to empty • Doesn't address ongoing I&I issues	• Storage would be oversized due to I&I issues • Doesn't address ongoing I&I issues • Station will still compete with Crediton SPS under high flow events	• May be difficult to isolate and repair • Could be a long time before realizing benefits
Cost	• New separate forcemain: $5.2 M • **Total: $5.2 M**	• Drop Crediton SPS system curve: $0.2 M • **Total: $0.2 M**	• New Storage: $0.45 M • **Total: $0.45 M**	• I&I Program: $0.85 M • **Total: $0.85 M**
Four-Point Criteria Evaluation	Technical Environ-mental Social & Cultural Financial	Technical Environ-mental Social & Cultural Financial	Technical Environ-mental Social & Cultural Financial	Technical Environ-mental Social & Cultural Financial
Recommended Alternative	• **Not Recommended:** High capital costs	• **Not Recommended:** Highest ongoing operations and maintenance costs	• **Recommended:** Recommended in line with Alternative 4. Provides immediate relief with Alternative 4 addressing ongoing issues.	• **Recommended:** Recommended in line with Alternative 3. Longer time frame to realize results.

Evaluation Scoring Legend: High Medium Low

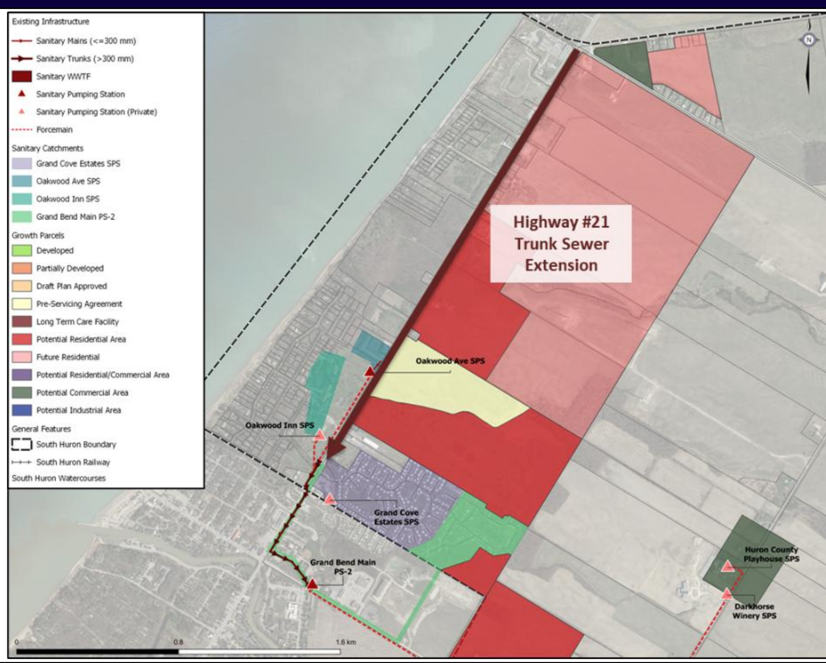
6.7 Local System Servicing Concepts

In addition to the larger catchment concepts that were reviewed, the following planned and proposed local system servicing concepts were presented.

6.7.1 Highway #21 Trunk Sewer Extension

Based on the recommendation from the Grand Bend Area Sewage Collection System Class EA, a trunk sewer will be installed from the Grand Bend Main PS2 to Highway #83, with Phase 1 to Indian Road and Highway #21 already complete. This Highway #21 trunk sewer will support growth along Highway #21 in Grand Bend. The trunk sewer will be sized to accommodate all potential growth within the Municipality of South Huron's Grand Bend service area catchment. **Table 29** details theses upgrades.

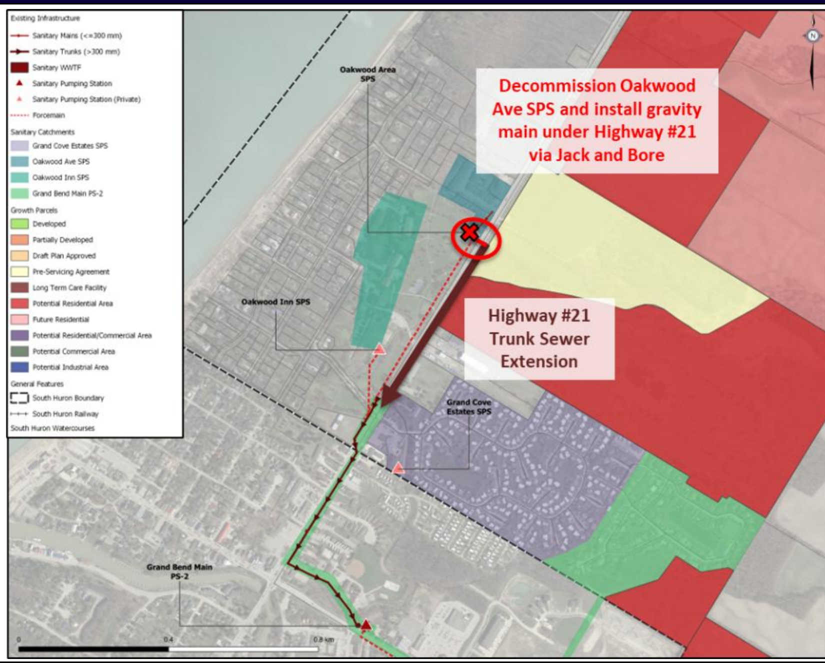
Table 29: Highway #21 Trunk Sewer Extension

Highway #21 Trunk Sewer Extension	
Map	
Overview	• Existing Highway #21 trunk sewer from the Grand Bend Main PS2 to Indian Road has sufficient capacity to accommodate all anticipated development flows within the catchment along Highway #21 • Trunk sewer extension to be sized to support north growth flows along Highway #21 to mitigate future capacity restrictions • Forms an important piece of the overall servicing strategy for the Municipality of South Huron's Grand Bend service area • Recommendation from Grand Bend Area Sewage Collection System Class EA
Planned Upgrades	• Install and size sewer upstream of existing 450 mm trunk sewer from Indian Road to the intersection of Highway #21 and Huron County Road #83 to accommodate all potential growth flows along Highway #21

6.7.2 Oakwood Area SPS Decommissioning

The Oakwood Area SPS is located at 70773 Bluewater Highway and currently has a forcemain that follows Highway #21, discharging to the Grand Bend Trunk Sanitary Sewer just north of Indian Road, where the sewage is conveyed to the Grand Bend Main PS2. It is recommended that the Oakwood Area SPS be decommissioned and connected via gravity to the new Grand Bend Trunk Sanitary Sewer (Phase 2) following the construction of the Highway #21 trunk gravity sewer extension to the Sol Haven Subdivision. **Table 30** details the planned upgrades.

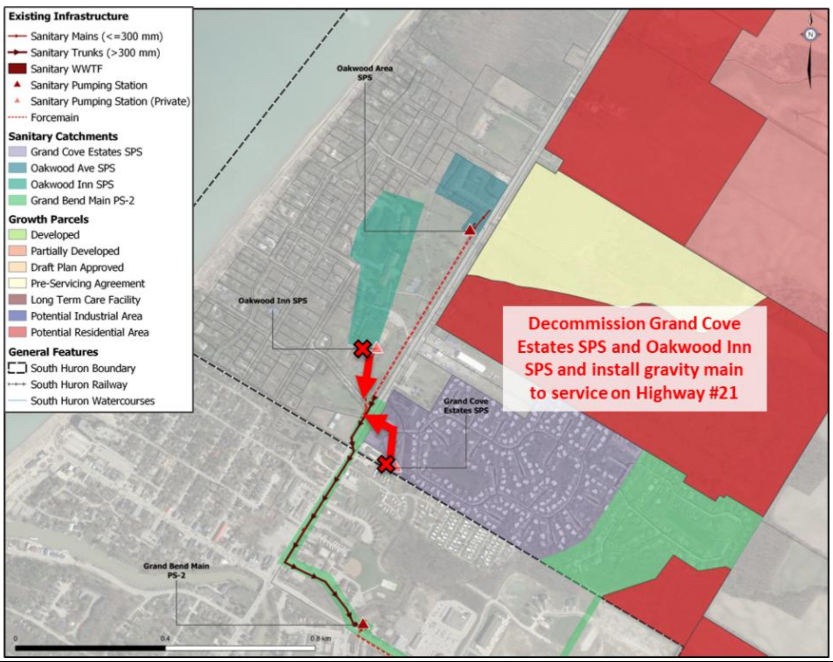
Table 30: Oakwood SPS Decommissioning

Oakwood SPS Decommissioning	
Map	
Overview	• The Oakwood Area SPS has a forcemain within an easement on private property along the west side of the Highway #21 right-of-way. • Opportunity to decommission the Oakwood Area SPS and connect via gravity to the new trunk sewer on Highway #21 once constructed • Include provisions for removal of structures • Gravity connection (Jack & Bore) Across Highway #21 at Oakwood Links Condos
Planned Upgrades	• Decommission Oakwood Area SPS • Install a gravity connection from the existing SPS (west side of Highway #21), crossing Highway #21 via Jack & Bore to the proposed trunk gravity sewer (east side of Highway #21)

6.7.3 Grand Cove Estates and Oakwood Inn & Resort SPS Decommissioning

The Grand Cove Estates SPS is a privately owned SPS for the Grand Cove Community in Grand Bend and the Oakwood Inn & Resort SPS is a privately owned SPS for the Oakwood Resort. A service has been installed from the Highway #21 trunk sewer to the property line of the Grand Cove Community. It is recommended that both the Grand Cove Estates SPS and Oakwood Inn SPS be decommissioned and connected via gravity to the existing Highway #21 trunk sewer, at the expense of the property owners. **Table 31** details the overview and planned upgrades to be complete by the property owner.

Table 31: Grand Cove Estates and Oakwood Inn SPS Decommissioning

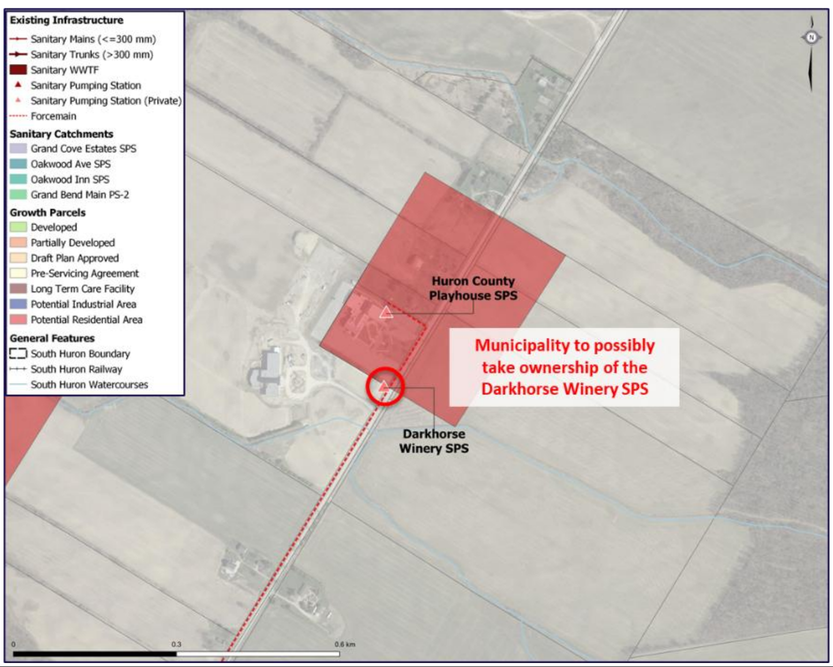
<table>
<tr><th colspan="2">Grand Cove Estates and Oakwood Inn SPS Decommissioning</th></tr>
<tr><td>Map</td><td>
</td></tr>
<tr><td>Overview</td><td>Property owner to decommission private Grand Cove Estates SPS and Oakwood Inn & Resort SPS and connect via gravity to the new trunk sewer on Highway #21 at Indian Road (Service installed across highway to property line)
Frees up Lambton Shores trunk sewer capacity, along Main Street East/County Road #81 and opens up opportunity for future development in South Huron along County Road #81 east of Grand Bend.</td></tr>
<tr><td>Planned Upgrades</td><td>Amend joint agreement with Lambton Shores to utilize freed up capacity in trunk sewer on County Road #81 for future development in South Huron, east of Mollard Line/Lambton Shores Boundary and north of County Road #81.</td></tr>
</table>

6.7.4 Darkhorse SPS Ownership

The Darkhorse SPS is located at 70665 B Line, Grand Bend, south of the Huron County Playhouse, within the Municipality. The SPS was constructed as a private station under a private contract; however, was generally designed to the Municipal standards. The Huron County Playhouse SPS is located just north of the Darkhorse SPS and has its own privately owned SPS. The Huron County Playhouse SPS pumps sewage through a 100 mm diameter forcemain that outlets at the Grand Bend WWTF. The Darkhorse SPS also outlets to this 100 mm forcemain, shared with the Huron County Playhouse SPS.

To accommodate future development surrounding the existing Darkhorse Winery and Huron County Playhouse, a SPS and forcemain will be required. There is opportunity for the Municipality to take ownership of the Darkhorse SPS which could accommodate future development flows without the need for an additional SPS and forcemain. **Table 32** details the overview and upgrades.

Table 32: Darkhorse SPS Ownership

Darkhorse SPS Ownership	
Map	
Overview	• Private SPS designed and constructed to Municipal standards, but some upgrades are required such as separate hydro service and emergency generator • Development proposed surrounding the existing Darkhorse SPS. • To accommodate development, an additional SPS and forcemain are needed. • Municipality to potentially take ownership of Darkhorse SPS to support development • Eliminates need for an additional SPS and forcemain
Planned Upgrades	• Complete upgrades for SPS to meet Municipal standards

6.7.5 Septic System Re-Inspection Program

Within Grand Bend, municipal wastewater services are not extended to all areas which have water services; as such, this service area is serviced by septic systems. As part of the ongoing documentation of these existing septic systems, the Municipality should create a record based on date of last inspection and condition rating as per the Ontario Ministry of Municipal Affairs and Housing Septic System Re-inspection program.

This program will catalogue each septic system in combination with local sampling of nearby watercourses such that identification of potential contamination due to a failing septic system can be flagged. Through this process, an additional study will be done to determine the trigger for the mandatory connection to the municipal sanitary system, following the construction of sewers along adjacent right-of-ways.

A Septic System Re-inspection program was a recommendation in the 2012 Grand Bend Area Sewage Collection System ESR.

6.7.6 Pumping Station Upgrade / Rehabilitation Projects

Existing SPSs within Stephen will require upgrades or rehabilitation as a number of components within these facilities are reaching the end of their useful life. Due to this deterioration, rehabilitation is noted at the following:

- POG SPS will require pump and mechanical upgrades.
- E-One grinder pumps in Centralia will require a condition assessment to determine the extents of the upgrades required.

6.8 Wet Weather Management

The wet weather management program has been recommended to address areas with high I&I that result in system capacity restrictions or basement flooding risk. The program is intended to deal with existing capacity constraints, and to provide growth-related capacity without expanding/upgrading existing infrastructure, or by minimizing the required expansion/upgrade. This program provides for a proactive and targeted approach to addressing wet weather impacts.

Further, due to pre-existing overflows within the Exeter and Huron Park, systems I&I reduction is required for the Municipality F-5-1 requirements. The requirement outlines that a nominally separated sewer systems does not allow for system overflows under typical annual precipitation conditions. As such, the I&I reduction program, in combination with the identified sewer and SPS upgrades, is required to achieve a net reduction in system overflows and a longer-term objective of eliminating overflows. Additionally, as there are existing system overflows, there should be a short-term objective to remove wet weather flows at a rate equal to or greater than new development flows.

This I&I reduction is required immediately to provide growth capacity and reduce upgrades at the existing SPSs. An overview of the wet weather management program and associated priority areas are provided below:

- **Exeter I&I Program**
    - Exeter is subject to very high RDII (2.67 L/s/ha under 10-Year Design Storm).
    - Peak flows exceed the William Street SPS and Snider Crescent SPS capacity.
    - I&I reduction is needed to avoid extensive sewer upgrades and SPS upgrades.
    - I&I reduction is needed to provide growth capacity.
    - Decommissioning of the back alley sewers.
- **Huron Park I&I Program**
    - Peak flows exceeding Huron Park SPS capacity causes overflows.
    - I&I reduction needed to avoid additional SPS upgrades.
    - Goal is to provide additional growth capacity in existing system.

6.8.1 Exeter

The Exeter wastewater system is subject to very high RDII (2.67 L/s/ha under 10-Year Design Storm) that result in peak flows exceeding the capacity at both the William Street SPS and Snider Crescent SPS. I&I reduction is needed to avoid upgrades to the stations beyond the planned rehabilitation. In the event that I&I reduction efforts are unsuccessful, additional upgrades and potential SPS upgrades may be required. I&I reduction is recommended to provide additional resilience to the local system and reduce total system baseflows which will help in managing available capacity at the Exeter WWTF.

6.8.2 Huron Park

The Huron Park catchment is subject to high RDII that is resulting in peak flows exceeding the station’s existing capacity. The planned emergency storage tank will minimize sewage by-passes during wet weather events; however, I&I reduction is still recommended to minimize the future station upgrades to support the 10-year design storm flows. I&I reduction will also provide additional resilience to the local system. In the event that I&I reduction efforts are unsuccessful, future SPS upgrades, including a larger wet well with new pumps, will be required.

6.8.3 Flow Monitoring

To support the wet weather management program, it is recommended that the Municipality develop an extensive flow monitoring program in the problem areas identified above, which is further outlined in **Section 7.6**.

7 PREFERRED WASTEWATER SERVICING STRATEGY

The recommended wastewater servicing strategy can be broken down into various components that have different aims but each contributing to the overall improvement of the existing system and service of the projected buildout due to growth.

The preferred servicing strategy was developed to ensure that any programs or upgrades to the existing wastewater distribution system are supportive of the existing and growth system and follows an integrated approach with the Municipality's existing and development plans.

7.1 Preferred Wastewater Servicing Strategy Overview

The preferred wastewater strategy consists of directing growth flows to existing trunk sewers and upgrading downstream SPSs where needed with the objective of maximizing the total area serviced by gravity.

7.1.1 Exeter

In general, the preferred wastewater servicing strategy for Exeter consists of:

- Continued upgrades at the Exeter WWTF in line with the long-term strategy and as triggered by capacity and effluent criteria.
- Construction and commissioning of the South Exeter SPS and forcemain to service proposed growth and existing Snider Crescent SPS flow.
- Upsize sewer from Waterloo Street to the Snider Crescent SPS to accommodate existing and growth flows in south Exeter.
- Implementing an I&I Reduction program in Exeter to address existing high peak wet weather flows.
- Upgrade sewers in line with planned road reconstruction projects.
- New trunk sewer along Main Street with services from all buildings fronting Main Street to allow for decommissioning of back-alley sewers.

Key capital projects required to achieve this strategy include:

- Exeter WWTF Sand Filter Rehabilitation
- Southwest Exeter trunk sewer
- South Exeter SPS and forcemain
- William Street SPS forcemain replacement (GEXR to Lagoons)
- New Main Street Trunk sewer and Decommission Main Street Back-Alley Sewers
- Exeter I&I and Flow Monitoring Programs

In addition to the key capital projects, several other projects and upgrades are included within the wastewater servicing strategy to address existing and future capacity needs within the collection systems.

7.1.2 Stephen

In general, the preferred wastewater servicing strategy for Stephen consists of:

- Extending the trunk sewer along Highway #21 to service future development in Grand Bend.
- Decommissioning private sanitary pumping stations and connecting to the existing gravity network along Highway #21.
- Implementing an I&I Reduction program in Huron Park to address existing high peak wet weather flows.
- Long term upgrades to the Grand Bend WWTF and Grand Bend PS2 to support growth to buildout.

Key capital projects required to achieve this strategy include:

- Highway #21 trunk sewer extension
- Various SPS upgrades
- Huron Park SPS Emergency Storage
- Grand Cove Estates and Oakwood SPS gravity connections
- Huron Park I&I Program
- Grand Bend septic system re-inspection program
- Upgrades to Grand Bend WWTF

7.2 Exeter WWTF

The Exeter WWTF is currently providing adequate treatment although the declining hydraulic capacity may result in declining effluent quality at some point in the future. It is recommended that the Municipality proceed with the rehabilitation of the intermittent sand filters by replacement of the media which includes the full replacement of the sand filter media.

As effluent criteria are reduced, the Municipality will transition to a conventional mechanical treatment plant at the end of the useful life of the rehabilitated sand filters. When proceeding with UV disinfection and mechanical filtration, the design should consider future integration with a mechanical treatment plant as there are opportunities for combining facilities and processes at that time.

Upgrades are classified into three sets of upgrades, based on an expediated timeline and are detailed as follows:

- 0-5 Year Upgrades
  - Blower Building Upgrades
  - Sand Filter Rehabilitation
- 5-10 Year Upgrades
  - Removal of Sludge from Lagoons
  - UV
- 10-15 Year Upgrades
  - Mechanical Filter
  - Full Mechanical Plant

The following details the recommended WWTF projects:

- **E-WW-TP-02 – Sewage Lagoon Sand Filters Rehabilitation:** Facilitate the rehabilitation of the sand filters at the Exeter Sewage Lagoons.
- **E-WW-TP-03 – Removal of Sludge from Exeter Sewage Lagoons:** Removal of the sludge buildup from the Exeter Sewage Lagoons.
- **E-WW-TP-04 – Exeter WWTP Short Term Upgrades: UV:** Install UV disinfection to improve effluent quality discharge (E-Coli); allow year-round discharge and increase capacity.
- **E-WW-TP-05 – Exeter WWTP Intermediate Upgrades: Mechanical Filter:** Removal of the intermittent sand filters and replacing them with mechanical filtration. Mechanical filter includes cloth filters or geotextile filters, and backwashing sand filters. Filters target the removal of TSS and phosphorus.
- **E-WW-TP-06 – Exeter WWTP Long-Term Upgrades: Mechanical Plant:** Replace existing sand filters with a mechanical plant.

7.3 Grand Bend WWTF

The Grand Bend WWTF has a 35.3% plant capacity allocation to South Huron. The facility has sufficient capacity to accommodate existing flows; however, with growth flows and current capacity allocation, is over capacity. It can be noted that growth flows are based on the long-term potential buildout and, as such, timing is unknown. The following details the recommended long term WWTF projects:

- **S-WW-TP-01 – Grand Bend WWTP Capacity Upgrades:** Capacity re-rating; reallocation; and/or upgrades at the Grand Bend WWTP to accommodate proposed growth.

7.4 Sanitary Pumping Stations

7.4.1 Sanitary Pumping Stations Capacity and Storage Upgrades

Based on the pumping review, there is an existing and long-term pumping deficit and storage need at several of the existing SPSs. Based on reviews with Municipal staff, a number of the SPSs are operating at a lower capacity than the ECA rated firm capacity and require upgrades. The following details the recommended SPS projects:

- **E-WW-PS-01 – South Exeter SPS:** New SPS in southwest Exeter to accommodate proposed growth and replace the existing Snider Crescent SPS "potentially" on the Ondrejicka lands, coordinated with future development.
- **E-WW-PS-02 – William Street SPS Pump & Mechanical Upgrades:** Pump and mechanical upgrades whiles maintaining existing forcemain.
- **S-WW-PS-01 – "Potential" transfer of ownership of Darkhorse Winery private SPS to the Municipality and Associated Municipal Standard Upgrades:** "Potential" for Municipality to take ownership of the private Darkhorse SPS to accommodate growth around the Darkhorse Estate Winery. At this time, flow can also be received from the Huron County Playhouse, extending the life of the 100mm Playhouse forcemain.
- **S-WW-PS-02 – Huron Park SPS Emergency Storage:** Installation of an underground equalization tank connected to the existing wet well of the SPS for additional sewage storage during wet weather events to minimize by-passes.
- **S-WW-PS-04 – POG SPS Upgrades:** Pump and mechanical upgrades at the POG SPS.
- **S-WW-PS-05 – Crediton SPS Upgrades:** Pump and mechanical upgrades at the Crediton SPS.
- **S-WW-PS-06 – Huron Park SPS Upgrades:** Completion of the engineering for the future replacement and upgrades of the mechanical, electrical, instrumentation and the installation of a larger wet well with new pumps to prevent sewage by-passes. Replace existing bypass flow meter at the Huron Park SPS
- **S-WW-PS-07 – Grand Bend PS2 Upgrades:** Pump and mechanical upgrades at PS2 to accommodate proposed growth.

7.4.2 Sanitary Pumping Stations Decommissioning

The following details the decommissioning of existing sanitary pumping stations:

- **E-WW-D-01 – "Former" John Street SPS Decommissioning:** "Former" John Street SPS no longer in use. Remove existing redundant underground infrastructure.
- **E-WW-D-03 – Decommission Snider Crescent SPS:** Decommission existing Snider Crescent SPS following the construction of the new South Exeter SPS.

- **S-WW-D-01 – Oakwood Area SPS Decommissioning:** Decommission Oakwood Area SPS once connected to the Highway 21 gravity sewer.
- **S-WW-D-02 – Grand Cove Estates Private SPS Decommissioning:** Property owner to decommission Grand Cove Estates private SPS once connected to the Highway 21 gravity sewer.
- **S-WW-D-03 – Oakwood Inn & Resort Private SPS Decommissioning:** Property owner to decommission Oakwood Inn & Resort private SPS once connected to the Highway 21 gravity sewer.

7.5 System Wide Servicing Needs

7.5.1 Forcemains

The following details the recommended forcemain projects:

- **E-WW-FM-01 – South Exeter SPS Forcemain:** New forcemain from South Exeter SPS to Exeter WWTP. Opportunity to utilize and twin with existing 300 mm Snider SPS forcemain.
- **E-WW-FM-02 – William Street SPS Forcemain Replacement (GEXR to Lagoons):** Twin existing 350 mm forcemain from GEXR to lagoons. Currently twinned from William Street SPS to GEXR. Improvement of the existing forcemain pipe from the east side of the GEXR railway line to the eastern limits of Exeter WWTF. Jack & bore and steel casing under the railway ROW.

7.5.2 Exeter Sanitary Sewer Upgrades

Projects to service the existing Exeter wastewater linear system include the following:

7.5.2.1 Aging Infrastructure and Inflow and Infiltration

The following sewers have been identified for replacement due to their age and material, are along corridors which have high I&I, and/or are along identified road reconstruction project:

- **E-WW-SS-03 – Victoria Street East Sewer (South Huron Recreation Centre to Main Street):** Replace existing 300-375 mm sewer on Victoria Street East from the South Huron Recreation Centre to Main Street.
- **E-WW-SS-04 – Gidley Street East Sewer (Main Street to Andrew Street):** Replace existing 375 mm sewer on Gidley Street East from Andrew Street to Main Street.
- **E-WW-SS-05 – Hardy Street Sewer (Senior Street to east end):** Replace existing 200 mm sewer on Hardy Street from east end to Senior Street.
- **E-WW-SS-09 – Thames Road West Sewer (GEXR to Main Street):** Replace existing 200-250 mm Thames Road West sewer from GEXR to Main Street, joint with Huron County.

- **E-WW-SS-10 – Hill Street Sewer (Andrew Street to east end):** Replace existing 200 mm sewer on Hill Street from east end to Andrew Street.
- **E-WW-SS-11 – Thomas Street Sewer (Marlborough Street to William Street):** Replace existing 250-300 mm sewer on Thomas Street from Marlborough Street to William Street
- **E-WW-SS-12 – Carling Street Sewer (Huron Street West to south end):** Replace existing 200 mm sewer on Carling Street from south end to Huron Street West.
- **E-WW-SS-13 – Mill Street Sewer (William Street to Market Street):** Replace existing 200 mm sewer on Mill Street from William Street to Market Street.
- **E-WW-SS-14 – Kingscourt Crescent Sewer (Pryde Boulevard to dead end):** Replace existing 200-250 mm sewer on Kingscourt Crescent from Pryde Boulevard to dead end.
- **E-WW-SS-15 – Waterloo Street Sewer (Acheson Street to Mary Street):** Replace existing 200 mm sewer on Waterloo Street from Acheson Street to Mary Street.
- **E-WW-SS-16 – Willis Way Sewer (west end to east end):** Replace existing 200 mm sewer on Willis Street from west end to east end.
- **E-WW-SS-17 – Church Street Sewer (Main Street to William Street):** Upsize existing 300 mm sewer to 600 mm from Main Street to William Street.
- **E-WW-SS-18 – William Street Sewer (Wellington Street to north end):** Replace existing 600 mm sewer on William Street from Wellington Street to north end.
- **E-WW-SS-19 – Huron Street West (Town Limit to Marlborough Street):** Replace existing 200 mm sewer with 200 mm west of Snider Crescent to the Town Limit and 250 mm east of Snider Crescent to Marlborough Street. This does not include section that will be apart of the new trunk sewer.
- **E-WW-SS-20 – William Street Sewer (Sanders Street to Wellington Street):** Replace existing 450-525 mm "former" combined sewer on William Street from Sanders Street to Wellington Street with an appropriately sized sewer. Install services for all properties on the east side of William Street to facilitate future abandonment of sewer in rear yard easement behind Main Street.
- **E-WW-SS-21 – Marlborough Street Sewer (Wellington Street to Sanders Street West):** Upsize existing 200-250 mm sewer to 300-375 mm sewer on Marlborough Street from Wellington Street to Sanders Street West.
- **E-WW-SS-22 – Simcoe Street Sewer (dead end to Edward Street):** Replace existing 200mm sewer on Simcoe Street from dead end to Edward Street.
- **E-WW-SS-23 – Andrew Street Sewer (Sanders Street to John Street East):** Replace existing 200 mm sewer on Andrew Street from Sanders Street to John Street East.

- **E-WW-SS-24 – Wellington Street West Sewer (Marlborough Street to William Street):** Replace existing 200 mm sewer on Wellington Street West from Marlborough Street to William Street.
- **E-WW-SS-25 – Gidley Street West Sewer (Main Street to William Street):** Replace existing 200 mm sewer on Gidley Street West from Main Street to William Street.
- **E-WW-SS-26 – Sanders Street W Sewer (Main to William):** Replace existing 200 mm sewer on Sanders Street West Main to William Street.
- **E-WW-SS-27 – Alexander Street East Sewer (Main Street to Orchard Street):** Replace existing 200 mm sewer on Alexander Street East from Main Street to Orchard Street.
- **E-WW-SS-28 – Andrew Street Sewer (MacNaughton Drive to Wellington Street East):** Replace / upgrade existing 200 mm sewer on Andrew Street from MacNaughton Drive to Wellington Street East.
- **E-WW-SS-29 – Wellington Street West Sewer (dead end to Marlborough Street):** Replace existing 200 mm sewer on Wellington Street West from dead end to Marlborough Street.
- **E-WW-SS-30 – Victoria Street West Sewer (William Street to Carling Street):** Replace existing 200mm sewer on Victoria Street West from William Street to Carling Street.
- **E-WW-SS-31 – John Street West Sewer (Marlborough Street to William Street):** Replace existing 200 mm sewer on John Street West from Marlborough Street to William Street
- **E-WW-SS-32 – John Street East Sewer (Edward Street to Pryde Boulevard):** Replace existing 200 mm sewer on John Street East from Edward Street to Pryde Boulevard.
- **E-WW-SS-33 – Devon Drive Sewer (George Street to dead end):** Replace existing 200mm sewer on Devon Drive from George Street to dead end.
- **E-WW-SS-34 – Hillcrest Drive Sewer (George Street to Riverside Drive):** Replace existing 200 mm sewer on Hillcrest Drive from George Street to Riverside Drive.
- **E-WW-SS-35 – Abby Lane Sewer (Pinewood Avenue to Pinewood Avenue):** Replace existing 200 mm sewer on Abby Lane from Pinewood Avenue to Pinewood Avenue.
- **E-WW-SS-36 – Pinewood Avenue Sewer (Huron Street East to Abbey Lane south leg):** Replace existing 200 mm sewer on Pinewood Avenue from Huron Street East to Abbey Lane south leg.
- **E-WW-SS-37 – Devon Drive Sewer (Alexander Street East to George Street):** Replace existing 200 mm sewer on Devon Drive from Alexander Street East to George Street.

- **E-WW-SS-38 – Carling Street Sewer (Thomas Street to Church Street):** Upsize existing 200-250 mm sewer to 300-450 mm on Carling Street from Thomas Street to Church Street to accommodate high I&I.
- **E-WW-SS-39 – Church Street Sewer (Carling Street to William Street):** Upsize existing 250 mm sewer to 450-525 mm on Church Street from Carling Street to William Street and high I&I.
- **E-WW-SS-40 – Thames Road East Sewer (Rosemount Avenue to Main Street):** Upsize existing 200 mm sewer to 300-375 mm on Thames Road East from Rosemount Avenue to Main Street.
- **E-WW-SS-41 – Main Street Sewer (Huron Street to Church Street):** New trunk sewer on Main Street from Huron Street to Wellington Street and upsize existing 200 mm from Wellington Street to Church Street, as part of a future MTO Connecting Link Project when funding is available.
- **E-WW-D-02 – Decommission Main Street Back-Alley Sewers:** Decommission main street back-alley sewers and connect services to new Main Street sewer.

7.5.2.2 Infrastructure Improvements

New sewers are recommended as infrastructure improvements as no existing sewer exists along an alignment that has a planned road reconstruction and include the following:

- **E-WW-SS-08 – Baldwin Street Sewer (Main Street to Andrew Street):** Install new 200 mm sewer on Baldwin Street from Andrew Street to Main Street.

7.5.2.3 Growth Related Sewer Upgrades:

New sewers or sewer upgrades that are required to accommodate growth include the following:

- **E-WW-SS-06 – Alexander Street West Sewer (McConnell Street to Francis Street):** Upsize existing 250 mm to 375 mm on Alexander Street West from McConnell Street to Francis Street.
- **E-WW-SS-07 – McConnell Street Sewer (Alexander Street to south end):** Upsize existing 250 mm sewer to 375 mm on McConnell Street from Alexander Street to south end.
- **E-WW-SS-42 – Southwest Exeter Trunk Sewer:** New trunk sewer on Mary Street from Waterloo Street to Huron Street and following Snider Crescent to the new South Exeter SPS.
- **E-WW-SS-43 – Ausable River Crossing Twinned Sewer:** Replace existing Ausable River Crossing twinned sewer to William Street SPS.
- **E-WW-SS-44 – Francis Street Sewer (Thames Road to Alexander Street):** Replace existing 250 mm sewer on Francis Street from Thames Road to Alexander Street.

7.5.3 Stephen Sanitary Sewer Upgrades

Projects to service the existing Stephen wastewater linear system include the following:

7.5.3.1 Aging Infrastructure

The following sewers have been identified for replacement due to their age and material and/or are along identified road reconstruction project.

- **S-WW-SS-01 – Huron Park Industrial Area Private Property Sewer Replacement:** Replacement of aging sanitary sewers in easements and on private property in the Huron Park Industrial Area to be completed by the developer that purchases the lands to accommodate high I&I.

7.5.3.2 Infrastructure Improvements

New sewers are recommended as infrastructure improvements as no existing sewer exists along an alignment that has a planned road reconstruction and include the following:

- **S-WW-SS-03 – Grand Cove Estates Gravity Connection:** Property owner abandon the Grand Cove Estates private sanitary pumping station and connect via gravity to the new trunk sewer on Highway 21 at Indian Road.
- **S-WW-SS-04 – Oakwood Area SPS Gravity Connection:** Abandon the Oakwood Area sanitary pumping station and connect via gravity to the new trunk sewer on Highway 21.
- **S-WW-SS-05 – Oakwood Inn & Resort Gravity Connection:** Property owner to decommission Oakwood Inn & Resort private SPS once connected to the Highway 21 gravity sewer.

7.5.3.3 Growth Related Sewer Upgrades:

New sewers or sewer upgrades that are required to accommodate growth include the following:

- **S-WW-SS-02 – Highway 21 Trunk Sewer Extension:** Extend trunk sewer along Highway 21 from Indian Road north to Gore Road to accommodate growth and development flows.

7.5.4 Studies and Strategies

A number of studies and strategies to support the ongoing management and performance of the wastewater system. These include the following:

- **S-WW-ST-01 – Grand Bend septic system re-inspection program:** Create a record of existing septic systems in the Grand Bend Service Area, date of last inspection and condition rating for each based on the Ontario Ministry of

Municipal Affairs and Housing Septic System Re-inspection program. Determine where and if it is possible to sample a nearby watercourse that would be affected by failing septic systems. Determine trigger point for when to implement mandatory hook up to a municipal sanitary collection system (when constructed).

- **E-WW-II-01 – Exeter I&I Program:** Wet weather management program to address growth and existing issues.
- **E-WW-II-02 – Exeter Flow Monitoring Program:** Exeter Flow Monitoring Program.
- **S-WW-II-01 – Huron Park I&I Program:** Wet weather management program to address growth and existing issues.
- **S-WW-PS-03 – E-One Grinder Pump Condition Assessment:** Undertake condition assessment of E-One grinder pumps. Repair or replace as required.

7.6 Inflow and Infiltration Reduction Program

The inflow and infiltration strategy prioritizes the areas with the worst system performance and high I&I to attain a higher probability of I&I removal in focused areas. Pre and post I&I remediation monitoring is required to confirm system flows and quantify removal.

7.6.1 Flow Monitoring

A flow monitoring program is recommended for both Exeter and Huron Park. This flow monitoring should be used to update the existing PCSWMM model for Exeter. The goal of the model is to make the model more operational by using flow monitoring to track capacity within existing sewers.

Flow monitoring data can be utilized to confirm flows modelled and to prioritize I&I programming. Any I&I remediation work completed should have post-works flow monitoring to confirm I&I reduction.

7.6.2 I&I Investigation and Remediation Programs

Priority I&I areas were identified based on the existing observed wet weather flows. These priority catchments have a higher potential for successful I&I removal due to high flows. I&I investigations will take a public-private approach with multiple methods of investigation including tactical flow monitoring to isolate wet weather flow sources, CCTV review, smoke and dye testing, curbside drainage surveys, and lateral inspections.

7.6.3 New Subdivision Flow Monitoring and Acceptance Criteria

It is also recommended that the Municipality complete flow monitoring in newly installed systems, development areas prior to the Municipality's acquisition of the sewer assets and to ensure growth lands are not contributing to wet weather flows.

Unitized RDII is most often used as a design parameter within design guidelines to ensure that adequate capacity is provided within new wastewater collection infrastructure to prevent sewer surcharging and surcharge-related basement flooding. In the absence of a synthesized design return period or measured precipitation event, unitized RDII remains a design (not performance) parameter. This distinction is important in the context of acceptance criteria which is not currently correlated to a design storm.

Figure 18 identifies different components of wet weather flow and highlights differences between static and dynamic models. Unitized RDII, without relation to a design storm, represents a static wet weather flow value. The amount of “buffer” space remaining during wet weather determines the Level of Service that the system can provide. Thus, a system designed to a higher Level of Service can convey more intense storms, but is dependent on the tightness of the system. By relating the acceptance criteria to 0.2 L/s/ha to a design storm/Level of Service, the acceptance criteria becomes a performance criteria. Flow monitoring can then be used to evaluate the return period of a storm and associated RDII flow.

The acceptance criteria will help to ensure I&I contributions from new subdivisions are lower than the design criteria and provides flexibility in future as pipes age and crack. The Municipality should implement a new acceptance policy for new development monitoring.

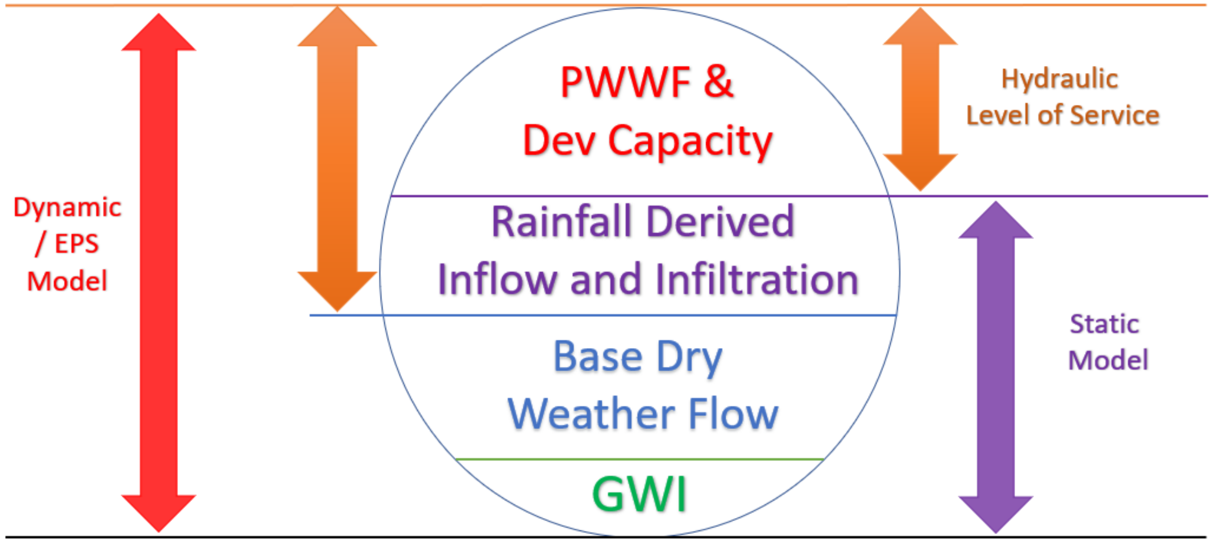


Figure 18: Hydraulic Level of Service

Flow monitoring will also provide guidance for wet weather flow management practices.

7.7 Capital Program

The preferred wastewater servicing strategy has been developed to support the servicing needs of the existing and future growth areas within the Municipality of South Huron. The capital costs for each project of the Preferred Strategy were estimated according to the costing methodology within **Volume I**. These projects are listed according to their project number and are shown in **Table 33**. The capital program table contains project descriptions, dimensions, proposed timing, and estimate total project cost. Detailed project sheets are included in **Appendix F**.

7.7.1 Implementation Plan

As outlined in **Volume I**, the 2023 MPU sets out to satisfy the Class EA Master Plan Approach 1 requirements according to the MEA Class EA document. The Preferred Wastewater Servicing Strategy will support the servicing needs of the Municipality of South Huron's future growth to buildout. This strategy will be implemented in accordance with each project Class EA schedule.

The Class EA requirements for each project have been identified in the Capital Program. Schedule A and A+ projects may move to design and construction, with A+ projects requiring public notification prior to implementation. Schedule B or equivalent projects that have been identified within the Preferred Wastewater Servicing Strategy will be part of a developer-led local servicing plan and approved through the Planning Act Municipal development review process or will be satisfied through separate Class EA studies prior to design and construction. A single Schedule C project was identified within the Preferred Wastewater Strategy as the full upgrade of the Exeter WWTF to a mechanical plant. The completion of this project is dependent on long term needs at the existing WWTF and should be initiated aligning with long term growth needs.

All necessary studies (environmental impact, cultural heritage resource, and archeological resource, etc.) should be undertaken by an appropriate professional as early as possible during the planning process for all Schedule B and C projects identified within the Preferred Servicing Strategy.

During the next steps of the implementation program, primarily during detailed design of the projects, the following requirements should be considered:

- Finalization of property requirements;
- Refinement of infrastructure alignment;
- Identification of preferred construction methodologies;
- Completion of additional supporting investigations as required (e.g. geotechnical, hydrogeological, etc.);
- Review and mitigation of potential construction related impacts; and,
- Satisfying all provincial, municipal and conservation authority approval requirements.

With respect to the Municipality's planning and budgeting, this program will be used as a high-level baseline estimate for the Municipality's capital budget. These costs will be further developed and refined during the implementation phases as detailed information becomes available.

The anticipated timing of each project within the Preferred Strategy has been established based on the projected population and employment growth within the Municipality, as well as ongoing reconstruction projects. The wastewater program's projected scheduling has also been cross referenced with the water programs to ensure project coordination along common alignments.

Given the growth-related nature of the servicing strategies, the water capital program forms the foundation for the water component of the Municipality of South Huron's Development Charged (DC) By-Law.

7.7.2 Project Costing

The wastewater Capital Program project costs were developed using a unit cost approach. A breakdown of the unit cost methodology is included in **Volume I.**

7.7.3 Project Timing and Triggers

To support the Municipality's long-term budgeting and water rates, a preliminary project timeline for each Wastewater Capital Program project has been identified. Project timing has been identified in the following increments:

- 0-5 Years
- 5-10 Years
- 10-15 Years

The estimated project timeline was based on the Municipality's Capital Program schedule.

7.7.4 Operational and Maintenance Impacts

The proposed wastewater system upgrades represent an increase in the Municipality's sewer trunk network, replacement of one SPS and the potential ownership of one additional SPS as well as future increases at the treatment facility.

It is anticipated that the above system expansions will increase the network operational network and maintenance costs by an equivalent amount. As such, these additional operational costs, and supporting staff increases, will need to be factored into the Municipality's long-term wastewater system financial planning and operational needs.

7.7.5 Capital Program Summary

Summary maps and tables of the recommended upgrades for the Capital Program are included in **Table 33** to **Table 34** and **Figure 19** to **Figure 21**.

Table 33: Wastewater Capital Program Summary – Exeter

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/Capacity	Total Component Estimated Cost	Timeline
E-WW-SS-03	Victoria Street East Sewer (South Huron Recreation Centre to Main Street)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	375 mm	$ 342,000	0-5 Years
E-WW-SS-04	Gidley Street East Sewer (Main Street to Andrew Street)	Exeter	A	Sewer 5m	Aging Infrastructure	375 mm	$ 137,000	0-5 Years
E-WW-SS-05	Hardy Street Sewer (Senior Street to east end)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 121,000	0-5 Years
E-WW-SS-06	Alexander Street West Sewer (McConnell Street to Francis Street)	Exeter	A	Sewer 5m	Growth	375 mm	$ 155,000	0-5 Years
E-WW-SS-07	McConnell Street Sewer (Alexander Street to south end)	Exeter	A	Sewer 5m	Growth	375 mm	$ 291,000	0-5 Years
E-WW-SS-08	Baldwin Street Sewer (Main Street to Andrew Street)	Exeter	A	Sewer 5m	Infrastructure Improvements	200 mm	$ 136,000	0-5 Years
E-WW-SS-09	Thames Road West Sewer (GEXR to Main Street)	Exeter	A	Sewer 5m	Aging Infrastructure	250 mm	$ 660,000	0-5 Years
E-WW-SS-10	Hill Street Sewer (Andrew Street to east end)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 113,000	0-5 Years
E-WW-SS-11	Thomas Street Sewer (Marlborough Street to William Street)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	300 mm	$ 629,000	0-5 Years
E-WW-SS-12	Carling Street Sewer (Huron Street West to south end)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 861,000	5-10 Years
E-WW-SS-13	Mill Street Sewer (William Street to Market Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 568,000	0-5 Years
E-WW-SS-14	Kingscourt Crescent Sewer (Pryde Boulevard to dead end)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	250 mm	$ 282,000	5-10 Years
E-WW-SS-15	Waterloo Street Sewer (Acheson Street to Mary Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 499,000	5-10 Years
E-WW-SS-16	Willis Way Sewer (west end to east end)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 499,000	5-10 Years
E-WW-SS-17	Church Street Sewer (Main Street to William Street)	Exeter	A	Sewer 5m	Growth / Inflow and Infiltration	600 mm	$ 258,000	5-10 Years
E-WW-SS-18	William Street Sewer (Wellington Street to north end)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	600 mm	$ 626,000	5-10 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/Capacity	Total Component Estimated Cost	Timeline
E-WW-SS-19	Huron Street West (Town Limit to Marlborough Street)	Exeter	A	Sewer 5m	Aging Infrastructure	250 mm	$ 613,000	5-10 Years
E-WW-SS-20	William Street Sewer (Sanders Street to Wellington Street)	Exeter	A	Sewer 5m	Aging Infrastructure	525 mm	$ 684,000	5-10 Years
E-WW-SS-21	Marlborough Street Sewer (Wellington Street to Sanders Street West)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 805,000	5-10 Years
E-WW-SS-22	Simcoe Street Sewer (dead end to Edward Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 175,000	10-15 Years
E-WW-SS-23	Andrew Street Sewer (Sanders Street to John Street East)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 136,000	10-15 Years
E-WW-SS-24	Wellington Street West Sewer (Marlborough Street to William Street)	Exeter	A	Sewer 5m	Aging Infrastructure	250 mm	$ 336,000	10-15 Years
E-WW-SS-25	Gidley Street West Sewer (Main Street to William Street)	Exeter	A	Sewer 5m	Aging Infrastructure	375 mm	$ 146,000	10-15 Years
E-WW-SS-26	Sanders Street W Sewer (Main to William)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 270,000	10-15 Years
E-WW-SS-27	Alexander Street East Sewer (Main Street to Orchard Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 290,000	10-15 Years
E-WW-SS-28	Andrew Street Sewer (MacNaughton Drive to Wellington Street East)	Exeter	A	Sewer 5m	Aging Infrastructure	250 mm	$ 761,000	10-15 Years
E-WW-SS-29	Wellington Street West Sewer (dead end to Marlborough Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 563,000	10-15 Years
E-WW-SS-30	Victoria Street West Sewer (William Street to Carling Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 383,000	10-15 Years
E-WW-SS-31	John Street West Sewer (Marlborough Street to William Street)	Exeter	A	Sewer 5m	Aging Infrastructure	250 mm	$ 761,000	10-15 Years
E-WW-SS-32	John Street East Sewer (Edward Street to Pryde Boulevard)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 535,000	10-15 Years
E-WW-SS-33	Devon Drive Sewer (George Street to dead end)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 176,000	10-15 Years
E-WW-SS-34	Hillcrest Drive Sewer (George Street to Riverside Drive)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 290,000	10-15 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/Capacity	Total Component Estimated Cost	Timeline
E-WW-SS-35	Abby Lane Sewer (Pinewood Avenue to Pinewood Avenue)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 440,000	10-15 Years
E-WW-SS-36	Pinewood Avenue Sewer (Huron Street East to Abbey Lane south leg)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 365,000	10-15 Years
E-WW-SS-37	Devon Drive Sewer (Alexander Street East to George Street)	Exeter	A	Sewer 5m	Aging Infrastructure	200 mm	$ 422,000	10-15 Years
E-WW-SS-38	Carling Street Sewer (Thomas Street to Church Street)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	450 mm	$ 2,116,000	5-10 Years
E-WW-SS-39	Church Street Sewer (Carling Street to William Street)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	525 mm	$ 434,000	5-10 Years
E-WW-SS-40	Thames Road East Sewer (Rosemount Avenue to Main Street)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	375 mm	$ 1,873,000	10-15 Years
E-WW-SS-41	Main Street Sewer (Huron Street to Church Street)	Exeter	A	Sewer 5m	Aging Infrastructure / Inflow and Infiltration	375 mm	$ 4,959,000	0-5 Years
E-WW-SS-42	Southwest Exeter Trunk Sewer	Exeter	A	Sewer 5m	Growth	600 mm	$ 5,362,000	0-5 Years
E-WW-SS-43	Ausable River Crossing Twinned Sewer	Exeter	A	Sewer 5m	Growth	300 mm	$ 862,000	0-5 Years
E-WW-SS-44	Francis Street Sewer (Thames Road to Alexander Street)	Exeter	A	Sewer 5m	Growth	250 mm	$ 455,000	0-5 Years
E-WW-FM-01	South Exeter SPS Forcemain	Exeter	A	Forcemain	Growth	300 mm	$ 3,574,000	10-15 Years
E-WW-FM-02	William Street SPS Forcemain Replacement (GEXR to Lagoons)	Exeter	A	Forcemain	Growth	350 mm	$ 990,000	5-10 Years
E-WW-D-01	"Former" John Street SPS Decommissioning	Exeter	A	Decommission	Redundant and Unutilized Infrastructure	N/A	$ 200,000	0-5 Year
E-WW-D-02	Decommission Main Street Back-Alley Sewers	Exeter	A	Decommission	Redundant and Unutilized Infrastructure	N/A	$ 500,000	5-10 Years
E-WW-D-03	Decommission Snider Crescent SPS	Exeter	A	Decommission	Redundant and Unutilized Infrastructure	N/A	$ 500,000	10-15 Years
E-WW-PS-01	South Exeter SPS	Exeter	B	Pumping	Growth	350 L/s	$ 15,713,000	10-15 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/Capacity	Total Component Estimated Cost	Timeline
E-WW-PS-02	William Street SPS Pump & Mechanical Upgrades	Exeter	B	Pumping	Growth	56 L/s	$ 2,941,000	15 Years
E-WW-II-01	Exeter I&I Program	Exeter	A+	I/I	Wet Weather Management	N/A	$ 5,763,000	0-5 Years
E-WW-II-02	Exeter Flow Monitoring Program	Exeter	N/A	I/I	Wet Weather Management	N/A	$ 472,000	0-5 Years
E-WW-TP-02	Sewage Lagoon Sand Filters Rehabilitation	Exeter	A+	Treatment	Aging Infrastructure	N/A	$ 1,800,000	0-5 Years
E-WW-TP-03	Removal of Sludge from Exeter Sewage Lagoons	Exeter	A+	Treatment	Aging Infrastructure	N/A	$ 3,000,000	10-15 Years
E-WW-TP-04	Exeter WWTP Short Term Upgrades: UV	Exeter	A+	Treatment	Growth	N/A	$ 830,000	5-10 Years
E-WW-TP-05	Exeter WWTP Intermediate Upgrades: Mechanical Filter	Exeter	B	Treatment	Growth	N/A	$ 4,500,000	10-15 Years
E-WW-TP-06	Exeter WWTP Long-Term Upgrades: Mechanical Plant	Exeter	C	Treatment	Growth	N/A	$ 20,000,000	15 Years
Exeter Capital Program Total:							**$ 91,172,000**	

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Table 34: Wastewater Capital Program Summary – Stephen

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/Capacity	Total Component Estimated Cost	Timeline
S-WW-SS-01	Huron Park Industrial Area Private Property Sewer Replacement	Stephen	A	Sewer 5m	Aging Infrastructure	N/A	Responsibility of Property Owner	Ongoing
S-WW-SS-02	Highway 21 Trunk Sewer Extension	Stephen	A	Sewer 5m	Growth	450 mm	$ 6,883,000	10-15 Years
S-WW-SS-03	Grand Cove Estates Gravity Connection	Stephen	A	Sewer 5m	Infrastructure Improvements	300 mm	Responsibility of Property Owner	0-5 Years
S-WW-SS-04	Oakwood Area SPS Gravity Connection	Stephen	A	Sewer 5m	Infrastructure Improvements	200 mm	$ 177,000	0-5 Years
S-WW-SS-05	Oakwood Inn & Resort Gravity Connection	Stephen	A	Sewer 5m	Infrastructure Improvements	200 mm	Responsibility of Property Owner	0-5 Years
S-WW-D-01	Oakwood Area SPS Decommissioning	Stephen	A	Decommission	Redundant and Unutilized Infrastructure	N/A	$ 200,000	0-5 Years
S-WW-D-02	Grand Cove Estates Private SPS Decommissioning	Stephen	A	Decommission	Redundant and Unutilized Infrastructure	N/A	Responsibility of Property Owner	0-5 Years
S-WW-D-03	Oakwood Area SPS Decommissioning	Stephen	A	Decommission	Redundant and Unutilized Infrastructure	N/A	Responsibility of Property Owner	0-5 Years
S-WW-PS-01	"Potential" transfer of ownership of Darkhorse Winery private SPS to the Municipality and Associated Municipal Standard Upgrades	Stephen	A	Pumping	Growth / Infrastructure Improvements	N/A	$ 500,000	5-10 Years
S-WW-PS-02	Huron Park SPS Emergency Storage	Stephen	A+	Pumping	Growth / Inflow and Infiltration	N/A	$ 450,000	0-5 Years
S-WW-PS-03	E-One Grinder Pump Condition Assessment	Stephen	A+	Pumping	Aging Infrastructure	N/A	Responsibility of Property Owner	0-5 Years
S-WW-PS-04	POG SPS Upgrades	Stephen	B	Pumping	Aging Infrastructure	109 L/s	$ 1,050,000	5-10 Years
S-WW-PS-05	Crediton SPS Upgrades	Stephen	B	Pumping	Aging Infrastructure	109 L/s	$ 1,575,000	15 Years
S-WW-PS-06	Huron Park SPS Upgrades	Stephen	B	Pumping	Growth	109 L/s	$ 3,200,000	5-10 Years

Capital Program ID	Name	Municipality	Class EA Schedule	Project Type	Improvement Type	Size/Capacity	Total Component Estimated Cost	Timeline
S-WW-PS-07	Grand Bend PS2 Upgrades	Stephen	B	Pumping	Growth	50 L/s	$ 3,000,000	10-15 Years
S-WW-II-01	Huron Park I&I Program	Stephen	A+	I/I	Wet Weather Management	N/A	$ 847,000	0-5 Years
S-WW-TP-01	Grand Bend WWTP Capacity Upgrades	Stephen	A+	Treatment	Growth	N/A	$ 3,000,000	15 Years
S-WW-ST-01	Grand Bend septic system re-inspection program	Stephen	N/A	Study	Private Septic Systems	N/A	$ 185,000	0-5 Years
Stephen Capital Program Total							**$ 21,067,000**	

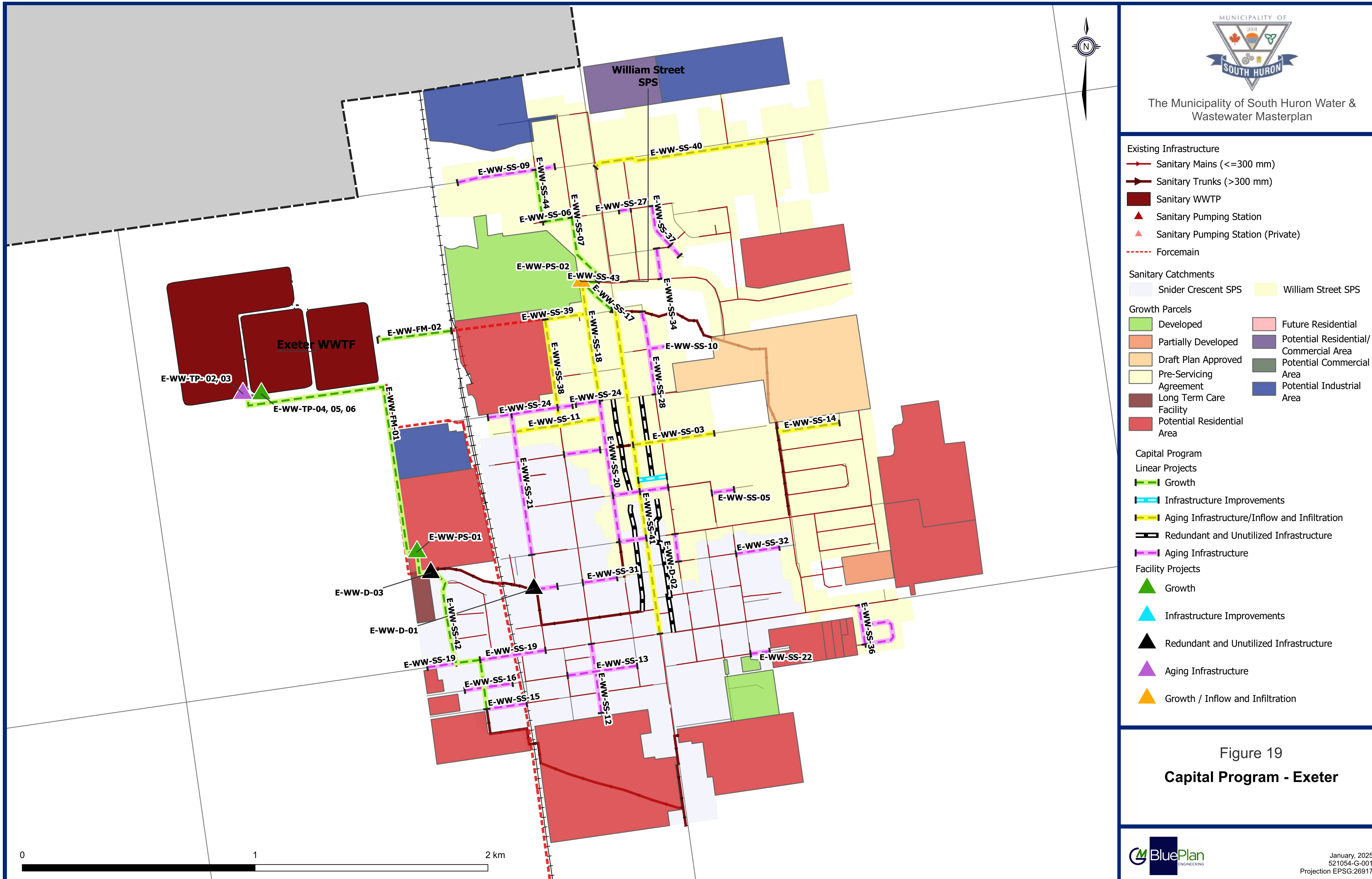
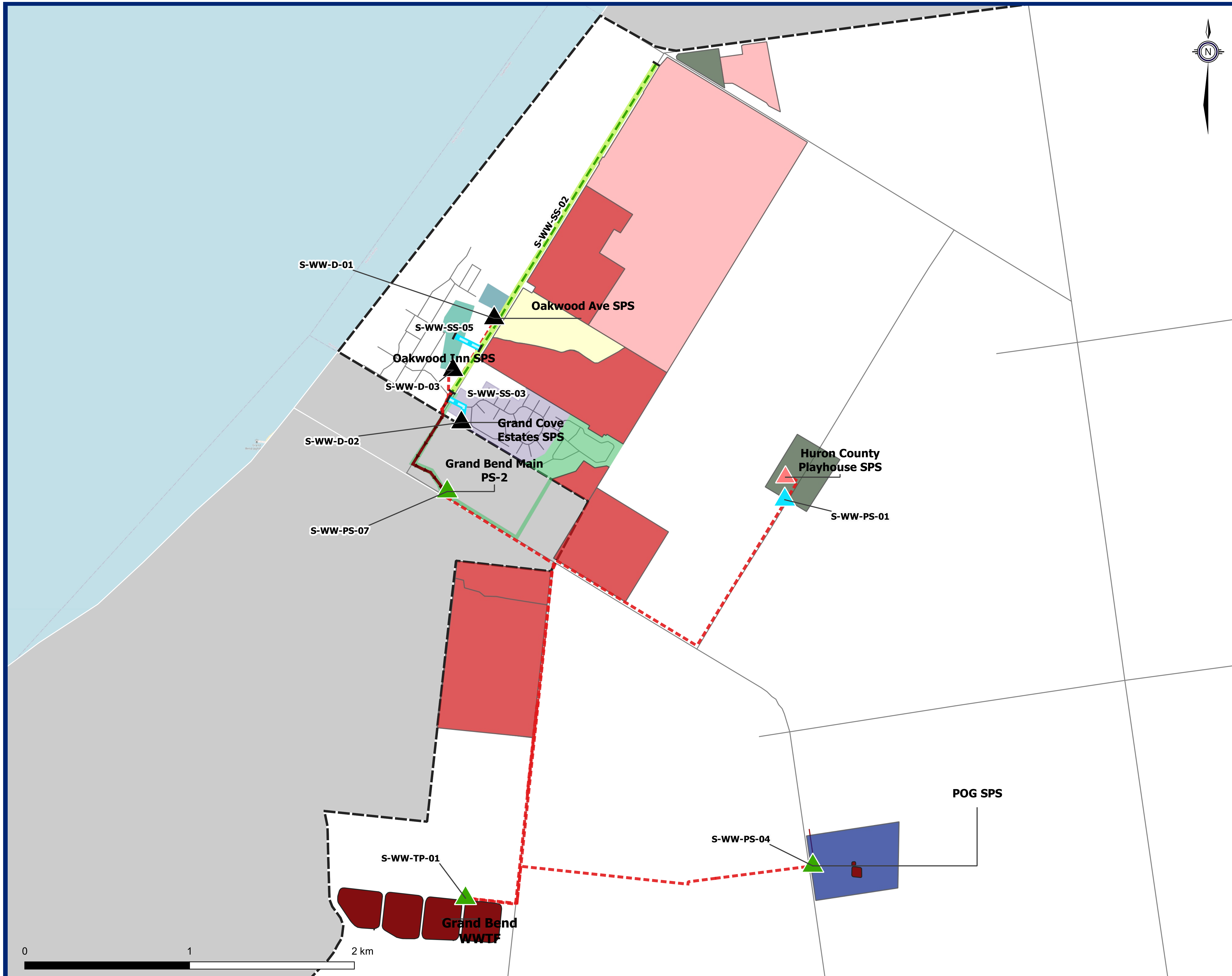


Figure 19

Capital Program - Exeter



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Existing Infrastructure
- Sanitary Mains (<=300 mm)
- Sanitary Trunks (>300 mm)
- Sanitary WWTP
- Sanitary Pumping Station
- Sanitary Pumping Station (Private)
- Forcemain

Growth Parcels
- Developed
- Partially Developed
- Draft Plan Approved
- Pre-Servicing Agreement
- Long Term Care Facility
- Potential Residential Area
- Future Residential
- Potential Residential/Commercial Area
- Potential Commercial Area
- Potential Industrial Area

Capital Program
Linear Projects
- Growth
- Infrastructure Improvements
- Aging Infrastructure/Inflow and Infiltration
- Redundant and Unutilized Infrastructure
- Aging Infrastructure

Facility Projects
- Growth
- Infrastructure Improvements
- Redundant and Unutilized Infrastructure
- Aging Infrastructure
- Growth / Inflow and Infiltration

Figure 20
Capital Program - Grand Bend

BluePlan ENGINEERING

January, 2025
521054-G-001
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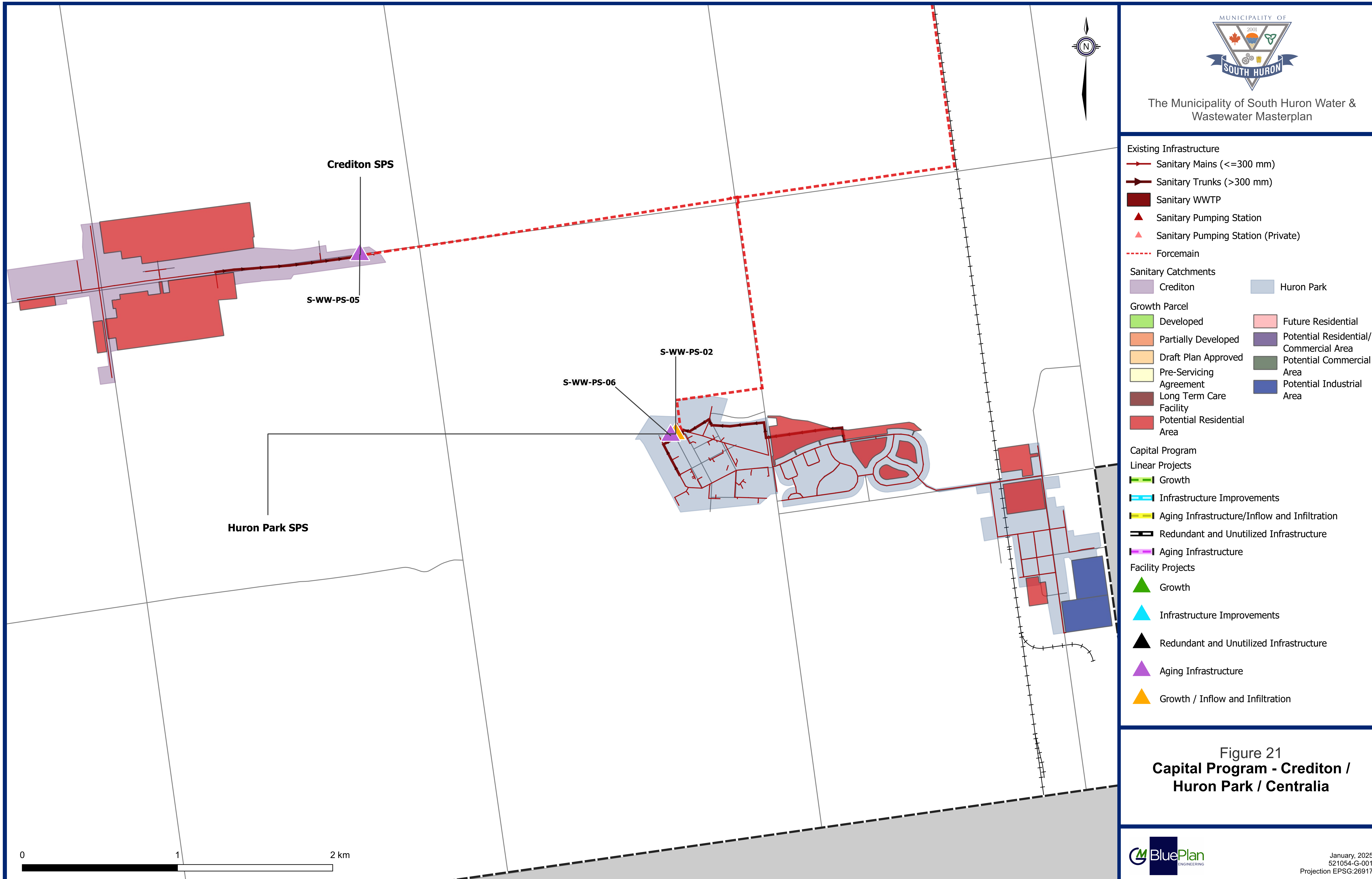

Figure 21
Capital Program - Crediton / Huron Park / Centralia

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January, 2025
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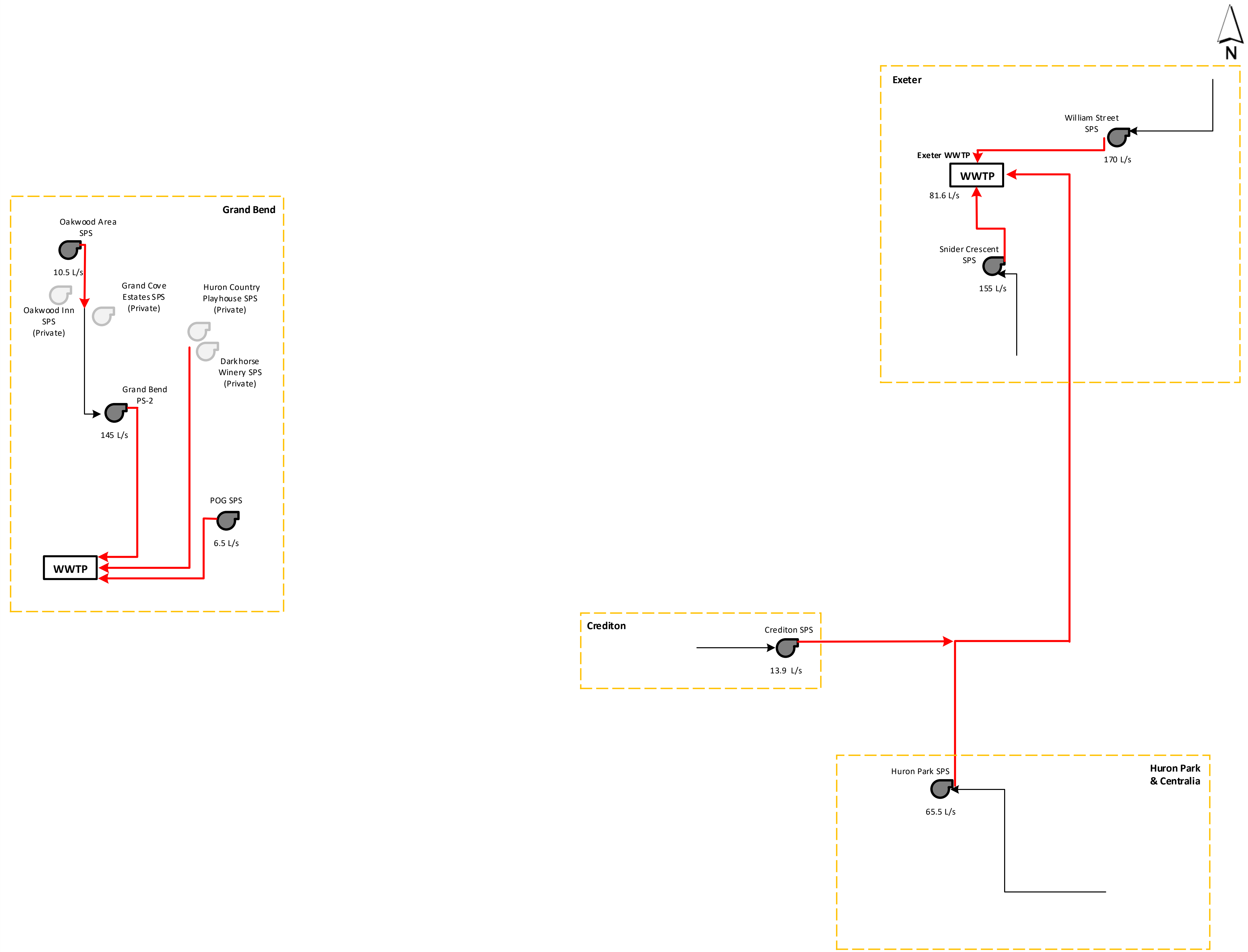
APPENDIX A:
F-5-1 EFFLUENT DESIGN OBJECTIVES

MOECC F-5-1 Effluent Criteria for Secondary Treatment or Equivalent

Treatment Level and Processes[1]	Effluent Design Objectives (mg/L) - BOD_5	Effluent Design Objectives (mg/L) - SS	Effluent Design Objectives (mg/L) - TP	Effluent Design Objectives (mg/L) – $(NH_3+NH_4^+)$-N	Effluent Guidelines (mg/L) - BOD_5	Effluent Guidelines (mg/L) - SS
Conventional Activated Sludge without TP removal	15	15	n/a	n/a	25	25
Conventional Activated Sludge with TP removal	15	15	1.0	n/a	25	25
Contact Stabilization with TP removal	20	20	n/a	n/a	25	25
Extended Aeration without TP removal	15	15	n/a	n/a	25	25
Continuous Discharge Lagoon without TP removal	25	30	n/a	n/a	30	40
Continuous Discharge Lagoon with TP removal	25	30	1.0	n/a	30	40
Seasonal Retention Lagoon without TP removal	25	30	n/a	n/a	30	40
Seasonal Lagoon with TP removal by batch chemical dosage	15	20	0.5 to 1.0	n/a	25	25
Seasonal Retention Lagoon with TP removal by continuous chemical dosage	25	30	1.0	n/a	30	40
Physical-chemical Treatment	20	20	1.0	n/a	25	25

[1] https://www.ontario.ca/page/f-5-1-determination-treatment-requirements-municipal-and-private-sewage-treatment-works. Accessed 20 September, 2019

APPENDIX B: WASTEWATER SYSTEM SCHEMATIC

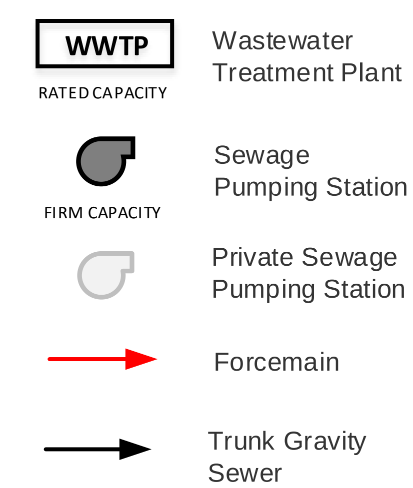


MUNICIPALITY OF SOUTH HURON

The Municipality of South Huron Water & Wastewater Masterplan

EXISTING COLLECTION SCHEMATIC

Legend



October 2023
Figure XX
Not to Scale

GM BluePlan ENGINEERING

APPENDIX C:
WASTEWATER CONDITION ASSESSMENTS

1 WASTEWATER FACILITY CONDITION ASSESSMENT APPROACH

1.1 Asset Condition and Risk Scoring

The condition of each asset is recorded by assigning a condition score on a scale of one (1) to five (5). Table 1 below provides the details of each condition score. Table 2 below provides the details of the performance condition score. Each asset is scored based on physical condition and performance condition (if applicable).

Table 1: Physical Condition Rating

Score	Condition	Remaining Useful Life	Description
NE	Non-Existent	0%	• Asset abandoned or does not exist.
NO	Not observed	Unknown	• Asset exists, but was not able to be inspected.
1	Excellent	80% - 100%	**Fit for the Future:** The assets in the system are generally in very good condition, typically new or recently rehabilitated.
2	Good	60% - 79%	**Adequate for Now:** Some asset elements show general signs of deterioration that require attention. A few elements exhibit deficiencies. May require some minor maintenance.
3	Fair	40% - 59%	**Requires Attention:** The assets in the system show general signs of deterioration and require attention, with some elements exhibiting significant deficiencies. May require immediate maintenance.
4	Poor	20% - 39%	**At Risk:** The assets in the system are in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. May require on-going monitoring and major maintenance or rehabilitation.
5	Very Poor	<20%	**Unfit for Sustained Service** The assets in the system are below standard condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which may be affecting service or increasing risks. Condition may be critical. May require extensive monitoring, rehabilitation and/or replacement.

Table 2: Performance Condition Ratings

Score	Condition	Description
NI	No input available	• No operational input gathered or obtained.
1	Excellent	• No performance concerns observed or communicated by operations • Meets all current and projected service levels effectively and efficiently • Sufficient capacity to meet projected needs • Does not experience operational issues • Cost of operating and maintaining justifies retention
2	Good	• Generally meets current service levels effectively and efficiently • Minor utilization issues at peak/trough demands • Rarely experiences operational issues • Cost of operating and maintaining justifies retention
3	Fair	• Meets only some service levels, regularly experiences issues • Fair capacity - periodical utilization issues at peak/trough demands • Regularly experiences operational issues • Cost of operating and maintaining is equal to the economic return necessary to justify retention
4	Poor	• Frequently does not meet services levels • Frequent utilization issues at peak/trough demands • Some deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention
5	Very Poor	• Does not meet current or projected service levels • Always experiences issues at peak/trough demands • Many deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention

1.2 Consequence of Failure

Each asset in the facilities is assigned a consequence of failure (CoF) score that ranges from 1-5 (refer to Table 3). The rating scale outlined in Table 3 is generally based on industry standard approaches tailored to a rural sewage pumping station facility.

Table 3: Consequence of Failure Rating

Score	Condition	Description
1	Minimal	Negligible Impact to Operations
2	Minor	Low Impact to Operations; work around solution can be readily implemented in less than 4 hours. No bypass recorded.
3	Moderate	Medium Impact to Operations; work-around solutions will require time to implement (up to 24 hours). Potential for small overflow bypass to environment expected prior to Operations mobilization to site. May require onsite manual operation of pumps.
4	Major	High Impact to Operations and Customer; work around solutions will required multiple days to implement and have a high cost to the Municipality. Hauling truck likely to maintain service. Overflow bypass to environment is expected.
5	Extreme	High Impact to Operations; ability to collect and convey wastewater in a safe & reliable manner is compromised. Significant overflow bypass occurring, upstream basement surcharging possible.

1.3 Risk Calculation and Priority Score

The risk of an asset failing is calculated as follows:

$$Risk = RP\ x\ RI$$

This calculation will yield Risk Scores ranging from 1 to 25. The following figure illustrates the combinations of Risk Probability (RP) and Risk Impact (RI) ratings and their corresponding risk scores.

		Condition of Asset				
		1	2	3	4	5
Consequence of Failure (CoF)	1	1	2	3	3	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

2 WATER FACILITY CONDITION ASSESSMENT APPROACH

2.1 Asset Condition and Risk Scoring

The condition of each asset is recorded by assigning a condition score on a scale of one (1) to five (5). **Table 4** below provides the details of each condition score. **Table 5** below provides the details of the performance condition score. Each asset is scored based on physical condition and performance condition (if applicable).

Table 4: Physical Condition Rating

Score	Condition	Remaining Useful Life	Description
NE	Non-Existent	0%	• Asset abandoned or does not exist.
NO	Not observed	Unknown	• Asset exists, but was not able to be inspected.
1	Excellent	80% - 100%	**Fit for the Future:** The assets in the system are generally in very good condition, typically new or recently rehabilitated.
2	Good	60% - 79%	**Adequate for Now:** Some asset elements show general signs of deterioration that require attention. A few elements exhibit deficiencies. May require some minor maintenance.
3	Fair	40% - 59%	**Requires Attention:** The assets in the system show general signs of deterioration and require attention, with some elements exhibiting significant deficiencies. May require immediate maintenance.
4	Poor	20% - 39%	**At Risk:** The assets in the system are in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. May require on-going monitoring and major maintenance or rehabilitation.
5	Very Poor	<20%	**Unfit for Sustained Service** The assets in the system are below standard condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which may be affecting service or increasing risks. Condition may be critical. May require extensive monitoring, rehabilitation and/or replacement.

Table 5: Performance Condition Ratings

Score	Condition	Description
NI	No input available	• No operational input gathered or obtained.
1	Excellent	• No performance concerns observed or communicated by operations • Meets all current and projected service levels effectively and efficiently • Sufficient capacity to meet projected needs • Does not experience operational issues • Cost of operating and maintaining justifies retention
2	Good	• Generally meets current service levels effectively and efficiently • Minor utilization issues at peak/trough demands • Rarely experiences operational issues • Cost of operating and maintaining justifies retention
3	Fair	• Meets only some service levels, regularly experiences issues • Fair capacity - periodical utilization issues at peak/trough demands • Regularly experiences operational issues • Cost of operating and maintaining is equal to the economic return necessary to justify retention
4	Poor	• Frequently does not meet services levels • Frequent utilization issues at peak/trough demands • Some deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention
5	Very Poor	• Does not meet current or projected service levels • Always experiences issues at peak/trough demands • Many deficiencies – cost of operating and maintaining exceeds the economic return necessary to justify retention

2.2 Consequence of Failure

Each asset in the facilities is assigned a consequence of failure (CoF) score that ranges from 1-5 (refer to Table 6). The rating scale outlined in Table 6 is generally based on industry standard approaches tailored to a rural potable water facility.

Table 6: Consequence of Failure Rating

Score	Condition	Description
1	Minimal	Negligible Impact to Operations
2	Minor	Low Impact to Operations; work around solution can be readily implemented in less than 8 hours.
3	Moderate	Medium Impact to Operations; work-around solutions will require time to implement (up to 24 hours).
4	Major	High Impact to Operations and Customer; work around solutions will required multiple days to implement and have a high cost to the Municipality. Potential loss of service for 24+ hours.
5	Extreme	High Impact to Operations; ability to produce/ deliver Treated Water Supply in a safe & reliable manner is compromised.

2.3 Risk Calculation and Priority Score

The risk of an asset failing is calculated as follows:

$$Risk = RP \; x \; RI$$

This calculation will yield Risk Scores ranging from 1 to 25. The following figure illustrates the combinations of Risk Probability (RP) and Risk Impact (RI) ratings and their corresponding risk scores.

		Condition of Asset				
		1	2	3	4	5
Consequence of Failure (CoF)	1	1	2	3	3	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Condition Assessment Register - Crediton Sanitary Pumping Station

Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment					Estimated Service Life	Remaining Service Life
					Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
Bollards, paving, grading, vegetation	D1 - Site		Four (4) Bollards in good condition. Asphalt driveway in good condition with minor ponding noted around wet well.	2007	Good Condition	2	2	1	2	50	35
Roofing	D2 - Structure		Asphalt shingle roof in good condition. Facia and eavestrough in good condition.	2007	Good Condition	2	2	3	6	50	35
Doors	D2 - Structure	One (1) double leaf painted door	Minor fading of paint on painted door.	2007	Fair Condition	3	3	1	3	40	25
Exterior Walls	D2 - Structure	Split face brick façade with rigid foam and vapour barrier and CMU interior with acoustical paneling	God condition, minor damage	2007	Good Condition	2	2	3	6	75	60
Roofing	D2 - Structure	Asphalt single roof system with plywood underlay and insulation	Couldn't be visually inspected due to snow. Assumed to be in good condition based on age	2007	Good Condition	2	2	3	6	75	60
Control Building Foundation	D2 - Structure		Building foundation in good condition based on dry pit condition. Unable to inspect exterior foundation walls.	2007	Good Condition	2	2	3	6	75	60
Wet Well	D2 - Structure	2.54m x 1.93m rectangular wet well, 7.7m deep precast wet well c/w two stainless steel square ventilation openings, two 900x900 aluminum pump hatches, one 1000x1600 aluminum access hatch, aluminum access ladder and grating	Visual inspection completed and appears to be in good condition.	2007	Good Condition	2	2	5	10	75	60
Pump 1	D3 - Mechanical	Flygt 3171.091-S0730032. 35hp, 3530rpm, 3-60Hz, 30A	Pump performance testing was not completed on the pumps. Pump considered to be in poor condition based on operating conditions and known wear issues	2007	Poor condition	4	4	4	16	30	15
Pump 2	D3 - Mechanical	Flygt 3171.091-S0730033. 35hp, 3530rpm, 3-60Hz, 30A	Pump performance testing was not completed on the pumps. Pump considered to be in poor condition based on operating conditions and known wear issues	2007	Poor condition	4	4	4	16	30	15
Pump 3	D3 - Mechanical	Flygt 3171.095-S2010008. 35hp, 3530rpm, 3-60Hz, 30A	New pump installed in 2020. Pump considered to be in excellent condition based on age.	2020	Excellent Condition	1	1	4	4	30	28
Air Release Valves (1)	D3 - Mechanical	Val-Matic 48AP1N1 - 50 mm diameter	Air release valve visually inspected. Considered to be in fair condition based on age.	2007	Fair Condition	3	3	3	9	30	15
Ball Valves (2)	D3 - Mechanical	50 mm diameter	SS ball valves visually inspected. Considered to be in good condition.	2007	Good Condition	2	2	3	6	30	15
Swing Flex Check Valves (2)	D3 - Mechanical	Val-Matic 508A - 150 mm diameter	Valves visually inspected. Considered to be in good condition	2007	Good Condition	2	2	3	6	30	15
Plug Valves (2)	D3 - Mechanical	150 mm diameter Valmatic	Valves visually inspected. Considered to be in good condition. Kickplate worn/corroded	2007	Good Condition	2	2	3	6	30	15
Gate Valve c/w Valve Box	D3 - Mechanical	200 mm diameter gate valve (assumed) c/w with valve box	Valves could not be visually inspected. Considered to be in fair condition based on age.	2007	Fair Condition	3	3	3	9	50	35
Flowmeter (1)	D3 - Mechanical	200 mm diameter Krohne electromagnetic flowmeter	Flowmeter appears new and recently replaced. Conduit needs to be updated to ensure water tight seal.	2020	Good Condition	2	2	1	2	20	18
Piping (Dry Pit)	D3 - Mechanical	Ductile Iron Piping. 150 - 200 mm diameter	Corrosion occurring on piping, coating appears to have failed. Recoating recommended. Piping considered to be in fair condition.	2007	Fair Condition	2	2	4	8	50	35

Condition Assessment Register - Crediton Sanitary Pumping Station

Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
			General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
Piping (Wet Well)	D3 - Mechanical	Ductile Iron Piping. 150 mm diameter	Fair condition. Only inspected from a distance. Corrosion occurring throughout as expected in a wet well	2007	Fair Condition	2	2	4	8	30	15
HVAC	D3 - Mechanical	Two (2) Ouellet (OAS07538AM) Electric heater - no A/C. One exhaust louvre for generator. Intake exhaust fan with associated ducting	HVAC equipment appears to be in good condition based on visual inspection and performance.	2007	Good Condition	2	2	1	2	20	5
Water Heater	D3 - Mechanical	Rheem Electric mounted above sink and eye wash station.	Appears to be in good condition and functioning properly	2007	Good Condition	2	2	1	2	10	-5
Platforms	D3 - Mechanical	Aluminum platform within wet well and for fueling piping	Inspected from above grade, appears to be in good condition with minor signs of corrosions around bolts and fasteners due to age	2007	Good Condition	2	2	4	8	50	35
Safety equipment, stairs, Ladders	D3 - Mechanical	HAWS Model 7461 Eye Wash Station c/w mixing valve	Eye wash station and stairs in good condition	2007	Good Condition	2	2	1	2	50	35
Hatches	D3 - Mechanical	Two 900x900 aluminum pump hatches, one 1000x1600 aluminum access hatch		2007	Good condition	2	2	1	2	40	25
Level Instrumentation	D4 - Electrical	Two (2) Siemens MultiRanger 100 ultrasonic level transmitters	Good condition	2007	Good condition	2	2	2	4	20	5
Interior Lighting	D4 - Electrical	Four (4) ceiling mounted fluorescence fixtures on main floor. Two (2) ceiling mounted fluorescence non-hazardous rated fixtures within dry pit.	All interior lighting are functional. Considered to be in good condition based on age.	2007	Good Condition	2	2	2	4	30	15
Exterior Lighting	D4 - Electrical	Two (2) wall mounted exterior lights	All exterior lighting are functional. Consider to be in good condition based on age.	2007	Good Condition	2	2	1	2	30	15
Generator	D4 - Electrical	Cummins Diesel Engine and Generator installed in main room in the control building. DGFB-5791815, 175Kw, 3PH, 600V, 218.7 KVA, 60Hz	Generator appears to be in good condition. Generator test was not completed.	2007	Good condition	2	2	3	6	30	15
Fuel Systems	D4 - Electrical	Double wall fuel tank, gauges, fuel lines, filling and vent pipes. 1200L Capacity, 2.0mm primary tank, 2.0mm double wall.	Fuel tank and concrete containment appear to be in good condition.	2007	Good condition	2	2	3	6	30	15
PLC	D4 - Electrical	Allen Bradley cabinet PLC which includes Allen Bradley Controller, HMI, relays, terminal blocks, Milltronics and Flygt Pump start/components	Internal components not inspected. Age based condition	2007	Good Condition	2	2	3	6	30	15
MCC	D4 - Electrical	MCC Enclosure, includes main breaker, switchgear units, bypass, surge protection device, Generator plug.	Internal components not inspected	2007	Good Condition	2	2	5	10	30	15
Automatic Transfer Switch	D4 - Electrical	Cutler-Hammer Automatic Transfer Switch (ATS) within MCC enclosure	Internal components not inspected	2007	Good Condition	2	2	5	10	30	15
Lighting Panel	D4 - Electrical	Wall mounted 120/240V Lighting panel in control building	Appears to be in good condition	2007	Good Condition	2	2	2	4	30	15

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Condition Assessment Register - Exeter Sewage Lagoons

Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
			General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
Bollards, paving, grading, vegetation	D1 - Site		Gravel/dirt roadways, no bollards, variable grading.	1963	Fair Condition	3	3	1	3	75	16
Fence/Gates	D1 - Site		Fence on Airport Line is down in some parts. Maintenance or replacement required.	1963	Fair Condition	3	3	1	3	75	16
Influent Metering Chamber	D2 - Structure	Could not be assessed visually.	Not accessed during inspection	1999	Not Inspected			4		75	52
Inlet pumps	D3 - Mechanical	Could not be assessed visually.	Not accessed during inspection	1999	Not Inspected			4		30	7
Inlet piping	D3 - Mechanical	350 mm , Could not be assessed visually.	Not accessed during inspection	1999	Not Inspected			4		75	52
Alum Pumps	D3 - Mechanical	ALLDOS pump. 55.5 gph 145 psi at 60hz	pumps are covered in alum. Process board is also covered in alum. One pump has failed as per operator comments.	1999	Poor Condition	4	4	3	12	30	7
Alum Piping	D3 - Mechanical		Considered to be in poor condition based on visual inspection and operator input	1999	Not Inspected	4	4	3	12	40	17
Effluent Control Structure	D2 - Structure	Could not be assessed visually.	Not accessed during inspection	1963	Not Inspected			3		75	16
Effluent Metering	D3 - Mechanical	Could not be assessed visually.	Not accessed during inspection	1963	Not Inspected			3		30	-29
Effluent Piping	D3 - Mechanical	Could not be assessed visually.	Not accessed during inspection	1963	Not Inspected			3		75	16
Outfall	D2 - Structure	Could not be assessed visually.	Not accessed during inspection	1963	Not Inspected			3		50	-9
Interior Walls (Blower/Chemical)	D2 - Structure	Metal clad (chemical storage bldg.), cinder block(blower bldg.)	Metal clad (chemical storage bldg.), cinder block(blower bldg.). Foundation has cracking in southwest corner.	1963	Fair Condition	3	3	5	15	75	16
Exterior Walls (Blower/Chemical)	D2 - Structure		Brick/cinder block	1963	Fair Condition	3	3	3	9	75	16
Roofing (Blower/Chemical)	D2 - Structure	Flat roof consider to be in fair condition based on age	Flat roof, could not be assessed visually.	1963	Fair Condition	3	3	3	9	30	-29
Doors (Blower/Chemical)	D2 - Structure			1963	Fair Condition	3	3	2	6	20	-39
Alum Tank (Blower/Chemical)	D2 - Structure			1999	Fair Condition	3	3	3	9	30	7
Chemical Room Sump Pump (Blower/Chemical)	D3 - Mechanical		unplugged and requires maintenance	1999	Poor Condition	4	4	3	12	30	7
Upgraded Blowers (2) (Blower/Chemical)	D3 - Mechanical	425 L/s positive displacement blowers	Duty	2015	Good Condition	1	1	3	3	30	23
Backup Blower (1) (Blower/Chemical)	D3 - Mechanical	800 L/s positive displacement blowers	Stand-by	1984	Fair Condition	3	3	3	9	30	-8
Chemical Feed System (Blower/Chemical)	D3 - Mechanical		Some leaking around valves	1984	Fair Condition	3	3	3	9	30	-8
HVAC (Blower/Chemical)	D3 - Mechanical			1984	Not Inspected			2		30	-8

Condition Assessment Register - Exeter Sewage Lagoons

Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment					Estimated Service Life	Remaining Service Life
					Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
Louvres (Blower/Chemical)	D3 - Mechanical		Chemical storage louvre requires cleaning.	1984	Fair Condition	3	3	2	6	30	-8
Butterfly Valve (2) (Blower/Chemical)	D3 - Mechanical	250mm diameter	Insulated piping and valves. Assumed to be in fair condition based on age.	1984	Fair Condition	3	3	3	9	25	-13
Butterfly Valve (3, upgraded) (Blower/Chemical)	D3 - Mechanical	250mm diameter	Insulated piping and valves. Assumed to be in fair condition based on age.	2001	Fair Condition	3	3	3	9	25	4
Check Valve (3) (Blower/Chemical)	D3 - Mechanical	250mm diameter	Insulated piping and valves. Assumed to be in fair condition based on age.	1999	Fair Condition	3	3	3	9	25	2
Piping (Blower/Chemical)	D3 - Mechanical	250mm diameter	Insulated piping and valves. Assumed to be in fair condition based on age.	1984	Fair Condition	3	3	3	9	25	-13
Piping (upgrades) (Blower/Chemical)	D3 - Mechanical	250mm diameter	Insulated piping and valves. Assumed to be in fair condition based on age.	2015	Fair Condition	3	3	3	9	25	18
Pressure Relief Valves (Blower/Chemical)	D3 - Mechanical			1999	Good Condition	2	2	3	6	25	2
Water Heater	D3 - Mechanical	SpaceSaver Water heater complete with FlexLite pressure tank		2021	Excellent Condition	1	1	2	2	25	24
Control Panels, Primary Electrical, Conduits and Wiring (Blower/Chemical)	D4 - Electrical		Local panels within chemical building. Storage buildings not inspected.	1984	Fair Condition	3	5	5	15	30	-8
Interior Lighting (Blower/Chemical)	D4 - Electrical			1999	Good Condition	2	2	1	2	30	7
Exterior Lighting (Blower/Chemical)	D4 - Electrical			1999	Good Condition	2	2	1	2	30	7
Milltronics	D4 - Electrical		Visually inspected. Considered to be in fair condition based on age.	1999	Fair Condition	3	3	2	6	21	-2
Static Tube Aerators	D3 - Mechanical		Considered to be in good condition based on age	2018	Good Condition	2	3	3	6	30	26
Tubular Fine Bubble Aerators	D3 - Mechanical		Considered to be in good condition based on age	2018	Good Condition	2	3	3	6	30	26
Exterior walls (Filter Building)	D2 - Structure	Metal clad		1999	Fair Condition	3	3	2	6	50	27
Interior walls (Filter Building)	D2 - Structure	Plywood		1999	Fair Condition	3	3	3	9	50	27
Roofing (Filter Building)	D2 - Structure	Metal		1999	Fair Condition	3	3	3	9	30	7
Door (Filter Building)	D2 - Structure		Seals are gone on door. Considered to be in fair condition based on age.	1999	Fair Condition	3	3	2	6	30	7
Pumps (2) (Filter Building)	D3 - Mechanical	475 L/s, 60 HP, 45 KW	Visually inspected, considered good based on age.	1999	Good Condition	2	5	3	6	30	7
Outlet check valves (Filter Building)	D3 - Mechanical		Visually inspected, showing signs of rusting. Considered to be in fair condition	1999	Fair Condition	3	3	3	9	25	2
Butterfly Valves (Filter Building)	D3 - Mechanical		Visually inspected, showing signs of rusting. Considered to be in fair condition	1999	Fair Condition	3	3	3	9	25	2

Condition Assessment Register - Exeter Sewage Lagoons

Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
			General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
HVAC (Filter Building)	D3 - Mechanical		Fans have been removed. One (1) heater installed and considered to be in fair condition	1999	Fair Condition	3	3	2	6	30	7
Louvres (Filter Building)	D3 - Mechanical			1999	Good Condition	3	3	2	6	30	7
Control Panels, Primary Electrical, Conduits and Wiring (Filter Building)	D4 - Electrical		Milltronics replaced in 2022.	1999	Fair Condition	3	5	5	15	25	2
Exterior lights (Filter Building)	D4 - Electrical			1999	Fair Condition	3	1	1	3	25	2
Interior lights (Filter Building)	D4 - Electrical			1999	Fair Condition	3	1	1	3	25	2
Collection Header (Sand Filters)	D3 - Mechanical	237 L/s, 60 HP, 45 KW	It has been noted the filter piping is becoming bent in places and requires maintenance or replacement. The filter media resembles a muddy soil instead of sand. Maintenance or replacement is required.	1999	Fair Condition	3	3	3	9	25	2
Perforated Collection Lateral (Sand Filters)	D3 - Mechanical	150 mm	It has been noted the filter piping is becoming bent in places and requires maintenance or replacement. The filter media resembles a muddy soil instead of sand. Maintenance or replacement is required.	1999	Good Condition	2	3	4	8	25	2
Distribution Header (Sand Filters)	D3 - Mechanical	400 mm. Poor condition.	It has been noted the filter piping is becoming bent in places and requires maintenance or replacement. The filter media resembles a muddy soil instead of sand. Maintenance or replacement is required.	1999	Poor Condition	4	3	3	12	25	2
Distribution Lateral (Sand Filters)	D3 - Mechanical	600 mm (Cell 1&3) 450 mm (Cell 2&4). Poor Condition.	It has been noted the filter piping is becoming bent in places and requires maintenance or replacement. The filter media resembles a muddy soil instead of sand. Maintenance or replacement is required.	1999	Poor Condition	4	3	3	12	25	2
Filter Media (Sand) (Sand Filters)	D1 - Site	usable SA = 23,400 m2. Poor Condition	It has been noted the filter piping is becoming bent in places and requires maintenance or replacement. The filter media resembles a muddy soil instead of sand. Maintenance or replacement is required.	1999	Poor Condition	4	4	4	16	20	-3
Berms	D1 - Site	Clay berms	Some slumping observed near Cell 3. Blocks to prevent erosion starting to slide.	1963	Fair Condition	3	1	5	15	100	41
Manholes	D1 - Site	Could not be assessed visually.	Not accessed during inspection	1999	Not Inspected		1	3		50	27
Interconnecting Chambers	D2 - Structure	Visually inspected. Considered to be in good condition based on age. Valving is not working within the chambers		1963	Fair Condition	3	2	5	15	75	16
Outlet Chambers	D2 - Structure	Visually inspected. Considered to be in good condition based on age. Valving is not working within the chambers		1963	Fair Condition	3	3	5	15	75	16
Piping	D3 - Mechanical	Could not be assessed visually.	Not accessed during inspection	1963	Not Inspected		1	3		75	16

Condition Assessment Register - Huron Park Sanitary Pumping Station

Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
			General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
Bollards, paving, grading, vegetation	D1 - Site		Asphalt driveway in good condition with minor cracking occuring.	1999	Good Condition	2	2	1	2	50	26
Roofing	D2 - Structure	Steel roofing system with plywood underlay, engineered truss system and batt insulation. aluminum facia and eavestrough installed.	Steel roof in good condition. Facia and eavestrough in good condition.	1999	Good Condition	2	2	3	6	50	26
Doors	D2 - Structure	One (1) double leaf painted steel door.	Paint showing signs of fading and chips on steel door. Considered to be in fair condition	1999	Fair Condition	3	3	1	3	40	16
Exterior Walls	D2 - Structure	Split face decorative exterior brick, air space, rigid insulation, vapour barrier and 150mm CMU interior	Considered to be in good condition	1999	Good Condition	2	2	3	6	75	51
Control Building Foundation	D2 - Structure		Building foundation in good condition based on dry pit condition. Unable to inspect exterior foundation walls.	1999	Good Condition	2	1	3	6	75	51
Wet Well	D2 - Structure	4.6m x 4.0m rectangular wet well, 4.9m depth precast wet well c/w one (1) 600x600mm access hatch, two (2) 600x600mm aluminum viewing hatches, two 900x1200mm pump hatches, two aluminum goosenecks for ventilation, aluminum access ladder and grating and steel pump hoist beam.	Visual inspection completed and appears to be in fair condition based on age.	1999	Fair Condition	3	3	5	15	75	51
Pump 1	D3 - Mechanical	Flygt 3300/615-0741130. 100 hp, 1780rpm, 95A, , 600V	Pumps performance testing was not completed on the pumps. Pump consider to be in fair condition based on operating scales and age.	1999	Fair Condition	3	3	5	15	30	6
Pump 2	D3 - Mechanical	Flygt 3300/615-0741130. 100 hp, 1780rpm, 95A, , 600V	Pumps performance testing was not completed on the pumps. Pump consider to be in fair condition based on operating scales and age.	1999	Fair Condition	3	3	5	15	30	6
Knife Gate Valves (2)	D3 - Mechanical	Two (1) knife gate valve installed within the wet well. 400mm diameter on outlet pipe and 200mm diameter on overflow pipe.	Knife gate visually inspected considered to be in fair condition based on age. Operation unknown	1999	Fair Condition	3	3	3	9	30	6
Check Valves (2)	D3 - Mechanical	Two (2) swing flex check valves installed within dry pit. 200mm Mueller swing flex check valve	Swing flex check valves visually inspected considered to be in fair condition based on age	1999	Fair Condition	3	3	3	9	30	6
Gate Valves (4)	D3 - Mechanical	Three (3) 200mm Mueller 200w gate valve and One (1) bypass 150mm Mueller 200w gate valve installed within dry pit.	Minor paint chips noted. Considered to be in good condition based on age and visual inspection	1999	Good Condition	2	2	3	6	30	6
Air valve (1)	D3 - Mechanical	One air valve installed on discharge piping within dry pit.	Considered to be in fair condition based on age.	1999	Fair Condition	3	3	3	9	30	6
Ball valves (2)	D3 - Mechanical	One (1) 25mm and One (1) 50mm ball valve.	Considered to be in fair condition based on age.	1999	Fair Condition	3	3	3	9	30	6
Pressure Gauge (1)	D3 - Mechanical	One (1) ABB pressure transmitter 251GSRKPNS1	Considered to be in good condition based on visual inspection and performance	1999	Good Condition	2	2	3	6	30	6
Sump Pump	D3 - Mechanical	Sump pump installed in dry pit complete with pvc discharge piping and float.	Considered to be in fair condition based on age.	1999	Fair Condition	3	3	3	9	30	6
Piping (dry pit)	D3 - Mechanical	Stainless steel piping. 200mm diameter.	Piping considered to be in good condition based on age and visual inspection	1999	Good Condition	2	2	4	8	50	26
Piping (Wet Well)	D3 - Mechanical	Ductile iron piping. 200mm diameter.	Piping visually inspected and major rusting occurring. Considered to be in poor condition.	1999	Poor Condition	4	4	4	16	50	26

Condition Assessment Register - Huron Park Sanitary Pumping Station

Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment						Estimated Service Life	Remaining Service Life
					Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
HVAC	D3 - Mechanical	Two (2) electromode sentinel #EUH03B83CT industrial unit heater, 600v, 3ph, 3kw. One exhaust louvre for generator. One louvre and Intake exhaust fan with associated ducting.	HVAC equipment appears to be in good condition based on visual inspection performance.	1999	Good Condition	2	2	1	2		20	-4
Water Heater	D3 - Mechanical	One (1) electric water heater.	Appears to be in good condition based on age and performance.	1999	Good Condition	2	2	1	2		20	-4
Platforms	D3 - Mechanical	Aluminum platform grating within wet well.	Inspected from above grade, appears to be in fair condition with signs of corrosions around bolts and fastener due to age.	1999	Fair Condition	3	3	4	12		50	26
Washroom	D3 - Mechanical	Complete with sink and toilet.	Appears to be in good condition based on age and performance.	1999	Good Condition	2	2	1	2		30	6
Overflow Flowmeter	D4 - Electrical	Area-Velocity Flowmeter	Failed condition	1999	Failed/Critical	5	2	4	20		30	6
Level Instrumentation	D4 - Electrical	One (1) Siemen MultiRanger 100 Ultrasonic level transmitter installed within PLC.	Good condition based on age and performance	1999	Good Condition	2	2	4	8		30	6
Interior Lighting	D4 - Electrical	Four (4) ceiling mounted fluorescence fixture on main floor. Four (4) wall mounted fluorescence hazardous rated fixtures within dry pit.	All interior lighting fixtures are working properly and appear to be in good condition based on age.	1999	Good Condition	2	2	2	4		30	6
Exterior Lighting	D4 - Electrical	One (1) wall mounted LED exterior light.	Exterior light is functioning and considered to be in good condition based on age.	1999	Good Condition	2	2	2	4		30	6
Generator	D4 - Electrical	Kohler Diesel Power Generator installed on main floor of control building. 150ROZJ, 160kW, 3Ph, 600V, 200Kva, 60hz	Generator appears to be in good condition. Generator was not tested for performance.	1999	Good Condition	2	2	3	6		30	6
Fuel Systems	D4 - Electrical	Double wall fuel tank located in control building. 1135 L capacity.	Fuel tank considered to be in good condition based on visual inspection and age.	1999	Good Condition	2	2	3	6		30	6
PLC	D4 - Electrical	Danby Electric PLC cabinet which includes Allen Bradley Controller, HMI, Relays, terminal blocks, Milltronics.	Fuel tank considered to be in good condition based on visual inspection and age.	1999	Good Condition	2	2	3	6		30	6
MCC	D4 - Electrical	Moeller Klockner MCC enclosure, includes main breaker, switchgear units, bypass, surge protector device, ATS, Generator plug, pressure transmitter screen.	Internal components not inspected but appear to be in good condition based on age.	1999	Good Condition	2	2	5	10		30	6
Lighting Panel	D4 - Electrical	Wall Mounted 120/240V lighting panel in control building	Appears to be in good condition based on age.	1999	Good Condition	2	2	2	4		30	6
Pump controller and VFD	D3 - Mechanical	Two (2) Allen Bradley enclosures complete with Flygt pump start/components, Flygt MiniCAS, VFD unit.	Internal components not inspected . Poor condition based on Operations input due to overheating.	2005	Poor Condition	4	4	5	20		30	12
Automatic Transfer Switch	D3 - Mechanical	Cutler-Hammer cabinet containing Cutler-Hammer ATS, ATS-MP1.	Internal components not inspected but appear to be in good condition based on age.	2005	Good Condition	2	2	5	10		30	12

Condition Assessment Register - Oakwood Area Sanitary Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment						Estimated Service Life	Remaining Service Life
						Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
OASPS1	Bollards, paving, grading, vegetation	D1 - Site		Asphalt driveway in good condition.	2006	Good Condition	2	2	1	2		50	33
OASPS2	Gates	D1 - Site		Black painted gate in good condition.	2006	Good Condition	2	2	1	2		50	33
OASPS3	Roofing	D2 - Structure	Asphalt single roof system with plywood underlay and insulation. Exterior roofing in good condition and unable to inspect interior of roofing system.	Asphalt roof in good condition. Facia and eavestrough in good condition.	2006	Good Condition	2	2	3	6		50	33
OASPS4	Doors	D2 - Structure	One (1) double leaf painted steel door.	Minor fading and paint chips on steel door.	2006	Good Condition	2	2	1	2		40	23
OASPS5	Exterior Walls	D2 - Structure	Split face masonry façade with rigid foam, vapour barrier and cmu interior.	Good condition.	2020	Good Condition	2	2	3	6		75	72
OASPS6	Control Building Foundation	D2 - Structure		Building foundation in good condition based on dry put condition. Unable to inspect exterior foundation walls.	2020	Good Condition	2	2	3	6		75	72
OASPS7	Wet Well	D2 - Structure	3.0m diameter wet well, 7.0m depth precast wet well c/w One 900x900 aluminum access hatch, two 900x900 pump hatches, two aluminum goosenecks for ventilation, aluminum access ladder and grating.	Visual inspection completed and appears to be in good condition.	2006	Good Condition	2	2	5	10		75	58
OASPS8	Pump 1	D3 - Mechanical	Flygt 3127.181-0610530. 10 hp, 1735rpm, 9.7A, imp#484., 600V	Pumps performance testing was not completed on the pumps. Pump consider to be in fair condition based on operating scales and age.	2006	Fair Condition	3	3	5	15		30	13
OASPS9	Pump 2	D3 - Mechanical	Flygt 3127.181-0610530. 10 hp, 1735rpm, 9.7A, imp#484., 600V	Pumps performance testing was not completed on the pumps. Pump consider to be in fair condition based on operating scales and age.	2006	Fair Condition	3	3	5	15		30	13
OASPS10	Air Release Valves (1)	D3 - Mechanical	Val-Matic 801A - 50mm diameter	Air release valve visually inspected. Rusting occurring and considered to be in fair condition	2006	Fair Condition	3	3	3	9		30	13
OASPS11	Ball Valves (2)	D3 - Mechanical	50mm diameter	SS ball valves visually inspected. Appear to be in good condition	2006	Good Condition	2	2	3	6		30	13
OASPS12	Swing Flex Check Valves (2)	D3 - Mechanical	Val-Matic 508A - 100mm diameter complete with position switch (Accutrak C2004A-BY-C21)	Valves visually inspect. Appears to be in good condition	2006	Good Condition	2	2	3	6		30	13
OASPS13	Gate Valve (5)	D3 - Mechanical	AVK C515 - 100mm diameter	Valves visually inspect. Appears to be in good condition	2006	Good Condition	2	2	3	6		30	13
OASPS14	Pressure Gauge (1)	D3 - Mechanical	Trerice 100 Psi complete with 25mm ball valve	Gauge visually inspected. Appears to be in good condition with minor rusting on process piping.	2006	Good Condition	2	2	3	6		30	13
OASPS15	Sump pump	D3 - Mechanical		Sump pump visually inspected. Appears to be in fair condition based on age and performance.	2006	Fair Condition	3	3	3	9		30	13
OASPS16	Piping (dry pit)	D3 - Mechanical	Stainless steel piping. 100mm diameter.	Piping considered to be in good condition based on age.	2006	Good Condition	2	2	4	8		50	33
OASPS17	Piping (Wet Well)	D3 - Mechanical	Stainless steel piping. 100mm diameter.	Piping considered to be in good condition based on age.	2006	Good Condition	2	2	4	8		50	33
OASPS18	HVAC	D3 - Mechanical	Two (2) electromode sentinel #EUH03B83CT industrial unit heater, 600v, 3ph, 3kw. One exhaust louvre for generator. Intake exhaust fan with associated ducting.	HVAC equipment appears to be in good condition based on visual inspection performance.	2006	Good Condition	2	2	1	2		20	3

Condition Assessment Register - Oakwood Area Sanitary Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment						Estimated Service Life	Remaining Service Life
						Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
OASPS19	Water Heater	D3 - Mechanical	One (1) SpaceSaver (52705) gas water heater.	Appears to be in good condition based on age and performance.	2006	Good Condition	2	2	1	2		30	13
OASPS20	Platforms	D3 - Mechanical	Aluminum platform grating within wet well.	Inspected from above grade, appears to be in good condition with minor signs of corrosions around bolts and fastener due to age.	2006	Good Condition	2	2	4	8		50	33
OASPS21	Washroom	D3 - Mechanical	Complete with sink and toilet.	Appears to be in good condition based on age and performance.	2006	Good Condition	2	2	1	2		30	13
OASPS22	Level Instrumentation	D4 - Electrical	One (1) Siemen MultiRanger 100 Ultrasonic level transmitter	Good condition based on age and performance	2006	Good Condition	2	2	2	4		30	13
OASPS23	Interior Lighting	D4 - Electrical	Two (2) ceiling mounted fluorescence fixture on main floor. Two (2) wall mounted fluorescence non-hazardous rated fixtures within dry pit.	All interior lighting fixtures are working properly and appear to be in good condition based on age.	2006	Good Condition	2	2	2	4		30	13
OASPS24	Exterior Lighting	D4 - Electrical	One (1) wall mounted exterior lights	Exterior light is functioning and considered to be in good condition based on age.	2006	Good Condition	2	2	2	4		30	13
OASPS25	Generator	D4 - Electrical	Cummins Diesel Power Generator installed on main floor of control building. DKAF-5770365, 25kW, 3Ph, 600V, 31.2Kva, 60hz	Generator appears to be in good condition. Generator was not tested for performance.	2006	Good Condition	2	2	3	6		30	13
OASPS26	Fuel Systems	D4 - Electrical	Double wall fuel tank located outside of building.	Fuel tank considered to be in good condition based on visual inspection and age	2006	Good Condition	2	2	3	6		30	13
OASPS27	PLC	D4 - Electrical	HTC cabinet PLC which include Allen Bradley Controller, HMI, relays, terminal blocks, back up battery.	Internal components appear to be in good condition	2006	Good Condition	2	2	3	6		30	13
OASPS28	MCC	D4 - Electrical	MCC enclosure, includes main breaker, switchgear units, bypass, surge protector device, Generator plug.	Internal components not inspected but appear to be in good condition based on age.	2006	Good Condition	2	2	5	10		30	13
OASPS29	Lighting Panel	D4 - Electrical	Wall Mounted 120/240V lighting panel in control building	Appears to be in good condition based on age	2006	Good Condition	2	2	2	4		30	13
OASPS30	Pump controller and VFD	D3 - Mechanical	Benshaw enclosure complete with Flygt pump start/components, Flygt MiniCAS, VFD unit	Internal components not inspected but appear to be in good condition based on age.	2006	Good Condition	2	2	5	10		30	13
						Average Condition	2.1	2.1	2.9	6.3			

Condition Assessment Register - POG Sanitary Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
POGSPS1	Bollards, paving, grading, vegetation	D1 - Site	Two (2) bollards, grass entrance.	Bollards in poor condition with major paint fading and rust. Entrance in good condition	2006	Poor Condition	3	3	2	6	50	34
POGSPS2	Gates	D1 - Site	Barb wired steel fence.	Considered to be in good condition based on visual inspection	2006	Good Condition	2	2	2	4	50	33
POGSPS3	Wet Well	D2 - Structure	3.0m diameter wet well, 7.0m depth precast wet well c/w One 900x900 aluminum access hatch, One 1200x900 pump hatches, two aluminum goosenecks for ventilation, alluminum ladder with safety handle and steel grating.	Visual inspection completd and appears to be in fair condition. Rusting occuring on platform. Aluminum goosenecks showing signs of rust on top gooseneck.	2006	Fair Condition	3	3	5	15	75	58
POGSPS4	Valve Chamber	D2 - Structure	Unknown condition as unable to open hatches. One (1) 900x900mm aluminum hatch. Two valve boxes installed on top.	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Unknown Condition			5		75	58
POGSPS5	Pump 1	D3 - Mechanical	Unknown pump installed as no tags were found.	Pumps preformance testing was not completed on the pumps. Pump consider to be in fair condition based on operating scales and age.	2006	Fair Condition	3	3	4	12	30	13
POGSPS6	Pump 2	D3 - Mechanical	Unknown pump installed as no tags were found.	Pumps preformance testing was not completed on the pumps. Pump consider to be in fair condition based on operating scales and age.	2006	Fair Condition	3	3	4	12	30	13
POGSPS7	Air Release Valves	D3 - Mechanical	Unknown	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Fair Condition			3		30	13
POGSPS8	Ball Valves	D3 - Mechanical	Unknown	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Good Condition			3		30	13
POGSPS9	Swing Flex Check Valves	D3 - Mechanical	Unknown	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Good Condition			3		30	13
POGSPS10	Gate Valve	D3 - Mechanical	Unknown	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Good Condition			3		30	13
POGSPS11	Pressure Gauge	D3 - Mechanical	Unknown	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Good Condition			3		30	13
POGSPS12	Piping (Valve Chamber)	D3 - Mechanical	Unknown	Visual inspection could not be completed as Hatch lock was rusted shut and required to be cut off in order to access.	2006	Good Condition	3	3	4	12	50	33
POGSPS13	Piping (Wet Well)	D3 - Mechanical	Ductile Iron piping 100mm	Piping considered to be in faircondition based on age and minor rusting occuring.	2006	Good Condition	3	3	4	12	50	33
POGSPS14	Platforms	D3 - Mechanical	Steel platform installed.	Inspected from above grade, appears to be in fair condition with minor signs of corrosions around bolts and fastener due to age.	2006	Fair Condition	3	3	4	12	40	23
POGSPS15	Level Instrumentation	D4 - Electrical	One (1) Milltronics MultiRanger 100 Ultrasonic level transmitter	Installed in PLC enclosure. Considered to be in fair condition based on age.	2006	Good Condition	3	3	2	6	30	13
POGSPS16	Wet Well Lighting	D4 - Electrical	One (1) wall mounted fluorescence hazardous rated fixture installed within wet well.	Appears to be in good condition based on age and functioning properly.	2006	Good Condition	2	2	2	4	30	13
POGSPS17	MCC	D4 - Electrical	Cabinet MCC which include pump controllers, hydro connection, milltronics	Internal components appear to be in fair condition. Cabinet showing signs of rusting and all seals are broken.	2006	Fair Condition	3	3	4	12	30	13

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Condition Assessment Register - Snider Crescent Sanitary Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
				General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
SCSPS1	Bollards, paving, grading, vegetation	D1 - Site		New asphalt patch, Five (5) new bollards installed and site grading completed as part of 2020 upgrades. Considered to be in good condition.	2020	Good Condition	2	2	1	2	50	48
SCSPS2	Roofing	D2 - Structure	Asphalt shingle roof system with plywood underlay. Blown in insulation in attic completed during 2020 upgrades. Facia and eavestrough installed.	Asphalt shingle roof, facia and eavestrough in fair condition based on visual inspection and due to age.	1991	Fair Condition	3	3	3	9	50	19
SCSPS3	Doors	D2 - Structure	Two (2) double leaf painted steel doors.	New doors installed during 2020 upgrades. Considered to be in excellent condition due to age.	2020	Excellent Condition	1	1	1	1	40	38
SCSPS4	Exterior Walls	D2 - Structure	Split face brick veneer façade with rigid insulation, air space, and vapour barrier. CMU masonry block interior.	Considered to be in good condition based on visual inspection with some brick veneer replaced during 2020 upgrades.	1991	Good Condition	2	2	3	6	75	44
SCSPS5	Interior Walls	D2 - Structure	390x390x150mm concrete block reinforced interior wall with six (6) L 152x152x9.5mm angle steel installed during 2020 upgrades in order to separate non-hazardous and hazardous rooms.	Considered to be in excellent condition based on visual inspection and age	2020	Excellent Condition	1	1	3	3	75	73
SCSPS6	Control Building Foundation	D2 - Structure	Interior foundation complete with fire rated insulation.	Building Foundation in good condition based on dry pit condition. Unable to inspect exterior foundation walls.	1991	Good Condition	2	2	3	6	75	44
SCSPS7	Wet Well	D2 - Structure	3.51m x 3.0m rectangular wet well, 7.63m deep cast in place wet well c/w two (2) stainless steel goosenecks for ventilation. Three (3) 1200 x 900mm aluminum pump access hatch and one 600 x 600mm aluminum ladder access hatch. Aluminum ladder and grating, and lifting davit arm.	Considered to be in good condition based on visual inspection with some upgrades completed in 2020 including One (1) new pump access hatch	1991	Good Condition	2	2	5	10	75	44
SCSPS8	Pump 1	D3 - Mechanical	Sulzer XFP155J-CB2, SN:300481680, 63 KW, 1785 rpm, 3-60Hz, 771.84A, 317.5mm impeller	New pump installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	5	5	30	28
SCSPS9	Pump 2	D3 - Mechanical	Sulzer XFP155J-CB2, SN:300481681, 63 KW, 1785 rpm, 3-60Hz, 771.84A, 317.5mm impeller	New pump installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	5	5	30	28
SCSPS10	Pump 3	D3 - Mechanical	Sulzer XFP155J-CB2, SN:300481682, 63 KW, 1785 rpm, 3-60Hz, 771.84A, 317.5mm impeller	New pump installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	5	5	30	28
SCSPS11	Knife Gate Valves (1)	D3 - Mechanical	One (1) knife gate valve installed within the wet well on the outlet pipe. 450mm Trueline F8112RS-NRN Knife Gate Valve complete with valve box stem.	New knife gate valve installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	3	3	30	28
SCSPS12	Check Valves (3)	D3 - Mechanical	Three (3) swing flex check valves installed within dry pit. 150mm Valmatic 506C.3BF swing flex check valve	New swing flex check valves installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	3	3	30	28
SCSPS13	Gate Valves (5)	D3 - Mechanical	Four (4) 150mm Mueller 200w gate valve and One (1) 300mm Mueller 200w gate valve installed within dry pit.	Minor paint chips noted. Considered to be in fair condition based on age	1991	Fair Condition	3	3	3	9	30	-1
SCSPS14	Air valve (1)	D3 - Mechanical	One air valve installed on discharge piping within dry pit.	Considered to be in fair condition based on age.	1991	Fair Condition	3	3	3	9	30	-1
SCSPS15	Ball valves (3)	D3 - Mechanical	Three (3) 25mm trueline N620 Ball Valve installed on discharge piping of each pump within dry pit.	Installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	3	3	30	28
SCSPS16	Pressure Gauge (3)	D3 - Mechanical	Trerice 100 Psi complete with 25mm ball valve	Installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	3	3	30	28
SCSPS17	Sump Pump	D3 - Mechanical	Liberty pump XFL52M, 0.5Hp, 230V, 1-60Hz, 7A	Installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	3	3	30	28
SCSPS18	Piping (dry pit)	D3 - Mechanical	Stainless steel piping. 150mm diameter and 300mm diameter	Piping considered to be in Fair condition based on age.	1991	Fair Condition	3	3	4	12	50	18
SCSPS19	Piping (Wet Well)	D3 - Mechanical	New Stainless steel piping installed during 2020 upgrades for each pump (3). 150mm diameter.	Piping considered to be in excellent condition based on age.	2020	Excellent Condition	1	1	4	4	50	47

Condition Assessment Register - Snider Crescent Sanitary Pumping Station

Asset ID	Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment						Estimated Service Life	Remaining Service Life
						Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score			
SCSPS20	HVAC	D3 - Mechanical	One (1) Chromalox unit heater HCH-401 installed in non-hazardous room. One (1) Ouellet unit heater OHX03000 installed within dry pit. Intake exhaust fan with associated ducting installed in hazardous room. One damper and actuator installed hazardous room.	All HVAC equipment installed during 2020 upgrades considered to be in excellent condition	2020	Excellent Condition	1	1	2	2		20	17
SCSPS21	Platforms	D3 - Mechanical	Aluminum platform grating within wet well.	Inspected from above grade, appears to be in Fair condition with signs of corrosions around bolts and fastener due to age.	1991	Fair Condition	3	3	4	12		50	18
SCSPS22	Level Instrumentation	D4 - Electrical	One (1) Siemen MultiRanger 100 Ultrasonic level transmitter. Five (5) float switches installed within wet well, ITT Flygt ENM-10.	Installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	4	4		30	27
SCSPS23	Overflow Flowmeter	D4 - Electrical	One (1) overflow area velocity transmitter and screen, Alpha AVFM 6.1.	Installed during 2020 upgrades considered to be in excellent condition. Performance is not as expected due to configuration of overflow outlet.	2020	Excellent Condition	1	4	3	3		30	27
SCSPS24	Interior Lighting	D4 - Electrical	Two (2) ceiling mounted LED fixture in non-hazardous room, Surface Tornado, S TO-0850 . Two (2) wall mounted fluorescence hazardous rated fixtures within dry pit. Two (2) ceiling mounted LED fixture in Hazardous room, AZZ MHD209L24U	All interior lighting fixtures are working properly and are considered to be in excellent condition based on age.	2020	Excellent Condition	1	1	2	2		30	27
SCSPS25	Exterior Lighting	D4 - Electrical	Two (2) wall mounted exterior lights above each door. XSPW WM-PLT12.	Installed during 2020 upgrades considered to be in excellent condition and working properly.	2020	Excellent Condition	1	1	1	1		30	27
SCSPS26	Generator	D4 - Electrical	Cummins Diesel Power Generator installed on concrete pad beside control building. C200D6D, 200kW, 3Ph, 600V, 250Kva, 60hz	Generator installed during 2020 upgrades and considered to be in excellent condition.	2020	Excellent Condition	1	1	3	3		30	27
SCSPS27	Fuel Systems	D4 - Electrical	Fuel tank installed attached to exterior generator.	Fuel tank considered to be in excellent condition	2020	Excellent Condition	1	1	3	3		30	27
SCSPS28	PLC	D4 - Electrical	cabinet PLC which include Allen Bradley Controller, HMI, relays, terminal blocks, back up battery.	Internal components appear to be in good condition.	1991	Good Condition	2	2	3	6		30	-2
SCSPS29	MCC	D4 - Electrical	Eaton MCC enclosure, includes main breaker, switchgear units, bypass, surge protector device, pump control devices, lighting panel and Generator plug.	Installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	5	5		30	27
SCSPS30	Automatic Transfer Switch	D4 - Electrical	Eaton automatic transfer switch	Installed during 2020 upgrades considered to be in excellent condition.	2020	Excellent Condition	1	1	5	5		30	27
						Average Condition	1.5	1.6	3.3	4.9			

Condition Assessment Register - William Street Sewage Pumping Station

Asset Name	Asset Categories	Asset Description			Condition Assessment					Estimated Service Life	Remaining Service Life
			General Comment	Installation Date	Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score		
Bollards, paving, grading, vegetation	D1 - Site		Four (4) Bollards in good condition. Asphalt driveway in good condition with minor ponding noted around wet well.	2020	Excellent Condition	1	1	1	1	50	48
Building	D2 - Structure	5.0m x 7.75m Precast concrete building, precast façade and precast simulated steel roof	Building in good condition .	2020	Excellent Condition	1	1	3	3	75	73
Doors	D2 - Structure	One (1) double leaf painted door	Good condition. Minor paint wear.	2020	Excellent Condition	1	1	1	1	30	28
Interior Lighting	D4 - Electrical	Four (4) ceiling mounted LED fixtures on within control room. Two (2) ceiling mounted LED vapour tight fixtures within dry pit.	All interior lighting are functional. Considered to be in good condition based on age.	2020	Excellent Condition	1	1	1	1	30	28
Exterior Lighting	D4 - Electrical	Three (3) wall mounted exterior lights	All exterior lighting are functional. Consider to be in good condition based on age.	2020	Excellent Condition	1	1	1	1	30	28
Control Building Foundation	D2 - Structure		Building foundation in good condition based on age. No exposed foundation to validate.	2020	Excellent Condition	1	1	3	3	75	73
Dry Well	D2 - Structure	5.5m x 3.5m rectangular wet well, 3m deep precast wet well c/w one stainless steel ventilation pipes, two 900x900 SS pump hatches and FRP ladders.	Good condition, minor water infiltration and hairline cracks.	2020	Excellent Condition	1	2	3	6	75	73
Wet Well	D2 - Structure	4.5m x 5.5m rectangular wet well, 9.3m deep precast wet well c/w two stainless steel ventilation pipes, three 1473x1066 SS pump hatches, one 1982x1266 SS access hatch, and one SS hatch.	Visual inspection completed and appears to be in good condition.	2020	Excellent Condition	1	1	5	5	75	73
Pump 1 - RSP-01	D3 - Mechanical	Flygt 3171.095-1980046. 34hp/25kW, 1765rpm, 3-60Hz, 32A. Spare impeller	Based on age, assumed to be in excellent condition. Spare impeller within control building.	2020	Excellent Condition	1	1	4	4	30	28
Pump 2 RSP-02	D3 - Mechanical	Flygt 3231/775-2011036 355hp/250kW, 1780pm, 3-60Hz, 5293A. Spare impeller.	Based on age, assumed to be in excellent condition. Operation noted, full speed has not been tested or implemented.	2020	Excellent Condition	1	3	4	12	30	28
Pump 3 - RSP-03	D3 - Mechanical	Flygt 3315.095-2010004 110hp/82kW, 1185rpm, 3-60Hz, 112A. Spare impeller.	Based on age, assumed to be in excellent condition. Spare impeller within control building.	2020	Excellent Condition	1	1	4	4	30	28
Surge Relief Valve	D3 - Mechanical	APCO Dezurik SRA-3000A Surge Relief Valve.	Appears to be functional and in good condition.	2020	Excellent Condition	1	2	4	8	30	28
Air Release Valves (2)	D3 - Mechanical	100mm ASC APCO combination air valve.	Appears to be functional and in good condition.	2020	Excellent Condition	1	1	3	3	30	28
Ball Valves (2)	D3 - Mechanical	50 mm diameter.	SS ball valves visually inspected. Considered to be in good condition.	2020	Excellent Condition	1	1	3	3	30	28
Swing Flex Check Valves (4)	D3 - Mechanical	3-250mm and 1 - 300mm - APCO/Dezurik 100S rubber flap check valve c/w hold open device.	Valves visually inspected. Considered to be in good condition.	2020	Excellent Condition	1	1	4	4	30	28
Knife Gate Valves (14)	D3 - Mechanical	150mm - 300mm Dezurik, 316SS EPDM wafer style knife gate valve. 2 - 600mm KGV in wet well not visually inspected. 2 - actuated valves on forcemain outlets.	Valves visually inspected. Considered to be in good condition.	2020	Excellent Condition	1	1	4	4	30	28
Slide Gate Valve	D3 - Mechanical	600x600mm slide gate valve located in dividing wall within wet well.	Valve failed per Operations.	2020	Failed Condition	5	5	2	10	50	48

Condition Assessment Register - William Street Sewage Pumping Station

Asset Name	Asset Categories	Asset Description	General Comment	Installation Date	Condition Assessment: Condition Comment	Physical Condition Rating (1-5)	Performance Condition Rating (Based on Operation's Input)	Consequence of Failure (1-5)	Risk Score	Estimated Service Life	Remaining Service Life
Overflow Flowmeter	D3 - Mechanical	Greyline AVFM 6.1 Area Velocity Flow Meter.	Flowmeter areas to be in good condition, minor solids build up indicating previous overflow.	2020	Good Condition	1	2	1	2	20	18
Flowmeter (2)	D3 - Mechanical	250mm Endress+Hauser Promag W electromagnetic flow meter with local display within control room .	Flowmeter appears new and recently replaced. Conduit needs to be updated to ensure water tight seal.	2020	Good Condition	1	1	1	1	25	23
Piping (Dry Pit)	D3 - Mechanical	50mm - 300mm 304L SS Process Piping with supports and welded flanges. Victaulic fittings. PVC piping for drain lines.	Minor corrosion on welds, overall good condition.	2020	Good condition	2	2	4	8	50	48
Piping (Wet Well)	D3 - Mechanical	50mm - 300mm 304L SS Process Piping with wall supports and welded flanges.	Corrosion on elbows and wear. Monitoring of condition is recommended.	2020	Good condition	2	2	4	8	30	28
HVAC	D3 - Mechanical	One (1) Ouellet Electric heater. One Wall mounted split unit AC	HVAC equipment appears to be in good condition based on visual inspection and performance.	2020	Good Condition	2	2	1	2	20	18
Security System	D3 - Mechanical	Three (3) exterior camera with CCTV monitor within the control building. C/w security system.	Appears to be in good condition and functioning properly	2020	Good Condition	1	1	1	1	20	18
Level Instrumentation	D4 - Electrical	Two (2) Siemens MultiRanger 100 ultrasonic level transmitters.	Good condition.	2020	Good condition	1	2	1	2	20	18
Generator	D4 - Electrical	Outdoor Kohler Diesel Engine and Generator with integrated fuel tank. 350kW, 3PH, 600V, 218.7 Kva, 60Hz.	Generator appears to be in good condition. Generator test was not completed.	2020	Good condition	1	1	3	3	25	23
PLC	D4 - Electrical	Allen Bradley cabinet PLC which includes Allen Bradley Controller, HMI, relays, and terminal blocks.	Internal components not inspected.	2020	Good Condition	1	1	3	3	20	18
MCC	D4 - Electrical	MCC Enclosure, includes main breaker, switchgear units, local disconnects, and three (3) VFD c/w Flygt MiniCAS or MAS 711.	Internal components not inspected.	2020	Good Condition	1	1	5	5	30	28
Automatic Transfer Switch	D4 - Electrical	Cutler-Hammer Automatic Transfer Switch (ATS) within MCC enclosure.	Internal components not inspected.	2020	Good Condition	1	1	5	5	30	28
Lighting Panel	D4 - Electrical	Wall mounted 120/240V Lighting panel in control building.	Appears to be in good condition.	2020	Good Condition	1	1	2	2	30	28
Platforms	D3 - Mechanical	FRP landings and grating.		2020	Good Condition	1	1	3	3	50	48
Safety equipment, stairs, Ladders	D3 - Mechanical	FRP landings, grating and ladders.		2020	Good Condition	2	2	3	6	30	28
Hatches	D3 - Mechanical	Three 1473x1066 SS pump hatches, one 1982x1266 SS access hatch, and one SS hatch. All complete with FRP safety grating.		2020	Good condition	2	2	1	2	30	28

APPENDIX D:
GROWTH FLOWS

SOUTH HURON
WATER AND WASTEWATER MASTER PLAN UPDATE
Growth Flows- Wastewater

Growth Details									Wastewater Flow Details						
ID	Status	Name	Town	Type	Area (ha)	Units	Population (2.3 ppu or 40 ppha)	ppha	SPS Catchment	RDII (L/s)	ADWF - Res (L/s)	ADWF - Emp (L/s)	ADWF - Total (L/s)	Peaking Factor	PWWF (L/s)
1A	Developed	Buckingham Estates	Exeter	Res	18.8	120	276	15	William SPS	3.76	0.77		0.77	4.09	6.89
8	Developed	Southpoint Subdivision	Exeter	Res	1.8	38	87	48	Snider SPS	0.36	0.24		0.24	4.26	1.40
10	Partially Developed	Stoney Ridge	Exeter	Res	3.7	32	74	20	William SPS	0.74	0.20		0.20	4.28	1.62
1B	Potential Residential Area	HDC Lands	Exeter	Res	11.4	328	754	66	William SPS	2.27	2.10		2.10	3.88	10.40
2	Potential Commercial/ Industrial/ Residential Area	Ondrejicka	Exeter	Res/Emp	13.8	-	552	40	Snider SPS	2.76	1.53		1.53	3.95	8.82
3	Long Term Care Facility	Southbridge	Exeter	Res	1.7	99	228	134	Snider SPS	0.34	0.63		0.63	4.13	2.95
4	Potential Residential Area	Willis Way	Exeter	Res	1.6	6	14	9	Snider SPS	0.32	0.04		0.04	4.40	0.48
5	Potential Residential Area	Shapton	Exeter	Res	2.2	38	87	39	Snider SPS	0.45	0.24		0.24	4.26	1.48
6	Potential Residential Area	McBride	Exeter	Res	26.5	-	1,060	40	Snider SPS	5.30	2.95		2.95	3.78	16.44
7	Potential Residential Area	Hamather	Exeter	Res	12.1	120	276	23	Snider SPS	2.41	0.77		0.77	4.09	5.55
9	Potential Residential Area	Pooley	Exeter	Res	5.8	100	230	40	Snider SPS	1.16	0.64		0.64	4.13	3.79
11	Potential Residential Area	Hamather/McBride	Exeter (Outside SAB)	Res	19.0	178	409	22	William SPS	3.80	1.14		1.14	4.02	8.37
12	Draft Plan Approved	Windermere Subdivision	Exeter	Res	23.6	160	368	16	William SPS	4.72	1.02		1.02	4.04	8.85
13	Potential Residential Area	Rasenberg	Exeter	Res	9.4	163	375	40	William SPS	1.89	1.04		1.04	4.04	6.09
14	Potential Residential Area	CVD Subdivision	Exeter	Res/Emp	17.5	238	916	52	William SPS	3.49	1.52	1.33	2.85	3.82	14.40
33	Potential Commercial/ Industrial Area	Exeter Produce	Exeter	Emp	11.9	-	475	40	William SPS	2.37	1.32		1.32	3.99	7.63
17B	Pre-Servicing Agreement	Sol Haven Phase I	Grand Bend	Res	12.2	182	490	40	PS2	2.44	1.36		1.36	3.98	7.85
15	Potential Residential Area	South of Pollock Farms	Grand Bend (Outside SAB)	Res	10.7	127	292	27	PS2	2.14	0.81		0.81	4.08	5.46
16	Potential Residential Area	Turnbull Lands	Grand Bend (Outside SAB)	Res	41.1	456	1,049	26	PS2	8.22	2.91		2.91	3.79	19.25
17A	Potential Residential Area	Sol Haven Phase II	Grand Bend	Res	40.4	241	554	14	PS2	8.08	1.54		1.54	3.95	14.16
18	Potential Residential Area	Zone 2 Future Development	Grand Bend	Res	164.9	1088	2,502	15	PS2	32.98	6.95		6.95	3.51	57.37
19	Potential Residential Area	Grand Cove Estates Phase 5	Grand Bend	Res	4.0	34	78	20	PS2	0.79	0.22		0.22	4.27	1.72
28	Potential Commercial/ Industrial Area	Bendtech	Grand Bend (Outside SAB)	Emp	21.2	-	850	40	POG	4.25	2.36		2.36	3.84	13.33
31	Potential Commercial Area	Watson	Grand Bend	Emp	3.5	-	141	40	PS2	0.71	0.39		0.39	4.20	2.36
35	Potential Residential Area	Hotson	Grand Bend	Res	8.4	-	336	40	PS2	1.68	0.93		0.93	4.06	5.47
36	Potential Commercial Area	Grand Bend Proposed Commercial	Grand Bend (Outside SAB)	Emp	11.1	-	444	40	PS2	2.22		1.61	1.61	4.00	8.64
20	Potential Residential Area	Crediton Village Centre	Crediton	Res	33.6	337	775	23	Crediton SPS	6.73	2.15		2.15	3.87	15.06
21	Potential Residential Area	Morrisey	Crediton	Res	1.3	8	18	15	Crediton SPS	0.25	0.05		0.05	4.39	0.48
22	Potential Residential Area	Stephan	Crediton	Res	7.4	-	298	40	Crediton SPS	1.49	0.83		0.83	4.08	4.86
23	Potential Residential Area	Huron Park Proposed 1	Huron Park	Res	4.1	48	110	27	Huron Park SPS	0.82	0.31		0.31	4.23	2.12
24	Potential Residential Area	Huron Park Proposed 2	Huron Park	Res	9.5	98	225	24	Huron Park SPS	1.89	0.63		0.63	4.13	4.48
29	Potential Residential Area	Huron Park Proposed 3	Huron Park	Res	1.3	-	51	40	Huron Park SPS	0.25	0.14		0.14	4.31	0.86
30	Potential Residential Area	Huron Park Proposed 4	Huron Park	Res	1.5	-	58	40	Huron Park SPS	0.29	0.16		0.16	4.30	0.99
25	Potential Residential Area	Pavkeje Subdivision	Centralia	Res	3.4	13	30	9	Huron Park SPS	0.69	0.08		0.08	4.35	1.05
26	Potential Residential Area	Hodgins	Centralia	Res	4.8	-	194	40	Huron Park SPS	0.97	0.54		0.54	4.15	3.20
27	Potential Residential Area	Centralia Proposed 1	Centralia	Res	2.0	-	81	40	Huron Park SPS	0.41	0.23		0.23	4.27	1.37
34	Potential Industrial Area	Centralia Proposed 2	Centralia	Emp	5.1	-	204	40	Huron Park SPS	1.02		0.74	0.74	4.14	4.09
37	Potential Industrial Area	Centralia Proposed 3	Centralia (Outside SAB)	Emp	18.2	-	244	40	Huron Park SPS	1.22		0.88	0.88	4.12	4.85
			Centralia	-	**21.5**	**13**	**753**		**POG**	**4.25**	**2.36**	**0.00**	**2.36**	**3.84**	**13.33**
			Exeter	-	**180.7**	**1620**	**6,181**		**William SPS**	**23.05**	**9.11**	**1.33**	**10.44**	**3.37**	**58.22**
			Grand Bend	-	**317.5**	**2128**	**6,737**		**Snider SPS**	**13.10**	**7.04**	**0.00**	**7.04**	**3.50**	**37.76**
			Crediton	-	**42.3**	**345**	**1,091**		**PS2**	**59.26**	**15.12**	**1.61**	**16.73**	**3.18**	**112.42**
			Huron Park	-	**16.3**	**146**	**445**		**Crediton SPS**	**8.47**	**3.03**	**0.00**	**3.03**	**3.78**	**19.91**
			Total	-	**578.4**	**4252**	**15,208**		**Huron Park SPS**	**7.56**	**2.08**	**1.62**	**3.70**	**3.75**	**21.44**
									Exeter WWTP	**52.17**	**21.26**	**2.95**	**24.22**	**3.03**	**125.44**
									Grand Bend WWTP	**63.51**	**17.48**	**1.61**	**19.09**	**3.12**	**123.11**

APPENDIX E: EVALUATION TABLE

Table 1: Exeter Wastewater Treatment Facility Evaluation

Category	Criteria	Alternative 1 – Do Nothing		Alternative 2 – Add UV Treatment		Alternative 3 – Mechanical Filter		Alternative 4 – Full Mechanical Plant	
Technical Impacts	**Meets existing and future servicing needs**	🔴	• Only services existing system and proposed growth	🟡	• Only services existing system and proposed growth	🟡	• Only services existing system and proposed growth	🟢	• Allows growth flexibility to service all settlement boundary expansion growth
	Provides a reliable service	🔴	• No focus on security of supply	🟡	• Minimal focus on security of supply	🟡	• Minimal focus on security of supply	🟢	• Provides redundancy for major system processes
	Minimizes and manages construction risk	🟢	• No impacts	🟢	• Minimal impacts during construction	🟢	• Minimal impacts during construction	🟡	• Moderate impacts during construction
	Supports phased expansion of the system	🔴	• Does not service all boundary expansion growth	🔴	• Does not service all boundary expansion growth	🔴	• Does not service all boundary expansion growth	🟢	• Services all growth
	Operational Complexity	🟢	• No changes	🟢	• Minimal changes to existing operations	🟢	• Minimal changes to existing operations	🟡	• Major changes to existing operations
	Resiliency to climate change	🔴	• No additional measures for system resiliency	🟡	• Supports further expansion of plant	🟡	• Supports further expansion of plant	🟢	• Provides more flexibility for processes to be taken offline for maintenance
Environmental Impacts	**Protects environment features**	🟢	• No impacts	🟢	• Construction to avoid	🟢	• Construction to avoid	🟢	• Construction to avoid
	Protects wildlife and species at risk	🟢	• No impacts	🟢	• Construction to avoid	🟢	• Construction to avoid	🟢	• Construction to avoid
	Minimizes climate change impacts	🟢	• No changes to existing GHG production	🟢	• Minimal increase in GHG due to increased facility operations	🟢	• Minimal increase in GHG due to increased facility operations	🟡	• Major increase in GHG due to increased facility operations
Social and Cultural Impacts	**Protects resident quality of life**	🟢	• No impacts to existing residents	🟢	• Minimal to no impacts to existing residents	🟢	• Minimal to no impacts to existing residents	🟡	• Greatest impacts to existing residents
	Manages and minimizes construction impacts	🟢	• No construction impacts	🟢	• Construction impacts at existing facility	🟢	• Construction impacts at existing facility	🟡	• Greatest construction impacts at existing facility
	Protects cultural heritage and archeological features	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological
Financial Impacts	**Capital and life-cycle costs**	🟢	• N/A	🟢	• $	🟢	• $$	🟡	• $$$$$
	Operation and maintenance costs	🟢	• No changes	🟢	• Moderate increase in O&M costs	🟢	• Moderate increase in O&M costs	🟡	• Highest O&M costs
	Aligns with approval and permitting process	🟢	• At existing site	🟢	• At existing site	🟢	• At existing site	🟢	• At existing site

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

Table 2: South Exeter SPS Evaluation

Category	Criteria	Alternative 1 – Upgrade existing Snider Crescent SPS (One SPS)		Alternative 2 – One new SPS north of existing Snider Crescent SPS (One SPS)		Alternative 3 – New SPS north of existing Snider Crescent SPS and utilize existing Snider Crescent SPS (Two SPS's)		Alternative 4 – One New SPS northwest of Snider Crescent SPS in Boundary Expansion Lands (One SPS)	
Technical Impacts	Meets existing and future servicing needs	High	• Yes	High	• Yes	High	• Yes	High	• Yes
	Provides a reliable service	Medium	• Only focuses on servicing proposed growth parcels southeast of existing SPS and not all boundary expansion lands	Medium	• Only focuses on servicing proposed growth parcels southeast of existing SPS and not all boundary expansion lands	Medium	• Only focuses on servicing proposed growth parcels southeast of existing SPS and not all boundary expansion lands	High	• Includes services to greater boundary expansion lands
	Minimizes and manages construction risk	High	• Construction in farm lands/proposed development lands	High	• Construction in farm lands/proposed development lands	High	• Construction in farm lands/proposed development lands	High	• Construction in farm lands/proposed development lands
	Supports phased expansion of the system	High	• Support growth within existing SAB	High	• Support growth within existing SAB	High	• Support growth within existing SAB	High	• Supports proposed growth and settlement boundary expansion lands
	Operational Complexity	High	• Simpler operation with one SPS	High	• Simpler operation with one SPS	Medium	• More complex operation with two SPS	High	• Simpler operation with one SPS
	Resiliency to climate change	Medium	• No additional measures for system resiliency	High	• Ability to size new SPS and forcemain to accommodate	High	• Ability to size new SPS and forcemain to accommodate	High	• Ability to size new SPS and forcemain to accommodate
Environmental Impacts	Protects environment features	High	• Construction to avoid	High	• Construction to avoid	High	• Construction to avoid	High	• Construction to avoid
	Protects wildlife and species at risk	High	• Construction to avoid	High	• Construction to avoid	High	• Construction to avoid	High	• Construction to avoid
	Minimizes climate change impacts	High	• No changes to existing GHG production with one SPS	High	• No changes to existing GHG production with one SPS	Medium	• Increase to existing GHG production with two SPS	High	• No changes to existing GHG production with one SPS
Social and Cultural Impacts	Protects resident quality of life	Medium	• Some impacts to existing residents	Medium	• Some impacts to existing residents	Medium	• Some impacts to existing residents	Medium	• Some impacts to existing residents
	Manages and minimizes construction impacts	Medium	• Moderate construction impacts	Medium	• Moderate construction impacts	Low	• Major construction impacts	Medium	• Moderate construction impacts
	Protects cultural heritage and archeological features	High	• Unknown impacts to cultural heritage and archeological	High	• Unknown impacts to cultural heritage and archeological	High	• Unknown impacts to cultural heritage and archeological	High	• Unknown impacts to cultural heritage and archeological
Financial Impacts	Capital and life-cycle costs	High	• $$	High	• $$	High	• $$	High	• $$
	Operation and maintenance costs	High	• Maintains similar O&M with one SPS	High	• Maintains similar O&M with one SPS	Low	• High O&M with two SPSs	High	• Maintains similar O&M with one SPS
	Aligns with approval and permitting process	High	• No land acquisition needed	Medium	• Land acquisition needed for new SPS • New SPS to be located in growth lands	Medium	• Land acquisition needed for new SPS • New SPS to be located in growth lands	Medium	• Land acquisition needed for new SPS and forcemains • New SPS to be located in growth lands

Evaluation Scoring Legend: High Medium Low

Table 3: William Street SPS Evaluation

Category	Criteria		Alternative 1 – William Street SPS Capacity Upgrades		Alternative 2 – William Street SPS Catchment I&I Reduction
Technical Impacts	Meets existing and future servicing needs	🟢	• Yes	🟢	• Yes
	Provides a reliable service	🟢	• Wet weather flows will continue to increase as sewers deteriorate and existing problems remain	🟢	• Reduced wet weather flows decreases potential for basement flooding
	Minimizes and manages construction risk	🟢	• Minimal impacts during construction	🟢	• Minimal impacts during construction
	Supports phased expansion of the system	🟢	• No additional flexibility from existing system	🟢	• Increased flexibility for proposed growth
	Operational Complexity	🟢	• No changes	🟢	• No changes
	Resiliency to climate change	🟡	• No additional measures for system resiliency	🟢	• Improved system resiliency due to relief on sewers
Environmental Impacts	Protects environment features	🟡	• Does not improve risk of overflows to the environment	🟢	• Reduces risk of overflows to the environment
	Protects wildlife and species at risk	🟡	• Does not improve risk of overflows to the environment	🟢	• Reduces risk of overflows to the environment
	Minimizes climate change impacts	🟡	• No additional measures for system resiliency	🟢	• Increased resilience due to management of existing I&I
Social and Cultural Impacts	Protects resident quality of life	🔴	• High risk of basement flooding due to existing sewer constraints	🟢	• Reduced risk of basement flooding due to existing sewer constraints • Provides resilience to existing system
	Manages and minimizes construction impacts	🟢	• Minimal impact as construction will be at existing facility	🟡	• May be difficult to isolate and repair existing constraints
	Protects cultural heritage and archeological features	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological
Financial Impacts	Capital and life-cycle costs	🟡	• $$ • Increased costs for pumping and treatment to address wet weather flows	🟢	• $ • Reduced costs for pumping and treatment to address wet weather flows
	Operation and maintenance costs	🔴	• High O&M costs to accommodate high flows through pumping	🟢	• Low O&M costs
	Aligns with approval and permitting process	🟢	• No land acquisition needed	🟢	• No land acquisition needed

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

Table 4: South Exeter Trunk Sewer Evaluation

Category	Criteria	Alternative 1 – Upgrade Existing Sewer		Alternative 2 – Construct New Trunk Sewer	
Technical Impacts	Meets existing and future servicing needs	🟢	• Yes	🟢	• Yes
	Provides a reliable service	🟡	• Existing trunk sewer can only accommodate proposed growth and not all the settlement boundary expansion lands	🟢	• Potential to size to accommodate all settlement boundary expansion lands
	Minimizes and manages construction risk	🟡	• Construction through existing neighbourhood	🟢	• Construction in farm lands/proposed development lands
	Supports phased expansion of the system	🟢	• Relieves existing deficiencies	🟢	• Supports proposed growth and settlement boundary expansion lands
	Operational Complexity	🟢	• No changes to existing complexity	🟢	• No changes to existing complexity
	Resiliency to climate change	🟢	• Upsize existing sewer to provide additional capacity	🟢	• New sewer to accommodate future PWWF
Environmental Impacts	Protects environment features	🟢	• No impact, construction in right-of-way	🟡	• Impacts to be minimized; however, potential impact through existing farmland
	Protects wildlife and species at risk	🟢	• No impact, construction in right-of-way	🟡	• Impacts to be minimized; however, potential impact through existing farmland
	Minimizes climate change impacts	🟢	• No changes	🟢	• No changes
Social and Cultural Impacts	Protects resident quality of life	🟢	• Sewers at capacity are upsized	🟢	• New sewer to accommodate flows in excess of existing sewer capacity
	Manages and minimizes construction impacts	🟡	• High impact to local traffic	🟢	• Minimal impact to local traffic with road crossing, remaining construction to be in undeveloped lands
	Protects cultural heritage and archeological features	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological
Financial Impacts	Capital and life-cycle costs	🟡	• $$$	🟡	• $$$
	Operation and maintenance costs	🟢	• Reduced I&I needs due to upsized sewer	🟢	• Reduced I&I needs due to upsized sewer
	Aligns with approval and permitting process	🟢	• No land acquisition needed	🟡	• Land acquisition required

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

Table 5: Exeter Sewer System Upgrades Evaluation

Category	Criteria	Alternative 1 – I&I Reduction Only		Alternative 2 – Sewer Upgrades Only		Alternative 3 – I&I Reduction and Sewer Upgrades	
Technical Impacts	Meets existing and future servicing needs	🟢	• Yes	🟢	• Yes	🟢	• Yes
	Provides a reliable service	🟢	• Reduced wet weather flows decreases potential for basement flooding	🟡	• Wet weather base flows will continue to be high	🟢	• Reduced wet weather flows decreases potential for basement flooding
	Minimizes and manages construction risk	🟢	• Minimal impacts during construction	🟡	• Construction through existing neighbourhoods	🟡	• Construction through existing neighbourhoods
	Supports phased expansion of the system	🟢	• Increased flexibility for proposed growth	🟢	• Immediately realize capacity for proposed growth	🟢	• Both short and long term increased flexibility for proposed growth
	Operational Complexity	🟢	• No changes	🟢	• No changes	🟢	• No changes
	Resiliency to climate change	🟢	• Improved system resiliency due to relief on sewers	🟢	• No additional measures for system resiliency	🟢	• No additional measures for system resiliency
Environmental Impacts	Protects environment features	🟢	• Reduces risk of overflows to the environment	🟢	• Reduces risk of overflows to the environment in the short term	🟢	• Reduces risk of overflows to the environment in both short and long term
	Protects wildlife and species at risk	🟢	• Reduces risk of overflows to the environment	🟢	• Reduces risk of overflows to the environment in the short term	🟢	• Reduces risk of overflows to the environment in both short and long term
	Minimizes climate change impacts	🟢	• Increased resilience due to management of existing I&I	🟢	• Increased resilience due to management of existing I&I	🟢	• Increased resilience due to management of existing I&I
Social and Cultural Impacts	Protects resident quality of life	🟢	• Reduced risk of basement flooding due to existing sewer constraints • Provides resilience to existing system	🟢	• Reduced risk of basement flooding due to existing sewer constraints • Provides resilience to existing system	🟢	• Reduced risk of basement flooding due to existing sewer constraints • Provides resilience to existing system
	Manages and minimizes construction impacts	🟡	• May be difficult to isolate and repair existing constraints	🟡	• Impact to local traffic	🟡	• May be difficult to isolate and repair existing constraints • Impact to local traffic
	Protects cultural heritage and archeological features	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological
Financial Impacts	Capital and life-cycle costs	🟢	• $ • Reduced costs for pumping and treatment to address wet weather flows	🟡	• $$ • Increased costs for pumping and treatment to address wet weather flows	🟢	• $$ • Reduced costs for pumping and treatment to address wet weather flows
	Operation and maintenance costs	🟢	• Lowest O&M costs	🟢	• High O&M costs to accommodate high flows through pumping	🟢	• Low O&M costs
	Aligns with approval and permitting process	🟢	• No land acquisition needed	🟢	• No land acquisition needed	🟢	• No land acquisition needed

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

Table 6: Crediton and Huron Park Pumping Stations Evaluation

Category	Criteria	Alternative 1 – Separate Crediton and Huron Park Forcemains		Alternative 2 – Drop Crediton SPS System Curve		Alternative 3 – New Storage at Huron Park SPS		Alternative 4 – Huron Park I&I Reduction	
Technical Impacts	Meets existing and future servicing needs	🟢	• Yes	🟢	• Yes	🟢	• Yes	🟢	• Yes
	Provides a reliable service	🟢	• Allows for the operation of both SPS simultaneously	🟢	• Allows for the operation of both SPS simultaneously	🟢	• Accommodation for overflows through storage	🟢	• Reduced wet weather flows to reduce overflows
	Minimizes and manages construction risk	🟡	• Construction along existing RoW	🟢	• No construction required	🟢	• Construction at existing facility	🟡	• Minimal impacts during construction
	Supports phased expansion of the system	🟡	• Does not address ongoing I&I issue	🟡	• Does not address ongoing I&I issue	🟢	• Increased flexibility for proposed growth	🟢	• Increased flexibility for proposed growth
	Operational Complexity	🟢	• Improves operation of the two SPS	🟢	• Improves operation of the two SPS	🟡	• No changes	🟡	• No changes
	Resiliency to climate change	🟡	• Does not address ongoing I&I issue	🟡	• Does not address ongoing I&I issue	🟢	• Improved resiliency to accommodate overflows	🟢	• Improved system resiliency due to relief on sewers
Environmental Impacts	Protects environment features	🟡	• Does not address overflows due to high wet weather flow	🟡	• Does not address overflows due to high wet weather flow	🟢	• Accommodation for overflows through storage	🟢	• Reduces risk of overflows to the environment
	Protects wildlife and species at risk	🟡	• Does not address overflows due to high wet weather flow	🟡	• Does not address overflows due to high wet weather flow	🟢	• Accommodation for overflows through storage	🟢	• Reduces risk of overflows to the environment
	Minimizes climate change impacts	🟢	• Allows SPS to operate at a higher capacity then existing	🟢	• Allows SPS to operate at a higher capacity then existing	🟡	• Resilience similar to existing	🟢	• Increased resilience due to management of existing I&I
Social and Cultural Impacts	Protects resident quality of life	🟢	• Provides resilience to existing system	🟢	• Provides resilience to existing system	🟢	• Reduced risk of basement flooding due to existing sewer constraints	🟢	• Reduced risk of basement flooding due to existing sewer constraints • Provides resilience to existing system
	Manages and minimizes construction impacts	🟡	• Impact to local, rural traffic	🟢	• No construction required	🟢	• Construction at existing facility	🟡	• May be difficult to isolate and repair existing constraints
	Protects cultural heritage and archeological features	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological	🟢	• Unknown impacts to cultural heritage and archeological
Financial Impacts	Capital and life-cycle costs	🟢	• $$	🟢	• $	🟢	• $	🟢	• $
	Operation and maintenance costs	🟡	• Increased O&M costs to operate new forcemain	🟢	• Similar O&M costs to existing	🟢	• Increased O&M costs to operate new storage	🟢	• Similar O&M costs to existing
	Aligns with approval and permitting process	🟢	• No land acquisition needed, forcemain in existing ROW	🟢	• No land acquisition needed	🟢	• No land acquisition needed, storage at existing site	🟢	• No land acquisition needed

Evaluation Scoring Legend: 🟢 High 🟡 Medium 🔴 Low

APPENDIX F: CAPITAL PROGRAM PROJECT SHEETS