TOWN OF SAUGEEN SHORES

2025 WATER AND WASTEWATER SERVICING MASTER PLAN UPDATE

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TOWN OF SAUGEEN SHORES

2025 WATER AND WASTEWATER SERVICING MASTER PLAN UPDATE

October 31, 2025

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File No. 24079

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TOWN OF SAUGEEN SHORES

2025 WATER AND WASTEWATER SERVICING MASTER PLAN UPDATE

EXECUTIVE SUMMARY

I. Introduction

The Town of Saugeen Shores initiated an update to the 2020 Water and Wastewater Servicing Master Plan to identify infrastructure needs associated with existing water treatment, storage and distribution system, and the wastewater treatment and collection systems in Port Elgin and Southampton.

This Master Plan will serve as a planning document for water and sanitary sewage service needs for the period from 2025-2045. This update to the 2020 Master Plan included a reassessment of current and future water and wastewater infrastructure needs, updating growth and development forecasts, reserve capacity calculations, and system modeling to identify future projects.

The Master Plan was completed following the Master Plan process as identified within the Municipal Class Environmental Assessment process. This Plan is following Approach 1, defining broad infrastructure requirements within the study area and serving as the basis for future detailed investigations as required.

II. Growth and Development

The current population of Port Elgin and Southampton are 9,619 and 3,993 persons respectively. The current customer count for the water system and wastewater systems, based on service laterals and curb stop are as follows:

- Saugeen Shores water system: 6,563
- Port Elgin wastewater system: 3,898
- Southampton wastewater system: 2,660
- Combined wastewater systems: 6,558

The Town of Saugeen Shores has experienced significant growth in recent years and continued growth is expected. For the assessment of reserve capacity and future infrastructure needs, water and wastewater usage associated with future development

was considered. This included committed or approved developments, active development proposals that are not considered commitments at this time, as well as vacant residential and future residential lands within and outside of the current urban boundaries (considered the potential long-term development or build-out scenario). The commitments also include the amount of water supply allocated to Saugeen First Nation in the current agreement with the Town.

The estimated number of additional Equivalent Residential Units (ERUs) related to approved developments, active development proposals and long-term development scenario are shown in Table 1.

Table 1 – Summary of Development Potential in ERUs

Community	Approved Development (ERUs)	Active Proposals (ERUs)	Potential Long-Term Development /Buildout (ERUs)
Port Elgin	1,549	1,674	2,178
Southampton	213	646	404
Totals	**1,762**	**2,320**	**2,582**

In addition to the examination of development proposals, the Master Plan assessed recent population growth forecasts for Port Elgin and Southampton. The high and low growth forecasts are shown in Table 2.

Table 2 – Summary of Forecasted Population Growth Scenarios

Community	Low Growth Scenario	High Growth Scenario
Port Elgin	14,244	15,700
Southampton	5,903	6,513
Total	**20,147**	**22,213**

It should be noted that the potential population from the current approved development commitments and active development proposals when combined, exceeds the forecasted population estimates. Current commitments and proposals combined, if fully built out, would increase the population of Port Elgin and Southampton to approximately 26,500 people.

III. Saugeen Shores Drinking Water System

Port Elgin and Southampton are serviced by a single drinking water system supplied from Lake Huron. The distribution system operates as two separated pressure zones. For the purposes of forecasting future water demands, the water demand per ERU was calculated to be 1.5 m^3/day per ERU.

III.i. Supply Capacity

The current Maximum Daily Demand (MDD) from existing customers is approximately 73% of the existing net treatment capacity. The addition of the approved developments will bring increase usage to 94% of the current net capacity. The current development proposals will increase supply demand beyond the current equipped capacity of the water treatment plant. Based on expected growth, capacity will be reached by approximately 2043.

The existing uncommitted supply is 767 m^3/day, which is equivalent to 511 ERUs, and the current active development proposals include 2,320 ERUs. Given the current rate of growth, the Town could potentially run out of the ability to approve additional development by 2029.

III.ii. Water Storage

Water storage needs for the two-zone system were modelled. From the review of storage needs, it was identified:

- There is an existing storage deficit of approximately 1,300 m^3 in Zone 1.
- To accommodate existing servicing commitments and active development proposals, approximately 2,600 m^3 of additional storage is required.
- For the long-term development or build-out scenario, an additional 5,100 m^3 of water storage will be required.

III.iii. Water Distribution

The water distribution system was modeled in WaterCAD®. For the purposes of this Master Plan, modeling scenarios included existing and future system conditions. The distribution system currently operates with two pressure zones. The modeling identified that with proper watermain sizing and looping, adequate supply to future development lands can be provided for normal operating conditions. Available fire flow, within the northeastern area of Southampton, may be at, or slightly lower than, typical optimum requirements for residential areas. This is already the case for the existing system extremities in that area.

From the modeling, a number of trunk watermain projects to accommodate future development areas were identified. The required watermain sizing will be dependent on the actual scale and sequence of development.

III.iv. Recommended Projects

The following projects related to water supply, storage, and distribution are recommended for existing and future needs and summarized in Table 3. It should be noted that costs are estimated at a conceptual level for planning purposes.

Table 3 – Recommended Projects for Saugeen Shores Drinking Water System

ID	Category	Water Capital Project	Priority	Total Project Cost	EA Requirements
W1	Existing Infrastructure Needs	**WTP Capacity Upgrades/Expansion** o Class EA is underway to address capacity requirements of the Saugeen Shores Water Treatment Plant.	High	TBD	C – currently underway
W2	Existing Infrastructure Needs	**Additional Storage** o Class EA is recommended in 2026 to examine storage upgrade alternatives.	High	TBD, but suggest in the order of $10,000,000 to construct one elevated storage facility	B
W3	Development Servicing Needs	**Concession 10 Watermain Extension** o 1,810 m of 250 mm watermain along Concession 10 from Lakeside Woods Crescent to Goderich Street.	Low, but subject to development timing	$2,650,000	Exempt - provided within existing road allowance
W4	Development Servicing Needs	**Summerside Watermain Extension 1** o 370 m of 250 mm watermain along Bruce Street from Hawthorne Street to Concession 10.	Low, but subject to development timing	$550,000	Exempt - provided within existing road allowance
W5	Development Servicing Needs	**Summerside Watermain Extension 2** o 230 m of 200 mm watermain along Waterloo Street from 225 m north of Mary Rose Avenue to Concession 10.	Low, but subject to development timing	$320,000	Exempt - provided within existing road allowance
W6	Development Servicing Needs	**Bruce Road 17 Watermain Extension** o 890 m of 300 mm watermain along Bruce Road 17 from Westlinks Drive to Sideroad 13/14.	Low, but subject to development timing	$1,410,000	Exempt - provided within existing road allowance
W7	Development Servicing Needs	**Sideroad 13/14 Watermain Extension** o 910 m of 300 mm watermain along Sideroad 13/14 from Bruce Road 17 to 910 m south of Bruce Road 17.	Low, but subject to development timing	$1,440,000	Exempt - provided within existing road allowance

IV. Port Elgin Sewage System

IV.i. Description

The Port Elgin sewage system includes six Sewage Pumping Stations (SPS) and a Wastewater Treatment Plant (WWTP), with gravity sewers and forcemains. It currently services approximately 3,900 customers in the community. The plant provides secondary level treatment and discharges to Mill Creek.

From current usage data and including an allowance for inflow and infiltration, a design flow of 1.0 m^3/day per ERU was utilized for forecasting purposes.

IV.ii. Port Elgin WWTP Reserve Capacity

The reserve capacity for the Port Elgin WWTP was assessed, based on existing usage and future development needs. There is currently 2,032 m^3/day of uncommitted capacity within the WWTP. If the active developments proposals within Port Elgin are considered, the remaining capacity is 358 m^3/day. To accommodate the long-term developments, an additional 2,224 m^3/day of capacity will be required. Based on projected growth, capacity at the WWTP will be available through to 2045.

IV.iii. Wastewater Collection System

Capacities of the SPSs for the Port Elgin sewage system were also reviewed. From the modeling, SPS 9 is operating at or near capacity under existing conditions. It is recommended peak flows at this station are monitored. Under the long-term development scenario, SPS 6 will require a capacity expansion. Upgrades 6 to the power supply at SPS 6 are also recommended if additional flows are directed to this station. A flow diversion from SPS 9 to SPS 6 via a sanitary sewer flow reversal on Highland Street is also recommended to address peak flows at each station.

Sewer capacities were also assessed against existing and future peak wastewater flow estimates. A number of sewer segments were identified as theoretically over-committed in terms of capacity for the existing system conditions. With growth, the number of sewer segments with constrained capacity will increase. Trunk sewer upgrades have been recommended to address future capacity requirements. It is also recommended that a sewer flow monitoring study be conducted to verify actual flow conditions and sewer slopes.

IV.iv. Recommended Projects

The following projects related to the Port Elgin sewage system are recommended (Table 4).

Table 4 – Recommend Projects for Port Elgin Sewage System

ID	Category	Wastewater Capital Project	Priority	EA Requirements	Total Project Cost
PE-WW1	Port Elgin – Existing Infrastructure Needs	WWTP Improvements/Capacity Upgrade o Class EA is underway to address capacity of the headworks, asset rehabilitation upgrades, and operational improvements.	Medium	C – currently underway	TBD
PE-WW2	Port Elgin – Existing Infrastructure Needs	Wellington Street Capacity Evaluation Flow monitoring and confirming slopes/capacity of: o 200 mm sanitary sewers (three sections of sewer 250 m in total length) along Wellington Street northeast of Devonshire Road Avenue to north of Century Drive. o 250 mm sanitary sewers (ten sections of sewer 310 m in total length) along Wellington Street north of Century Drive to River Street.	Low	Exempt	$150,000 for a flow monitoring program targeting various locations in community including SPSs
PE-WW3	Port Elgin – Development Servicing Needs	SPS 6 Upgrades o Identify and complete upgrades needed for the station to operate at design capacity.	Medium	TBD based on findings of assessment	$15,000 to assess issue and identify recommended upgrades Cost of upgrades TBD based on findings
PE-WW4	Port Elgin – Development Servicing Needs	Highland Street Flow Reversal o 320 m of 600 mm sanitary sewer Highland Street from Green Street to Market Street.	Medium	Exempt provided within existing road allowance	$850,000
PE-WW5	Port Elgin – Development Servicing Needs	SPS 8 Forcemain Extension o 1,190 m of 200 mm sanitary forcemain from Lehnen Street between Gustavus St and Green St, to the Port Elgin WWTP.	Low	Exempt provided within existing road allowance	$1,640,000
PE-WW6	Port Elgin – Development Servicing Needs	Harbour Street Upgrades o 220 m of 525 mm sanitary sewer along Harbour Street from Izzard Street to just south of Green Street.	Low	Exempt provided within existing road allowance	$520,000

V. Southampton Sewage System

V.i. General

The Southampton Sewage System consists of a WWTP, and five SPSs. There are approximately 2,660 customers within Southampton. The WWTP provides secondary level treatment and discharges to the Saugeen River.

Similar to the Port Elgin system, a design sewage flow was calculated for future development. The design sewage flow is 1.0 m^3/day per ERU.

V.ii. Southampton WWTP Reserve Capacity

The current treatment capacity of the Southampton WWTP is 3,032 m^3/day. Existing development commitments and active development proposals can be accommodated based on the current capacity. A small increase in WWTP rating will be required to service the long-term development scenario. Such an increase may be achievable with a re-rating. From forecasted growth, capacity will be available beyond 2045.

V.iii. Southampton Sewage Collection System

The capacity of the SPSs was also reviewed. When considering existing demands and committed development, SPS 1, 2, 3, and 5 are theoretically at or near capacity. It is noted that SPS 1 is currently undergoing testing and field investigation to review the station capacity. It is recommended that flows to SPS 2, 3, and 5 are monitored and planning for increases in capacity commence only if peak flows are found to approach station capacity. At SPS 3, any capacity increase should consider the hydraulic implications of the forcemain shared with SPS 1.

The wastewater collection system for Southampton was modeled under existing and future conditions. No sewers were identified as having existing or future flows greater than 100% of their theoretical capacity.

V.iv. Recommended Projects

The following projects are recommended for the Southampton WWTP and collection system (Table 5).

Table 5 – Recommended Projects for Southampton Sewage System

ID	Category	Wastewater Capital Project	Priority	Total Project Cost	EA Requirements
SH-WW1	Southampton – Existing Infrastructure Needs	**WWTP Capacity Upgrades** o Construction underway for Phase 1 of the planned upgrades.	High	$ 26,000,000	EA Completed
SH-WW2	Southampton – Existing Infrastructure Needs	**SPS Flow Monitoring** o Monitoring of peak flow entering SPS 2, 3, and 5 to verify model results of estimated existing peak flows exceeding rated capacities.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Exempt
SH-WW3	Southampton – Development Servicing Needs	**SPS 1 Capacity Upgrade** o Initially, monitor actual flows relative to theoretical estimates o Expand capacity for future design peak flows once impact from development warrants.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring is exempt. Upgrades within existing SPS exempt
SH-WW4	Southampton – Development Servicing Needs	**SPS 2 Capacity Upgrade** o Initially, monitor actual flows relative to theoretical estimates. o Expand capacity for future design peak flows once impact from development warrants.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring – Exempt Upgrades within existing SPS exempt
SH-WW5	Southampton – Development Servicing Needs	**SPS 3 Capacity Upgrade** o Initially, monitor actual flows relative to theoretical estimates. o Expand capacity for future design peak flows once impact from development warrants.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring – Exempt Upgrades within existing SPS exempt
SH-WW6	Southampton – Development Servicing Needs	**SPS 5 Capacity Upgrades** o Initially, monitor actual flows relative to theoretical estimates. o Expand capacity for future design peak flows once impact from development warrants.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring – Exempt Upgrades within existing SPS exempt

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2025 WATER AND WASTEWATER SERVICING MASTER PLAN UPDATE

1.0 INTRODUCTION

1.1 Purpose of the Master Plan

The Town of Saugeen Shores initiated a Master Plan in March of 2025 to identify infrastructure requirements associated with existing water treatment, storage and distribution systems, and the sanitary sewage treatment and collection systems in Port Elgin and Southampton.

This Master Plan establishes a framework for planning for the water and sanitary sewage services needed for the period 2025 to 2045 and is as an update to the Town of Saugeen Shores Water and Sanitary Sewer Servicing Master Plan – 2020 Report (B. M. Ross and Associates Limited, 2021).

This update reassesses current and future water and wastewater infrastructure needs, considering revised growth projections, recent projects, and the timing of future improvements. The Master Plan serves as a strategic planning document to guide and support future water and wastewater infrastructure projects, addressing the timing and sequence of future works and serves as the basis for any future investigations.

1.2 General Description of Master Plans

Master Plans are long-term, strategic planning tools developed by municipalities to integrate land use and infrastructure planning, often for water, wastewater and transportation systems, with the MCEA process (Municipal Engineers Association, 2023). They typically fulfill phases 1 and 2 of the MCEA by identifying problems or opportunities and evaluating alternative solutions. Public, stakeholder and agency consultation is a core component throughout the process, ensuring alignment with community needs and environmental priorities. Master Plans generally share the following characteristics.

Address the key principles of successful environmental planning;

- Provide a strategic level of assessment of various options to better address overall system needs and potential impacts and mitigation;

- Address at least the first two phases of the municipal Class Environmental Assessment (MCEA) process;
- Are generally long-term in nature
- Apply a system-wide approach to planning which relates to infrastructure either geographically or by a particular function;
- Recommend an infrastructure servicing plan which can be implemented through the completion of separate projects; and
- Include descriptions of the specific projects needed to implement the Master Plan

1.3 Integration with the MCEA Process

1.3.1 MCEA Phases

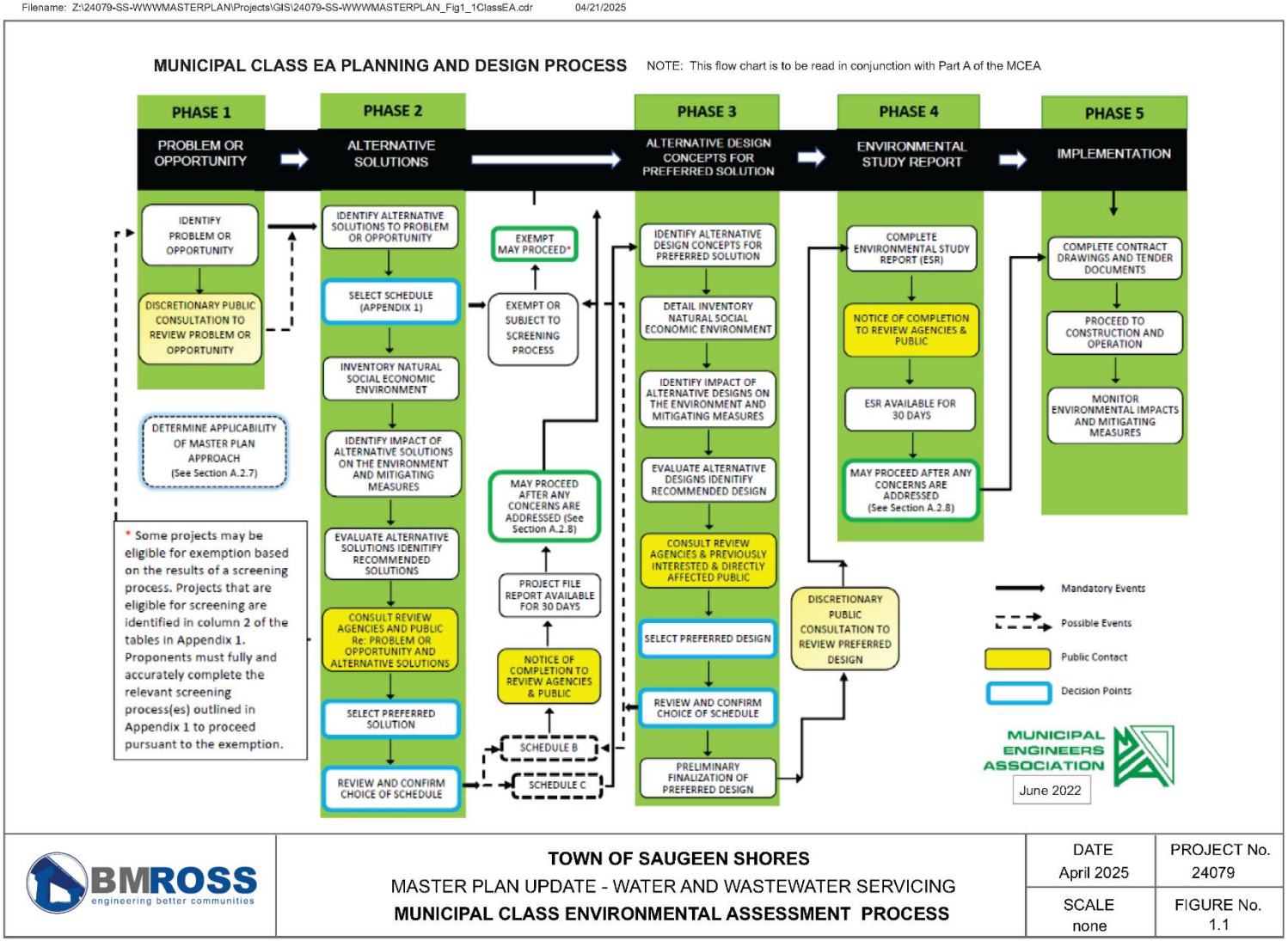
The Master Plan has been completed in accordance with the planning and design process of the MCEA. The MCEA is an approved planning document describing the environmental assessment process that proponents must follow in order to meet the requirements of the Environmental Assessment Act (EA Act) (Municipal Engineers Association, 2023).

The MCEA approach allows for the evaluation of alternative methods of carrying out a project and identifies potential environmental impacts.

The MCEA planning process is divided into five phases, which are described below and illustrated in Figure 1.1.

- Phase 1 – Problem or opportunity identification
- Phase 2 – Evaluation of alternative solutions to the defined problems and selection of a preferred design concept;
- Phase 3 – Identification and evaluation of alternative design concepts and selection of a preferred design concept;
- Phase 4 – Preparation and submission of an Environmental Study Report (ESR) for review; and
- Phase 5 – Implementation of the preferred alternative and monitoring of any impacts.

Figure 1.1 – Municipal Class Environmental Assessment Process



1.3.2 Classification of Project Schedules

Projects associated with master plans are classified into different project schedules according to the potential complexity and the degree of environmental impacts that could be associated with the project. There are four schedules:

- Exempt – Projects that are exempt from the Environmental Assessment Act
- Exempt following completion of the archaeological potential screening and/or collector road screening – projects that may be eligible for exemptions based on the results of the archaeological potential and/or collector screening process.
- Schedule B – Projects that are approved following the completion of a screening process that incorporates Phases 1 and 2 of the MCEA process, as a minimum; and
- Schedule C – Projects that are approved, subject to following the full MCEA process.

The MCEA process is self-regulatory, and municipalities are expected to identify the appropriate level of environmental assessment based upon the projects they are considering.

1.4 Master Plan Framework

1.4.1 Master Plan Approaches

Given the broad nature and scope of Master Plans, the MCEA document provides proponents with four approaches to conducting Master Plan investigations. Proponents are encouraged to adapt and tailor the master planning process to suit the needs of the study being undertaken, providing that, at a minimum, the assessment involves an evaluation of servicing deficiencies followed by a review of possible solutions (i.e. Phases 1 and 2 of the MCEA process).

Table 1.1 summarizes four Master Plan approaches outlined within the MCEA document MCEA.

Table 1.1 – Summary of the MCEA Master Plan Approach

Approach	Key Characteristics	Project Implementation
1	- Master Plan prepared at the conclusion of Phases 1 and 2 of the MCEA process. - Completed at a broad level of assessment. - Serves as the basis for future investigations associated with specific Schedule B and C projects.	- Schedule B and C projects would require further MCEA investigations.

Approach	Key Characteristics	Project Implementation
2	- Master Plan prepared at the conclusion of Phases 1 and 2 of MEA MCEA process. - Includes a more detailed level of investigation and consultation completed, such that it satisfies requirements for Schedule B screenings. - Final public notice for Master Plan serves as Notice of Completion for individual Schedule B projects.	- Schedule B projects are approved. - Schedule C projects must complete Phase 3 and 4 of MCEA process.
3	- Master Plan prepared at the conclusion of Phase 4 of MCEA process. - Level of review and consultation encompasses Phases 1 to 4 of the MCEA process. - Final public notice for Master Plan serves as Notice of Completion for Schedule B and C projects reviewed through the Master Plan.	- Further MCEA investigations are not required for projects reviewed through the Master Plan.
4	- Integration of Master Plan with associated Planning Act approvals. - Establishes need and justification in a very broad context. - Best suited when planning for a significant geographical area for an extended time period.	- Depending on level of investigation associated with the Master Plan, MCEA investigations may be required for specific projects.

1.4.1 Applied Framework

For the purposes of this Master Plan Update, it was determined during the course of the investigation that Approach 1 would be the most appropriate planning framework to utilize for this assessment. The Master Plan, therefore, defines broad infrastructure requirements within the study area and serves as the basis of future detailed investigations.

This Master Plan will identify future infrastructure projects, timing for infrastructure needs and any requirements for additional MCEA investigations for Schedule B or C projects. This Master Plan intends to broadly identify infrastructure needs and serve as the background justification for more detailed investigations at a later date.

1.4.2 Approval Requirements

The Master Plan is subject to approval from the Town of Saugeen Shores but does not require formal approval under the EA Act. A Completion Notice will be issued at the conclusion of the Master Plan. Any projects identified within this Master Plan that are considered Schedule B or C activities will be required to complete additional

investigations to satisfy the requirements of the MCEA process, prior to design and construction.

1.4.3 Past Master Plans

The Town of Saugeen Shores has historically utilized master plans for water and wastewater servicing planning. Previous master plans were completed in 1999, 2002, 2006, 2009, 2014 and 2020. This Master Plan builds on the findings of previous plans.

2.0 STUDY AREA AND EXISTING CONDITIONS

2.1 Study Area

The Town of Saugeen Shores is a municipality in Bruce County located on the eastern shore of Lake Huron. It was formed in 1999 through the amalgamation of the former Saugeen Township and Towns of Southampton and Port Elgin. The Town is bordered by Lake Huron to the west, Municipality of Kincardine to the south, Municipality of Arran-Elderslie to the east, and Saugeen First Nation and Municipality of North Bruce Peninsula to the north. The permanent population of Saugeen Shores is 15,908 as reported in the 2021 Census (Statistics Canada, 2023).

For the purposes of the Water and Wastewater Master Plan, only the urban areas of Port Elgin and Southampton were assessed. These two communities are the largest urban centers within the Town and the only areas with municipal water and wastewater systems. The general location of the Town, as well as the communities of Port Elgin and Southampton, are shown in Figure 2.1.

Port Elgin is the largest urban community in Saugeen Shores. It is located approximately 25 kilometres north of Kincardine and 45 kilometers south of Owen Sound. The main access routes are Highway 21 (north-south) and Bruce County Road 17 (east-west). The urban settlement area of Port Elgin extends from approximately Concession 4 and the boundary with MacGregor Point Provincial Park north to Concession 10, and from the lakeshore to Mill Creek to the east. The permanent population of Port Elgin is approximately 9,619 as reported in the 2021 Census (Statistics Canada, 2023). The urban settlement area of Port Elgin, as identified in the Official Plan, is shown in Figure 2.2.

Port Elgin's housing stock has traditionally been low-density, single-family homes, but recent development has introduced more medium and high-density units, such as townhouses and apartments. Most residences are occupied year-round, though some serve as seasonal homes, given the proximity of the town to Lake Huron. Since 2020, new residential development has occurred west of Highway 21/Goderich Street on both the north and south ends of the community, with limited growth east of the Highway. Housing demand continues to rise, driven primarily by the employment opportunities at Bruce Power.

Port Elgin serves as the commercial and institutional hub of Saugeen Shores and the surrounding rural areas, offering a range of retail, professional services and healthcare facilities, with the commercial uses concentrated along Goderich Street (Highway 21). Future commercial and employment lands are located along Concession 6 and east of Highway 21 at Concession 10. A new elementary school was approved in January 2025 and will be located between Hawthorne Street and Concession 10. The community features three elementary schools, a secondary school and two community centers, as well as the Unifor Family Education Centre (conference center).

Figure 2.1 – Location of the Town of Saugeen Shores

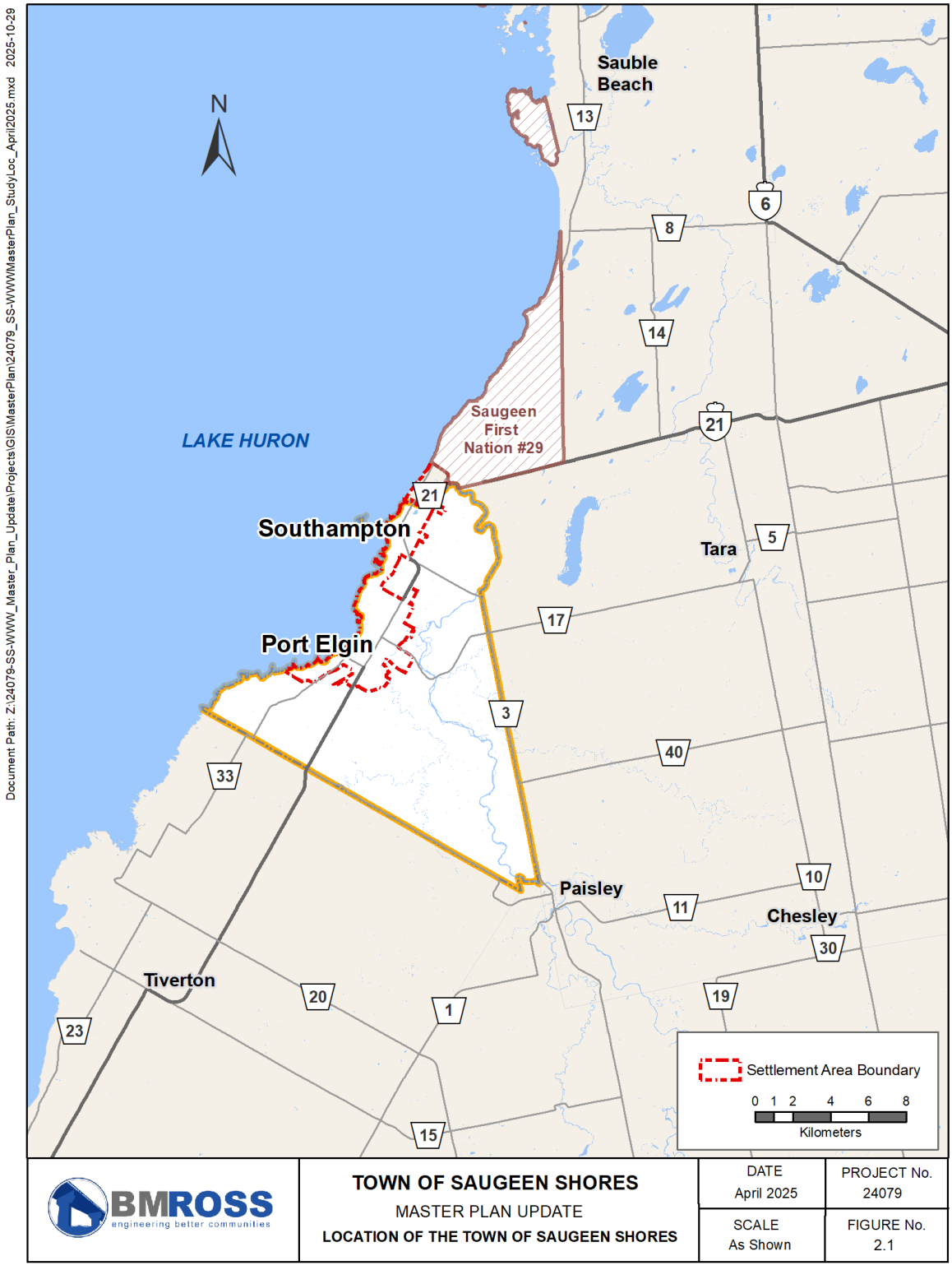
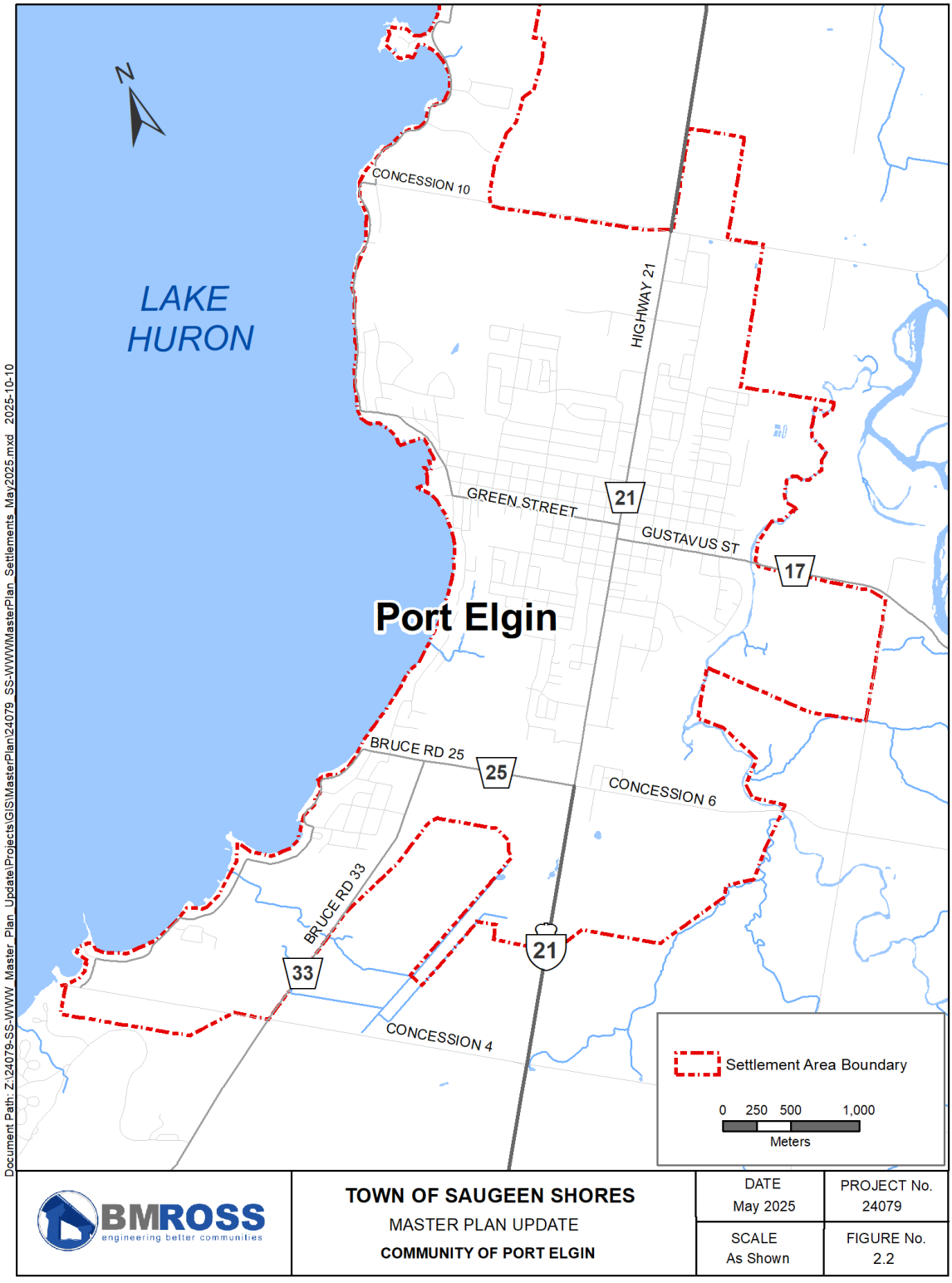


Figure 2.2 – Urban Settlement Area, Port Elgin



Southampton is approximately three kilometres north of Porth Elgin. The community is located along Highway 21, from South Street north to the boundary with Saugeen First Nation. The Saugeen River flows through the northern part of the community and outlets into Lake Huron south of South Rankin Street. The urban settlement area for Southampton is shown in Figure 2.3. Southampton is smaller than Port Elgin in terms of area and permanent population, with an estimated population of 3,993 as of 2021 (Statistics Canada, 2023).

Similar to Port Elgin, Southampton's historical residential development consisted mainly of single-detached homes, and in recent years has seen the addition of medium and high-density units. Many lakeshore residences in Southampton are seasonal. While development was traditionally driven by the demand for seasonal and retirement homes, employment at Bruce Power has recently supported further residential growth. Commercial uses are concentrated along Albert Street (Highway 21) and High Street, with key institutional facilities including a hospital, an elementary school and the Bruce County Museum and Cultural Center.

2.2 General Description of Water and Wastewater Facilities

2.2.1 Saugeen Shores Drinking Water System

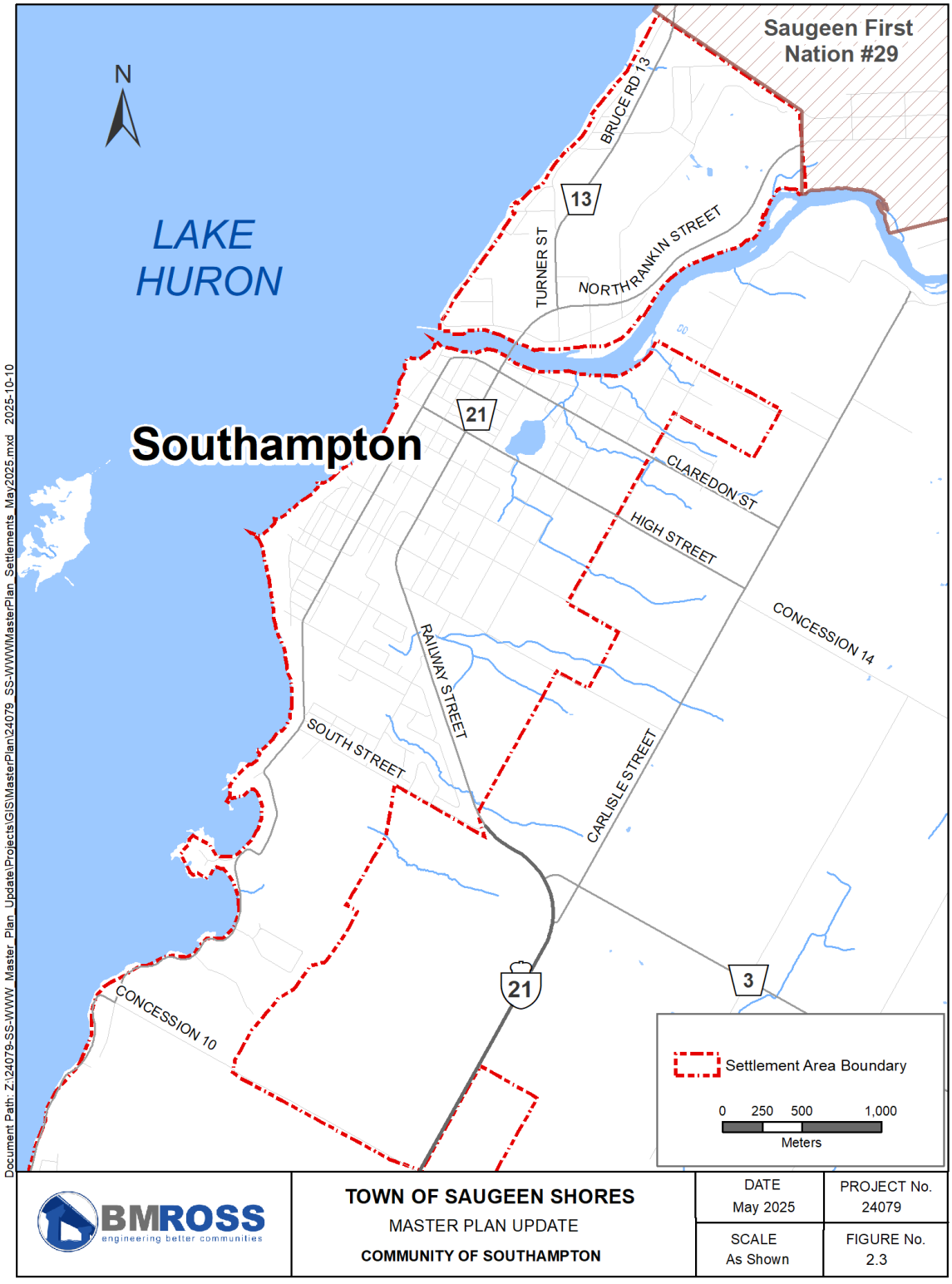
A detailed description of the Saugeen Shores Drinking Water System (DWS) is included in Section 4.0 of the Master Plan.

The DWS services Port Elgin and Southampton as well as MacGregor Point Provincial Park and the Saugeen First Nation #29. The water system has a single source of water at the Saugeen Shores WTP located in Southampton, which takes raw water from Lake Huron.

Treated water storage facilities currently exist in both communities. The distribution system has two pressure zones. Zone 1 is the area of Southampton west of Grenville Street. Zone 2 is Port Elgin and the east part of Southampton. There are approximately 170 km of watermain and 11,294 customers.

In 2024, the Town of Saugeen Shores retained Ainley Group to explore options for expanding the Saugeen Shores WTP. The project aims to address the community's future water supply capacity needs through a MCEA Schedule C process. The projected capacity needs are to be derived in conjunction with the 2025 Master Plan Update.

Figure 2.3 – Urban Settlement Area, Southampton



2.2.2 Port Elgin Wastewater System

Each community has its own wastewater collection and treatment systems. Detailed descriptions of the Port Elgin and Southampton wastewater systems are included in Sections 5.0 and 6.0 of the Master Plan, respectively.

In Port Elgin, the collection system generally drains east to west with major pumping stations at the 10th Concession (SPS 6) and Harbour Street (SPS 9) pumping to the WWTP. There are four smaller secondary SPSs.

The WWTP discharges treated effluent to Mill Creek which then drains to the Saugeen River. In Port Elgin, there are approximately 80 km of gravity sewer and 3,900 connections.

In early spring 2025, the Town of Saugeen Shores retained the Ainley Group to explore options for expanding the Port Elgin WWTP. The project aims to address the community's future sanitary sewage treatment needs through 2053 and resolve existing hydraulic issues through a MCEA Schedule C processes. The works associated with this project were recommended in the 2020 Water and Wastewater Servicing Master Plan, completed by BMROSS.

2.2.3 Southampton Wastewater System

The Southampton wastewater system consists of a WWTP, approximately 50 km of gravity collection system and five SPSs servicing approximately 2,660 connections. Three of the pumping stations (SPS 1, SPS 3, and SPS 5) discharge directly to the Southampton WWTP, which in turn discharges treated wastewater to the Saugeen River. SPS 2 and SPS 4 discharge to other locations in the collection system.

In 2019, the Town of Saugeen Shores retained the Ainley Group to conduct an MCEA to identify and evaluate alternatives for expansion of the Southampton WWTP. The objective of this project is to address the community's long-term sanitary sewage treatment requirements through the year 2049, accommodate increased seasonal peak flows, address treatment process bottlenecks, and support anticipated growth within the Southampton service area. The need for a MCEA study to investigate options for increasing capacity of the Southampton WWTP was identified in the 2020 Master Plan.

Through the MCEA process, the preferred solution was identified as an expansion of the WWTP on Town-owned lands to the south. The design of the preferred alternative includes rerating the WWTP with upgrades to the headworks, solid treatment and storage facilities and sewage pumping station, and construction of a peak flow equalization tank. The rerating will increase the ADF capacity to 3,626 m^3/day meeting the 2049 projected ADF. The Town received grant funding for this work in 2025.

2.3 Environmental Setting

The MCEA process for Master Plans requires an inventory of the environment of the study area. Given the large spatial scale of this study, as well as its broad scope, the environmental review represents a general overview of local conditions.

2.3.1 General Physiography

Port Elgin and Southampton are located within the physiographic region known as the Huron Fringe (Chapman & Putnam, 1966). The Huron Fringe is a narrow band of land that stretches from Tobermory south to Sarnia, along Lake Huron shoreline. The Huron Fringe is characterized by the wave-cut terraces of glacial Lake Algonquin and Lake Nipissing. At the outskirts of Port Elgin, there was a barrier beach associated with Lake Algonquin, composed of fine sand and silt that were deposited. This caused the Saugeen River to divert northward from Port Elgin towards Southampton.

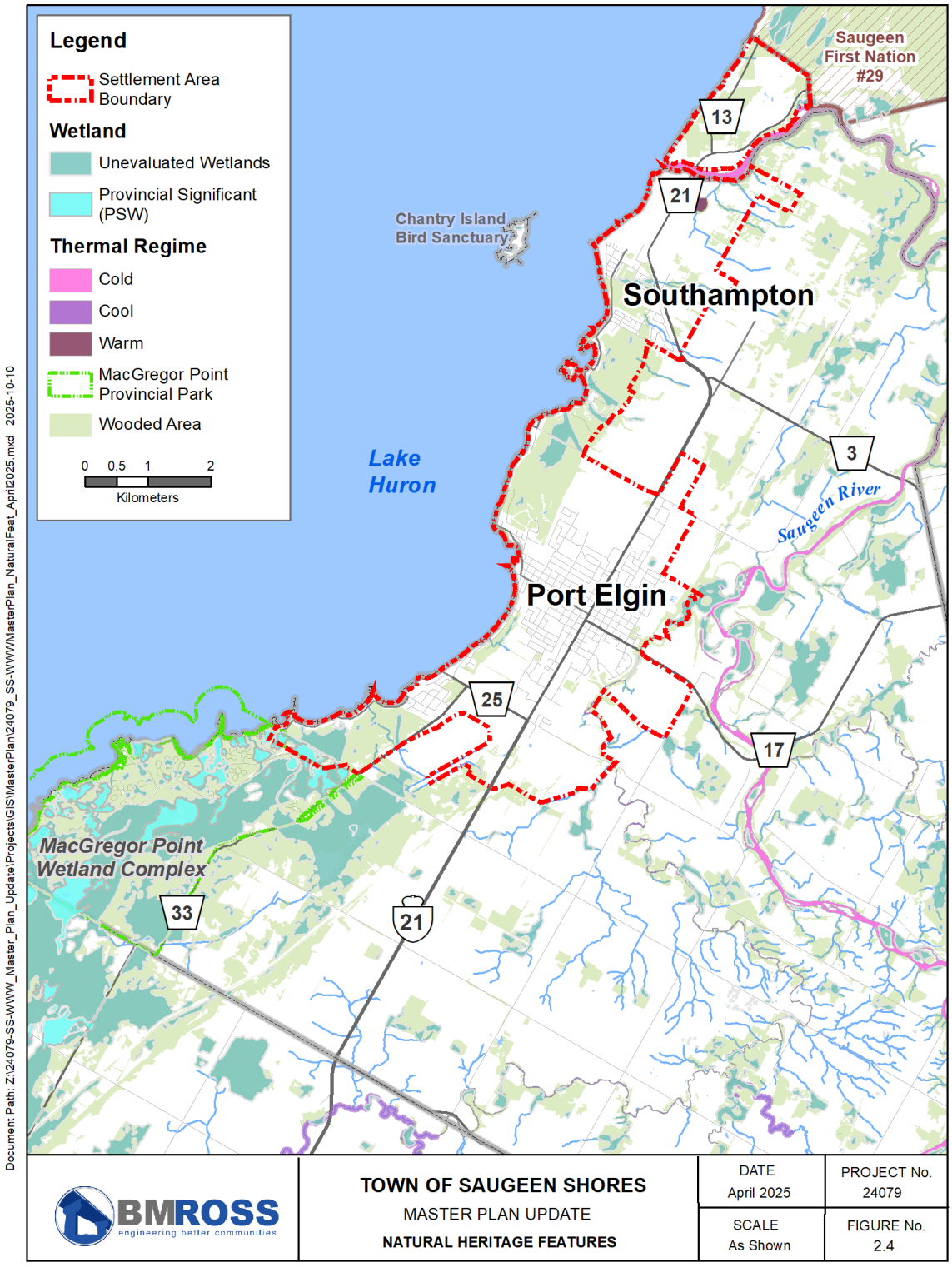
2.3.2 Significant Natural Features

The study area includes the urban areas of Port Elgin and Southampton. A review of sensitive natural heritage features in the vicinity of the project areas was carried out through the course of the Master Plan process. The Ontario Ministry of Natural Resources (MNR) Natural Heritage Information Center (NHIC) database was consulted to identify significant natural areas or features in the general vicinity of the study area (Ministry of Natural Resources, 2024).

The communities of Port Elgin and Southampton are located on the eastern shoreline of Lake Huron. There are several unevaluated wetlands within the study areas, but no provincially significant wetlands were identified. Additionally, within the study area, there are several woodlots within the Southampton study area and fragmented forested areas (see Figure 2.4).

The Saugeen River is the largest watercourse within the study area and flows between Port Elgin and Southampton, and outlets into Lake Huron at Southampton. The Saugeen River drains an area of over 4,000 km² in midwestern Ontario, with the main branch headwater located near Dundalk (Chapman & Putnam, 1966). The river maintains a strong summer flow, due in part to contributions from its tributaries of the North Saugeen, Rocky Saugeen, Beatty and Teeswater Rivers. Historically, the river has long been a key travel route from Southampton and Port Elgin to Walkerton for Indigenous people and settlers. Many used it as a source of power for numerous dams, sawmills and gristmills. Denny’s Dam is located upstream from Southampton and includes a fish ladder that allows the migration of the salmon and trout during their spawning runs. The dam was originally constructed in 1905 to originally power a sawmill. There are many small marinas located between Denny’s Dam and the outlet of the river at Lake Huron. Today, the river serves as a canoeing/kayaking route and is a recreational fishing destination.

Figure 2.4 – Natural Heritage Features



The following natural areas were identified from the NHIC database.

- Denny's Dam is located at the end of Carlisle Street, approximately 500 metres from the Southampton urban settlement area boundary and is under the regulation of the Saugeen Conservation Authority.
- The Saugeen River is located north and east of Southampton and east of Port Elgin. The mouth of the Saugeen River has been identified as habitat for colonial waterbird nesting areas and mixed wader nesting colonies. The river is known for its fishing opportunities and as a canoe route.
- Chantry Island is a significant natural area located approximately 1 kilometre offshore from Southampton and is a migratory bird sanctuary.
- Chantry Dunes is a significant natural area comprised of a dune complex located along the Southampton waterfront.

Within the urban area of Port Elgin, there are relatively few natural features; however, south and north of the community, there are woodland areas located along the shoreline. The woodlands between Port Elgin and Southampton are extensive and include wetland areas. Within Southampton, there are some scattered and fragmented woodland areas. North of High Street and west of Grey Street is Fairy Lake, a small lake with a recreational trail around it. MacGregor Point Provincial Park is located south of Port Elgin. It is classified as a natural environment provincial park as it contains "extensive, undeveloped forest land, varied wildlife populations and numerous sensitive evaluated provincial wetland areas" (Ministry of Natural Resources, 2024).

2.3.3 Areas of Natural and Scientific Interest (ANSI)

ANSIs are provincially or regionally significant landscapes that contain unique geological, ecological, or biological features. These areas represent critical habitats, rare ecosystems, or scientific research opportunities and are protected under provincial policies to ensure their conservation (Ministry of the Environment, Conservation and Parks, 2024). The MNR NHIC database was consulted to determine if there was any inventory of ANSIs located within the study area. The review did not identify any ANSI sites within or adjacent to Southampton and Port Elgin.

2.4 Species at Risk (SAR)

An evaluation of the presence of SAR and their associated habitats within the study area has been incorporated into the project planning process. A review of available information on species and habitat occurrences determined that the study area may contain species and/or associated habitats that are legally protected under Provincial and Federal legislation.

The protection of species at risk and their associated habitats comes from the following federal and provincial legislation:

- The Federal Species at Risk Act, 2002 (SARA) provides for the recovery and legal protection of listed wildlife species and associated critical habitats that are extirpated, endangered, threatened or of special concern and secures the necessary actions for their recovery. On lands that are not federally owned, only aquatic species and bird species included in the Migratory Bird Convention Act (1994) are legally protected under SARA.

- The Provincial Endangered Species Act, 2007 (ESA) provides legal protection for endangered and threatened species and their associated habitat in Ontario. Under the legislation, measures to support their recovery are also defined.

Based on the information available for the occurrences of species at risk and their associated habitats from the following sources, a summary of all known federally and provincially recognized species with the potential to be present within the project study area is listed in Table 2.1:

- Natural Heritage Information Centre, Make a Natural Heritage Map (Ministry of Natural Resources, 2024).
    - The 1 km NHIC squares corresponding with the study area in Port Elgin are: 17MK6722,17MK6822,17MK6922,17MK6721, 17MK6821, 17MK6921, 17MK6720, 17MK6820, 17MK6920, 17MK6619,17MK6719, 17MK6819, and 17MK6919
    - The 1 km NHIC squares corresponding with the study area in Southampton are: 17MK6722, 17MK7027, 17MK7127, 17MK7227, 17MK6926, 17MK026, 17MK7126,17MK7226, 17MK6925, 17MK725, 17MK6924, and 17MK7024
- Ontario Reptiles and Amphibian Atlas (Ontario Nature, 2023).
    - The 10 km square corresponding with Southampton is 17MK72
    - The 10 km square corresponding with Port Elgin is 17MK62
- Ontario Breeding Bird Atlas (Birds Canada, 2005).
    - The 10 km square corresponding with Southampton is 17MK72
    - The 10 km square corresponding with Port Elgin is 17MK62
- Ontario Butterfly Atlas (Macnaughton, Layberry, Cavasin, Edwards, & Jones, 2025).
    - The 10 km square corresponding with Southampton is 17MK72
    - The 10 km square corresponding with Port Elgin is 17MK62
- Atlas of the Mammals of Ontario (Dobbyn, 1994).

The table below is based on potential habitats and occurrences throughout the general study area. It should be noted that the majority of the study area for this Master Plan is within the existing urban settlement area, with extensive previously disturbed areas and

limited habitat potential. Depending on the scale and potential of recommended works associated with this master plan, additional studies and mitigation measures may be recommended and assessed to avoid or minimize harm to the listed species.

Table 2.1 – Species at Risk Within General Study Area

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Bird	Bank Swallow	*Riparia riparia*	Threatened	Threatened
Bird	Barn Swallow	*Hirundo rustica*	Threatened	Special Concern
Bird	Black Tern	*Chlidonias niger*	N/A	Special Concern
Bird	Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened
Bird	Canada Warbler	*Cardellina canadensis*	Threatened	Special Concern
Bird	Cerulean Warbler	*Setophaga cerulea*	Endangered	Threatened
Bird	Chimney Swift	*Chaetura pelagica*	Threatened	Threatened
Bird	Common Nighthawk	*Chordeiles minor*	Special Concern	Special Concern
Bird	Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened
Bird	Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened
Bird	Eastern Wood-Pewee	*Contopus virens*	Special Concern	Special Concern
Bird	Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern	Special Concern
Bird	Golden-winged Warbler	*Golden-winged Warbler*	Threatened	Special Concern
Bird	Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern	Special Concern

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Bird	Henslow Sparrow	*Ammodramus henslowii*	Endangered	Endangered
Bird	King Rail	*Rallus elegans*	Endangered	Endangered
Bird	Least Bittern	*Lxobrychus*	Threatened	Threatened
Bird	Loggerhead shrike	*Lanius ludovicianus*	N/A	Endangered
Bird	Louisiana Waterthrush	*Parkesia motacilla*	Threatened	Threatened
Bird	Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Special Concern
Bird	Peregrine Falcon	*Falco peregrinus*	Special Concern	Special Concern
Bird	Piping Plover	*Charadrius melodus*	Endangered	Endangered
Bird	Prothonotary Warbler	*Protonotaria citrea*	Endangered	Endangered
Bird	Red-headed Woodpecker	*Melanerpes erythrocephalus*	Endangered	Endangered
Bird	Rusty Black Bird	*Euphagus carolinus*	Special Concern	Special Concern
Bird	Short-eared Owl	*Asio flammeus*	Special Concern	Threatened
Bird	Wood Thrush	*Hylocichla mustelina*	Threatened	Special Concern
Bird	Yellow Rail	*Coturnicops noveboracensis*	Special Concern	Special Concern
Fish	Black Redhorse	*Moxostoma duquesnei*	Threatened	Threatened
Fish	Lake Sturgeon (Great Lakes- Upper St Lawrence River Population)	*Acipenser fulvescens*	N/A	Endangered

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Fish	Northern Brook Lamprey	*Ichthyomyzon fossor*	Special Concern	Special Concern
Fish	Northern Sunfish	*Lepomis peltastes*	Special Concern	Special Concern
Fish	Redside Dace	*Clinostomus elongatus*	Endangered	Endangered
Fish	Shortnose Cisco	*Coregonus reighardi*	Endangered	Endangered
Fish	Silver Lamprey (Great Lakes- Upper St Lawrence River Population)	*Ichthyomyzon unicuspis*	Special Concern	Special Concern
Fish	Silver Shiner	*Notropis photogenis*	Threatened	Threatened
Mussel	Fawnsfoot	*Truncilla donaciformis*	Endangered	Endangered
Mussel	Rainbow	*Villosa iris*	Special Concern	Special Concern
Insects	American Bumble Bee	*Bombus pensylvanicus*	Special Concern	Special Concern
Insects	Hungerford's Crawling Water Beetle	*Brychius hungerfordi*	Endangered	Endangered
Insects	Lake Huron Grasshopper	*Trimerotropis huroniana*	Threatened	Threatened
Insects	Skillet Clubtail	*Gomphurus ventricosus*	Endangered	Threatened
Insects	Monarch	*Danaus plexippus*	Endangered	Special Concern
Insects	Transverse Lady Beetle	*Coccinella transversoguttata*	Special Concern	Endangered

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Insect	West Virginia White	*Pieris virginiensis*	N/A	Special Concern
Insect	Yellow Banded Bumble Bee	*Bombus terricola*	Special Concern	Special Concern
Mammal	American Badger (Southwestern Ontario Population)	*Taxidea taxus*	Endangered	Endangered
Mammal	Eastern small-footed myotis	*Myotis Leibii*	N/A	Endangered
Mammal	Little brown myotis	*Myotis lucifugus*	Endangered	Endangered
Mammal	Northern myotis	*Myotis septentrionalis*	Endangered	Endangered
Mammal	Tri-coloured bat	*Perimyotis subflavus*	Endangered	Endangered
Plant	American Ginseng	*Panax quinquefolius*	Endangered	Threatened
Plant	American Hart's-tongue Fern	*Asplenium scolopendrium var. americanum*	Special Concern	Special Concern
Plant	Black Ash	*Fraxinus nigra*	N/A	Endangered
Plant	Broad Beech Fern	*Phegopteris hexagonoptera*	N/A	Special Concern
Plant	Butternut	*Juglans cinerea*	Endangered	Endangered
Plant	Dwarf Lake Iris	*Iris lacustris*	Special Concern	Special Concern
Plant	Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Endangered	Endangered
Plant	Gattinger's Aganlinis	*Agalinis gattingeri*	Endangered	Endangered
Plant	Hill's Pondweed	*Potamogeton hillii*	Special Concern	Special Concern

Type	Species Common Name	Species Scientific Name	Federal Status	Provincial Status
Plant	Hill's Thistle	*Cirsium hillii*	Threatened	Threatened
Plant	Houghton's Goldenrod	*Solidago houghtonii*	Special Concern	Threatened
Plant	Lakeside Daisy	*Tetraneuris herbacea*	Threatened	*Special Concern*
Plant	Pitcher's Thistle	*Circium pitcheri*	Special Concern	Threatened
Plant	Tuberous Indian-plantain	*Arnoglossum Plantagineum*	Special Concern	Special Concern
Reptile	Eastern Massasauga	*Sistrunrus catenatus*	N/A	Threatened
Reptile	Eastern Ribbonsnake	*Thamnophis sauritus*	Threatened	Special Concern
Reptile	Queensnake	*Regina septemvittata*	Endangered	Endangered
Turtle	Blanding's Turtle	*Emydoidea blandingii*	Endangered	Threatened
Turtle	Northern Map Turtle	*Graptemys geographica*	Special Concern	Special Concern
Turtle	Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern
Turtle	Spotted Turtle	*Clemmys guttata*	Endangered	Endangered

2.4.1 Breeding Birds

The Atlas of Breeding Birds of Ontario (2001-2005) was consulted to identify the bird species with confirmed, probable, and possible breeding habitats in proximity to the study area. Port Elgin and Southampton are located in separate 100 km^2 squares of the Atlas. Identified as 17MK62 & 17MK72, in Region 8: Bruce. Within the square, a total of 38 birds are confirmed to be breeding within the area, including species at risk such as Bobolink, Bank Swallow, Chimney Swift, and Barn Swallow. An additional 53 species were categorized as having probable breeding status, and 24 are considered to have possible breeding status in the area (Birds Canada, 2005).

The survey area includes key habitats for identified species, such as forests (in all stages of growth), riverine areas, agricultural areas, wetlands and shoreline areas. The study area for the Master Plan forms a very small portion of this region and includes urban areas with significant disturbance.

2.5 Cultural Heritage and Archeological Resources

Port Elgin and Southampton, located within the Town of Saugeen Shores, have cultural heritage closely tied to Indigenous history and European settlement. Given this Master Plan is following Approach 1, which involves a broad, high-level assessment, future projects will require site-specific assessments to determine impacts to built heritage resources, cultural heritage landscapes and archaeological resources. This section summarizes general information regarding cultural heritage and archaeological resources within Port Elgin and Saugeen Shores.

The Town also recently completed a draft Cultural Heritage Master Plan. The CHMP provides a high-level assessment of the Town's cultural heritage value and properties, enhancing the identification, evaluation, protection, and commemoration of historical assets. It also outlines the Town's responsibilities under the Ontario Heritage Act and the Planning Act.

Port Elgin and Southampton are known areas of past Aboriginal use, with agricultural activities dating back 2,000 years. There were semi-permanent villages supported by agricultural activities as evidenced by the Nodwell Site, dating to the 1300s (NPG Planning Solutions Inc, TMHC Inc., Bray Heritage, and M. R. Letourneau and Associates Inc., 2025)In the 17th century, the Odawa lived in the area. Later, the area was home to the Anishinaabe, including the Saugeen Ojibway at the mouth of the Saugeen River.

A Hudson's Bay Company post was established near the Saugeen Village. Following closure of the trading post, a number of traders remained, and their families formed what would later become known as the Historic Saugeen Metis settlement (NPG Planning Solutions Inc, TMHC Inc., Bray Heritage, and M. R. Letourneau and Associates Inc., 2025).

The Town of Saugeen Shores has a municipal heritage committee, which makes recommendations related to the Heritage Register, as well as a number of historical plaque and heritage programs. The Town does not have a heritage conservation district.

Within Saugeen Shores, there are 16 provincially designated heritage properties (Town of Saugeen Shores, 2025). There are 14 in Southampton and 2 in Port Elgin. The designated properties are listed in Table 2.2. These properties include institutional buildings and private residences. These properties are protected under the Ontario Heritage Act. There are an additional 114 properties listed on the Town's Heritage Register as locally significant.

Table 2.2 – Provincially Significant Heritage Properties, Town of Saugeen Shores

Southampton	Port Elgin
55 Victoria Street, North	708 Goderich Street
20 Albert Street South	780 Highland Street
201 High Street	
317 High Street	
221 Clarendon Street	
97 Huron Street South	
22 Victoria Street South	
18 Huron Street North	
56 Front Street	
268 Spence Street	
47 Albert Street North	
30 Grosvenor Street South	
117 Huron Street South	
34 Victoria Street North	

A review of the Ontario Heritage Trust website identified three historic plaques located within the study area (Ontario Heritage Trust, 2025):

- Nodwell Indian Village Site – High and Market Street, Port Elgin
- Fur Trading at Saugeen – Pioneer Park, Southampton
- Founding of Port Elgin – Park Place, Port Elgin

In addition to the above-noted plaques, the Town has installed 18 heritage plaques throughout Port Elgin and Southampton commemorating local landmarks and events (Town of Saugeen Shores, 2025). The Town also maintains four cemeteries within Port Elgin and Southampton. This includes the Pioneer Cemetery, Southampton Cemetery and St. Patrick's Cemetery in Southampton and Sanctuary Park Cemetery in Port Elgin.

There are three designated heritage lighthouses in Saugeen Shores. These lighthouses have been designated by Parks Canada in recognition of their historical, architectural and community values: the Saugeen River Front Range Lighthouse, McNab Point Lighthouse and Saugeen River Rear Range Lighthouse (Parks Canada, 2025). The McNab Point Lighthouse is located between Port Elgin and Southampton, and the remaining lighthouses are located in Southampton.

For the projects identified within this Master Plan that require further investigation through the MCEA process, the Ministry of Citizenship and Multiculturalism (MCM) Criteria for Evaluating Archaeological Potential and Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes should be completed.

2.6 Climate Change

As part of the MCEA process, the impacts associated with climate change need to be evaluated. Some of the phenomena associated with climate change that will need to be considered include:

- Changes in frequency, intensity, and duration of precipitation, wind, and heat events.
- Changes in soil moisture.
- Changes in sea/lake levels.
- Shifts in plant growth and growing seasons.
- Changes in the geographic extent of species ranges and habitat.

There are two approaches that can be utilized to address climate change in project planning. These are as follows:

- Reducing a project's impact on climate change (climate change mitigation). Mitigation of climate change impacts may include:
    - Reducing greenhouse gas emissions related to the project.
    - Alternative methods of completing the project that would reduce any adverse contributions to climate change.
- Increasing the project's and local ecosystem's resilience to climate change (climate change adaptation). Considerations related to climate adaptation include:
    - How vulnerable is the project to climate-related severe events?
    - Are there alternative methods of carrying out the project that would reduce the negative impacts of climate change on the project?

Through the evaluation of alternatives as part of the second phase of the MCEA, consideration of each of these approaches should be completed and included in the final determination of the preferred approach to completing a project. Consideration of the impacts of climate change within this Master Plan is done for any projects identified as part of the evaluation of alternatives.

2.7 Planning Policies

2.7.1 Provincial Planning Policies

The Provincial Planning Statement, 2024 (PPS) provides policy direction for land use planning and development across the province. Local planning policies and land use decisions must conform to the policies of the PPS. The PPS promotes long-term prosperity, environmental health, public safety, and social well-being through the efficient use of land and development patterns (Ministry of Municipal Affairs and Housing, 2024).

With respect to planning for growth and municipal infrastructure projects, there are a number of applicable policies within the PPS. The PPS directs that planning horizons for land use should meet needs for at least 20 years and no more than 30 years; however, infrastructure planning may extend beyond this horizon. Settlement areas, such as Port Elgin and Southampton, will be where growth and development are focused. Within settlement areas, land use patterns should promote the use of existing and planned infrastructure. Phasing of growth is encouraged to ensure development aligns with the provision of required infrastructure.

Chapter 3 of the PPS contains policies related to infrastructure and public services facilities. The policies in this section of the PPS promote the efficient provision of public infrastructure and service facilities to accommodate forecasted growth promptly, promote water and energy conservation, and accommodate future needs (3.6.1.a & 3.6.1.b). Planned infrastructure is to be financially viable over its life cycle and sufficient to meet existing and future needs. Additionally, infrastructure should support the effective and efficient delivery of emergency services and ensure public health and safety protection.

The PPS establishes a hierarchy of servicing options, prioritizing full municipal services as the preferred method of accommodating growth within settlement areas. Where full services are not feasible. Municipalities may consider communal or partial services (s.3.6.2). Partial service is permitted in three specific scenarios:

- Where necessary to address failed septic systems and private wells in existing areas.
- Within settlement areas to allow for infill and minor rounding out of existing development, provided that site conditions are suitable for long-term provision of servicing, with no negative impacts.
- Within rural settlement areas where new development will be serviced by individual on-site water services in combination with municipal sewage services or private communal sewage services.

Planning officials may permit lot creation where there is confirmed sufficient reserve sewage and water capacity (s.3.6.7).

2.7.2 Bruce County Official Plan

The County of Bruce is currently in the process of updating their Official Plan (OP). The draft Official Plan is expected to be brought forward to Council in late 2025 for adoption. The County of Bruce Official Plan guides long-term planning decisions across the County. The OP identifies settlement areas categorized as primary urban communities, secondary urban communities and hamlet communities. The primary urban communities are expected to accommodate the majority of residential and non-residential growth in the future. Within the OP, growth management policies direct future growth and intensification within communities where there is existing or planned full municipal servicing (County of Bruce, 2024).

The provision of municipal servicing is identified as critical to ensuring development occurs in a sustainable and cost-effective manner. The OP promotes coordinating land use planning, asset management and infrastructure investments, including the capital funding needed to support the growth and development forecasted.

In accordance with the PPS, the preferred form of servicing for new and existing development is full municipal water and wastewater services. Communal services may be used where municipal servicing is not available or feasible. Private water and wastewater services may be utilized where full or communal servicing is not available, and site conditions allow for no negative impacts.

The OP requires multi-year sewage and water servicing plan or master plan to support any new official plans, updates. Recommendations from the servicing or master plan should direct policies within the local OP. Further, the County OP directs that if there is a servicing or master plan, development approvals must be consistent with the plan.

2.7.3 Town of Saugeen Shores Official Plan

The Town of Saugeen Shores OP 2014 establishes the local framework for managing growth and development. It aims to accommodate an additional 5,000 permanent and seasonal residents and 1,125 jobs by 2031. To support a diverse population, the plan requires that 35% of all new housing be medium to high density while ensuring new development remains in character with existing neighbourhoods. Additionally, 15% of growth must be achieved through intensification, directing development toward infill and redevelopment opportunities.

One of the goals within the local OP is to ensure municipal services meet the needs of current and future residents and businesses efficiently and in an environmentally sensitive manner. The OP directs that municipal water and wastewater services should be utilized efficiently within the settlement area and unnecessary expansions should be avoided to areas not planned for development. Growth should be focused in the Saugeen Shore Settlement Area on the municipal water and sewage systems.

2.8 Clean Water Act (Source Protection)

The Clean Water Act of 2006 was created to protect sources of municipal drinking water, following the Walkerton water crisis. It emphasizes prevention by requiring communities to identify potential threats to their local water sources and to develop Source Protection Plans to manage or eliminate risk. The Act supports a proactive science-based approach to water protection, involving municipalities, conservation authorities and local stakeholders. This legislature ensures that proposed municipal projects consider impacts on drinking water sources and contribute to long-term water quality and safety.

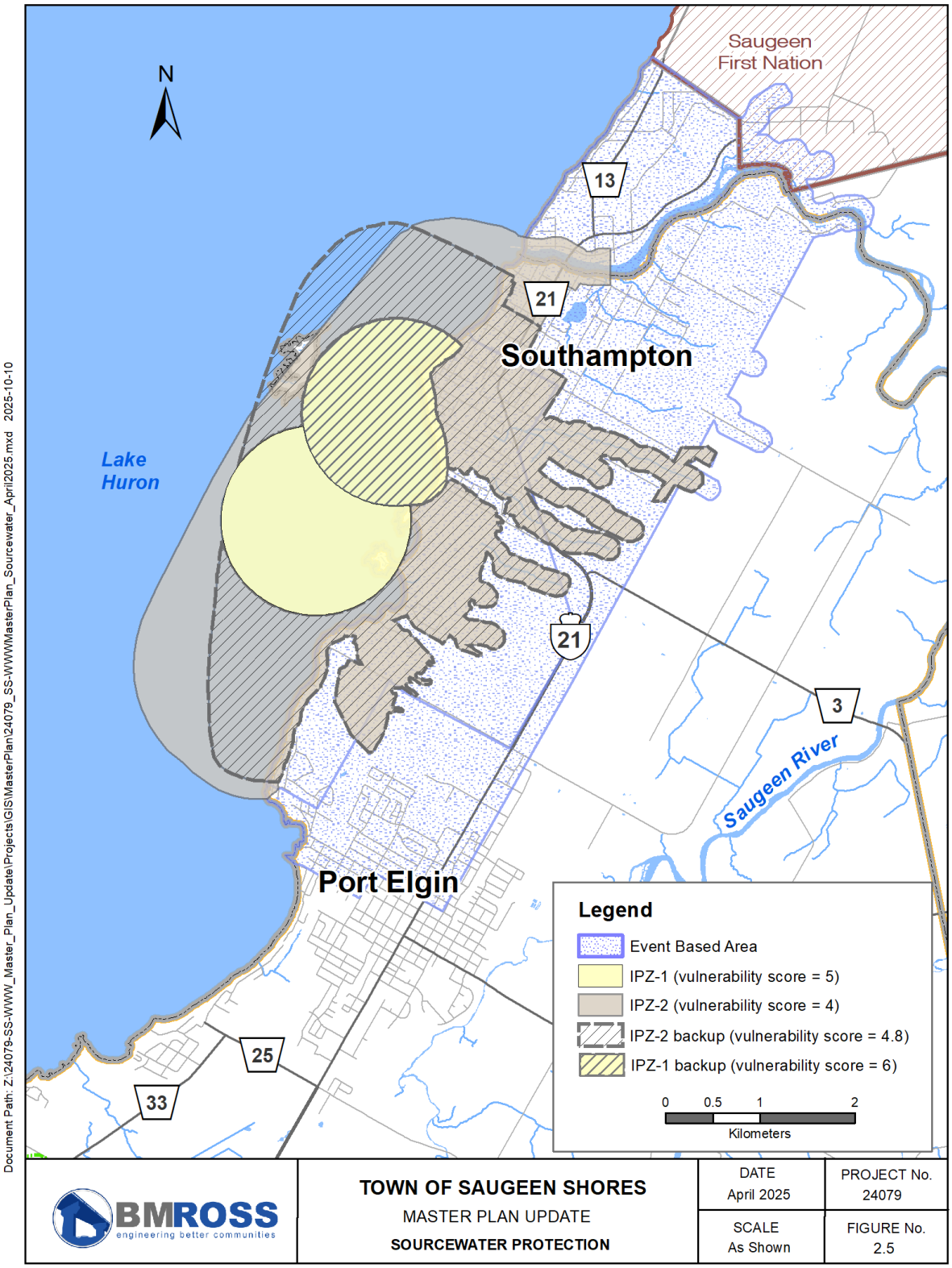
The study area is located within the Saugeen Valley Source Protection Area, where the Source Protection Plan (SPP) has been in effect since 2015. This plan includes policies aimed at protecting municipal drinking water sources from identified threats, based on findings from the approved Assessment Report, which outlines watershed characteristics, drinking water system details and potential risks to drinking water. The Ontario Source Protection Information Atlas, developed by the MECP, was reviewed to identify the characteristics of the Intake Protection Zone (IPZ) and associated vulnerability scores relevant to the study area.

Port Elgin and Southampton are serviced by a single water system. This system is a surface water intake system, drawing raw water from Lake Huron. The system has two intakes. The main intake was constructed in 2008, and an older intake is maintained for backup and emergency purposes. The WTP and intakes are located in Southampton. The main intake extends approximately 1,600 m into Lake Huron to an approximate depth of 10 m. The backup intake extends 355 m from the shore to a depth of approximately 3.5 m (B.M. Ross and Associates Limited, 2020).

IPZs were identified for the two intakes as part of the work completed for the Assessment Report (Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region, 2015). IPZ1 is a 1,000 m radius circle around the intake point. Where IPZ1 abuts land and is not impacted by a watercourse or transport pathway, the IPZ is extended by 120 m. IPZ2 is defined as the area within a 2-hour time of travel to the intake. IPZ3 and Event-Based Areas (EBA) are calculated based on modelling. IPZ3 is the area where a spill of a pathogen or chemical contaminant would reach the intake. An EBA is an area where modelling of event scenarios shows a spill would cause a deterioration of raw water quality. For this intake, two EBA categories were modelled: a spill of 13,000 L or greater and 22,500 L or greater. The intake protection zones and EBA for the Saugeen Shores Drinking Water System are shown in Figure 2.5.

The SPP defines policies in place within vulnerable areas to protect water sources from significant drinking water threats (Saugeen, Grey Sauble, Nothern Bruce Peninsula Source Protection Region, 2015). Within the vulnerable areas associated with the Saugeen Shores Drinking Water System, there were five significant drinking water threats identified. All of these threats are categorized under fuel handling and storage.

Figure 2.5 – Source Water Protection Areas



Given the relatively low vulnerability scores of the main and backup intakes for IPZ 1 (5 and 6, respectively) and IPZ 2 (4 and 4.8, respectively), there are no source protection policies that apply within these areas. Within the EBA, the following policies apply:

Table 2.3 – Water Protection Policies within Study Area

Policy ID	Name	Description
15-04	Handling and Storage of Fuel – Prohibition	Applies to future activities, the establishment of new fuel storage where quantity exceeds amount specified.
15-05	Handling and Storage of Fuel – Risk Management Plan	Applies to existing activities, where fuel is stored in a quantity of 13,000 L or more, or 22,500 L or more, a Risk Management Plan is required.
G-01	General – Restricted Land Use (Non-Residential)	Municipalities are required to amend Official Plan and Zoning Bylaw designations to restrict land use where the associated activity is or would be a significant drinking water threat.
G-02	General - Restricted Land Use (Residential)	Municipalities are required to amend Official Plan and Zoning Bylaw designations to restrict land use where the associated activity is or would be a significant drinking water threat.
G-03	General - Restricted Land Use (Non-Residential for Fuel Near Intakes)	In an EBA, land use designations and zoning will be updated to restrict the handling and storage of fuel where it would be a significant drinking water threat.
G-04	General - Amend Official Plan and Zoning By-law	Municipalities will be required to amend their official plan and zoning bylaws to include vulnerable area mapping and source protection policies.

2.9 Air Quality, Dust and Noise

The study area, which encompasses the communities of Port Elgin and Southampton, includes sensitive receptors including residential dwellings, schools, day care facilities, a hospital, community centres, places of worship, hotels, and motels.

Locally, there are relatively few existing sources of noise, dust or air pollution. The Port Elgin WWTP is located at the eastern border of the community, adjacent to Mill Creek. North of the WWTP is a concrete plant and aggregate operations. In Southampton, the WWTP is located at the north end of the community, adjacent to the Saugeen River. Both communities are surrounded by agricultural land, where normal farming practices may include spreading of agricultural and non-agricultural source material.

In both communities, the prevalent winds are from the west and southwest (i.e. off Lake Huron).

2.10 Contaminated Sites

Data on historical and active landfills was reviewed to identify sites within the vicinity of the study area. Presently, the only active landfill is in the vicinity of Southampton and Port Elgin is the Southampton Landfill, located at 140 Concession 14, east of Southampton. There is a former landfill site located north of the Port Elgin WWTP on Lehnen Street. This facility was closed in 1983. In Southampton there is a former landfill located between McNabb Street and Creekwood Drive, south of Beausoleil Road.

2.11 Servicing, Utilities and Facilities

Within the study area, there are above and unground utilities and services. These services include electrical services, natural gas and telecommunication lines. Municipal services within the study area include water, wastewater and stormwater infrastructure. Portions of the urban area, such as Gobles Grove, have partial services (i.e. no municipal sewage services).

3.0 POPULATION, GROWTH AND FUTURE DEVELOPMENT

3.1 Information Sources

The primary source of current population data for the Town of Saugeen Shores is the 2021 Census of Population from Statistics Canada.

There are several recent population forecasts developed that were utilized for the purposes of this Master Plan. In 2023, the Town undertook a Development Charge Background Study, which forecasted population growth to 2042 (DFA Infrastructure International Inc, 2023). Additionally, the County of Bruce completed population and employment forecasts in 2022 for each lower tier municipality in conjunction with the County's Official Plan process (Watson and Associates Economists Ltd and WSP, 2022). The Ministry of Finance Census Division Population Projection (2024) was also reviewed (Ministry of Finance, 2021).

3.2 Existing Population

The existing population of Port Elgin and Southampton, as reported in the 2021 Census, are 9,619 and 3,993 persons respectively. The total urban population of Saugeen Shores is 13,612 persons, with 71% of the urban population in Port Elgin and 29% in Southampton.

3.3 Existing Customers

The existing customer counts for the water and wastewater systems, as of December 31st, 2024, are summarized below. The number of wastewater system customers in each community has been estimated based on the number of sanitary service laterals and the number of water customers is based on the number of curb stops.

- Saugeen Shores water system: 6,563
- Port Elgin wastewater system: 3,898
- Southampton wastewater system: 2,660
- Combined wastewater systems: 6,558

3.4 Definition of an Equivalent Residential Unit (ERU)

For the purposes of quantifying servicing requirements for current development commitments and future growth, water demands, and wastewater flows are described in terms of Equivalent Residential Units (ERUs). An ERU is defined as the unit flow design value for a single detached residential unit. Design flows for other types of residential development are proportioned to single detached units based on average per person occupancies (PPU). The following values were taken from the 2023 Development Charges (DC) Background Study and used for calculation purposes:

- Single detached = 2.76 PPU = 1.00 ERU
- Multi-family unit =1.81 PPU = 0.66 ERU
- Apartments =1.50 PPU = 0.54 ERU

3.5 Development Commitments and Proposals

The Town of Saugeen Shores has experienced significant growth in recent years with continued residential growth anticipated. Town staff provided information on current approved and conceptual development proposals.

For the assessment of future long-term water and wastewater infrastructure needs, including the reserve capacity calculations, the following were considered:

- **Approved developments**: developments that are approved and considered commitments.
- **Active Proposals**: developments that are currently proposed but not yet approved or committed to.
- **Potential Long-Term Development/Ultimate buildout**: includes vacant lands within the urban boundary that have not been proposed for development and are zoned residential or future development. It also includes future development lands that would require an adjustment to the urban boundary (see Section 3.5). Servicing to these lands is not approved or committed to at this point in time.

The approved developments, active proposals and potential long-term development areas are shown in Figure 3.1 for Port Elgin and Figure 3.2 for Southampton. Table 3.1 summarizes the number of ERUs of approved developments and active proposals.

Table 3.1 – Summary of Total Number of Approved and Active Development Proposals in ERUs (2025)

Community	Approved Development (ERUs)	Active Proposals (ERUs)	Total ERUs
Port Elgin	1,549	1,674	3,223
Southampton	213	646	859
Totals	**1,762**	**2,320**	**4,082**

For the purposes of forecasting future water needs and sewage flows, it was determined that a 5% increase of the existing customer base was an appropriate allowance for potential infill and conversions. Given there are approximately 6,563 residential water customers, the infill allowance is 328 units. The infill allowance has been divided between Port Elgin and Southampton based on their relative proportional current populations, with 195 units allocated to Port Elgin and 133 to Southampton.

For reserve capacity calculations, the same flows have been applied to each unit. Further, the number of active proposals units also includes trailer park units in Port Elgin. The trailer units are assumed to have water flows equivalent to an apartment unit and are not expected to utilize municipal sewage services.

Figure 3.1 – Potential Development Lands – Port Elgin

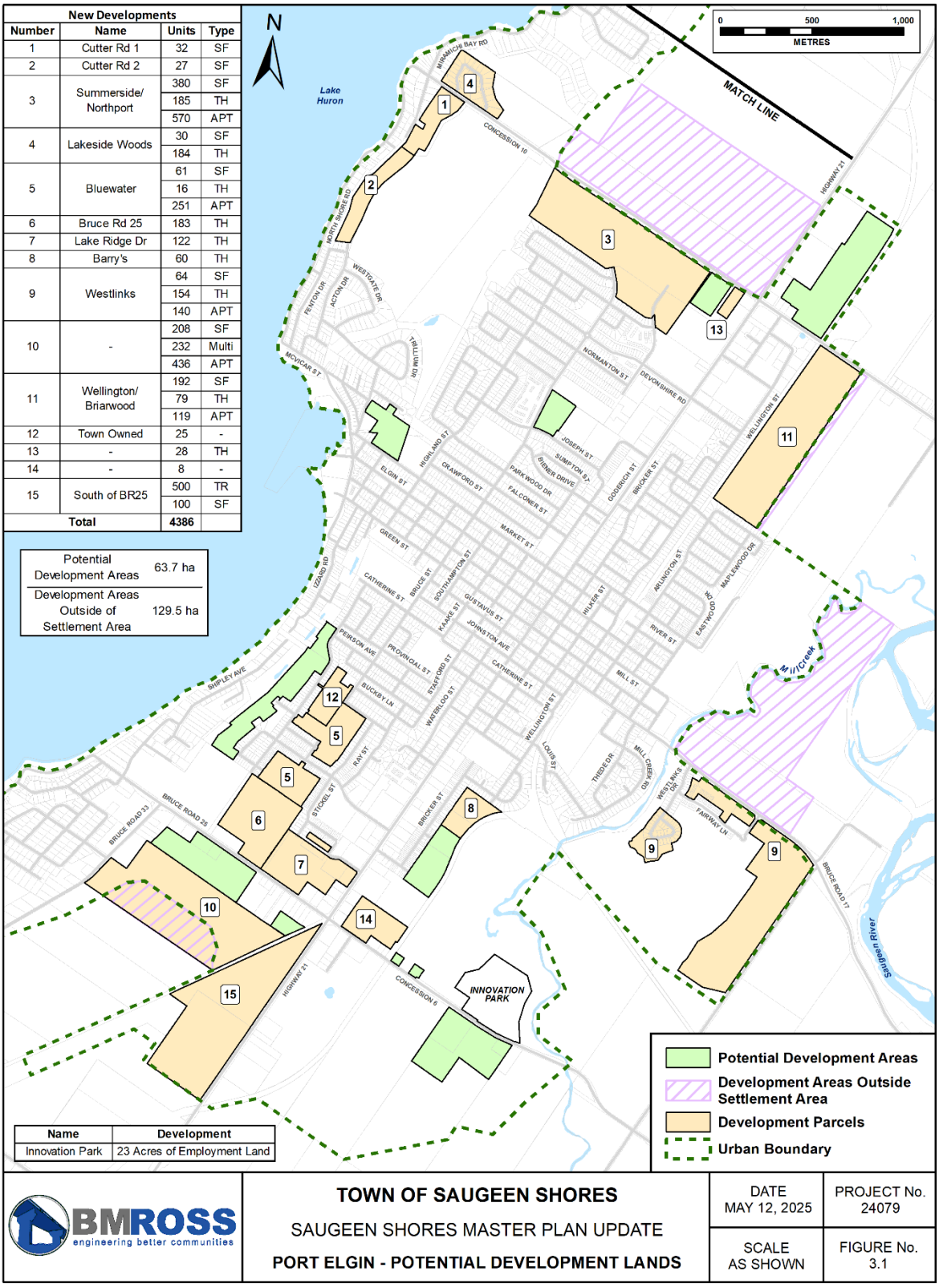
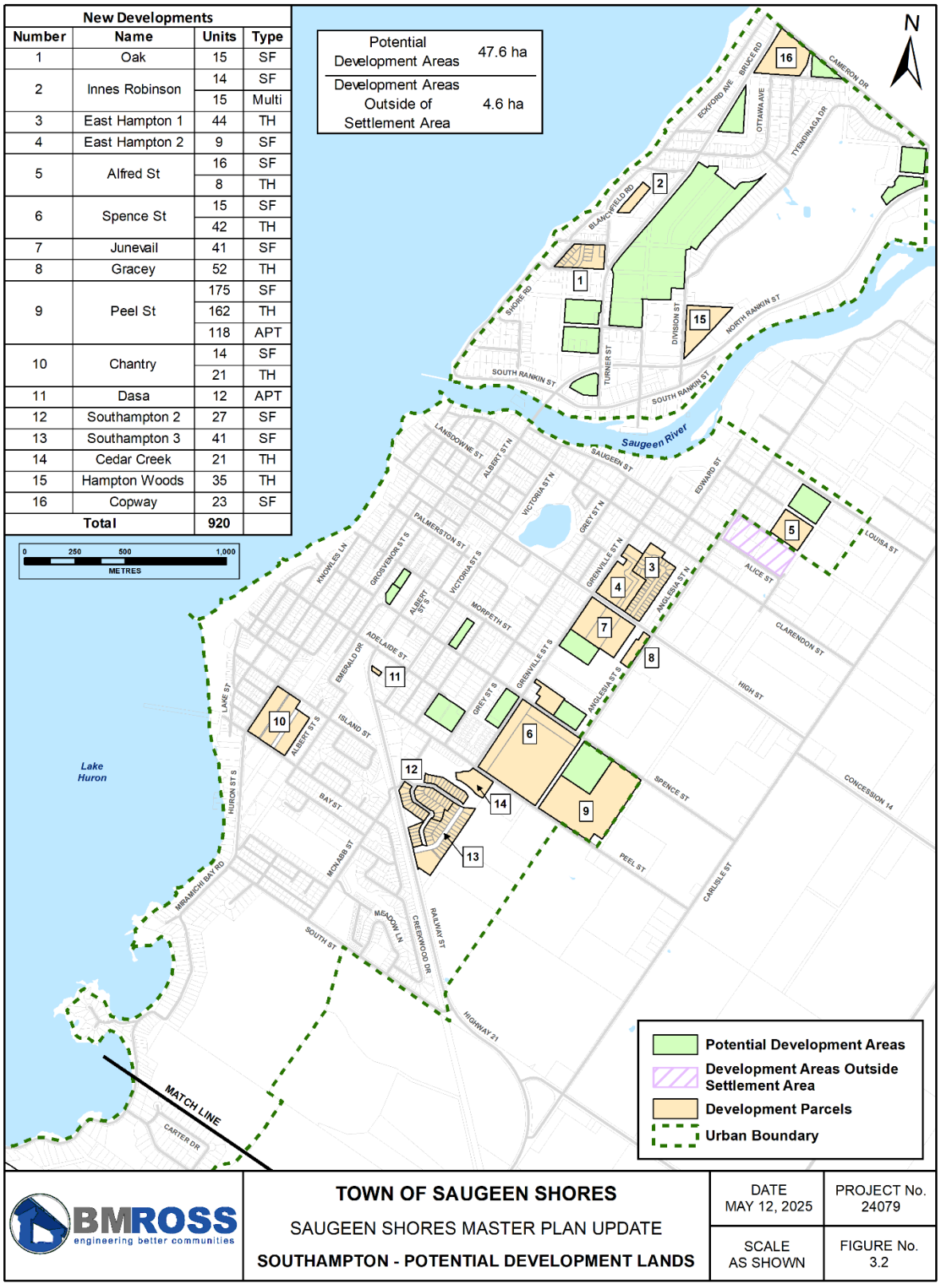


Figure 3.2 – Potential Development Lands – Southampton



3.6 Saugeen First Nation

Saugeen First Nation (SFN) obtains water from the Saugeen Shores Drinking Water System. The current agreement between the Town and SFN from 2006 specifies a Maximum Day Demand (MDD) of 925 m^3/day. Based on data provided by the Town, SFN's current water utilization is 671 m^3/day as an MDD. The difference between the amount specified in the agreement and current utilization (254 m^3/day) is considered a further servicing commitment relevant to the drinking water system. At this time, it is understood the agreement for water provision may be revised in the future; however, for the purposes of this Master Plan, the commitment allocated to SFN reflects an appropriate growth allowance within the constraint of the current agreement.

Currently, Saugeen Shores does not provide wastewater treatment for SFN. It is understood that SFN is currently undertaking a Capital Needs Study that will include an evaluation of potential options for wastewater servicing for the community. The Capital Needs Study is in the initial phases and at this time, sewage servicing needs in terms of capacity and treatment methodology have not been established. There is potential for SFN to operate their own sewage treatment facility or request capacity at the Southampton WWTP. It is expected that as the SFN Capital Needs Study progresses, additional information will be made available regarding potential capacity needs as part of future discussions regarding the potential for the provision of wastewater treatment for SFN by Saugeen Shores.

The calculations of additional sewage capacity needs do not include servicing of SFN at this time, as it is unknown if SFN will request treatment capacity or implement a different sewage servicing strategy. However, given the existing 400 m^3/day water Average Day Demand (ADD) by SFN and assuming an equivalent average day sewage flow, it is estimated the provision of sewage treatment services at the Southampton WWTP would utilize approximately 13.2% of the currently approved WWTP capacity and cause overall committed capacity to reach approximately 91.1%.

3.7 Potential Long-Term Development/Ultimate Buildout

The analysis for the reserve capacity calculations also included an examination of capacity associated vacant residential and future development lands within the urban boundary and those that would require an adjustment to the urban boundary. At this time, these potential future developments outside the boundary are not approved nor considered commitments but were included in the reserve capacity calculations for long-term planning purposes to ensure a conservative approach. For these areas, the number of additional potential ERUs was calculated. The projected number of residential units per hectare was based on the average number of units per current development proposals with the current corresponding zoning or assumed future zoning. Table 3.2 summarizes the densities used:

Table 3.2 – Future Residential Density Assumptions

Density Designation	Assumed Unit Type	Density (units per ha)
Low – R1	SFUs	6
Medium – R2 and R3	Townhouses	22
High – R4	Apartments	100
Commercial Recreation	Trailers	17

It is important to note that the current average densities are significantly less than what is actually allowed by current zoning provisions. The total number of potential additional units for the potential long-term development areas/ultimate build out, which includes possible urban boundary expansion, is noted in Table 3.3. The additional units in Table 3.3. also include units on lands that are currently outside the settlement area boundary but that have been identified as potential areas for a settlement area expansion.

Table 3.3 – Additional ERUs for the Long-term Development/Ultimate Buildout Scenario

Development Category	Potential Long-Term Development / Buildout
Addition ERU – Port Elgin	2,178
Additional ERU – Southampton	404

3.8 Population Growth Forecasts

Three existing population growth forecasts for Saugeen Shores were utilized for this study and included;

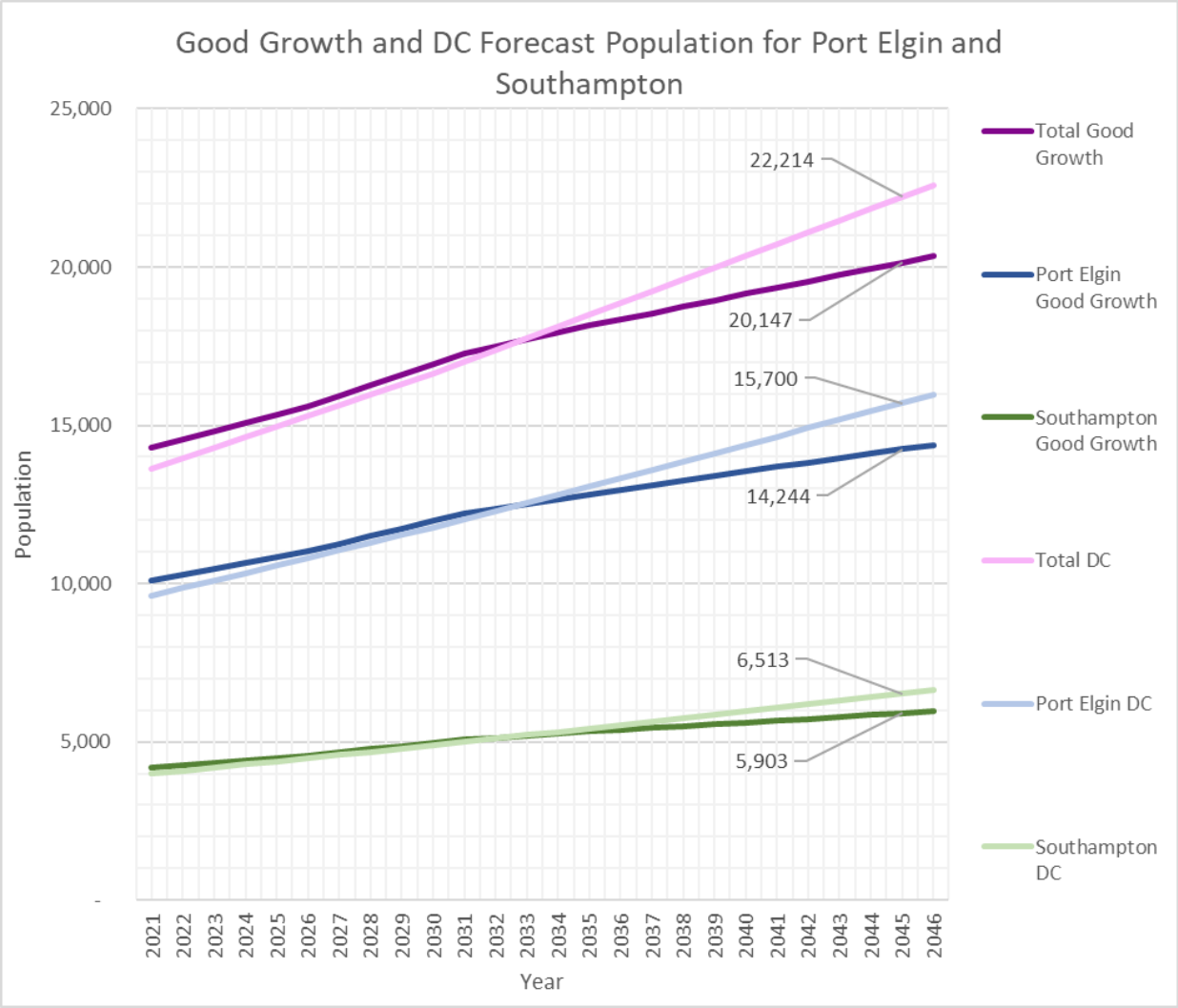
- Ministry of Finance Census Division Projections
- Bruce County Good Growth Forecast
- 2023 Development Charge Forecast

The current urban population of Saugeen Shores is approximately 15,000. The Development Charge forecast predicts the highest growth (2.4% declining to 1.7% by 2045), while the Good Growth projections forecast the lowest growth (1.8% decline to 1.0% by 2045). By 2045, projections range from 36% (an additional 5,400 people) to 50% growth (an additional 7,500 people).

To plan future servicing and facility expansions, water and wastewater projections were made using both forecasts, providing early (worst-case) and late (best-case) scenarios. In general terms, it is expected that changes in water demands and wastewater flows will

occur coincident with population growth. Figure 3.3 shows the population forecasts for Port Elgin, Southampton and the urban communities combined.

Figure 3.3 – Population Forecasts for Port Elgin and Southampton (2025-2045)



Based on the estimates of the existing population and future development, the expected 2045 population is summarized in Table 3.4, based on the DC (high growth) and Good Growth (low growth) population projection scenario for each community.

Table 3.4 – Forecasted Population in 2045, Port Elgin and Southampton

Community	Low Growth Scenario (Good Growth)	High Growth Scenario (DC)
Port Elgin	14,244	15,700
Southampton	5,903	6,513
Total	**20,147**	**22,213**

On the basis that one ERU is equivalent to 2.76 people (see Section 3.4), the potential population from the current development commitments and development proposals when combined exceeds the forecasted population based on the maximum growth presented in Figure 3.3. Current commitments and proposals combined would, if fully built out, increase the population of Port Elgin and Southampton to approximately 26,500 people.

4.0 SAUGEEN SHORES DRINKING WATER SYSTEM

4.1 Description

4.1.1 General

The communities of Port Elgin and Southampton are serviced by a single DWS that takes water from Lake Huron. The DWS operates under Municipal Drinking Water License (MDWL) No. 093-101 Issue No. 3 and Drinking Water Works Permit (DWWP) No. 093-201 Issue No. 4; both dated, March 19, 2021.

Originally two separate water systems, they became a single system served by the Saugeen Shores WTP in approximately 2006. The distribution systems operate as two separated pressure zones.

4.1.2 Water Treatment

The water treatment system has a rated capacity of 18,000 m^3/day per Schedule C, Table 1 of the MDWL and the PTTW. The plant is currently equipped with membranes for up to 15,000 m^3/day. Physical expansion of the WTP would be required to add more membranes and increase capacity to greater than 15,000 m^3/day.

However, the above capacity is based on the assumption that the membranes are fully functional and operating at full efficiency (i.e. new condition). No provision is built into the value for membrane cleaning or deterioration over time as the membranes age. Raw water quality will also have an impact, although this will typically be reflected in the cleaning time and frequency.

To assess the impact of in-plant losses we reviewed the annual totals for raw water supplied to the WTP compared to treated water discharged to the distribution system. The difference is the net available supply. We also considered water sales compared to water discharged from the WTP. The difference would be system losses through various factors including non-metered uses (e.g. flushing, fires, meter error). Details are summarized in Table 4.1.

Table 4.1 – Net Available Water Supply and Sales

Year	Total Raw (m^3)	Total Treated (m^3)	Annual Difference (m^3)	% Difference	Total Sold (m^3)	Annual Difference (m^3)	% Difference
2021	2,234,239	2,054,434	179,805	8.1			
2022	2,324,220	2,063,910	260,310	11.2	1,573,906	490,004	23.7
2023	2,339,920	2,071,242	268,679	11.5	1,608,788	462,454	22.3
2024	2,422,260	2,209,107	213,153	8.8			
			4 Year Average	9.9		2 Year Average	23.0

The data shows that the net available supply has been deteriorating as a percentage of the raw water supplied each year. Based on the values in Table 4.1 we recommend that, for reserve capacity calculations, the capacity of the water supply be considered as 89% of the 15,000 m^3/day value which is approximately **13,425 m^3/day**.

4.1.3 Water Storage

There are four treated water storage facilities. Total and effective storage volumes were presented in the 2020 Master Plan (MP) (Table 4.3 on Page 39). For the 2025 MP, additional analysis was undertaken using current modelling and a better knowledge of how the system is operated. The effective volumes have changed slightly.

As summarized below, the effective storage capacity of the system facilities is approximately 7,400 m^3. This is considerably less than the built capacity which is 11,700 m^3. The principal difference is that a large proportion of the standpipe contents is currently unavailable without booster pumping.

The effective storage of the standpipes is limited by the ability to maintain adequate distribution system pressures without pumping. Therefore, the current method of operation is to operate the systems with the standpipes as full as possible (i.e. within the top one metre). In effect peak flow equalization for Zone 1 is achieved by the High-lift Pumps and WTP Clear Well and, for Zone 2, the Clear Well in combination with the Port Elgin Reservoir and Booster Pumping Station (BPS).

Neither the standpipes nor the Port Elgin Reservoir can be expanded. It is assumed that the WTP Clear Well can be expanded but property acquisition may be necessary. Table 4.2 summarizes the total and estimated effective volumes based on the most recent analysis.

Table 4.2 – Summary of Treated Water Storage Facilities

Facility	Effective Volume (m^3)	Total Volume (m^3)
WTP Clear Well	1,514	1,600
Southampton Standpipe	317[1]	2,900
Port Elgin Standpipe	1,090[1]	2,400
Port Elgin Reservoir	4,500	4,500
Total	**7,421**	**11,400**

Notes:
1. Below this volume, less than 140 kPa pressure would be available.

4.1.4 Summary for Treatment and Storage

Table 4.3 summarizes the approved water supply and effective storage capacities for the Saugeen Shores DWS.

Table 4.3 – Saugeen Shores Water Facility Capacity

System Component	Capacity	Source Information
Water Treatment (WTP)	Rated 18,000 m^3/day Effective 13,425 m^3/day	MDWL / PTTW[1.] BMROSS June 19/25 Memo[2.]
High-Lift Pumps • Zone 1 • Zone 2	 108 L/s (firm) 162 L/s (firm)	 Town Town
Port Elgin Booster Pumping Station	279 L/s (firm)	DWWP
<u>Water Storage</u> WTP Clear Well Southampton Standpipe Port Elgin Standpipe Port Elgin Reservoir	 1,514 m^3 (effective) 317 m^3 (effective) 1,090 m^3 (effective) 4,500 m^3 (effective)	

Notes:
1. PTTW refers to Permit to Take Water No. 1133-AQQLPH.
2. Technical Memo No. 1 (TM1) provides an estimated net capacity based on equipped membranes.

4.1.5 Water Distribution Systems

The Saugeen Shores water distribution system is divided into two pressure zones:

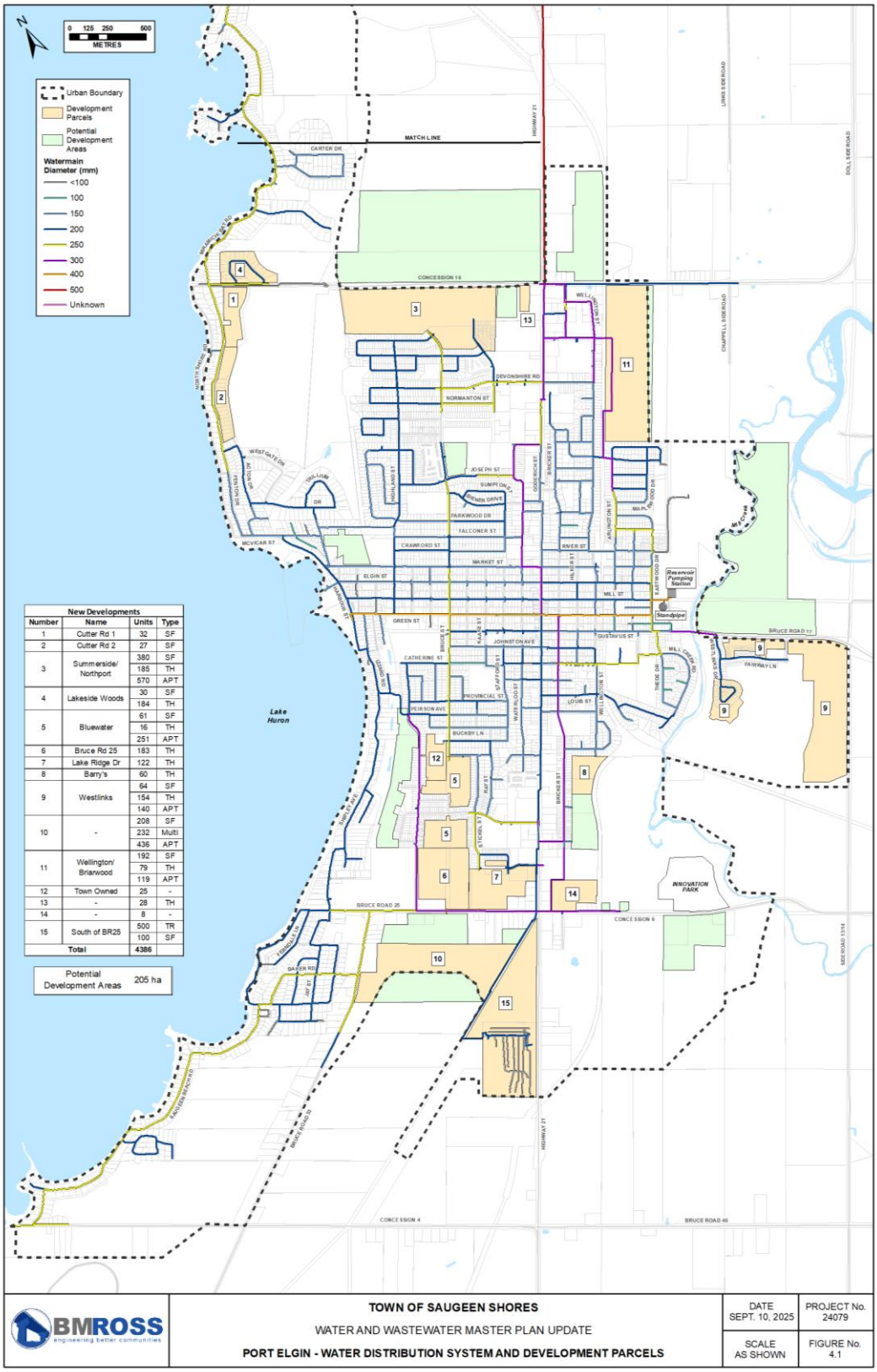
- Zone 1 Southampton west of Grenville Street. Pressure is controlled by the Southampton Standpipe and High-Lift pumps at the WTP.

- Zone 2 Port Elgin and Southampton east of Grenville Street. Pressure is controlled by the Port Elgin Standpipe and High-Lift pumps at the WTP.

In total there is approximately 150 km of watermain, 100 mm diameter or greater. There are approximately 6,600 customers. The estimated serviced population is approximately 15,000 people.

Figures 4.1 and 4.2 show the locations of the watermains and major facilities.

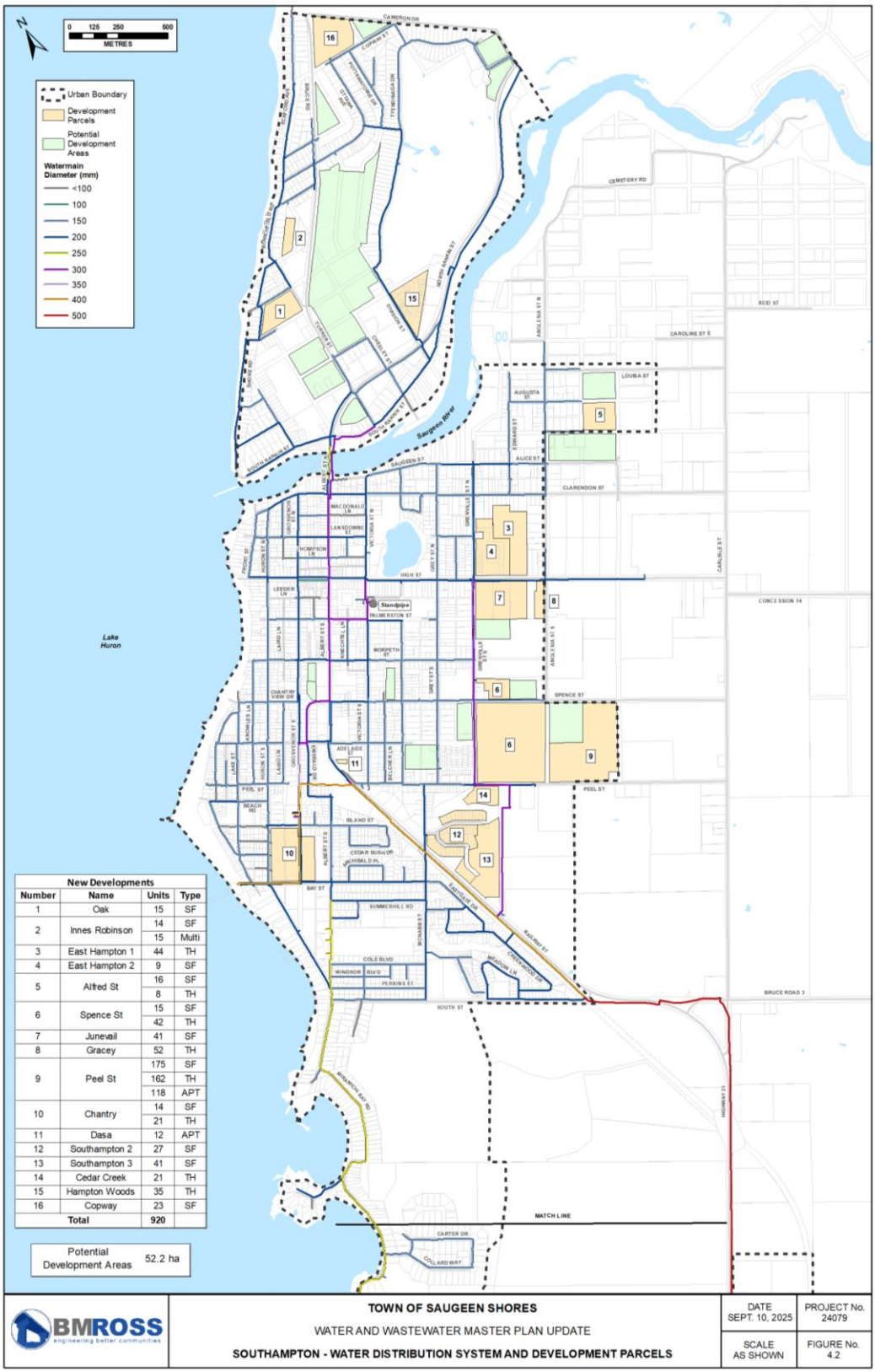
Figure 4.1 – Port Elgin Water Distribution System



New Developments			
Number	Name	Units	Type
1	Cutter Rd 1	32	SF
2	Cutter Rd 2	27	SF
3	Summerside/ Northport	380	SF
		185	TH
		570	APT
4	Lakeside Woods	30	SF
		184	TH
5	Bluewater	61	SF
		16	TH
		251	APT
6	Bruce Rd 25	183	TH
7	Lake Ridge Dr	122	TH
8	Barry's	60	TH
9	Westlinks	64	SF
		154	TH
		140	APT
10	-	208	SF
		232	Multi
		436	APT
11	Wellington/ Brianwood	192	SF
		79	TH
		119	APT
12	Town Owned	25	-
13	-	28	TH
14	-	8	-
15	South of BR25	500	TR
		100	SF
	Total	4386	

Potential Development Areas	205 ha

Figure 4.2 – Southampton Water Distribution System



New Developments			
Number	Name	Units	Type
1	Oak	15	SF
2	Innes Robinson	14	SF
		15	Multi
3	East Hampton 1	44	TH
4	East Hampton 2	9	SF
5	Alfred St	16	SF
		8	TH
6	Spence St	15	SF
		42	TH
7	Junevail	41	SF
8	Gracey	52	TH
9	Peel St	175	SF
		162	TH
		118	APT
10	Chantry	14	SF
		21	TH
11	Dasa	12	APT
12	Southampton 2	27	SF
13	Southampton 3	41	SF
14	Cedar Creek	21	TH
15	Hampton Woods	35	TH
16	Copway	23	SF
Total		920	

Potential Development Areas	52.2 ha

4.2 Existing and Design Water Demands

4.2.1 Existing Average and Maximum Daily Flows

Water supplied to each zone is recorded on a daily basis. Tables 4.4 and 4.5 provide a summary of recent Annual Average day (AAD) and MDD values.

Table 4.4 – Historical Water Demands

Year	Zone 1 AAD (m^3/day)	Zone 1 MDD (m^3/day)	Zone 2 AAD (m^3/day)	Zone 2 MDD (m^3/day)	Combined AAD (m^3/day)	Combined MDD (m^3/day)
2021	1,910	3,384	3,719	7,169	5,629	8,104
2022	2,085	3,352	3,599	5,890	5,655	9,243
2023	1,970	3,291	3,708	6,360	5,675	9,531
2024	*	*	*	*	6,036	9,761

* Zone specific breakdown not available for 2024.

Table 4.5 – Ratio of Maximum to Average

Year	Combined AAD (m^3/day)	Combined MDD (m^3/day)	Ratio MDD/ADD
2021	5,629	8,104	1.44
2022	5,655	9,243	1.63
2023	5,675	9,531	1.68
2024	6,036	9,761	1.62

Typical design values for a serviced population of 15,000 would suggest using an MDD/ADD ratio of 1.9. Given recent historical values, which are reasonably consistent but lower, we propose using a ratio of 1.8 for planning purposes.

From the above values we note:

- Average Flows to both Zones have been reasonably consistent over the years considered.
- The average flow split is generally 35% to Zone 1, 65% to Zone 2.
- Zone 2 MDD values are trending upward.
- For demand forecasting purposes the existing MDD has been assumed to be 9,761 m^3/day (2024 value). It is noted that an even greater MDD was observed in 2025, but the study is based on customer count and flow data up to year-end 2024.

4.2.2 Methodology to Determine Unit Flows

Annual water consumption per customer was available for 2022 and 2023. The current customer count for Port Elgin and Southampton includes both residential and non-residential. To develop a reasonable approximation of growth-related flows the following steps were taken:

- Step 1: The 10 largest customers, based on water consumption, were subtracted from the total water supplied value. It is assumed that these large users (e.g. SON, hospital, High School, MacGregor Point Provincial Park) would not be replicated with growth.
- Step 2: The cut-off minimum annual flow per customer was taken as 50 m^3/year. Volumes less than 50 m^3/year were considered too low to represent actual usage.
- Step 3: The annual average "per customer" flow was developed to be 0.61 m^3/day using the net value after Steps 1 and 2. The top 20^{th} percentile value was used as the average per customer, providing a measure of conservatism as compared to using the 50^{th} percentile value.
- Step 4: The "per customer" flow was increased by 23% to account for the difference between the WTP discharge and the sum of metered consumption.
- Step 5: For calculation purposes it is assumed that for every residential unit built there will be a proportional increase in non-residential. This is generally accounted for by the fact that, other than the 10 largest customers being removed from the calculation as noted above, all other non-residential customers serviced by the system will be included in current demands. For purposes of the reserve calculation, the historical "per customer flow" from Step 3 plus 10% is used as the water demand for one ERU, to further account for non-residential growth.
- Step 6: Because the critical water demand is the maximum daily demand (MDD) the annual per customer demand calculated from Steps 1 to 5 was multiplied by the ratio of maximum day to average day based on total water supplied.

It is assumed, for demand forecasting purposes, that one existing customer is the same as one ERU. Based on the method described previously, the water demand per ERU is:

MDD per ERU = 0.61 x 1.23 x 1.1 x 1.8

= 1.49 m^3/day

= 1.5 m^3/day per ERU (rounded up)

Peak hour demands are assumed to be 150% of maximum day values. This is consistent with MECP Guidelines (MOE, 2008).

4.3 Reserve Capacity Calculations for Water Supply

4.3.1 Total Reserve Capacity

The Total Reserve Capacity is the difference between the net WTP capacity, as currently equipped and functional, and the current MDD. It identifies available surplus capacity at this point in time to be:

Total Reserve = 13,425 – 9,761

= **3,664 m^3/day**

4.3.2 Uncommitted Reserve

The Uncommitted Reserve is the difference between the Total Reserve and what is currently committed to approved future development. The uncommitted reserve is available to the Town to allocate to future development proposals.

Section 3.5 identified the following development commitments:

For Port Elgin	1,549 ERUs
For Southampton	213 ERUs
Total Commitments	= 1,762 ERUs

At 1.5 m^3/day per ERU (Section 4.2.2) the committed demand is 2,643 m^3/day. An additional 254 m^3/day for SFN's unused agreement threshold must also be considered a commitment. Therefore, the uncommitted reserve for water supply is:

Uncommitted Reserve = 3,664 – 2,643 – 254

= **767 m^3/day**

4.3.3 Impact of Development Proposals

Section 3.5 also identified active development proposals. Although there is no current commitment to service these proposals it is important to understand the potential impact if they proceed to the commitment stage. The proposals currently add up to:

For Port Elgin	1,674 ERUs
For Southampton	646 ERUs
Total Proposals	= 2,320 ERUs

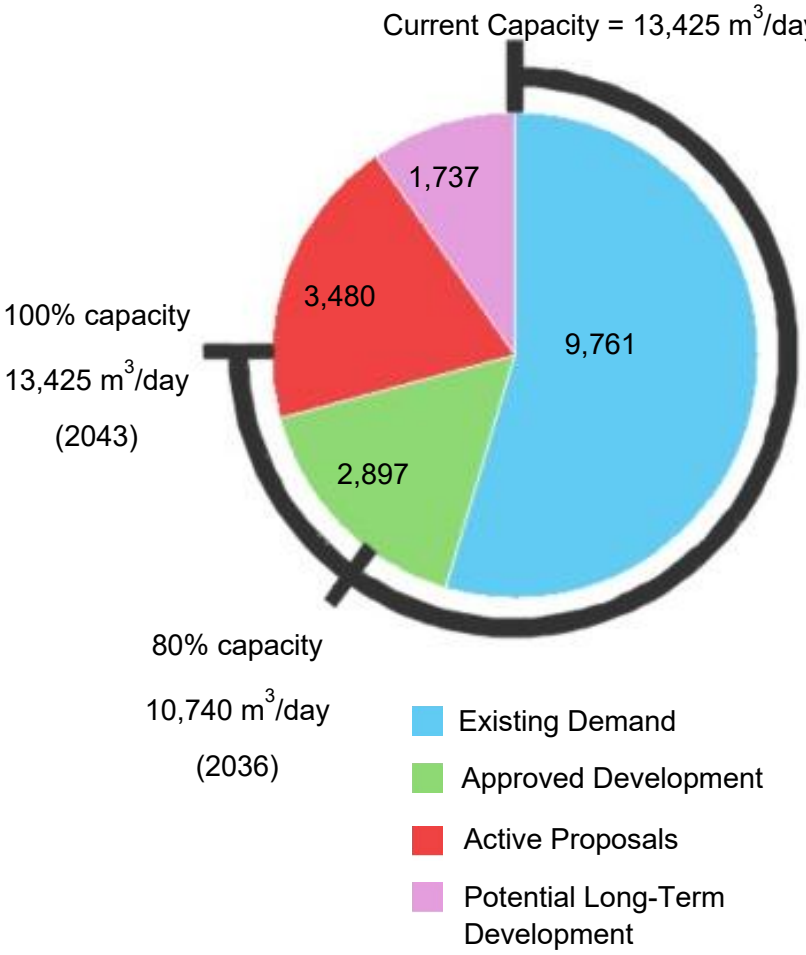
At 1.5 m^3/day per ERU (Section 4.2.2) the potential water demand that would result from approval of the proposals is 3,480 m^3/day.

Reserve after Proposals = 767 – 3,480

= **- 2,713 m^3/day**

Figure 4.3 shows the water treatment capacity utilized by the existing demand (current customers), the approved developments or committed demand (which includes the capacity not currently utilized by SFN see Section 3.6), the active development proposals and potential long-term development lands. The current capacity is shown as the black line surrounding the chart.

Figure 4.3 – Reserve Capacity, Water Treatment System



4.3.4 Forecasted Water Demands

Table 4.6 shows the required WTP capacity based on accommodating various development milestones. The required capacity shown takes into account in-plant and distribution system losses. The “Ultimate” scenario is based on adding currently vacant in-fill lands plus some boundary adjustment to the developments that are currently committed to or actively being discussed.

Table 4.6 – Water Treatment Capacity Required[1]

Servicing Scenario	Total Capacity Required (m^3/day)	Additional Capacity Required[3] (m^3/day)
Existing	9,761[2]	Nil
Existing + Commitments	12,658	Nil
Existing + Commitments + Active Proposals	16,138	2,713
Ultimate	20,000	6,575

Notes:

1. Capacity required is based on meeting MDD.
2. The existing capacity required is the 2024 actual MDD.
3. The additional capacity is based on an assumed current net capacity of 13,425 m^3/day.

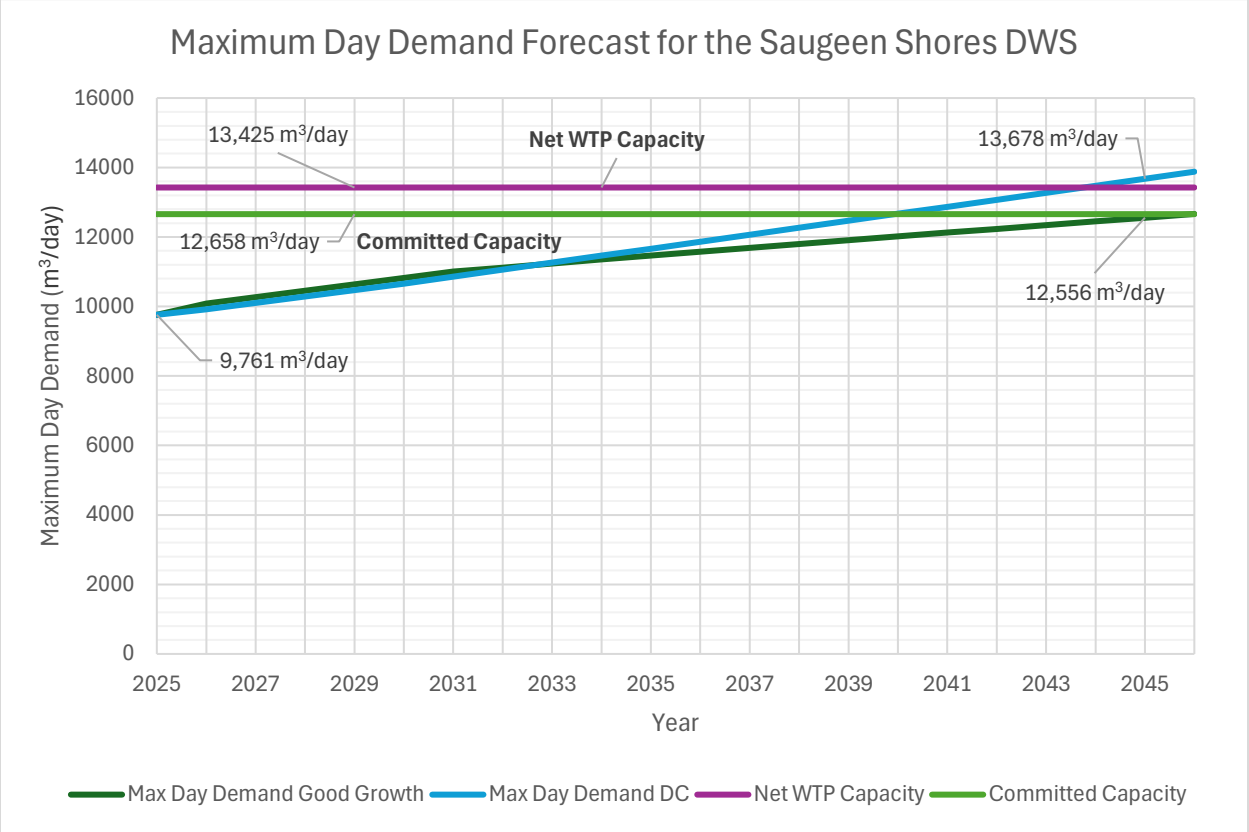
The approved capacity of the WTP, including the current PTTW limit is 18,000 m^3/day. For the WTP this would be considered the “net” capacity after in-plant losses. For the PTTW this would be considered as the “gross” taking allowed from Lake Huron. Based on the values in the Table above, existing commitments plus active proposals can be accommodated within the current plant rating (but not the current plant capacity). An increase in both the WTP rating and the PTTW value would be required for the ultimate servicing scenario.

The above analyses were based on meeting development milestones. We also looked at the relationship between capacity required and time.

It is estimated that the existing serviced population for the DWS is approximately 15,000 people. The forecasted MDD used per ERU is 1.5 m^3/day. In Section 3.4 an ERU is defined as 2.76 people. Therefore, the MDD per capita is approximately 0.543 m^3/day.

Figure 4.4 shows forecasted MDD based on the growth information in Section 3.4.

Figure 4.4 – Maximum Day Water Demand 2025 to 2045



4.3.5 Conclusions for Water Supply

From the above it is concluded that existing MDD is approximately 73% of the existing net treatment capacity. After considering the potential demand from current development commitments the demand would increase to approximately 94% of the net capacity. Current unapproved proposals, if approved, would increase the committed capacity to greater than the equipped capacity.

The maximum predicted growth rate (from Development Charges studies) is in the order of 2.5% initially, declining to 1.7% per year. Based on expected real growth, the MDD will be at the equipped capacity by approximately 2043. The 80% capacity planning threshold (12,000 m^3/day) will be exceeded by approximately 2036.

It is important to note that the existing uncommitted supply is only 767 m^3/day (511 ERUs) whereas there are active development proposals for 3,480 m^3/day (2,320 ERUs). The Town could potentially run out of the ability to approve additional development by 2029.

4.4 Reserve Capacity for Water Storage

4.4.1 Facilities

Currently there are four treated water storage facilities. They are listed in Table 4.1 and described in more detail below. A replacement for the original Port Elgin Standpipe was put into service in 2019. The original standpipe is still in service but is expected to be decommissioned at some point and has not been factored into the reserve capacity calculations.

Table 4.7 provides a summary of the capacities of the various facilities.

Table 4.7 – Summary of Treated Water Storage Facilities

Facility	Zone Served[1]	Effective Volume (m^3)	Total Volume (m^3)	Operational Constraint
WTP Clear Well	Zones 1 and 2	1,514	1,600	Use is constrained by the high-lift pumps and the need to maintain adequate retention for chlorine.
Southampton Standpipe	Zone 1	317[2]	2,900	Bottom 2,300+ m^3 is only available by pumping.
Port Elgin Standpipe	Zone 2	1,090[3]	2,400	Bottom 1,300+ m^3 is only available by pumping.
Port Elgin Reservoir	Zone 2	4,500	4,500	Use is constrained by the capacity of the booster pumps.
Total	**-**	**7,421**	**11,400**	**-**

Notes:

1. Zone 1 is the Southampton Area west of Grenville St. Zone 2 is the Port Elgin Area and the areas east of Grenville St. in Southampton
2. Water Level is based on maintaining >140 kPa during MDD + Fire. This value assumes the existing booster pump at the base of the standpipe is not functional. If the pump is operating the effective volume would become approximately 2,900 m^3. For PHD the SP is maintained full and has no effective storage capacity. Assumes the LWL during fire is 227.1 mASL.
3. Based on WaterCAD® modelling, water levels below 236.9 mASL will not provide adequate (>140 kPa) pressure during MDD + Fire. WL below 246.9 mASL will not provide > 275 kPa for PHD.

4.4.2 Operation of the Existing Facilities

There are two pressure zones. Each Zone has a dedicated set of high-lift pumps which take water from the WTP Clear Well. Pump start/stop is based on the standpipe water level in each Zone.

Normal operation is to keep the standpipes as full as possible. Thus, peak demands are generally met from the WTP. The Port Elgin Reservoir is routinely operated to augment WTP flows and provide turnover. Normal usage from the reservoir is limited to

approximately the top two metres which is reported (OCWA 2023) to be approximately 1,250 m^3. When the reservoir is filling the booster pumps cannot operate because of the single fill/discharge piping. During this time Zone 2 is being supplied from both the WTP and the Zone 2 standpipe.

To estimate storage requirements in each Zone the effective capacity of the WTP Clear Well has been allocated based on ADD values as recorded at the WTP. The allocation is:

Zone 1 (35%) = 530 m^3

Zone 2 (65%) = 984 m^3

Total = 1,514 m^3

4.4.3 Storage Needs

(a) Two Zone Distribution System

Table 4.8 summarizes the storage requirements by Zone for various servicing scenarios based on retention of a two-zone system.

Table 4.8 – Storage Required – Two Zone Option

Servicing Scenario	Zone 1 Total (m^3)	Zone 1 Additional (m^3)	Zone 2 Total (m^3)	Zone 2 Additional (m^3)	Total (m^3)	Total Additional (m^3)
Existing	2,112	1,265	4,507	Nil	6,619	1,265
Existing + Commitments + Active Proposals	2,949	2,102	7,093	519	10,042	2,621
Ultimate [1]	2,949 [2]	2,102	10,931	4,357	13,880	6,459

Notes:
1. The ultimate scenario is based on development of existing vacant properties and a limited expansion of the urban boundary.
2. It is assumed that once existing commitments and proposals are built out, the effect of infill of vacant lands will have little impact on storage needs.

From Table 4.8 we note the following:

- There is an existing storage deficit of approximately 1,300 m^3 in Zone 1.
- To accommodate existing servicing commitments and active development proposals a total of approximately 2,600 m^3 of additional storage is required, the majority (2,100 m^3) in Zone 1. Therefore, some additional storage is required in both Zones.
- The total additional storage required is approximately 6,500 m^3 based on the “ultimate” scenario.

- For the ultimate scenario Zone 2 needs relatively more additional storage than Zone 1.

- Of the 13,880 m^3 total storage required, approximately 5,100 m^3 is required for peak flow balancing (i.e. equalization).

(b) Single Zone Distribution System

If the existing system is converted to a single pressure Zone, the total additional storage required increases by approximately 140 m^3, as a result of how fire flows are calculated.

Also, it is not possible to operate the system as a single Zone and retain the existing Southampton Standpipe, thus the existing effective capacity decreases.

Table 4.9 – Storage Required – Single Zone Option

Servicing Scenario	Zones Combined Total (m^3)	Zones Combined Additional (m^3)
Existing	6,752	Nil
Existing + Commitments + Active Proposals	11,857	4,753
Ultimate	14,017	6,913

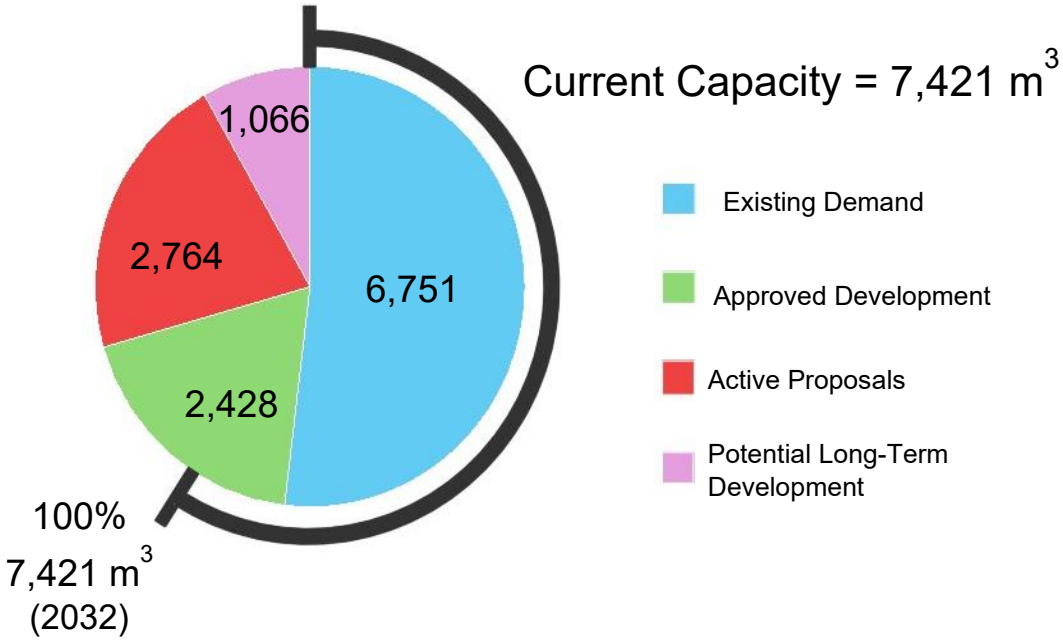
As indicated in Table 4.9, an additional 7,000 m^3 of effective storage would be required for the ultimate scenario in a single zone system. Of the 14,000 m^3 storage required approximately 5,000 m^3 is required for peak flow balancing.

Because of elevation differences between the two current pressure Zones and the overall range of minimum to maximum pressures in both, converting to a single pressure Zone would require reaching a compromise pressure. The currently established operational pressures within each Zone would change; customers in Port Elgin, especially near the existing standpipe, would have noticeably lower pressures. Additionally, the older watermains in Southampton, now experiencing higher pressure, may break at greater frequency. The rate of failure is difficult to predict, but the potential would exist for a significant number of occurrences.

4.4.4 Reserve Capacity for Storage

Figure 4.5 shows the reserve capacity for water storage, with the existing demand, amount (in m^3) required for current approved developments, the active proposals and potential long-term development.

Figure 4.5 – Reserve Capacity, Water Storage



The previous sections have shown that Zone 1 has a significant storage deficit and thus no reserve.

Currently there is a surplus of approximately 2,100 m^3 in Zone 2. The storage in Zone 2 can almost meet (500 m^3 deficit) the requirements for all existing commitments and active proposals. We estimate that approximately 1,800 ERUs of additional development could proceed in Zone 2 with the available surplus.

Allowing Zone 2 to supply Zone 1 through the existing PRV connections along Grenville Street would reduce the Zone 2 surplus to approximately 800 m^3 which would allow approximately 1,100 ERUs.

4.5 Water Distribution System Modelling

4.5.1 Background

The Saugeen Shores water distribution system was modelled using WaterCAD®. The purpose of the modelling was to identify potential flow and pressure issues during periods of high demand and to determine requirements for supplying future development areas. It is noted that the focus of the modelling is to identify any distribution system deficiencies, and assumes adequate supply and storage are provided.

4.5.2 Model Details

(a) WaterCAD® Software

BMROSS used Bentley® WaterCAD® CONNECT Edition Update 4 for the water distribution system modelling. The model contains 581 pipes and 385 junctions for the existing distribution network.

(b) Sources of Data

In order to produce a WaterCAD® model for the Saugeen Shores watermain network, several sources of information were used. In summary:

- The existing model from the 2020 Master Plan Update (BMROSS, 2020) was used as a basis and updated to reflect a change in conditions since that time.
- Watermain installation locations and diameters were obtained from distribution system mapping (i.e. GIS files) provided by the Town of Saugeen Shores.
- Watermain C-factors were assigned in accordance with values provided in the MECP Guidelines (MOE, 2008), as summarized in the table below.

Diameter (mm)	C Factor
150	100
200-250	110
300-600	120

- Elevation information for new infrastructure constructed since 2020 was obtained from data provided by the Town. Where specific data was not available, particularly for future development areas, Google™ Earth imagery was used.
- Pump and storage characteristics were obtained from a combination of the 2020 Master Plan Update, the DWWP for the Saugeen Shores Drinking Water System, and information provided by OCWA staff.
- Water demand information was developed as part of this Master Plan (refer to Section 4.2).
- Assessments for fire protection capability were made applying National Fire Protection Association (NFPA) categorization by available fire flow from NFPA Standard 291, as listed in Table 4.10. All fire flows were assessed at 140 kPa minimum system residual pressure.

Table 4.10 – NFPA 291 Hydrant Classification

Class	Colour Code	Available Fire Flow (gpm)	Available Fire Flow (L/s)
Class AA	Light Blue	1,500 or more	94.6 or more
Class A	Green	1,000 – 1,499	63.1 – 94.5
Class B	Orange	500 – 999	31.5 – 63.0
Class C	Red	Below 500	Below 31.5

(c) Establishing Flows at Junctions

WaterCAD® model "junctions" are created at every pipe intersection or dead-end. Water demands for the system are applied at these junctions. For the existing Saugeen Shores model, the top ten water customers by annual usage had the associated demand applied at the nearest model junction(s). The remaining water demand for the total system demand was divided by the total number of remaining model junctions in order to calculate the demand per junction. Appendix A contains a detailed summary of the demand allocation methodology.

For future model scenarios, assumed locations for future trunk watermains were incorporated into the model, creating a series of additional pipes and junctions within the development lands. Demands associated with each development area were applied to the nearest junction(s) adjacent to the development lands.

4.5.3 Analyses Run

In general, the model was used to determine system pressures under average and peak demands, and available fire flows under maximum day demands, for three scenarios: (1) existing, (2) existing and committed development, and (3) ultimate, which includes demands from existing, committed, and future potential development under different storage and pumping configurations. The modelling was carried out for the existing two-zone system. A detailed list of all model scenarios includes:

- Existing development demands (average, peak)
    - Standpipes at high water level (HWL)
    - High-lift pumps (HLPs) on
- Existing development demands (maximum day) plus fire flow
    - Standpipes at bottom of operating range
    - HLPs on
- Existing and committed development demands (average, peak)
    - Standpipes at HWL
    - HLPs on

- Existing and committed development demands (maximum day) plus fire flow
    - Standpipes at bottom of operating range
    - HLPs on
- Ultimate development demands (average, peak)
    - Standpipes at HWL
    - HLPs on
- Ultimate development demands (maximum day) plus fire flow
    - Standpipes at bottom of operating range
    - HLPs on

4.5.4 Qualifications on Results

Results of the distribution system modelling are based on the system information as described above. Model results were compared to fire hydrant flushing summary data provided by OCWA for 2024. Average day pressure results from the model matched closely to the hydrant data (i.e. median difference of 6%). Elevated water storage operational ranges and typical WTP discharge pressure ranges, as provided in a 2023 report by OCWA for a review of the high lift pumping system, were used to update the model setup.

In the event that future distribution system modifications are to be based on the results of system modelling, it is recommended that a field testing program be carried out for the purpose of verifying the 2024 hydrant data and comparing current actual field measurements to model predictions.

4.5.5 Results of Analysis

The results of the WaterCAD® analysis for each model scenario are presented in Table 4.11.

Table 4.11 – Summary of WaterCAD® Analysis

Analysis[1,2] and Criteria[3]	Existing 2 Zone	Existing + Commitments 2 Zone	Ultimate 2 Zone
Average Flow			
No. of junctions with kPa > 700	24	24	21
No. of junctions with kPa > 480 and <= 700	236	236	234
No. of junctions with kPa > 350 and <= 480	125	130	134
No. of junctions with kPa > 275 and <= 350	6	7	9
No. of junctions with kPa < 275	0	0	0
Peak Flow			
No. of junctions with kPa > 700	17	13	1
No. of junctions with kPa > 480 and <= 700	222	209	162
No. of junctions with kPa > 350 and <= 480	136	158	207
No. of junctions with kPa > 275 and <= 350	10	9	19
No. of junctions with kPa < 275	0	1	1
Fire Flows[4,5,6]			
No. of junctions with Q < 31.5 L/s at 140 kPa	0	1	1
No. of junctions with Q > 31.5 and < 63 L/s at 140 kPa	26	30	33
No. of junctions with Q > 63 and < 94.6 L/s at 140 kPa	46	44	46
No. of junctions with Q > 94.6 at 140 kPa	313	316	311

Notes:

1. For all scenarios, pumps are operating.
2. The existing and commitments scenario and ultimate scenario assume same pipe as existing model plus several extensions to development lands where required.
3. Pressure and flow criteria based on MECP Design Guidelines for Drinking Water Systems, 2008.
   Pressures (in kPa)
   > 700 not recommended, < 275 unacceptable
   > 480 but < 700, and > 275 but <350, are acceptable
   > 350 but < 480 is optimum
   Fire Flows
   < 31.5 L/s not recommended for residential areas
4. Fire flow analyses assume PE and SH standpipe water levels at the bottom of operating range, 250.40 mASL and 228.4 mASL, respectively. Results represent initial fire flow available at the beginning of a fire event (i.e. full storage facilities) and assume that adequate storage is provided for the duration of a fire, as per MECP Design Guidelines for Drinking Water Systems, 2008.
5. All fire flow analyses assume WTP HLPs are operating.

The flow and pressure conditions for existing and future scenarios are presented on figures in Appendix A.

(a) Findings for Existing Scenario

The existing arrangement has two zones interconnected, but operating as independent systems. Each system, referred to as Zone 1 and Zone 2, has its independent supply (high-lift pumps at the WTP) and storage facilities.

The WaterCAD® model identified the following conditions for the existing two-zone arrangement:

- There are no junctions under average or peak demand conditions with pressures < 275 kPa.
- Under average demand conditions, 24 junctions (≈ 6% of system) have pressures > 700 kPa. Under peak demand conditions, 17 junctions (≈ 4% of system) have pressures > 700 kPa.
- Approximately 33% of the system is in the optimum pressure range (350 kPa to 480 kPa) during average demands and approximately 35% during peak demands.
- No junctions have <31.5 L/s fire flow.

(b) Findings for Existing and Commitments Scenario

With reference to Table 4.11, the model predicts the following for the existing and commitments scenario:

- Operating pressures under average demand conditions are predicted to be similar to the existing scenario. Under peak demand conditions, there is one junction with below optimum pressure and slightly fewer with above optimum pressure. Under the existing and commitments scenario, there are more junctions with optimal pressure than under the existing scenario at both average and peak flows.
- Fire flow analysis was conducted with the water level in the Southampton Standpipe at 228.40 mASL and the Port Elgin Standpipe at 250.40 mASL. This elevation represents the water level in the Standpipes at the bottom of operating range. Results in Table 4.11 represent initial fire flow available at the beginning of a fire event (i.e. full storage facilities) and assume that adequate storage is provided for the duration of a fire, as per MECP Design Guidelines for Drinking Water Systems, 2008.
- In general, servicing of development lands beyond the existing developed area will require suitably sized extensions, without the need for upgrading any existing trunk watermain.

(c) Findings for Ultimate Scenario

With reference to Table 4.11, the model predicts the following for the ultimate scenario:

- Operating pressures under average demand conditions are predicted to be similar to the existing and commitments scenario. Under the ultimate scenario, there are slightly less junctions with above optimum pressure and more junctions with optimal pressure.
- Under peak demand conditions, there are significantly less junctions above optimum operating pressure and more junctions within the optimum pressure range compared to the existing and commitments scenario. Similar to the existing plus commitments scenario, there is one junction with below optimum pressure.
- Fire flow analysis was conducted with the water level in the Southampton Standpipe at 228.40 mASL and the Port Elgin Standpipe at 250.40 mASL. This elevation represents the water level in the Standpipes at the bottom of operating range. Results in Table 4.11 represent initial fire flow available at the beginning of a fire event (i.e. full storage facilities) and assume that adequate storage is provided for the duration of a fire, as per MECP Design Guidelines for Drinking Water Systems, 2008.
- In general, servicing of development lands beyond the existing developed area will require suitably sized extensions, without the need for upgrading any existing trunk watermain.

4.5.6 Conclusions and Recommendations

The following are general conclusions reached as a result of the modelling.

- A WaterCAD® model was created for the Saugeen Shores distribution network. The model was used for general analysis of existing and potential future system conditions. Some calibration/verification was attempted based on hydrant test records from 2024. Should the model be used for specific system modifications of significance, it is recommended that a field testing program be carried out for the purpose of verifying the 2024 hydrant data and comparing current actual field measurements to model predictions.
- The Saugeen Shores system is currently operated with two pressure Zones. Zone 1 is the area of Southampton west of Grenville Street. Zone 2 is Port Elgin and the east part of Southampton. Based on 2020 Master Plan results, additional brief modelling completed during the 2025 Master Plan update, discussions with the Town, it is not part the recommendations presented to convert the system from a two-zone system to a one zone system at this time, largely due to the implications for storage as well as potential adverse pressure impacts in parts of the system.

- With proper watermain sizing and looping, adequate supply to future development lands can be provided for normal operating conditions. Available fire flow, within the northeastern area of Southampton, may be at, or slightly lower than, typical optimum requirements for residential areas. This is already the case for the existing system extremities in that area.

Suggested trunk watermain projects to accommodate the future development areas are identified in Section 4.9. It is important to note that the required watermain sizing is dependent on the actual scale and sequence of development. The watermain sizes indicated are considered sufficient provided there is internal looping.

4.6 Climate Change Considerations

Climate change is predicted to result in more intense storms and potentially, periods of prolonged drought. The Saugeen Shores water supply comes from Lake Huron which, as a source of water, has capacity far greater than the potential water takings of a lakeside community like Saugeen Shores. Having said that, prolonged droughts could encourage more water use for discretionary uses such as lawn watering in the summer period. There is potential for the physical treatment and storage facilities to become overtaxed at some point in the future. Increased restrictions and/or seasonal water rates may be required to manage demand and thus mitigate potential impacts on supply and storage.

Having multiple storage facilities is an asset and mitigates against temporary loss of serviceability of a single structure as a result of storms. Currently most of the effective treated water storage is in below or at ground facilities that rely on pumping. It will be important to maintain adequate redundant pumping and standby power capability.

4.7 Problems and Opportunities for Water

4.7.1 General

For the Saugeen Shores drinking water supply the problems and opportunities fall into three categories; supply and treatment, storage and distribution. Significant issues have been identified for both treatment and storage. Existing distribution system issues are minor but there will be localized expansion needs to support individual developments.

4.7.2 Water Supply and Treatment

The existing WTP has an existing net capacity of 13,425 m^3/day. Based on the maximum expected rate of growth the MDD will reach this value in approximately 2043. Current demands combined with committed capacity are currently at approximately 12,658 m^3 which is 94% of the available supply. Although total capacity will not be exhausted for several years the Town could potentially be in a situation where it has no ability to approve new development proposals as early as 2029.

The threshold for initiating expansion planning is generally considered to be 80% of capacity. To address this the Town has retained the Ainley Group to undertake a Class EA to examine expansion alternatives.

4.7.3 Water Storage

There is substantial built storage in the Saugeen Shores water system. As currently equipped and controlled approximately 27% of the total is available for normal daily operational use and less than 65% of the built storage is available for all purposes including emergencies. It was determined that there are existing storage deficiencies as summarized below:

- There is an existing storage deficit of approximately 1,300 m^3 in Zone 1.
- To accommodate existing servicing commitments and active development proposals a total of approximately 2,600 m^3 of additional storage is required, the majority (2,100 m^3) in Zone 1. Therefore, some additional storage is required in both Zones.
- The total additional storage required is approximately 6,500 m^3 based on the “ultimate” development scenario.

4.7.4 Water Distribution

Modelling of the existing, existing and commitments, and ultimate scenarios for the water distribution system have identified the following:

- Other than isolated local situations where a lack of looping impacts on supply, there are no specific problems with the water distribution system.
- In general, servicing of development lands beyond the existing developed area will require suitably sized extensions and internal development looping, without the need for upgrading any existing trunk watermain.
- Suggested trunk watermain sizing to accommodate the future development areas has been established. It is important to note that the required watermain sizing is dependent on the actual scale and sequence of development. The watermain sizes indicated in Section 4.9 are considered sufficient provided there is internal looping. Table 4.12 summarizes order of magnitude probable costs for the identified watermain.
- At this time, it is not recommended to convert the system from a two-zone system to a one-zone system.

4.8 Alternative Solutions

4.8.1 Water Treatment

As noted previously, the WTP is operating at approximately 73% of its effective treatment capacity. Existing development commitments account for approximately 21% of the total capacity, leaving only 6% of the capacity available to allocate. There are active development proposals that far exceed this amount.

The Town has retained Ainley Associates to undertake a Class EA and determine the preferred approach to increasing capacity.

4.8.2 Water Storage

(a) General

As noted previously there is a current storage deficit in Zone 1 and additional storage will be required in Zone 2 to accommodate current commitments and active development proposals.

Because of the complexity of the existing system (i.e. two pressure zones, multiple existing storage facilities) the approach to storage expansion will require detailed analysis that is beyond the scope of this Master Plan. Expansion approaches that include a new structure on a new site or expansion of an existing site will require that the Class EA process be followed. The alternatives would be examined and a preferred solution determined within the EA process.

In our opinion, expansion can occur through modification of existing facilities or the addition of new facilities or a combination of both.

Given that storage expansion is will have a high cost and economies of scale will be a factor and also, given that facilities can have a useful life of 75 years or more, it will be important to consider if it is appropriate to expand for the ultimate development scenario.

(b) Alternatives to be Examined

If the system is to be retained as two pressure zones, storage could be increased by:

- Expanding the WTP Clear Well.
- Modifying (or replacing) the booster pumping system at the base of the Southampton Standpipe to make more of the structure's volume effective.
- Constructing a new elevated tank within the system.

These options are discussed briefly in the following sections.

It may also be possible to modify the connection to the Port Elgin Standpipe to allow it to drain to the adjacent reservoir and take advantage of the existing booster pumping system.

Expansion of the WTP Clear Well

Technically, all or part of the additional storage required could be provided by expansion of the WTP Clear Well.

The advantage of Clear Well expansion is that it will not be necessary to add another (i.e. fifth) storage structure to the system with related cost and complexities. There are several disadvantages:

- It would require a 300% expansion of the Clear Well.
- Fire flows for Zone 1 would have to come from the WTP which would require higher capacity pumps at the WTP than currently exist.
- Given that the greater additional volume requirement is actually in Zone 2, then the current reliance on the existing 400/500 mm interconnecting main will increase with a corresponding increase in risk.

Rather than expanding the Clear Well to achieve the full additional volume it would also be possible to have a smaller Clear Well expansion in conjunction with another alternative, thus reducing the size of any new facility. Whether that is beneficial is largely an economic consideration that could be investigated in a Class EA process.

Modification or Replacement of the Southampton Standpipe Booster

There is currently a BPS at the base of the Southampton Standpipe. With proper pump control and pressure regulation on both the inflow and discharge of a BPS, a standpipe can be made to operate essentially as an above-grade reservoir. It is our understanding that for the Southampton Standpipe and BPS, the station piping configuration and pump controls have made operation of the pumping system challenging to the point of impractical, and historically it has not functioned for its originally intended purpose.

Ideally the amount required for peak flow equalization should be available without resorting to a booster pump at the standpipe. The Zone 1 equalization required under the ultimate development scenario is approximately 1,400 m^3 which is greater than the sum of what is available in the Clear Well and the top part of the existing standpipe (approximately 850 m^3).

It is also likely that it would be necessary to replace the existing booster pumping station with a larger building which could require property acquisition.

A new pumping system at the base of the standpipe, combined with a Clear Well expansion of approximately 550 m^3 would satisfy the Zone 1 ultimate requirements.

Improvements to the existing Southampton Standpipe, to increase the effective volume, would achieve, at most, approximately 2,600 m^3 which is only 40% of the total additional storage required in a two-zone system. Storage expansion for Zone 2 would also be necessary.

The potential advantages of modifying the booster pumping system at the base of the Southampton Standpipe are:

- It makes use of an existing facility that was refurbished in 2021.
- It would satisfy the Zone 1 storage requirements for the ultimate growth scenario.

The disadvantages are:

- It does not reduce the additional volume required for Zone 2. Modifying the Southampton Standpipe only helps Zone 1.
- Property acquisition, or at least temporary easements, will likely be required.
- The overall operational complexity of the system will be increased because of the need for pressure regulation at the standpipe.

Construction of an Elevated Storage Tank

Theoretically, additional storage could be provided within Zone 1 by constructing an elevated tank. To add an elevated tank for Zone 1 only, knowing that additional storage is also required in Zone 2, is in our opinion impractical. If elevated storage is to be the means for increasing the effective storage, we believe that it should be in Zone 2 and designed to augment capacity in both Zones.

An elevated tank located in Southampton east of Grenville Street (i.e. within Zone 2) could be configured to serve both Zones. For a two-zone system, and in the absence of other improvements such as Clear Well expansion and/or modifications to the Southampton Standpipe, the required elevated tank volume is 6,500 m^3. As explained in Section 4.7.3, the elevated tank volume would have to increase to 7,000 m^3 for a single Zone system.

The advantages of adding an elevated tank are:

- A single additional structure, strategically located, can serve both pressure zones.
- No increase in pumping capacity would be required at the WTP.
- If the system is retained as two pressure zones only minor changes to system operation and control would be required.

The disadvantages are:

- The relatively high cost of an elevated storage tank.
- The addition of a 5^{th} storage facility to the water system.

(c) Elevated Storage Location

Single or Two Zone Elevated Storage

In our opinion the preferred location for an elevated storage tank, regardless of whether the system is retained as two pressure zones or converted to a single zone, is in that part of Zone 2 which is within the east part of Southampton (i.e. east of Grenville Street). This opinion is based on the following considerations:

- There is already substantial storage in the Port Elgin area of Zone 2.
- There is significant expected growth in the Zone 2 area in the east part of Southampton.
- Locating additional storage in Zone 2 has the potential to benefit Zone 1 but storage in Zone 1 cannot benefit Zone 2.
- Locating additional storage in the east part of Southampton means that the water does not have to flow to Port Elgin first, thus reducing dependence on the 500/400 mm interconnecting watermain.

For topographic and connection reasons the preferred location is likely somewhere along Anglesia St. S. between Spence and High Street. Further east would reduce the structure height but increase the cost of connection to the existing distribution system.

4.8.3 Water Distribution

One vs Two Pressure Zones

There are factors both in favour of, and against, changing the distribution system from the existing two zones to a single pressure zone.

<u>The factors in favour of changing to a single zone are:</u>

- Once completed, the requirements for control and monitoring would be simplified.
- Available fire flows would increase throughout Zone 1 as result of increased system pressures.
- There would be increased pressures north of the Saugeen River which could increase supply to the Saugeen First Nation if there was interest.

<u>The factors that are not in favour of a change are:</u>

- There will be significantly increased pressures on the older watermains in the west part of Southampton. The pressures in Southampton would not exceed those experienced in Port Elgin (Zone 2) but would be greater than Zone 1 has historically experienced. It is probable that there will be a period of increased watermain breakage.

- Energy costs related to pumping will increase as all water will be pumped against a higher head. Currently about 30% is to the lower head Zone 1.
- The effective volume in the Southampton Standpipe will be lost and will need to be replaced. The Standpipe was re-furbished in 2021.
- Modifications, and potentially pump changes will be required at the WTP high-lift pumping system.

4.9 Water Identified Projects

The Master Plan has established the following potential projects to improve water servicing and water management for existing need and future development areas. Additional engineering investigations are recommended to confirm individual project scope.

Figure 4.6 identifies water projects. Projects are noted as 'W#'. Several water projects have been identified for development lands and are dependant on timing of those developments. Future watermain improvements have been highlighted as a future servicing need that needs to be addressed as part of future development planning.

4.9.1 Existing Infrastructure Needs

WTP Capacity Upgrades/Expansion (W-1)

The current capacity of the WTP is limited relative to future development demand projections. A Class EA is underway to address capacity requirements of the Saugeen Shores Water Treatment Plant.

It is recommended that capacity increases be reviewed in conjunction with an assessment of additional water storage alternatives.

Additional Storage (W-2)

A Class EA is recommended in 2026 to examine storage upgrade alternatives.

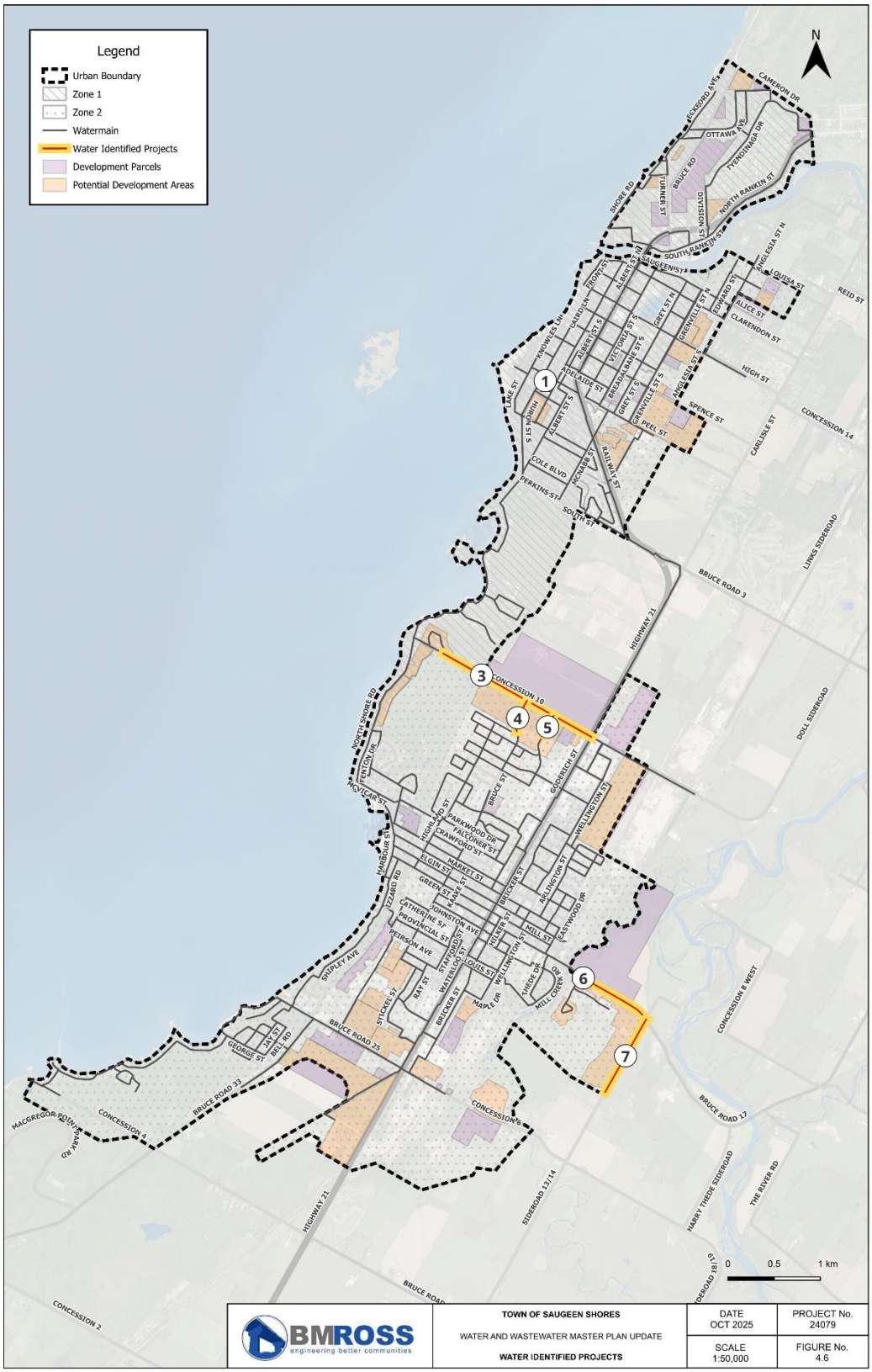
4.9.2 Development Servicing Needs

Concession 10 Watermain Extension (W-3)

The following watermain extension is recommended to improve watermain looping and in preparation of servicing development lands:

- 1810 m of 250 mm watermain along Concession 10 from Lakeside Woods Crescent to Goderich Street.

Figure 4.6 – Water Identified Projects



Summerside Watermain Extension 1 (W-4)

The following watermain extension is recommended to improve watermain looping and in preparation of servicing development lands:

- 370 m of 250 mm watermain along Bruce Street from Hawthorne Street to Concession 10.

Summerside Watermain Extension 2 (W-5)

The following watermain extension is recommended to improve watermain looping and in preparation of servicing development lands:

- 230 m of 200 mm watermain along Waterloo Street from 225 m north of Mary Rose Avenue to Concession 10.

Bruce Road 17 Watermain Extension (W-6)

The following watermain extension is recommended in preparation of servicing development lands:

- 890 m of 300 mm watermain along Bruce Road 17 from Westlinks Drive to Sideroad 13/14.

Sideroad 13/14 Watermain Extension (W-7)

The following watermain extension is recommended in preparation of servicing development lands:

- 910 m of 300 mm watermain along Sideroad 13/14 from Bruce Road 17 to 910 m south of Bruce Road 17.

4.10 Water Capital Costs

Capital costs for identified existing infrastructure need and future development projects have been estimated at a conceptual level for planning purposes and are summarized in Table 4.12. Refer to Section 4.9 for detailed project descriptions. Location of projects are shown on Figure 4.6. Costs for watermain projects are based on typical 2025 costs per meter and do not assume full urban reconstructions (i.e. cost shown is for individual asset type only). Cost saving could be incurred with coordination of water and storm replacements where applicable. Costs include 15% engineering and 20% contingencies.

Table 4.12 – Water Project Costs

ID	Category	Water Capital Project	Priority	Total Project Cost	EA Requirements
W1	Existing Infrastructure Needs	**WTP Capacity Upgrades/Expansion** o Class EA is underway to address capacity requirements of the Saugeen Shores Water Treatment Plant.	High	TBD	C – currently underway
W2	Existing Infrastructure Needs	**Additional Storage** o Class EA is recommended in 2026 to examine storage upgrade alternatives.	High	TBD, but suggest in the order of $10,000,000 to construct one elevated storage facility	B
W3	Development Servicing Needs	**Concession 10 Watermain Extension** o 1,810 m of 250 mm watermain along Concession 10 from Lakeside Woods Crescent to Goderich Street.	Low, but subject to development timing	$2,650,000	Exempt - provided within existing road allowance
W4	Development Servicing Needs	**Summerside Watermain Extension 1** o 370 m of 250 mm watermain along Bruce Street from Hawthorne Street to Concession 10.	Low, but subject to development timing	$550,000	Exempt - provided within existing road allowance
W5	Development Servicing Needs	**Summerside Watermain Extension 2** o 230 m of 200 mm watermain along Waterloo Street from 225 m north of Mary Rose Avenue to Concession 10.	Low, but subject to development timing	$320,000	Exempt - provided within existing road allowance
W6	Development Servicing Needs	**Bruce Road 17 Watermain Extension** o 890 m of 300 mm watermain along Bruce Road 17 from Westlinks Drive to Sideroad 13/14.	Low, but subject to development timing	$1,410,000	Exempt - provided within existing road allowance
W7	Development Servicing Needs	**Sideroad 13/14 Watermain Extension** o 910 m of 300 mm watermain along Sideroad 13/14 from Bruce Road 17 to 910 m south of Bruce Road 17.	Low, but subject to development timing	$1,440,000	Exempt - provided within existing road allowance

Note:

1. Refer to Figure 4.6 for proposed project locations.
2. Total project costs assumed based on 2025 sanitary sewer costs per meter, 15% Engineering and 20% Contingencies. Costs are rounded up to nearest $10,000.

For full urban street reconstructions, a cost of $5,000 per meter can be assumed for a “typical” street with 300 mm diameter storm, 200 mm diameter sanitary, and 150 mm diameter watermain (includes aforementioned engineering and contingency fees). Costs presented assume typical construction conditions with no special effort such as rock excavation, well point dewatering requirements, etc. As pipe diameters increase, the projected cost per meter increases as follows:

- $6,600 per meter if going to 750 mm diameter storm, 450 mm diameter sanitary, 300 mm diameter water.
- $8,000 per meter with 900 mm, 600 mm, and 400 mm diameters, respectively.

4.11 Considerations for Further Study

To determine the preferred solution for providing additional treated water storage the following should be further examined though a Class EA:

1. What is the appropriate long-term servicing scenario to use for tank volume determination?
2. Is WTP Clear Well expansion feasible from a property footprint consideration?
3. Does dividing the additional storage between a Clear Well expansion and a new storage facility have a lower cost than building a single larger facility?
4. What is the best location for a new storage facility considering property acquisition and connection costs?
5. Will the system be retained as two Zones or converted to a single zone?

5.0 PORT ELGIN SEWAGE SYSTEM

5.1 Description

5.1.1 Pumping and Treatment

The community of Port Elgin is serviced by a communal sewage system consisting of approximately 65 km of gravity sewer, six SPSs, and a WWTP. Two of the SPSs (SPS 6 and SPS 9) discharge directly to the WWTP. SPSs 7, 8, 10, and 11 are smaller secondary stations discharging to locations within the collection system which, in turn, drain by gravity to SPS 9. There is approximately 8 km of forcemain related to the SPSs. The current service area is approximately 600 ha. As of 2024 there were approximately 3,900 sewage customers in Port Elgin.

All collection sewers and SPSs operate under Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA) No. 093-W601, Issue No. 1, dated January 10, 2023.

The WWTP operates under ECA No. 0556-AKQN3Q dated May 30, 2017. The plant provides secondary level treatment and discharges continually to Mill Creek which, in turn, drains to the Saugeen River.

Table 5.1 provides a summary of the capacity of the major facilities. Figure 5.1 provides a map of the collection system and shows the location of SPSs and WWTP.

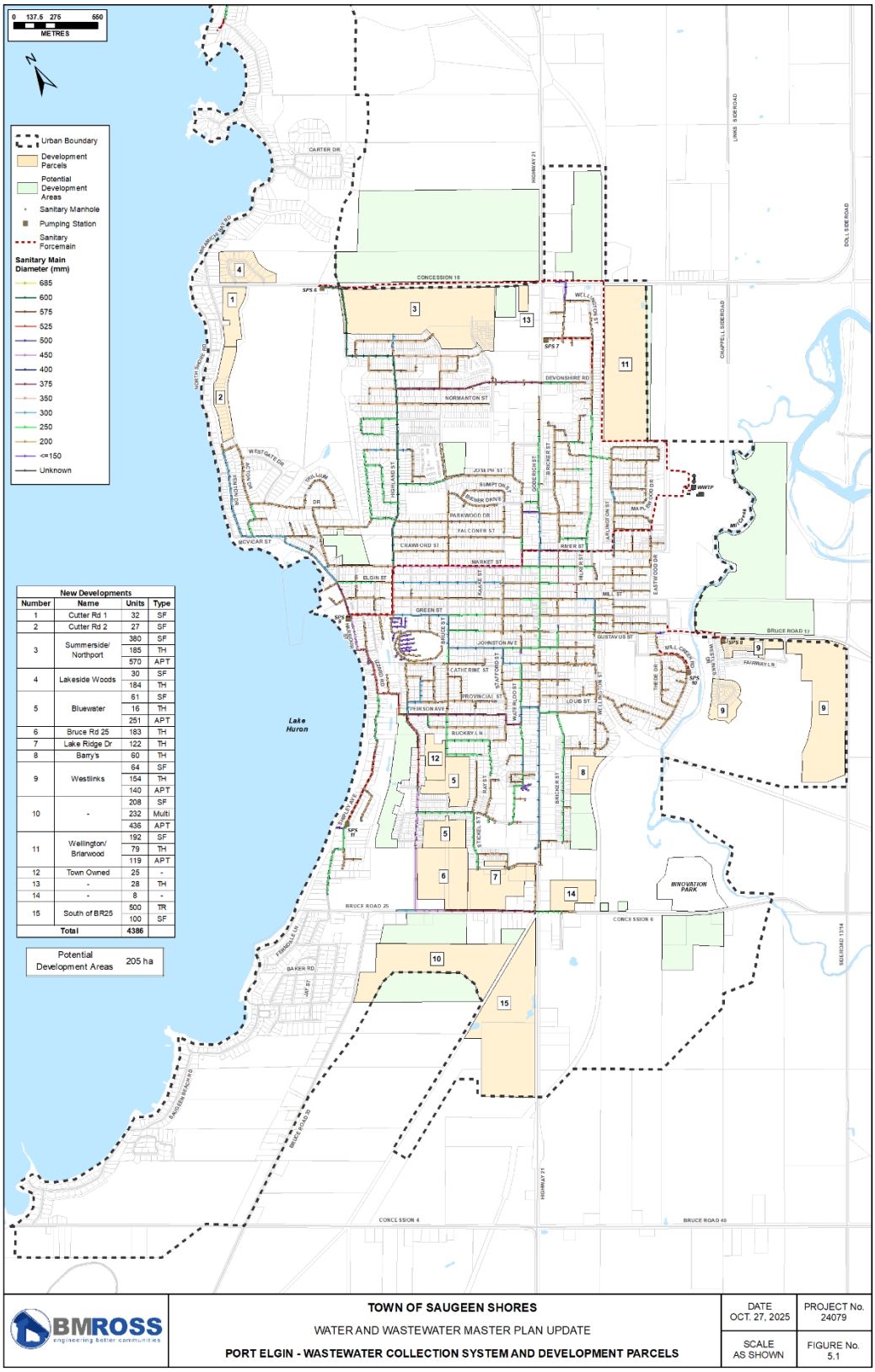
Table 5.1– Port Elgin Wastewater Facility Capacities

System Component	Capacity	Source Information
SPS 6 (10th Conc.)	137 L/s (firm)[1.]	CLI ECA
SPS 7 (Tomlinson Dr.)	23.4 L/s[2.]	Drawdown Testing
SPS 8 (Westlink)	13.7 L/s (firm)[3.]	CLI ECA
SPS 9 (Harbour St.)	214 L/s (firm)	CLI ECA
SPS 10 (Mill Creek Rd.)	12.8 L/s[2.]	Drawdown Testing
SPS 11 (Shipley Ave.)	12.6 L/s[2.]	Drawdown Testing
Wastewater Treatment Plant (WWTP)	6,455 m^3/day[4.]	2017 ECA

Notes:

1. If pumps were to operate at full speed, SPS 6 capacity would be 231 L/s with 1 of 2 pumps operating. There is reported to be power supply limitations restricting the effective capacity to 137 L/s.
2. Capacity is based on drawdown testing completed in 2019 and estimated as noted.
3. SPS 8 interim capacity is 13.7 L/s. At ultimate construction, final capacity will be 74.4 L/s with 2 of 3 pumps operating.
4. This is the Annual Average Day rating. There is no peak day rating.

Figure 5.1 – Port Elgin Sanitary Collection System



5.1.2 Collection System

The Port Elgin collection system has two drainage areas draining to the WWTP, SPS 6 (130 ha) and SPS 9 (570 ha). Within the collection system, SPSs 7, 8, 10 and 11 are relatively small drainage areas draining to the SPS 9 system.

In total there is approximately 65 km of sewer.

5.2 Existing and Design Wastewater Flows

5.2.1 Total Sewage Flows

A detailed analysis of existing sewage flows was included in the Reserve Capacity Memo (BMROSS, June 2025). The following is a summary.

Tables 5.2 and 5.3 summarize recent historical sewage flows for the port Elgin WWTP as taken from the Annual Performance Reports.

Table 5.2 – Port Elgin WWTP Flows

Year	Annual Average (m^3/day)	Maximum Monthly Average (m^3/day)	Low Monthly Average (m^3/day)
2021	2,640	2,901	2,352
2022	2,707	3,204	2,381
2023	2,805	3,233	2,592
2024	2,875	3,287	2,492

The values in Table 5.2 for the Port Elgin WWTP are the reported Raw Sewage Flows. Reported Effluent flows from the same facility are typically 40% to 50% greater. This is a concern because the difference is outside the range of what would be considered acceptable meter error.

Based on the raw sewage inflow value for 2024 and the estimated number of customers (i.e. 3,898) the AADF per customer for Port Elgin was 0.738 m^3/day.

The total sewage flows, as observed at the WWTPs, are a combination of three components.

- True sewage (i.e. lowest flow month)
- Infiltration (i.e. groundwater leakage, foundation drains)
- Inflow (i.e. direct connections to surface)

Table 5.3 provides a summary of the recent historical DWF and WWF based on the lowest and highest monthly average flows each year for Port Elgin.

Table 5.3 – Port Elgin – Historical Sewage Flows[1]

Year	AADF[2] (m^3/day)	DWF[3] (m^3/day)	WWF[4] (m^3/day)	WWF/DWF Ratio	Max. Single Day (m^3)
2021	2,640	2,352	2901	1.23	3.646
2022	2,707	2,381	3,204	1.35	3,574
2023	2,805	2,592	3,233	1.25	4,374
2024	2,874	2,492	3,287	1.32	4,538
4 Year Average	2,757	2,454	3,156	1.29	4,538 Max.

Notes:
1. AADF = Annual Average Daily Flow
2. DWF = Dry Weather Flow is the lowest monthly average.
3. WWF = Wet Weather Flow is the highest monthly average.

5.2.2 True Sewage Flows (TSF)

The TSF is assumed to be equal to the DWF. On a per customer basis over the last four years the TSF for Port Elgin was approximately:

- Port Elgin (3,898 customers) = 0.630 m3/day per customer

5.2.3 Infiltration and Inflow (I-I)

For forecasting purposes, it is assumed that I-I values, on a unit basis, will remain the same as current values. This is considered conservative given that growth will tend to occur at greater densities (i.e. PPU/ha) and with better sewers.

The I-I flow on an annualized basis is assumed to be equal to the WWF less the DWF. On a per customer basis over the last four years the value for Port Elgin was approximately:

- Port Elgin Annual I-I = 0.180 m^3/day per customer

As noted in the section of the report that presents the Southampton I-I values, the Southampton I-I value was much greater (i.e. 0.338 m^3/day per customer). For forecasting growth related wastewater flows have used 0.260 m^3/day per customer which is approximately the average of the two values. The rationale is that growth will typically occur with new sewers which should have similar values in each community.

5.2.4 Design Unit Sewage Flow

Similar to the approach used for water supply, for flow forecasting purposes it is assumed that one existing customer is equivalent to one ERU. Therefore, the unit flow per ERU will be:

- The True Sewage Flow (TSF) = 0.630 m^3/day
- Allowance for I–I = 0.260
- 10% allowance for ICI = 0.090
- Flow per ERU = 0.980 m^3/day

= **1.0 m^3/day per ERU (Rounded)**

5.2.5 By-pass or Overflow

There are no known locations where by-pass or overflow is occurring within the Port Elgin collection system.

5.3 Port Elgin WWTP Reserve Capacity

5.3.1 General

Typically, the Total Reserve Capacity of a WWTP is determined by deducting the average AADF from the previous 3 to 5 years from the ECA rated capacity. AADFs at Port Elgin have been increasing every year, consistent with observed development. For that reason, we have chosen to use the highest observed value (2024) as the existing flow for the Port Elgin WWTP.

Tables 3.1 and 3.3 provide lists of known development proposals converted into ERUs.

5.3.2 Port Elgin WWTP Reserve

This section presents the Total and Uncommitted Reserve capacities and also the impact of approving current active development proposals.

Total Reserve

The Port Elgin WWTP is rated for an AADF of 6,455 m^3/day per the ECA. The Total Reserve Capacity is as follows:

Rated Capacity	=	6,455 m^3/day
Existing AADF	=	2,874 (2024)
Total Reserve	**=**	**3,581 m^3/day**

Uncommitted Reserve

Table 3.1 identifies 1,549 ERUs of committed development for Port Elgin. Based on 1.0 m^3/day AADF from an ERU (see Section 5.2.4), the uncommitted reserve capacity of the Port Elgin WWTP is:

Total Reserve Capacity	=	3,581 m^3/day
Committed Flow	=	1,549
Uncommitted Reserve	**=**	**2,032 m^3/day**

Consideration of Development Proposals

Although not yet approved, Table 3.1 identifies a further 1,674 ERUs of potential development under current consideration in Port Elgin. When applied to the Uncommitted Reserve value the result is:

Uncommitted Reserve Capacity	=	2,032 m^3/day
Current Proposals	=	1,674
Reserve after Proposals	=	358 m^3/day

5.3.3 Forecasted Port Elgin WWTP Capacity

Table 5.4 shows the required Port Elgin WWTP capacity required based on accommodating various development milestones. The “Ultimate” scenario is based on adding currently vacant in-fill lands plus some boundary adjustment to the developments that are currently committed to or actively being discussed.

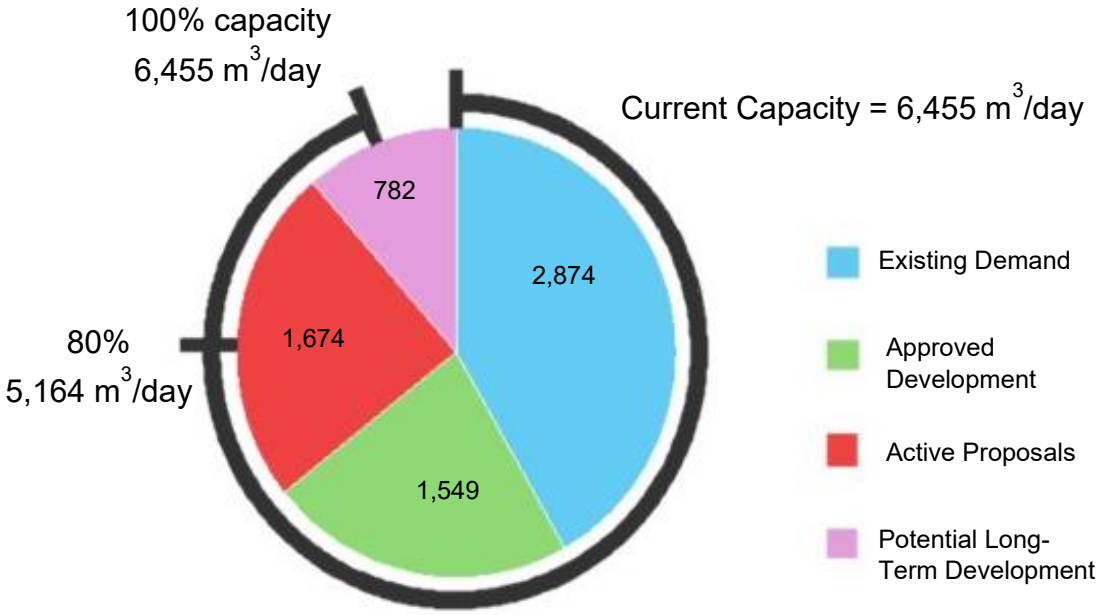
Table 5.4 – Port Elgin Wastewater Treatment Capacity Required[1]

Servicing Scenario	Total Capacity Required (m^3/day)	Additional Capacity Required[3] (m^3/day)
Existing[2]	2,874	Nil
Existing + Commitments	4,423	Nil
Existing + Commitments + Active Proposals	6,097	Nil
Ultimate	6,879	2,224

Notes:
1. Capacity required is based on meeting AADF.
2. The existing capacity required is the 2024 actual AADF.
3. The additional capacity is based on an assumed current WWTP capacity of 6,455 m3/day.

Existing commitments plus active proposals can be accommodated within the current plant rated capacity. An increase in the WWTP rating will be required for the ultimate servicing scenario. Figure 5.2 shows the capacity utilized by current demand and what is required for approved developments (commitments), active proposals and long-term development.

Figure 5.2 – Reserve Capacity, Port Elgin WWTP

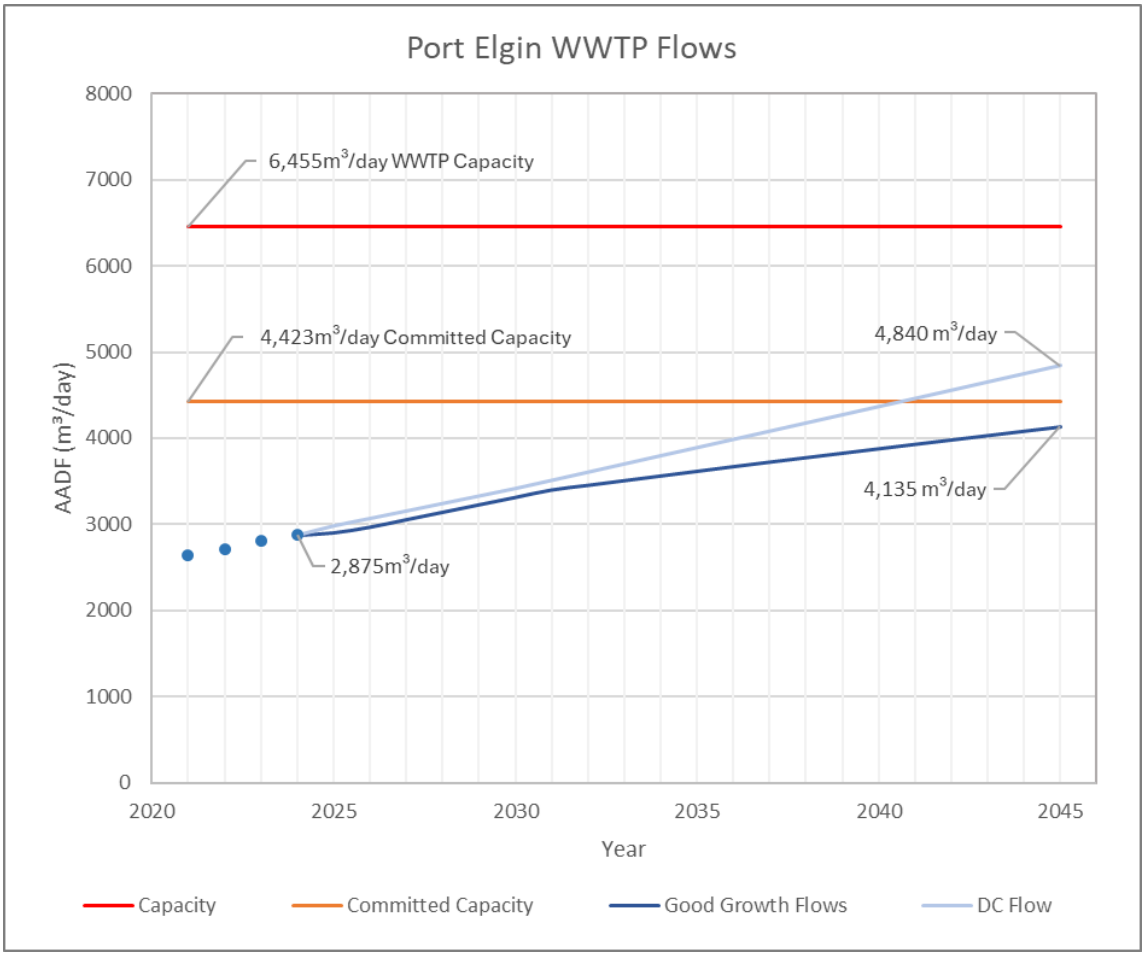


The above analyses were based on meeting development milestones. We also looked at the relationship between capacity required and time.

5.3.4 Port Elgin WWTP Capacity vs Time

Figure 5.3 presents existing, committed, and forecasted flows for the Port Elgin WWTP to 2045. Based on projected growth there will be capacity available until beyond 2045. The 80% capacity planning threshold would also be met after 2045.

Figure 5.3 – Port Elgin WWTP Flows from 2020-2045



5.4 Port Elgin WWTP Treatment Performance

5.4.1 Effluent Criteria

The existing ECA for the Port Elgin WWTP provides both treatment objectives and limits. The criteria are as follows:

DESIGN OBJECTIVES

(1) The Owner shall use best efforts to design, construct and operate the Works such that the design objectives named below as effluent parameters are consistently achieved in the Final Effluent from the Sewage Treatment Plant. The Owner shall design and operate the Sewage Treatment Plant in accordance with the following objectives for the Final Effluent:

a. Final Effluent concentration:

Final Effluent Parameter	Objective	Averaging Calculator
CBOD5	15.0 mg/L	Monthly Average Effluent Concentration
Total Suspended Solids	15.0 mg/L	Monthly Average Effluent Concentration
Total Phosphorus	0.8 mg/L	Monthly Average Effluent Concentration
E. coli	100 organisms per 100 mL	Monthly Geometric Mean Density
pH	between 6.5 - 8.5 inclusive	Single Sample Result

b. *Final Effluent is essentially free of floating and settable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.*

c. *The Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.*

(2) *The Owner shall make an assessment of the issues and recommendation of pro-active actions if any is required, and report to the Water Supervisor under the following situations:*

a. When any of the design objectives is not achieved consistently;

b. When the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity.

COMPLIANCE LIMITS

(1) The Owner shall operate and maintain the Sewage Treatment Plant such that the following compliance limits are met in Final Effluent:

a. Final Effluent concentration:

Final Effluent Parameter	Limit	Averaging Calculator
CBOD5	25.0 mg/L	Monthly Average Effluent Concentration
Total Suspended Solids	25.0 mg/L	Monthly Average Effluent Concentration
Total Phosphorus	1.0 mg/L	Monthly Average Effluent Concentration
E. coli	200 organisms per 100 mL	Monthly Geometric Mean Density
pH	between 6.0 - 9.5 inclusive	Single Sample Result

b. Final Effluent loading:

Final Effluent Parameter	Limit	Averaging Calculator
$CBOD_5$	161 kg/d	Monthly Average Effluent Concentration
Total Suspended Solids	161 kg/d	Monthly Average Effluent Concentration
Total Phosphorus	6.5 kg/d	Monthly Average Effluent Concentration

The Objectives and Limits would not be considered stringent compared to current day standards and it should be expected that any proposal for expansion of capacity would trigger a review and a probable requirement for better effluent quality.

5.4.2 Performance Review

A review of Annual Reports for 2021 to 2024 identified no performance issues for the period. With the exception of two months in the fall of 2022 average monthly concentrations for all parameters were below the objective concentrations for the entire period. Average monthly loadings for all parameters were below the loading limits for the entire period.

5.5 Reserve Pumping Station Capacity

5.5.1 General

Existing capacity requirements for SPSs in Port Elgin were determined by SewerCAD® modelling and then compared to the expected additional capacity required to accommodate committed and proposed development within the existing drainage areas. In total, three scenarios were modelled to investigate impacts of development; (1) existing conditions, (2) adding current commitments, and (3) adding active proposals, vacant lands, and possible boundary adjustments (referred to as the ultimate condition).

Because of the generalized assumptions required for existing and projected flows withing the drainage area for any specific SPS the results should be used for guidance only and not assumed to be actual flows. Also:

- For modelling purposes, we assumed the “worst case” with all SPSs operational simultaneously at their rated capacity.
- For cases where “existing utilization” is >100% capacity, and there are not reports of overflows/bypasses, it is our opinion this demonstrates that modelling assumptions are conservative.

5.5.2 Modelling Results

Table 5.5 Summarizes the results of the SPS capacity modelling for the Port Elgin collection system.

Table 5.5 – Summary of SPS Capacity Modelling

Port Elgin SPS	Assumed Capacity (L/S)	Existing SPS Peak Inflow (L/s)	Existing Capacity Utilized (%)	Committed Development SPS Peak Inflow (L/s)	Committed Development - Capacity Utilized (%)	Ultimate Scenario - SPS Peak Inflow (L/s)	Ultimate Scenario Capacity Utilized (%)
6	137[1]	50	36	80	58	152	111
7	23.4[2]	6.6	28	6.6	28	14	62
9	214[3]	219	102	229	107	314	146
10	12.8[2]	7.6	59	7.6	59	7.8	60
11	12.6[2]	7.1	56	7.1	5	7.3	57

Notes:

1. Assumed capacity is based on values in CLI ECA No. 093-W601, Issue No. 1, dated January 10, 2023. For SPS 6 the CLI ECA indicates the capacity with one pump at full speed is 231 L/s. Our understanding is that pump speeds are currently restricted for power supply reasons.
2. Assumed capacity is based on drawdown testing results from 2019.
3. Assumed capacity is based on values in CLI ECA No. 093-W601, Issue No. 1, dated January 10, 2023.

5.5.3 Discussion for Existing and Commitments

When considering existing and committed development, the only SPS with potential capacity issues is SPS 9 which is a key facility directly pumping wastewater to the WWTP. Based on the sewer modelling SPS 9 is already operating at near capacity.

At full development SPS 6 will also require capacity expansion.

5.5.4 SPS 6 – 10th Concession

SPS 6 has a catchment area of approximately 130 ha and is located on the 10th Concession approximately 1,400 m west of Goderich St. Currently the SPS is fed from two larger diameter sewers on Highland Street and Devonshire Road.

The station has two pumps (one lead, one standby), and one pump at the current maximum speed has a capacity of 137 L/s. As per the CLI ECA, one pump at full speed would have a capacity of 231 L/s; however, there are reported to be power supply constraints. For assessment purposes we have assumed the firm capacity of SPS 6 is 137 L/s.

Existing peak flows are estimated to be in the order of 50 L/s and additional peak design flows from committed and potential development are estimated to be in the order of 100 L/s. Though future peak flows are estimated to be greater than the rated SPS capacity, these values are based on theoretical peaking factors and are likely to be conservative. To accommodate future development, it is recommended that upgrades are made to the power supply for pumps to operate at full speed.

If flow on Highland Street is reversed, as discussed in section 5.5.7, the estimated peak flow redirected from existing, committed, and potential development is estimated to be in the order of 80 L/s for a total station design flow of 234 L/s. This would nearly match the rated capacity with pumps at full speed, and if the Highland reversal is to proceed, reinforces the recommendation to upgrade station power supply.

5.5.5 SPS 7 – Tomlinson Dr.

SPS 7 has a catchment area of approximately 22 ha and is located on Tomlinson Drive approximately 40 m east of Goderich Street. The station has two pumps (one lead, one standby), which are not rated in the CLI ECA. For modelling purposes, station rated capacity was assumed to be 23.4 L/s, based on 2019 drawdown tests. The catchment area for this SPS may be affected by potential future development identified in Section 3, however the magnitude would depend on the location of future servicing connections to the existing system.

5.5.6 SPS 8 – Westlink

SPS 8 is relatively new (constructed in 2023) and has a catchment area of approximately 5 ha and is located on Bruce County Road 17 near Westlinks Drive. At interim capacity, the station currently has two pumps (one lead, one standby), each rated at 13.7 L/s. For existing modelling purposes, interim station rated capacity was assumed to be 13.7 L/s and for future scenarios, SPS 8 is assumed to discharge directly to the WWTP as per the CLI ECA. At ultimate capacity, the station is planned to have three pumps each rated at 37.2 L/s. SPS 8 catchment area was not included in modelling analysis as it was recently constructed.

5.5.7 SPS 9 – Harbour St.

SPS 9 has a catchment area of approximately 570 ha and is located on Harbour Street near Green Street. It receives flow from SPS 7, 8, 10, and 11. The station has a firm capacity of 214 L/s and is equipped with three sewage pumps (one lead, two standby) with the following rating:

- One pump at 100% of full speed – 137 L/s
- Two pumps at 100% of full speed – 214 L/s
- Three pumps at 100% of full speed – 236 L/s

Existing peak flows are estimated to be in the order of 220 L/s and additional peak design flows from committed and potential development are estimated to be in the order of 100 L/s. Though existing peak flows are estimated to be greater than the rated SPS capacity, these values are based on theoretical peaking factors and are likely to be conservative. According to annual WWTP reports available no bypasses or abnormal discharge events occurred from 2021 and 2024.

The Town suggested an investigation of the option that flow on Highland Street be reversed, redirecting flow from a significant area of SPS 9 towards SPS 6. Based on our analysis, the estimated peak flow redirected from existing, committed, and potential development is estimated to be in the order of 80 L/s, which would reduce the estimated peak flow to the station from 314 L/s to 231 L/s. This approach would more evenly distribute design flows in proportion to SPS 6 and SPS 9 capacities.

Gobles Grove is not included in the flow values stated above. If it were to be serviced, the estimated peak flow contributions from that area are estimated to be in the order of 25 L/s (based on 500 residential units). It was assumed that sanitary sewers servicing Gobles Grove would connect to the collection system at Ridge Street and Bruce Road 25. Based on our analysis, estimated peak flow from this area in addition to estimated peak flow from existing, committed, and potential development would:

- Further contribute to the need for trunk collection sewer upgrades along Harbour Street (refer to Section 5.6.5 and 5.10 for additional detail).

- Further contribute to SPS 9 being over capacity, thereby necessitating the Highland Street flow reversal project to proceed or otherwise increase the capacity of SPS 9.

5.5.8 SPS 10 – Mill Creek Rd.

SPS 10 has a catchment area of approximately 14 ha and is located on Mill Creek Road approximately 62 m north of Hoover Court. The station has two pumps (one lead, one standby), which are not rated in the CLI ECA. For modelling purposes, station rated capacity was assumed to be 12.8 L/s, based on 2019 drawdown tests. The catchment area for this SPS is not affected by development lands identified in Section 3, but an allowance for infill was considered.

5.5.9 SPS 11 – Shipley Ave.

SPS 11 has a catchment area of approximately 20 ha and is located on Shipley Avenue approximately 160 m north of Sieffert Court. The station has two pumps (one lead, one standby), each rated at 47.9 L/s. For modelling purposes, station rated capacity was assumed to be 12.6 L/s, based on 2019 drawdown tests. The catchment area for this SPS is not affected by development lands identified in Section 3, but an allowance for infill was considered.

5.6 Wastewater Collection System Modelling

5.6.1 Background

The Port Elgin wastewater collection system was modelled using SewerCAD®. Each SPS catchment area of interest was modelled separately. The purpose of the modelling was to identify potential pipe capacity constraints during periods of peak flow and to determine requirements for servicing future development areas.

5.6.2 Model Details

(a) Software

BMROSS used Bentley® SewerCAD® CONNECT Edition Update 3 for the wastewater collection system modelling. Separate models were created, one for each of the SPS catchment areas considered in the Master Plan. Refer to Appendix B for model details.

(b) Sources of Data

In order to produce a SewerCAD® model for the sewer networks, several sources of information were used. In summary:

- The existing models from the 2020 Master Plan Update (BMROSS, 2020) were used as a basis and updated to reflect a change in conditions since that time.
- Sanitary sewer and maintenance hole (MH) installation locations, elevations, and diameters were obtained from collection system mapping (i.e. GIS files) and As-Recorded drawings provided by the Town of Saugeen Shores.
- Data validation found several sources of error related to pipe and MH elevations in the existing models. The model was corrected using BMROSS and other municipal records, where available.
- A Manning's n value of 0.013 was used for all gravity sewer pipes.
- Wastewater flows for each catchment area were developed as part of this Master Plan (refer to Appendix B).
- Assessments of sanitary sewer pipes were completed on the basis of comparing calculated peak flow estimates in the pipe to full-flow capacity. Pipes were identified where the ratio of flow to capacity:
    - Exceeded 80% but was below 100%
    - Exceeded 100%

(c) Establishing Flows at Maintenance Holes

Wastewater flows in the SewerCAD® model may be applied at MHs (i.e. point loads) or over the length of a sewer pipe (i.e. linear loads). For the existing Port Elgin models, annual average day flow (AADF) was used as a basis to calculate peak flow for the entire

collection system. The top 10 water customers by annual usage had the associated estimated sanitary sewage peak flow applied at the nearest model MH, if applicable, assuming 100% of facility water use was converted to sanitary flow. To calculate flow per MH, total peak wastewater flow, minus flow from large individual water users, was divided by the total number of MHs in the collection system.

As each SPS catchment area was modelled individually, SPSs that do not discharge directly to the Port Elgin WWTP had the rated capacity applied as a point load to the appropriate catchment area MH corresponding to the discharge location. It was assumed that all SPSs are operating at capacity simultaneously.

For future development model scenarios, flow values were calculated based on number of development units planned based on an ERU calculation as described in Section 3. Flows for existing development were left unchanged, and the incremental future flows were added to applicable adjacent MHs.

Refer to Appendix B for detailed calculations and flow allocation methodology.

5.6.3 Analyses Run

The model was used to calculate the flow in each sanitary sewer pipe, and percentage of full-flow capacity utilized, for peak flow conditions in the following scenarios:

- Existing development flows.
- Existing and committed development flow.
- Future flows, which includes flow from existing, committed, and future potential development.

5.6.4 Qualifications on Results

Results of the wastewater system modelling are based on the system information as described above. Limited work was completed in relation to verifying model elevation data from GIS to actual field measurements. Peak flows were calculated based on the methodology described in Appendix B. Where the model indicates that flows are near (i.e. > 80% of capacity) or exceeding the existing sewer capacity, there would be value in field checking elevation information to confirm model accuracy and/or installing flow meters to determine actual flows.

5.6.5 Model Results

(a) SPS 6 CATCHMENT AREA

Table 5.6 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 5.6 – Summary of SewerCAD® Analysis – SPS 6 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	146	144	142
Approximate No. of pipes with flow >80% and <100% design capacity	0	1	3
Approximate No. of pipes with flow >100% design capacity	0	1	1

The slope of the single constrained sewer meets the MECP Design Guidelines (MOE, 2008) minimum value. It is marginally over capacity (<5 L/s and approximately 15% of pipe full-flow capacity) with the addition of theoretical peak flow from commitments and potential future development. In our opinion, the projected exceedance is marginal, and prior to planning for replacement of such sewers, it would be worth verifying the flow to confirm actual capacity utilization.

(b) SPS 7 CATCHMENT AREA

Table 5.7 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 5.7 – Summary of SewerCAD® Analysis – SPS 7 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	19	19	17
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	1
Approximate No. of pipes with flow >100% design capacity	0	0	1

The slope of the single constrained sewer is marginally over capacity (<1 L/s) with the addition of theoretical peak flow from potential future development. In our opinion, the magnitude of the projected exceedance does not warrant further action.

(c) SPS 9 CATCHMENT AREA

Table 5.8 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

The SPS 9 catchment area includes a gravity collection sewer system and receives flows from SPS 7, SPS 8, SPS 10, and SPS 11.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 5.8 – Summary of SewerCAD® Analysis – SPS 9 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	441	441	438
Approximate No. of pipes with flow >80% and <100% design capacity	7	7	9
Approximate No. of pipes with flow >100% design capacity	9	9	10

It is noted that of the sewers identified as having flows greater than 100% of theoretical capacity, many have been indicated to have slopes that are below the MECP Design Guidelines (MOE, 2008) minimum values. In our opinion, prior to planning for replacement of such sewers, it may be worth verifying the sewer elevation data to confirm actual slopes.

It is recommended to upsize two sections of 450 mm sanitary trunk sewer adjacent to SPS 9, along Harbour Street between Izzard Street and Green Street, to accommodate development. There is limited capacity within the existing trunk sewers to service estimated peak development flows for the ultimate scenario; one section of sewer is over capacity (<25 L/s and approximately 20% of pipe full-flow capacity), the other section downstream is between 80% and 100% capacity utilization.

(d) SPS 10 CATCHMENT AREA

Table 5.9 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

The SPS 10 catchment area is not impacted by future development, but additional flow was applied to all MHs in the collection system to account for potential infill.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 5.9 – Summary of SewerCAD® Analysis – SPS 10 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	146	144	142
Approximate No. of pipes with flow >80% and <100% design capacity	0	1	3
Approximate No. of pipes with flow >100% design capacity	0	1	1
Approximate No. of pipes with flow <80% design capacity	22	22	22
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	0
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

(e) SPS 11 CATCHMENT AREA

Table 5.10 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

The SPS 11 catchment area is not impacted by future development, but additional flow was applied to all MHs in the collection system to account for potential infill.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 5.10 – Summary of SewerCAD® Analysis – SPS 11 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	19	19	19
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	0
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

5.7 Climate Change Considerations

Climate change is predicted to result in more intense storms and potentially, periods of prolonged drought. The Port Elgin wastewater system will potentially be impacted by precipitation events that increase the amount of extraneous flow in the sanitary collection system. This could impact on both the ability to convey the wastewater and treat it at the WWTP. The number of power outages related to extreme weather events could increase in the future. It will be important to ensure that emergency power facilities (i.e. generators) are properly sized and maintained.

5.8 Problems and Opportunities

5.8.1 Wastewater Treatment

The following wastewater treatment issues have been identified:

- There is currently un-committed reserve capacity available at the WWTP (i.e. 2,032 m^3/day or 2,032 ERUs) to service active proposals identified in Section 3. Currently vacant in-fill lands plus some boundary adjustment, not yet committed for servicing, have associated ERUs beyond the current uncommitted reserve. An increase in the WWTP rating will be required for the ultimate servicing scenario.
- A Class EA is underway to address capacity of the headworks, asset rehabilitation upgrades, and operational improvements at the Port Elgin WWTP.

5.8.2 Wastewater Pumping

There are two SPSs in Port Elgin that pump directly to the Port Elgin WWTP:

- SPS 6 – 10th Concession.
- SPS 9 – Harbour Street.

SPS 7, 8, 10, and 11 discharge to the SPS 9 drainage area.

Comparing calculated existing peak flow estimates to rated capacities of SPSs in Southampton, the following stations may be undersized for estimated existing peak flows:

- SPS 9

At this time, given there have been no report of bypassing or overflows at the station in recent years due to actual peak flows exceeding capacity, it is our opinion that flows to the station should continue to be monitored. Planning for a station capacity increase should commence only if peak flows are verified to be at station capacity.

Comparing calculated future peak flow estimates to rated capacities of SPSs in Southampton, the following stations are undersized for estimated future peak flows:

- SPS 6
- SPS 9

Upgrades or alternative projects (i.e. flow diversion) would be required to each of these stations to accommodate the future design peak flows that have been calculated. It is recommended that the Town continue to monitor flows to each identified SPS as developments proceed, and in the event that peak flows increase meaningfully, planning commence for station upgrades and/or flow diversion. At this time, the recommended approach for handling increased peak flows to each station includes electrical service upgrades at SPS 6 in order to allow pumps to operate at full rated capacity, and flow diversion from SPS 9 to SPS 6 via sanitary sewer flow reversal on Highland Street.

5.8.3 Wastewater Collection

The wastewater collection system (sewers) in Port Elgin was modelled using SewerCAD® for existing development, committed development, and potential future development, as defined in Section 3. Sewer capacities were assessed against existing and future peak wastewater flow estimates. Section 5.6.5 identifies the number of sewer sections operating at less than 80% capacity, between 80% and 100% and at more than 100%. The locations of constrained sewers are identified in figures presented in Appendix B.

Modelling results for Port Elgin indicate that there are a number of sewer segments that are currently theoretically over-committed in terms of capacity for the existing system conditions. With further development, the number of sewer segments with constrained capacity increases. Table 5.12 and Figure 5.4 identify several proposed projects, including trunk sewer upgrades within the existing collection system, which are recommended to address future capacity requirements. The diameters shown for the recommended upgrades are theoretically what would be required to ensure flows <100% of capacity. The actual diameter will need to consider other design factors including such factors as downstream sewer diameter.

Given that theoretical values indicate constraints in the existing system, but there have not been reports or observances of capacity issues (i.e. surcharges, sewer backups), it is possible that the theoretical data over-estimates actual flows or that some sewer capacities are greater than calculated. It is noted that, of the sewers identified as having flows greater than 100% of theoretical capacity, many have been indicated to have slopes that are below MECP Design Guidelines (MOE, 2008) recommended minimum values. Prior to planning to replace existing constrained sewers, especially in areas not impacted by future development, it is recommended that a sewer flow monitoring study be conducted to verify actual flow conditions and sewer slopes. The resultant data will be useful for either confirming or disproving capacity issues.

The identification of constrained sewer capacity in some sewer sections that are affected by future development is to be expected given the significant number of development units contemplated.

5.9 Alternative Solutions

5.9.1 Wastewater Treatment

The Port Elgin WWTP is currently operating at approximately 45% of its rated capacity. Existing development commitments account for approximately 24% of the total capacity, leaving 31% of the capacity available to allocate. Active development proposals represent another 26% of the current rated capacity, therefore if all were approved it would result in only 5% of the plant capacity remaining available to commit.

Based on projected rates of growth, there will be available capacity at the plant beyond 2045.

On behalf of the Town, Ainley Associates is currently undertaking a Class EA for the WWTP that is focused on addressing headworks capacity, asset rehabilitation and operational issues, and will also give consideration to future capacity requirements.

5.9.2 Sewage Pumping Capacity

(a) General

Based on theoretical modelling results, SPS 9 is the only station within the Port Elgin collection system that may experience current peak flows greater than station capacity. The calculated theoretical peak is 102% of capacity. At the Ultimate buildout scenario, the calculated SPS 9 peak would become 146% of rated capacity and the SPS 6 peak would become 111% of its currently equipped capacity.

Given the observation that there have been no reports of bypass or overflows in recent years, it is our opinion that the peak flow calculations may be conservatively high. Therefore, the initial recommendation is ongoing monitoring of station flows and potentially more detailed flow monitoring to confirm actual peaks. The following sections briefly describe alternatives to be considered if peak flows are confirmed to be approaching or above station rated capacity.

(b) Alternatives to be Examined

Where sewage pumping capacity is deemed to be insufficient, alternatives for addressing the capacity shortfall may include:

- SPS capacity increase by way of upgrades.
- Construct a new SPS with greater capacity.
- Flow diversion from the SPS to an alternate catchment area.

- Reduce sanitary sewage flows.

These options are discussed briefly in the following sections.

Upgrade Existing SPS to Increase Capacity

In the case of SPS 6, the station is currently equipped to operate with pumps at reduced speed due to a reported electrical service constraint. The CLI ECA reports the current capacity to be 137 L/s, but at the same time authorizes a capacity of 231 L/s if pumps are made able to operate at full speed. For this site, it is recommended to investigate and confirm what works are required to upgrade the electrical service, then proceed to do so once a station capacity increase is confirmed to be required.

In the case of SPS 9, a capacity increase would require pump replacement, probable electrical service and distribution upgrades, and associated station piping, electrical, and HVAC upgrades. It would be necessary to confirm that this is all physically feasible within the current station building and site footprint if planning this approach. Upsizing of the forcemain for the station may also be required depending on pressure and velocity considerations. For this site, upgrades are recommended only if flow diversion as discussed later in this section is not successful and/or peak flows increase to a point that station capacity is noticeably inadequate (i.e. bypassing or overflows begin to occur).

Construct a New SPS to Increase Capacity

Generally, replacement of an existing SPS with a completely new facility will only occur if one or more of the following considerations apply:

- The state of the overall existing station capacity is such that rehabilitation and upgrades are considered impractical.
- There is insufficient physical space within the existing station structures to house new equipment associated with the capacity increase.
- The cost of implementing upgrades to the existing station is considered less financially sound than an entirely new build.

At this time, in our opinion there is no reason to suggest that this approach should be considered for SPS 6 or 9. In the event this is ever reconsidered, such a construction would need to consider site footprint constraints, potential need for additional property, and Class EA requirements associated with a new building and site.

Flow Diversion from SPS Catchment Area

To reduce flows from an SPS catchment area by way of diversion requires first identifying a viable outlet to an alternate catchment area. The Town suggested a review of flow diversion from SPS 9 to SPS 6 catchment areas by way of reversing the flow direction in a portion of collection sewer on Highland Street. Based on our analysis and calculated theoretical peak flows, if this were completed, under the Ultimate buildout scenario the design peak values would:

- For SPS 6, increase from 152 to 234 L/s, nearly matching the approved station capacity of 231 L/s with pumps at full speed per the CLI ECA. See previous notes regarding current electrical constraints at the station.
- For SPS 9, decrease from 314 to 232 L/s, slightly greater than the current capacity of 214 L/s. In our opinion, in this case the potential exceedance is marginal to the point that a capacity increase at SPS 9 would potentially be avoided altogether or at least deferred for many years.

Reduce Flows to SPS

In our experience and based on a comparison of average daily sewage flows to peak values, the increase from average to peak values is most attributable to wet weather events (i.e. infiltration and inflow or I-I) rather than extreme customer usage. Actual reduction of peak flows due to I-I would therefore require physical repair or replacement of infrastructure contributing to I-I, which can be relatively costly depending on how widespread the issues are. The Town completed an I-I investigation in 2019-2020, and the findings concluded that inflow (directly related to precipitation) is not significant, and infiltration (groundwater) is directly related to the water table elevation, which can vary significantly with seasonal changes. Reduction of infiltration may therefore require extensive storm drainage network improvements in some areas, efforts to reduce the groundwater table, or extensive work to better seal sanitary sewers, all of which are anticipated to be challenging and costly.

In our opinion, while efforts to reduce I-I should be continued as part of other planned infrastructure projects (e.g. road reconstructions), flow reduction within the system may not be a practical means to address SPS capacity issues where they exist.

5.10 Wastewater Identified Projects

The Master Plan has established the following potential projects to improve overall sanitary servicing and wastewater management for existing infrastructure and future development areas. Additional engineering investigations are recommended to confirm individual project scope. Flow monitoring may be conducted for key problem areas for model verification and projected future peak flows.

Figure 5.4 identifies wastewater projects for Port Elgin. Projects are noted as ‘PE-WW#’. Several sanitary projects have been identified for development lands and are dependant on timing of those developments. Future sanitary sewer and pumping station improvements have been highlighted as a future servicing need that needs to be addressed as part of future development planning.

5.10.1 Existing Infrastructure Needs

WWTP Improvements/Capacity Upgrade (PE-WW1)
A Class EA is underway to address capacity of the headworks, asset rehabilitation upgrades, and operational improvements. A capacity increase at the Port Elgin WWTP will be required to facilitate projected wastewater flows from all potential development identified in Section 3.

Wellington Street Capacity Evaluation (PE-WW2)
Sewers on Wellington Street should be further evaluated for capacity relative to the SPS 7 discharge rate. Sewers are unaffected by development and there are currently no known issues, therefore this is a low priority project.

5.10.2 Development Servicing Needs

SPS 6 Upgrades (PE-WW3)
The station rated capacity is less than the design capacity due to reported power supply issues. Upgrades required for pumps to reach 100% full speed should be identified and completed. It is recommended to complete this project in conjunction with or before project PE-WW4.

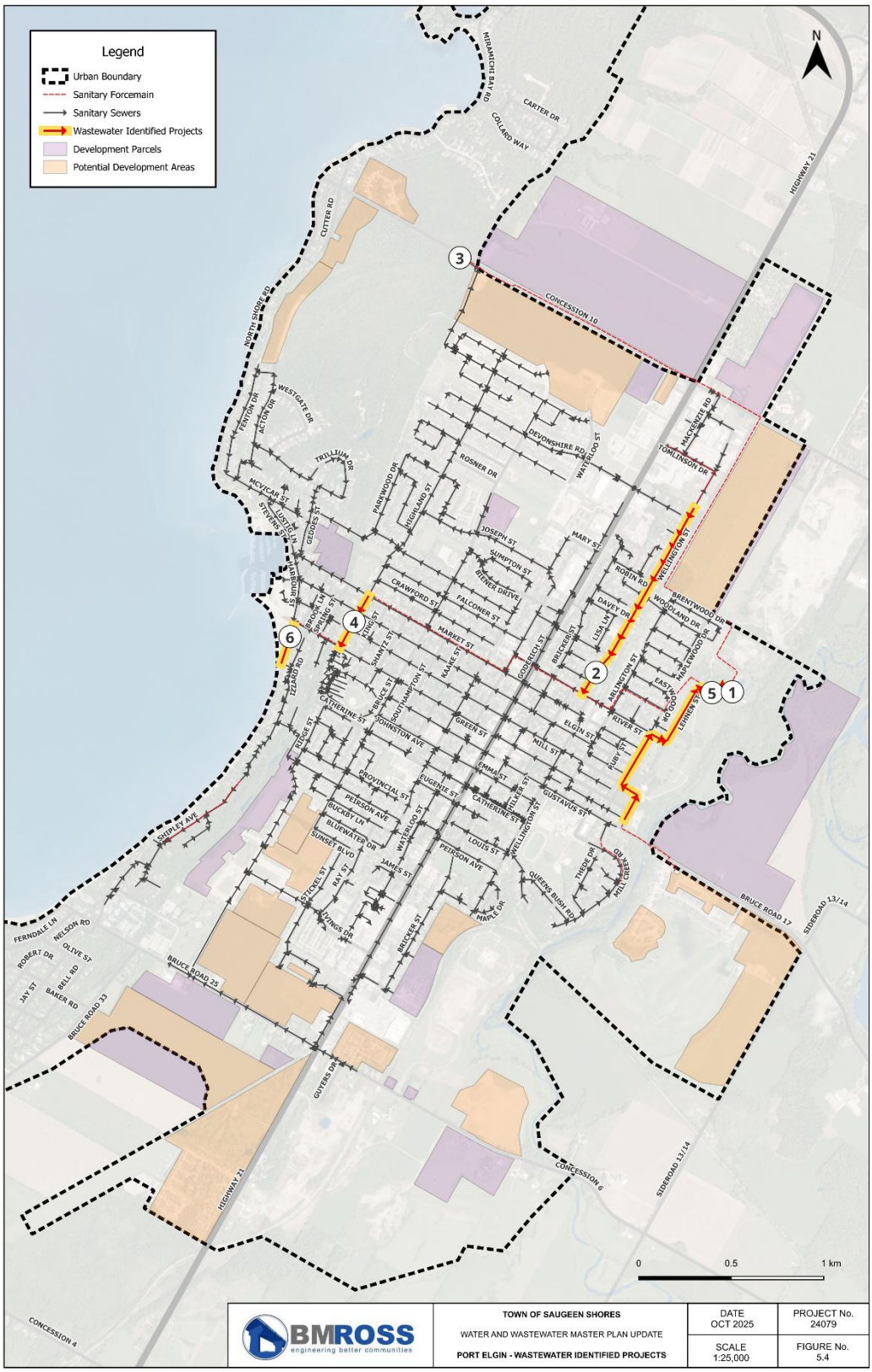
Highland Street Flow Reversal (PE-WW4)
Reversing flow on Highland Street is recommended to better proportion flows between SPS 6 and 9 in accordance with each station capacity. Timing will depend on status of flows to each station.

SPS 8 Forcemain Extension (PE-WW5)
SPS 8 forcemain extension to directly outlet to the WWTP once flows to SPS 9 have increased to the point of requiring additional capacity at the station or downstream sewer capacity of the existing forcemain outlet location are nearing capacity. This future design consideration is captured in the CLI ECA for the collection system.

Harbour Street Upgrades (PE-WW6)
There is limited capacity within existing sanitary sewers along Harbour Street adjacent to SPS 9 to service estimated peak development flows for the ultimate scenario. Therefore, to reduce potential for surcharging, the following conceptual sanitary sewer upgrades are recommended:

- Approximately 215 m of 525 mm sanitary sewer along Harbour Street from Izzard Street to just south of Green Street.

Figure 5.4 – Port Elgin Wastewater Identified Projects



5.11 Wastewater Capital Costs

Capital costs for identified existing infrastructure need and future development projects have been estimated at a conceptual level for planning purposes and are summarized in Table 5.11. Refer to Section 5.10 for detailed project descriptions. Location of projects are shown on Figure 5.4. Costs for sanitary sewer projects are based on 2025 costs per meter and do not assume full urban reconstructions (i.e. costs are for the individual asset only). Costs presented assume typical construction conditions with no special effort such as rock excavation, well point dewatering requirements, etc. Costs include 15% engineering fees and 20% contingencies.

For the assumed cost of full urban street reconstructions, see Section 4.10.

Table 5.11 – Wastewater Project Costs

ID	Category	Wastewater Capital Project	Priority	Total Project Cost	EA Requirements
PE-WW1	Port Elgin – Existing Infrastructure Needs	WWTP Improvements/Capacity Upgrade o Class EA is underway to address capacity of the headworks, asset rehabilitation upgrades, and operational improvements.	Medium	TBD	C – currently underway
PE-WW2	Port Elgin – Existing Infrastructure Needs	Wellington Street Capacity Evaluation Flow monitoring and confirming slopes/capacity of: o 200 mm sanitary sewers (three sections of sewer 250 m in total length) along Wellington Street northeast of Devonshire Road Avenue to north of Century Drive. o 250 mm sanitary sewers (ten sections of sewer 310 m in total length) along Wellington Street north of Century Drive to River Street.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Exempt
PE-WW3	Port Elgin – Development Servicing Needs	SPS 6 Upgrades o Identify and complete upgrades needed for the station to operate at design capacity.	Medium	$15,000 to assess issue and identify recommended upgrades Cost of upgrades TBD based on findings	TBD based on findings of assessment
PE-WW4	Port Elgin – Development Servicing Needs	Highland Street Flow Reversal o 320 m of 600 mm sanitary sewer Highland Street from Green Street to Market Street.	Medium	$850,000	Exempt provided within existing road allowance
PE-WW5	Port Elgin – Development Servicing Needs	SPS 8 Forcemain Extension o 1,190 m of 200 mm sanitary forcemain from Lehnen Street between Gustavus St and Green St, to the Port Elgin WWTP.	Low	$1,640,000	Exempt provided within existing road allowance
PE-WW6	Port Elgin – Development Servicing Needs	Harbour Street Upgrades o 220 m of 525 mm sanitary sewer along Harbour Street from Izzard Street to just south of Green Street.	Low	$520,000	Exempt provided within existing road allowance

Note:

1. Refer to Figure 5.4 for proposed project locations.
2. Total project costs assumed based on 2025 sanitary sewer costs per meter, 15% Engineering and 20% Contingencies. Costs are rounded up to nearest $10,000.

6.0 SOUTHAMPTON SEWAGE SYSTEM

6.1 Description

6.1.1 Pumping and Treatment

The community of Southampton is serviced by a communal sewage system consisting of approximately 50 km of gravity sewer, five SPSs and a WWTP. Three of the SPSs (SPS 1, 3, and 5) discharge directly to the WWTP. SPSs 2 and 4 are smaller secondary stations discharging to locations within the collection system. SPS 2 discharges to the SPS 1 drainage area and SPS 4 discharges to the SPS 5 drainage area. There is approximately 6.3 km of forcemain related to the SPSs. The current service area is approximately 450 ha. As of 2024 there were approximately 2,660 sewage customers (based on the number of laterals) in Southampton.

All collection sewers and SPSs operate under CLI ECA No. 093-W601, Issue No. 1, dated January 10, 2023.

The WWTP is rated for an AADF of 3,042 m^3/day and operates under ECA No. 7640-D6FQP3 dated November 5, 2024. The plant provides secondary level treatment and discharges continuously to the Saugeen River.

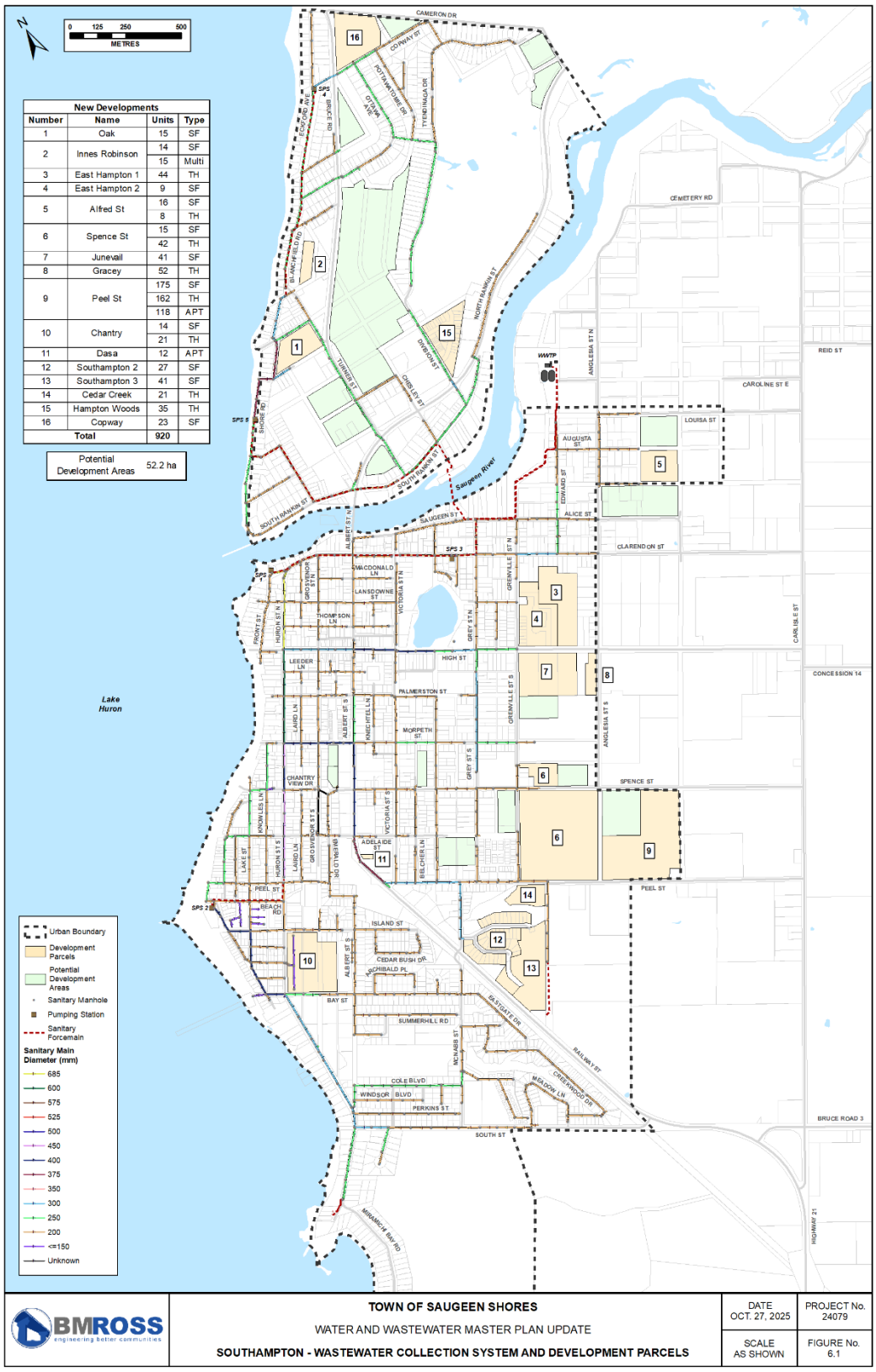
Table 6.1 provides a summary of the capacity of the major facilities. Figure 6.1 provides a map of the collection system and shows the location of the SPSs and WWTP.

Table 6.1 – Southampton Wastewater Facility Capacities

System Component	Capacity	Source Information
SPS 1 (Front St.)	116 L/s (firm)	CLI ECA
SPS 2 (Beach Rd.)	48 L/s (firm)	CLI ECA
SPS 3 (Clarendon St.)	16 L/s (firm)	CLI ECA
SPS 4 (Eckford Ave.)	36 L/s	Southampton WPCP Upgrades Class EA[1]
SPS 5 (Shore Rd.)	48 L/s (firm)	CLI ECA
Wastewater Treatment Plant (WWTP)	3,042 m^3/day (AADF) 6,084 m^3/day (Peak Day)	2024 ECA

Notes:
1. SPS capacity information was not available in the CLI ECA and was assumed, as noted in the SH MCEA (2019) Appendix A.

Figure 6.1 – Southampton Sanitary Collection System



6.1.2 Collection System

The Southampton collection system has three drainage areas draining to the WWTP, SPS 1 (313 ha), SPS 3 (57 ha), and SPS 5 (164 ha). Within the collection system SPSs 2 and 4 are relatively small drainage areas, discharging to the SPS 1 and SPS 5 areas, respectively.

In total there is approximately 50 km of sewer.

6.2 Existing and Design Wastewater Flows

6.2.1 Total Sewage Flows

A detailed analysis of existing sewage flows was included in the Reserve Capacity Memo (BMROSS, June 2025). The following is a summary.

Table 6.2 summarizes recent historical sewage flows for the Southampton WWTP as taken from the Annual Performance Reports.

Table 6.2 – Southampton – Historical Sewage Flows[1]

Year	AADF[2] (m^3/day)	DWF[3] (m^3/day)	WWF[4] (m^3/day)	WWF/DWF Ratio	Max. Single Day (m^3)
2021	2,009	1,616	2,274	1.41	3,124
2022	1,927	1,522	2,723	1.79	3,834
2023	2,148	1,820	2,610	1.43	4,161
2024	1,998	1,405	2,352	1.67	4,050
Averages	**2,021**	**1,591**	**2,490**	**1.58**	**4,161 (max)**

Notes:
1. AADF= Annual Average Daily Flows
2. DWF = Dry Weather Flow is lowest monthly average
3. WWF = Wet Weather Flow is highest monthly average

6.2.2 True Sewage Flows (TSF)

The TSF for Southampton was developed using the same methodology as Port Elgin (see Section 5.2.1).

The TSF is assumed to be equal to the DWF. Because of the relative stability of the Southampton flows we have used the four year average values for analysis. On a per customer basis over the last four years the TSF for Southampton was approximately:

- Southampton (2,660 customers) = 0.598 m^3/day per customer

This value is slightly less than the Port Elgin value but within 5%.

6.2.3 Infiltration and Inflow (I-I)

Infiltration and Inflow for Southampton was developed using the same methodology as Port Elgin (see Section 5.2.3).

On a per customer basis over the last four years the value for Southampton was approximately:

- Southampton Annual I-I = 0.338 m^3/day per customer

Southampton I-I value is much greater compared to Port Elgin (i.e. 0.180 m^3/day per customer). For forecasting growth related wastewater flows have used 0.260 m^3/day per customer which is approximately the average of the two values. The rationale is that growth will typically occur with new sewers which should have similar values in each community.

6.2.4 Design Unit Sewage Flows

Unit sewage flows for new development in Southampton were assumed to be the same as for Port Elgin (see Section 5.2.4). The value is 1.0 m^3/day per ERU as an annual average value.

6.2.5 By-pass or Overflow

There are no known locations where by-pass or overflow is occurring within the Southampton collection system.

6.3 Southampton WWTP Reserve Capacity

6.3.1 General

Typically, the Total Reserve Capacity of a WWTP is determined by deducting the average AADF from the previous 3 to 5 years from the ECA rated capacity. AADFs at Southampton have been fairly stable. To calculate reserve capacity, we have chosen to use the highest observed value in the previous four years (2023) as the existing flow for the Southampton WWTP.

Table 3.1 provides a list of known development commitments and proposals converted into ERUs.

6.3.2 Southampton WWTP Reserve

This section presents the Total and Uncommitted Reserve capacities and also the impact of approving currently active development proposals.

Total Reserve

The Southampton WWTP is rated for an AADF of 3,042 m^3/day per its ECA. The Total Reserve Capacity is as follows:

Rated Capacity	=	3,042 m^3/day
Existing AADF	=	2,148 (2023)
Total Reserve	**=**	**894 m^3/day**

Uncommitted Reserve

Table 3.1 identifies 213 ERUs of committed development for Southampton. Based on 1.0 m^3/day AADF from an ERU (see Section 5.2.4), the uncommitted reserve capacity of the Southampton WWTP is:

Total Reserve Capacity	=	894 m^3/day
Committed Flow	=	213
Uncommitted Reserve	**=**	**681 m^3/day**

Consideration of Development Proposals

Although not yet approved, Table 3.1 identifies a further 646 ERUs of potential development under current consideration in Southampton. When applied to the Uncommitted Reserve value the result is:

Uncommitted Reserve Capacity	=	681 m^3/day
Current Proposals	=	646
Reserve after Proposals	=	35 m^3/day

6.3.3 Forecasted Southampton WWTP Capacity

Table 6.3 shows the Southampton WWTP capacity required based on accommodating various development milestones. The “Ultimate” scenario is based on adding currently vacant in-fill lands plus some boundary adjustment to the developments that are currently committed to or actively being discussed.

Table 6.3 – Southampton Wastewater Treatment Capacity Required[1]

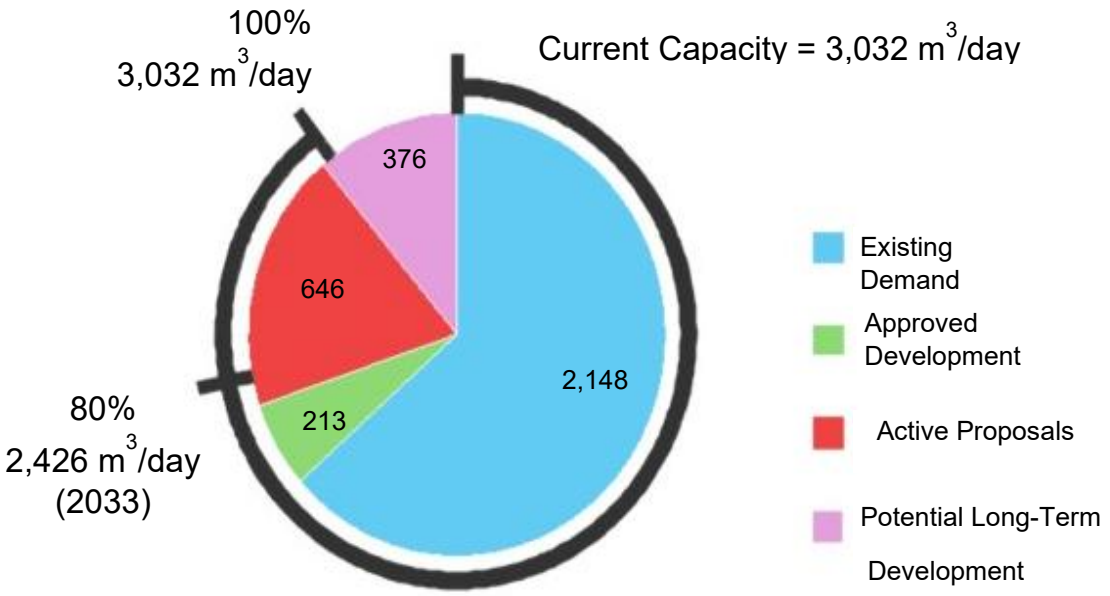
Servicing Scenario	Total Capacity Required (m^3/day)	Additional Capacity Required[3] (m^3/day)
Existing[2]	2,148	Nil
Existing + Commitments	2,361	Nil
Existing + Commitments + Active Proposals	3,007	Nil
Ultimate	3,411	369

Notes:
1. Capacity required is based on meeting AADF.
2. The existing capacity required is the 2023 actual AADF.
3. The additional capacity is based on an assumed current WWTP capacity of 3,042 m^3/day.

Existing commitments plus active proposals can be accommodated within the current plant rated capacity. A small increase in the WWTP rating will be required for the ultimate servicing scenario. The increase, depending on plant performance, may be achievable with a re-rating. Alternatively, some flow diversion to Port Elgin would also be an option to be considered.

Figure 6.2 shows the treatment capacity currently utilized by the existing demand and what would be required for the current approved developments (commitments), active proposals and potential long-term development.

Figure 6.2 – Reserve Capacity, Southampton WWTP

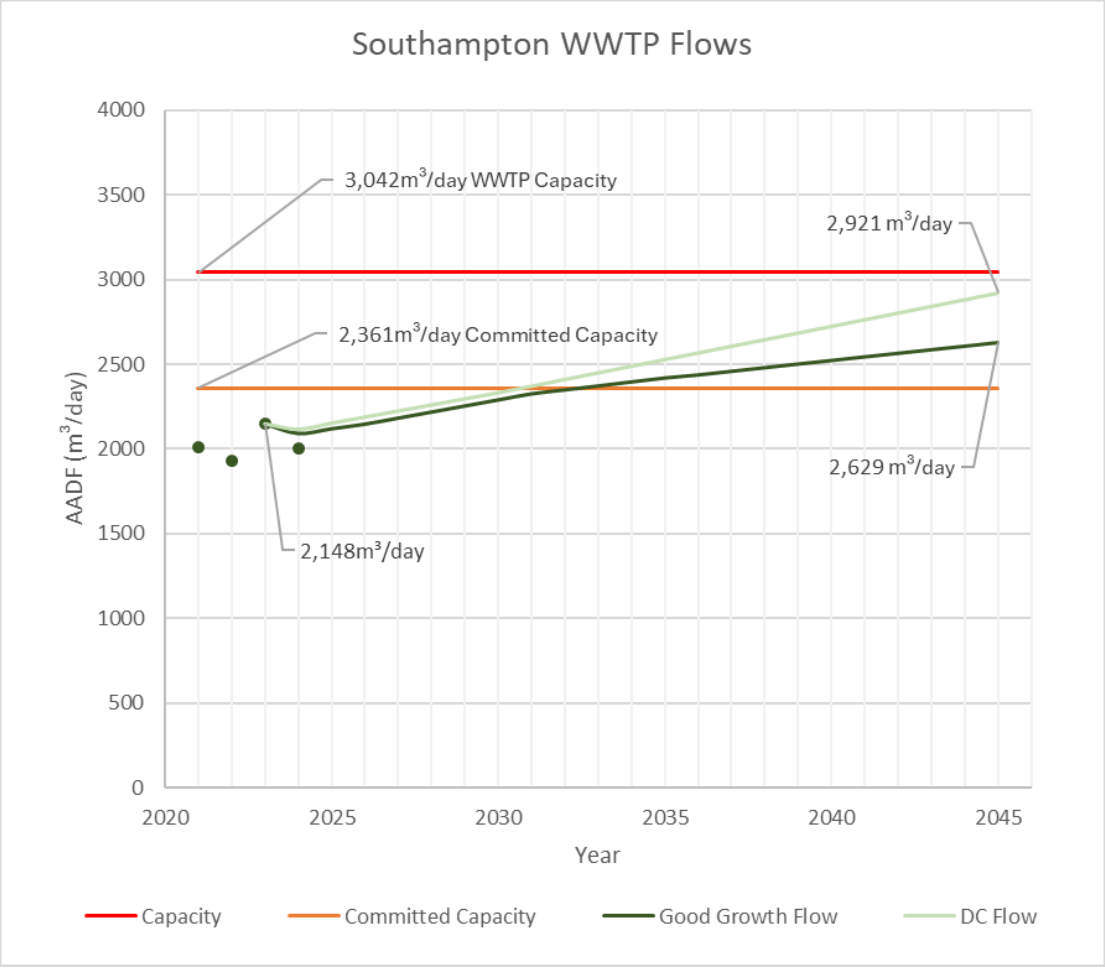


The above analyses were based on meeting development milestones. We also looked at the relationship between capacity required and time.

6.3.4 Southampton WWTP Capacity vs Time

Figure 6.3 presents existing, committed, and forecasted flows for the Southampton WWTP to 2045. Based on projected growth there will be capacity available until beyond 2045. The 80% capacity planning threshold would also be met in approximately 2033.

Figure 6.3 – Southampton WWTP Flows from 2020-2045



6.4 Southampton WWTP Treatment Performance

6.4.1 Effluent Criteria

The existing ECA for the Southampton WWTP provides both treatment objectives and limits. The criteria are as follows:

EFFLUENT OBJECTIVES

a. *The Owner shall design, construct and operate the sewage treatment works with the objective that the concentrations and loadings of the materials named below are achieved. The Director may review and amend the Certificate if the objectives are not met:*
Effluent Objectives:

Final Effluent Parameter	Average Annual Concentration	Average Annual Loading
BOD_5	20 mg/L	60.8 kg/d
Suspended Solids	20 mg/L	60.8 kg/d
Total Phosphorus as P	0.5 mg/L*	1.5 kg/d
E. coli	*150 CFU per 100 mL	Monthly Geometric Mean Density
pH	between 6.5 - 8.5 inclusive	Single Sample Result

**The objective for Total Phosphorus as P shall be based on "average monthly concentrations".*
**If the MPN method is utilized for E. coli analysis the objective shall be 150 MPN/100 mL.*

b. *The geometric mean density of E. Coli in effluent should not exceed 150 organisms per 100 ml for any calendar month.*

NON-COMPLIANCE (Limits)

a. *The sewage treatment plant shall be operated in such a manner and with such facilities that the concentrations and loadings of the materials named below as effluent parameters shall not be exceeded in the effluent from the plant. Any exceedance constitutes non-compliance with this Certificate.*
Effluent Limits:

Final Effluent Parameter	Average Annual Concentration	Average Annual Loading
BOD_5	25 mg/L	76.1 kg/d
Suspended Solids	25 mg/L	76.1 kg/d
Total Phosphorus as P	1 mg/L*	3 kg/d
E. coli	*200 CFU per 100 mL	Monthly Geometric Mean Density
pH	between 6.0 – 9.5 inclusive	Single Sample Result

**The objective for Total Phosphorus as P shall be based on "average monthly concentrations".*
**If the MPN method is utilized for E. coli analysis the objective shall be 200 MPN/100 mL.*

b. *The geometric mean density of E. Coli in the effluent shall not exceed 200 organisms per 100 ml for any calendar month. Any exceedance constitutes non-compliance with this Certificate.*

FLOW

a. *The sewage works has been approved to treat sewage at an average flow of 3,042 m^3/d and a peak flow rate of 6,084 m^3/d.*

b. For the purposes of this Certificate and Subsection 107 (3) of the Ontario Water Resources Act, the introduction of sewage flows in excess of the peak flow rate shown in subsection (a) is not approved under this Certificate.

The Objectives and Limits would not be considered stringent compared to current day standards and it should be expected that any proposal for expansion of capacity would trigger a review and a probable requirement for better effluent quality.

6.4.2 Performance Review

A review of Annual Reports for 2021 to 2023 identified two performance issues for the period:

The monthly average Total Phosphorus concentration in June 2021 was 0.6 mg/L. This concentration slightly exceeds the Objective of 0.5 mg/L but is within the Limit of 1 mg/L.

The monthly average Total Phosphorus concentration in August 2023 was 0.52 mg/L. This concentration slightly exceeds the Objective of 0.5 mg/L but is within the Limit of 1 mg/L.

With the exception of two performance issues identified above, average monthly concentrations for all parameters were below the objective concentrations for the entire period. Average monthly loadings for all parameters were below the loading limits for the entire period.

6.5 Reserve Pumping Station Capacity

6.5.1 General

Existing capacity requirements for SPSs 1 to 5 in Southampton were determined by SewerCAD® modelling and then compared to the expected additional capacity required to accommodate proposed development within the existing drainage areas. In total, three scenarios were modelled to investigate impacts of development; (1) existing conditions, (2) adding current commitments, and (3) adding active proposals, vacant lands, and possible boundary adjustments (referred to as the ultimate condition).

Because of the generalized assumptions required for existing and projected flows withing the drainage area for any specific SPS the results should be used for guidance only and not assumed to be actual flows. Also:

- For modelling purposes, we assumed the “worst case” with all SPSs operational simultaneously at their rated capacity.
- For cases where “existing utilization” is >100% capacity, and there are not reports of overflows/bypasses, it is our opinion this demonstrates that modelling assumptions are conservative.

6.5.2 Modelling Results

Table 6.4 Summarizes the results of the SPS capacity modelling for the Southampton collection system.

Table 6.4 – Summary of SPS Capacity Modelling

Southampton SPS	Assumed Capacity (L/s)	Existing Conditions SPS Peak Inflow (L/s)	Existing Conditions Capacity Utilized (%)	Committed Development SPS Peak Inflow (L/s)	Committed Development Capacity Utilized (%)	Ultimate Scenario SPS Peak Inflow (L/s)	Ultimate Scenario Capacity Utilized (%)
1	116[1]	111	96	125	108	150	129
2	48[1]	66	138	66	138	70	146
3	16[1]	18	115	19	124	27	169
4	36[2]	23	66	23	66	34	95
5	48[1]	60	126	63	132	73	152

Notes:
1. Assumed capacity is based on values in CLI ECA No. 093-W601, Issue No. 1, dated January 10, 2023.
2. Assumed capacity is based on value in Municipal Class Environmental Assessment (MCEA) for Southampton, dated November 2021.

6.5.3 Discussion for Existing and Commitments

When considering existing and committed development, the SPSs with potential capacity issues are SPS 1, 2, 3, and 5, three of which are key facilities directly pumping wastewater to the WWTP. Based on the sewer modelling SPS 2, 3, and 5 are already operating at near capacity.

6.5.4 SPS 1 – Front St.

Most sewage generated south of the river (including the discharge from SPS 2) drains to SPS 1 and is then pumped to the WWTP. The station has two pumps (one lead, one standby), each rated at 116 L/s. For assessment purposes we have assumed the firm capacity of SPS 1 is 116 L/s, though testing in recent years has demonstrated lower capacity for unknown reasons. The forcemain for SPS 3 connects to the forcemain for SPS 1 on Clarendon St. near Lakeland Drive. From that point both SPSs use a common forcemain. The drainage area for SPS 1 is approximately 313 ha.

Existing peak flows are estimated to be in the order of 110 L/s and additional peak design flows from committed and potential development are estimated to be in the order of 40 L/s.

SPS 1 is currently undergoing testing and field investigation to determine the cause of capacity being less than rated.

6.5.5 SPS 2 – Beach Rd.

SPS 2 has a catchment area of approximately 152 ha and is located on Beach Road at Front Street. The station has two pumps (one lead, one standby), each rated at 48 L/s. For modelling purposes, station rated capacity was assumed to be 48 L/s.

Existing peak flows are estimated to be in the order of 65 L/s and additional peak design flows from committed development are estimated to be less than 5 L/s. Though existing peak flows are estimated to be greater than the rated SPS capacity, according to annual WWTP reports available no bypasses or abnormal discharge events occurred from 2021 and 2024. Therefore estimated existing peaks, which are based on theoretical peaking factors, are likely to be conservative.

At this time, it is our opinion that flows to the station should continue to be monitored. Planning for a station capacity increase should commence only if peak flows are found to approach station capacity.

6.5.6 SPS 3 – Clarendon St.

SPS 3 has a catchment area of approximately 57 ha and is located on Clarendon Street near Lakeland Drive. The station has two pumps (one lead, one standby), each rated at 16 L/s. For assessment purposes we have assumed the firm capacity of SPS 3 is 16 L/s. Existing peak flows are estimated to be in the order of 20 L/s and additional peak design flows from committed development is estimated to be in the order of 10 L/s. Though existing peak flows are estimated to be greater than the rated SPS capacity, according to annual WWTP reports available no bypasses or abnormal discharge events occurred from 2021 and 2024. Therefore estimated existing peaks, which are based on theoretical peaking factors, are likely to be conservative.

At this time, it is our opinion that flows to the station should continue to be monitored. Planning for a station capacity increase should commence if development within the catchment area causes significant peak flow increases. Any capacity increase through pump replacement should consider the hydraulic implications of the forcemain shared with SPS 1.

6.5.7 SPS 4 – Eckford Ave.

SPS 4 has a catchment area of approximately 69 ha and is located on Eckford Avenue 350 m north of Walnut Street. The station has two pumps (one lead, one standby), which are not rated in the CLI ECA. For modelling purposes, station rated capacity was assumed to be 36 L/s, based on 2021 Municipal Class Environmental Assessment (MCEA) for Southampton. Existing peak flows are estimated to be in the order of 25 L/s and additional peak design flows from committed development are estimated to be in the order of 10 L/s.

Based on information available, we do not believe there is a need to increase the capacity of SPS 4 within the foreseeable future.

6.5.8 SPS 5 – Shore Rd.

SPS 5 has a catchment area of approximately 164 ha and is located on Shore Road near the end of Madwayosh Street. It receives flow from SPS 4. The station has two pumps (one lead, one standby), each rated at 48 L/s. For assessment purposes we have assumed the firm capacity of SPS 5 is 48 L/s. Existing peak flows are estimated to be in the order of 60 L/s and additional peak design flows from committed development is estimated to be in the order of 15 L/s. Though existing peak flows are estimated to be greater than the rated SPS capacity, according to annual WWTP reports available no bypasses or abnormal discharge events occurred from 2021 and 2024. Therefore estimated existing peaks, which are based on theoretical peaking factors, are likely to be conservative.

At this time, it is our opinion that flows to the station should continue to be monitored. Planning for a station capacity increase should commence only if peak flows are found to approach station capacity.

6.6 Wastewater Collection System Modelling

6.6.1 Background

Refer to 5.6.1 for Port Elgin. Similar comments apply to Southampton.

6.6.2 Model Details

(a) Software

Refer to 5.6.2 (a) for Port Elgin. Similar comments apply to Southampton.

(b) Sources of Data

Refer to 5.6.2 (b) for Port Elgin. Similar comments apply to Southampton.

(c) Establishing Flows at Maintenance Holes

Refer to 5.6.2 (c) for Port Elgin. Similar comments apply to Southampton.

6.6.3 Analyses Run

Refer to 5.6.3 for Port Elgin. Similar comments apply to Southampton.

6.6.4 Qualifications on Results

Refer to 5.6.4 for Port Elgin. Similar comments apply to Southampton.

6.6.5 Model Results

(a) SPS 1 CATCHMENT AREA

Table 6.5 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

The SPS 1 catchment area includes a gravity collection sewer system and receives flows from SPS 2.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 6.5 – Summary of SewerCAD® Analysis – SPS 1 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	201	201	197
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	4
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

(b) SPS 2 CATCHMENT AREA

Table 6.6 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 6.6 – Summary of SewerCAD® Analysis – SPS 2 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	203	203	202
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	1
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

(c) SPS 3 CATCHMENT AREA

Table 6.7 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 6.7 – Summary of SewerCAD® Analysis – SPS 3 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	57	57	57
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	0
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

(d) SPS 4 CATCHMENT AREA

Table 6.8 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 6.8 – Summary of SewerCAD® Analysis – SPS 4 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	68	68	68
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	0
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

(e) SPS 5 CATCHMENT AREA

Table 6.9 summarizes the results of the SewerCAD® analysis for the existing system, as well as the future scenarios. Full details are provided in Appendix B.

The SPS 5 catchment area includes a gravity collection sewer system and receives flows from SPS 4.

Figures in Appendix B illustrate the sanitary collection system, highlighting sewer sections modelled that are approaching (>80% of capacity) or over capacity for each scenario.

Table 6.9 – Summary of SewerCAD® Analysis – SPS 5 Catchment Area

Analysis and Criteria	Existing	Existing + Commitments	Future
Approximate No. of pipes with flow <80% design capacity	75	75	75
Approximate No. of pipes with flow >80% and <100% design capacity	0	0	0
Approximate No. of pipes with flow >100% design capacity	0	0	0

The wastewater collection system capacity is considered adequate for the existing and future conditions, and no upgrades were identified as being required at this time.

6.7 Climate Change Considerations

Climate change is predicted to result in more intense storms and potentially, periods of prolonged drought. The Southampton wastewater system will potentially be impacted by precipitation events that increase the amount of extraneous flow in the sanitary collection system. This could impact on both the ability to convey the wastewater and treat it at the WWTP. The number of power outages related to extreme weather events could increase in the future. It will be important to ensure that emergency power facilities (i.e. generators) are properly sized and maintained.

6.8 Problems and Opportunities

6.8.1 Wastewater Treatment

The following wastewater treatment issues have been identified:

- There is currently un-committed reserve capacity available at the WWTP (i.e. 681 m^3/day or 681 ERUs) to service active proposals identified in Section 3. Currently vacant in-fill lands plus some boundary adjustment, not yet committed for servicing, have associated ERUs beyond the current uncommitted reserve. An increase in the WWTP rating will be required for the ultimate servicing scenario.

- Construction is underway for Phase 1 of the planned upgrades at the Southampton WWTP.

6.8.2 Wastewater Pumping

There are three SPSs in Southampton that pump directly to the Southampton WWTP:

- SPS 1 – Front Street.
- SPS 3 – Clarendon Street.
- SPS 5 – Shore Road.

SPS 2 discharges to the SPS 1 drainage area and SPS 4 discharges to the SPS 5 drainage area.

Comparing calculated existing peak flow estimates to rated capacities of SPSs in Southampton, the following stations are undersized for estimated existing peak flows:

- SPS 2
- SPS 3
- SPS 5

At this time, it is our opinion that flows to the stations should continue to be monitored. Planning for a station capacity increase should commence for each station only if actual peak flows approach rated capacity.

Comparing calculated future peak flow estimates to rated capacities of SPSs in Southampton, the following stations are undersized for estimated future peak flows:

- SPS 1
- SPS 2
- SPS 3
- SPS 5

Upgrades would be required to each of these stations to accommodate the future design peak flows that have been calculated. SPS 1 is currently undergoing testing and field investigation to determine the cause of capacity being less than rated, though depending on growth within the catchment area it may in the future require a capacity increase beyond the current rating.

It is expected that capacity increases for these stations would require a combination of mechanical and electrical upgrades, and potentially forcemain paralleling or replacement depending on final design capacity. It is recommended that the Town continue to monitor flows to each identified SPS as developments proceed, and in the event that peak flows increase meaningfully, planning commence for station upgrades.

Increase to existing station capacity within the existing station building and site footprint is an exempt project under the Class EA process.

6.8.3 Wastewater Collection

The wastewater collection system (sewers) in Southampton was modelled using SewerCAD® for both the existing development, committed development, and potential future development, as defined in Section 3. Sewer capacities were assessed against estimated existing flows and future flows. Section 6.6.5 identifies the number of sewer sections operating at less than 80% capacity, between 80% and 100% and at more than 100%. The locations of constrained sewers are identified in figures presented in Appendix B.

No sewers have been identified as having existing or future flows greater than 100% of theoretical capacity.

6.9 Alternative Solutions

6.9.1 Wastewater Treatment

The Southampton WWTP is currently operating at approximately 71% of its rated capacity. Existing development commitments account for approximately 7% of the total capacity, leaving 22% of the capacity available to allocate. Active development proposals represent another 21% of the current rated capacity, therefore if all were approved it would result in the plant capacity being essentially fully committed.

Based on projected rates of growth, there will be available capacity at the plant beyond 2045. The 80% capacity planning threshold would be met in approximately 2033.

A Class EA for the WWTP identified recommended works including expanded headworks, additional solids treatment and biosolids storage facilities, and a target re-rating of 3,626 m^3/day. A project to expand the headworks was tendered and awarded in 2025, representing part of the works identified in the Class EA.

6.9.2 Sewage Pumping Capacity

(a) General

Based on theoretical modelling results, SPS 2, 3, and 5 within the Southampton collection system may experience current peak flows greater than station capacity. At the Ultimate buildout scenario, SPS 1 would be added to the list.

Comparing the Existing conditions scenario to the Committed Development scenario, there is relatively little difference in estimated peak flows at SPS 2 (no change), SPS 3 (6% increase or 1 L/s), or SPS 5 (5% increase or 3 L/s). Given the observation that there have been no reports of bypass or overflows in recent years, it is our opinion that the peak flow calculations may be conservatively high. Based on this observation, and the relatively minor impact from development commitments, the initial recommendation is ongoing monitoring of station flows and potentially more detailed flow monitoring to confirm actual peaks. The following sections briefly describe alternatives to be considered if peak flows are confirmed to be approaching or above station rated capacity.

(b) Alternatives to be Examined

Where sewage pumping capacity is deemed to be insufficient, alternatives for addressing the capacity shortfall may include:

- SPS capacity increase by way of upgrades.
- Construct a new SPS with greater capacity.
- Flow diversion from the SPS to an alternate catchment area.
- Reduce sanitary sewage flows.

These options are discussed briefly in the following sections.

Upgrade Existing SPS to Increase Capacity

Refer to Section 5.10.1 for a discussion regarding SPS 9. Similar comments apply here.

Construct a New SPS to Increase Capacity

Refer to Section 5.10.1 for a discussion regarding this alternative. In our opinion, similar to SPS 6 and 9, there is currently no reason to assume this alternative would be considered for any of the Southampton SPSs.

Flow Diversion from SPS Catchment Area

To reduce flows from an SPS catchment area by way of diversion requires first identifying a viable outlet to an alternate catchment area. At this time, there are no identified situations within the Southampton system where this would be considered a viable approach.

Reduce Flows to SPS

Refer to Section 5.10.1 for a discussion regarding this alternative. Similar comments apply here.

6.10 Wastewater Identified Projects

The Master Plan has established the following potential projects to improve overall sanitary servicing and wastewater management for existing infrastructure and future development areas. Additional engineering investigations are recommended to confirm individual project scope. Flow monitoring may be conducted for key problem areas for model verification and projected future peak flows.

Figure 6.4 identifies wastewater projects for Southampton. Projects are noted as 'SH-WW#'. Several sanitary projects have been identified for development lands and are dependant on timing of those developments. Future pumping station improvements have been highlighted as a future servicing need that needs to be addressed as part of development planning.

6.10.1 Existing Infrastructure Needs

WWTP Capacity Upgrades (SH-WW1)
A capacity increase at the Southampton WWTP will be required to facilitate projected wastewater flows from all development identified in Section 3. Construction is underway for Phase 1 of the planned upgrades.

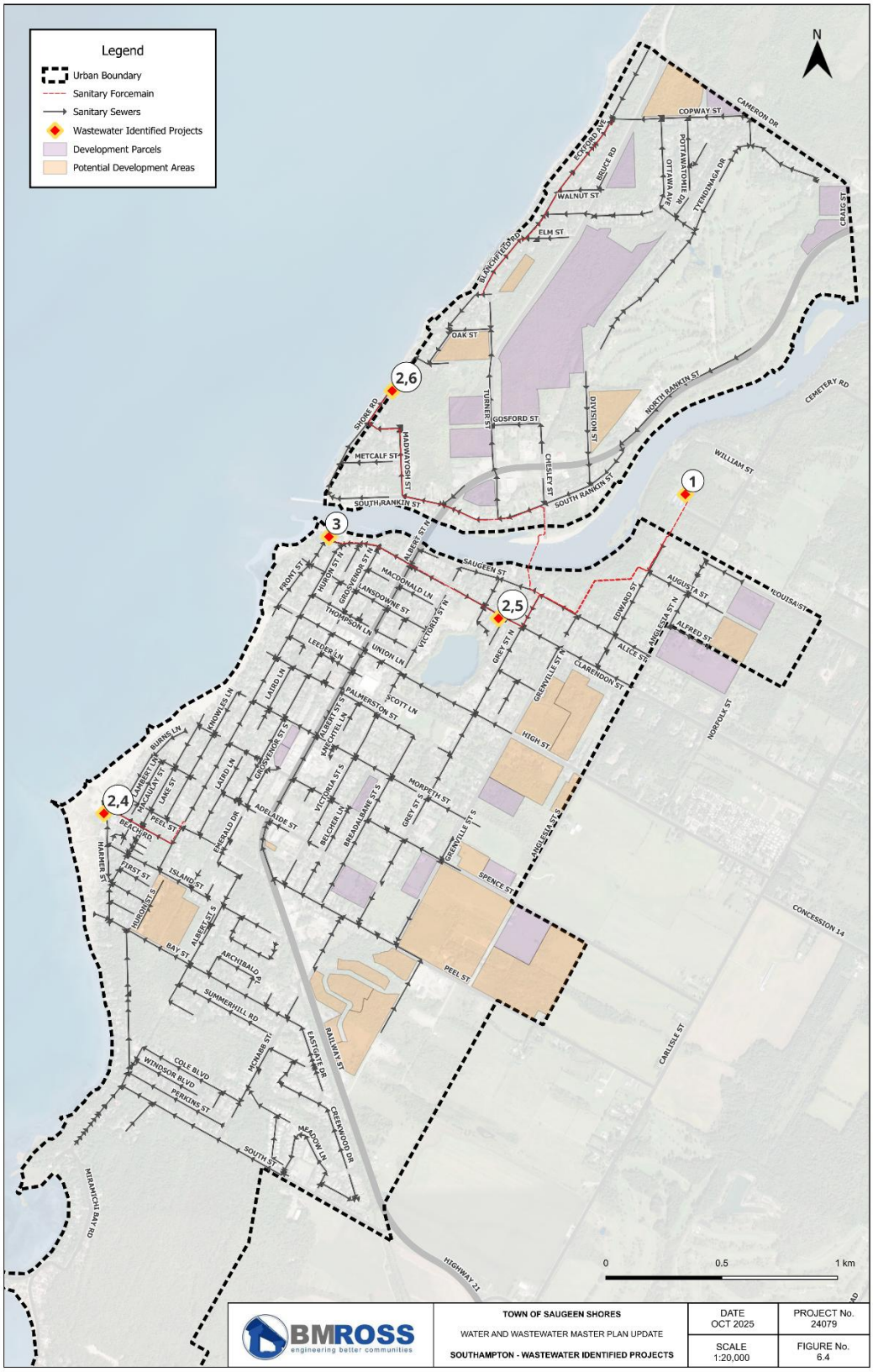
SPS Flow Monitoring (SH-WW2)
It is recommended to monitor existing flows at SPS 2, 3, and 5, to compare theoretical existing peak flows with actual peak flows and determine if upgrades are required.

6.10.2 Development Servicing Needs

SPS 1 Capacity Upgrade (SH-WW3)
It is recommended to closely monitor flows at SPS 1. Planning for a station capacity increase should commence if development within the catchment area causes significant peak flow increases. Any capacity increase through pump replacement should consider the hydraulic implications of the forcemain shared with SPS 3.

SPS 2 Capacity Upgrade (SH-WW4)
It is recommended to closely monitor flows at SPS 2, and when actual flows increase noticeably relative to station capacity, planning for a station capacity increase should commence.

Figure 6.4 – Southampton Wastewater Identified Projects



SPS 3 Capacity Upgrade (SH-WW5)
It is recommended to closely monitor flows at SPS 3. Planning for a station capacity increase should commence if development within the catchment area causes significant peak flow increases. Any capacity increase through pump replacement should consider the hydraulic implications of the forcemain shared with SPS 1.

SPS 5 Capacity Upgrade (SH-WW6)
Similar recommendation to SH-WW4.

6.11 Wastewater Capital Costs

Capital costs for identified existing infrastructure need and future development projects have been estimated at a conceptual level for planning purposes and are summarized in Table 6.10. Refer to Section 6.10 for detailed project descriptions. Location of projects are shown on Figure 6.3. Costs for sanitary sewer projects are based on 2025 costs per meter and do not assume full urban reconstructions (i.e. costs are for the individual asset only). Costs presented assume typical construction conditions with no special effort such as rock excavation, well point dewatering requirements, etc. Costs include 15% engineering fees and 20% contingencies.

For the assumed cost of full urban street reconstructions, see section 4.10.

Table 6.10 – Wastewater Project Costs

ID	Category	Wastewater Capital Project	Priority	Total Project Cost	EA Requirements
SH-WW1	Southampton – Existing Infrastructure Needs	**WWTP Capacity Upgrades** o Construction underway for Phase 1 of the planned upgrades.	High	$ 26,000,000	EA Completed
SH-WW2	Southampton – Existing Infrastructure Needs	**SPS Flow Monitoring** o Monitoring of peak flow entering SPS 2, 3, and 5 to verify model results of estimated existing peak flows exceeding rated capacities.	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Exempt
SH-WW3	Southampton – Development Servicing Needs	**SPS 1 Capacity Upgrade** o Initially, monitor actual flows relative to theoretical estimates o Expand capacity for future design peak flows once impact from development warrants	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring is exempt. Upgrades within existing SPS exempt
SH-WW4	Southampton – Development Servicing Needs	**SPS 2 Capacity Upgrade** o Initially, monitor actual flows relative to theoretical estimates o Expand capacity for future design peak flows once impact from development warrants	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring – Exempt Upgrades within existing SPS exempt
SH-WW5	Southampton – Development Servicing Needs	**SPS 3 Capacity Upgrade** o Initially, monitor actual flows relative to theoretical estimates o Expand capacity for future design peak flows once impact from development warrants	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring – Exempt Upgrades within existing SPS exempt
SH-WW6	Southampton – Development Servicing Needs	**SPS 5 Capacity Upgrades** o Initially, monitor actual flows relative to theoretical estimates o Expand capacity for future design peak flows once impact from development warrants	Low	$150,000 for a flow monitoring program targeting various locations in community including SPSs	Flow monitoring – Exempt Upgrades within existing SPS exempt

Note:

1. Refer to Figure 6.3 for proposed project locations.
2. Total project costs assumed based on 2025 sanitary sewer costs per meter, 15% Engineering and 20% Contingencies.

7.0 CONSULTATION

7.1 General

Public consultation represents an integral part of the master planning process. During this study, a consultation program was implemented to obtain input on key study issues from the general public, government review agencies, and key stakeholders. Information gathered through this process was incorporated into the analysis of future servicing needs and the evaluation of alternatives. The following subsections summarize the consultation program.

7.2 Initial Public Consultation

Initial comments were solicited from residents by way of a public notice issues in the local newspapers. The Notice of Project Commencement summarized the purpose and intent of the Master Plan study and requested comments from interested persons. The notice was issued on February 13, 2025, in the Shoreline Beacon, and placed on the Town's website and the Engage Saugeen Shores website. A copy of the Notice is included in Appendix C.

Table 7.1 summarizes the comments and questions received following the Notice of Project Commencement.

Table 7.1 – Summary of Comments Received Following Project Commencement

Member of Public	Comments	Action Taken
Resident Via email on February 14th, 2025	Notes they are a seasonal resident of the Goble Grove area and are involved with the Lake Huron Coastal Centre initiatives. The individual expressed concern about the scale of recent infill development in the Goble Grove area and suggested implementing municipal sewage in the cottage area. This would help mitigate the impact on the natural processes of the septic system and provide residents with the opportunity to opt in before requiring a new septic system. The resident asked to be a part of the email list for considered residents and future notifications.	Thanked resident, shared his comment with town staff, and added them to the contact list. Comment was filed and noted.

Member of Public	Comments	Action Taken
Resident Via email on March 4th, 2025	The Resident asked for additional details concerning the criteria being used/ assessed in the revised Master Plan.	Explained the Master Plan update will evaluate both Port Elgin and Southampton current water and sewage systems, including evaluation of demands, flows, and future water and sewage demands based on the projected growth and developments over the next 20-25 years. The plan will additionally review the current capacity and use of water treatment, storage, pumping facilities and sewage treatment.
Resident Via email on March 5th, 2025	The resident inquired if source water and stormwater management be evaluated within the scope of the Master plan.	Responded that stormwater management is not included within the scope of the Master Plan. The MP will assess source water management in terms of potential impacts to changes to water and wastewater infrastructure against existing source protection policies and requirements.
Resident Via Engage Saugeen Shores Portal March 5th, 2025	The resident requested that the Master Plan address the treatment of PFAS, agricultural chemicals, pharmaceuticals, and microplastics in both drinking water and wastewater effluent, citing studies that highlight their presence and risk to human health.	The comment was filed and noted on April 7th. 2025.
Resident Received via email on	The resident stated they own two properties adjacent to the settlement area.	The email was filed and noted on March 6th. The resident was added to the email list.

Member of Public	Comments	Action Taken
March 6th, 2025	They requested the inclusion of these lands in the Servicing Master Plan and noted that conceptual plans will be available for review by the end of April. The email provided attachments, including a boundary adjustment request, a letter, an existing infrastructure site plan for both properties, and minutes from a September 28th, 2023 with the Town and County.	
Resident Received via Engage Saugeen Shores Portal March 6th, 2025	The resident strongly opposed the privatization or public-private partnerships for water and sanitation services within Saugeen Shores, emphasizing that these services should remain entirely publicly owned and operated. Citing global examples and research indicating privatization often leads to higher costs, reduced service quality, and diminished public accountability. Specific reference included a 2017 Transnational Institute report, and a 2016 study by Food and Water Watch, highlighting that many municipalities have reversed privatization due to negative outcomes. The commenter urges that water and sewer services remain entirely publicly managed to ensure long-term affordability, quality, and transparency.	The comment was filed and noted on April 7th. 2025.
Resident Via Telephone April 9, 2025	Lives on Saugeen River near outfall. Concern related to muskellunge (muskie) fishery. Has observed muskies in Mill Creek, which is the outlet for the WWTP. Noted that MNR has studied and reported on the local muskie population. Noted a requirement for monitoring in Mill Creek as part of the WWTP expansion. Would like to be kept informed of the project.	Thanked for comments and added to contact list.

Member of Public	Comments	Action Taken
Resident Via Telephone April 9, 2025	Owns properties in Saugeen Shores and works closely with development industry. Interested in process and would like to be kept informed of the progress of the study.	Thanked for comments and added to contact list.
Resident Via Engage Saugeen Shores Portal June 6, 2025	Is against the addition of fluoride as part of the water treatment process. Residents can opt into receiving fluoride through various routes and for various reasons through other sources they choose, but mass treatment without consent should not be funded in Saugeen Shores.	Noted. The scope of the Master Plan does not include an evaluation of treatment capabilities or technologies. No plans to add fluoride to the water system at this time.
Resident Via Engage Saugeen Shores Portal June 6, 2025	Current open lagoons emit very strong foul odour. Ensure lagoons are covered.	Comment directed to Saugeen Shore staff. Staff currently working on addressing odour issue.

7.3 Review Agency and Stakeholder Consultation

Input into the Master Plan was solicited from government review agencies and identified stakeholders by way of email correspondence. Agencies and organizations that might have an interest in the project were sent an information package detailing the scope of the Master Plan. The information was circulated to ten review agencies on February 13th, 2025. The organizations were asked to comment on the project on or before March 15th, 2025.

Table 7.2 summarizes the comments received because of this consultation.

Table 7.2 – Initial Agency and Stakeholder Comments

Review Agency	Comments	Action Taken
Sara Porter, Southampton BIA Received via email on February 13th, 2025	Inquired if the initial notice would be circulated to every business and residential tenant by the Town. Noted that the BIA would distribute the notice to their membership. Sara expressed concern for the 70 apartments and their residents downtown who will not read the newspaper and do not know to go to the Town's website for information on water service disruptions that may be associated with the Master Plan.	Responded the Town was not planning a general mailout. The notice of commencement would be placed in the Shoreline Beacon for two weeks, placed on the Town's website and the Town's Engage Saugeen Shores Website. Explained that the Water and Wastewater Servicing Master Plan update is a broad technical review of the water and wastewater systems, and the Master Plan itself will not result in service disruptions.
Klarika Hamer, Bruce County Received via email on February 14th, 2025	Indicated Bruce County has received the notice of commencement and understood that questions/ comments are requested by March 15th, 2025.	Comment was filed and noted on February 14th, 2025.

Review Agency	Comments	Action Taken
Joline Christiani, Realtors Association of Grey Bruce Owen Sound (GBOS) Received via email on February 18th, 2025	Provided the initial notice would be circulated with the membership. Additionally inquired about the stage of the project and if questions were being welcomed prior to the commencement of the Master Plan.	Confirmed the Master Plan is in the commencement stage and welcomes any initial questions or feedback that are encouraged through the process of the Master Plan progress. Thanked the respondent for sharing the notice with their membership.
Monika Macki, MECP Environmental Resource Planner / Environmental Assessment Coordinator Received via email on February 19th, 2025	Acknowledged the notice of commencement for the Master Plan in accordance with MCEA Approach 1 and provided the supporting attachments for Species at Risk (SAR) and proponents' delegation of procedural aspects of consultation with Aboriginal communities.	Aboriginal communities noted within the MECP letter were circulated Initial Notice.
Carl Seider, Project Manager Source Water Protection (Grey Sauble) Received via email on February 19th, 2025	Indicated they wish to stay informed as recommendations detailed in the Master Plan that substantially alters the Municipal Drinking Water System (MDWS) will require an amendment to Section 34 of the Source Protection Plan as provided in the Clean Water Act.	Comment was filed and noted on February 19th, 2025.

Review Agency	Comments	Action Taken
Lisa Mills, Coordinator, Port Elgin BIA Received via email on February 20th, 2025.	Indicated that the link within the letter is broken and the Master Plan is not listed on the Engage Saugeen Shores Website.	Noted that the link will be active following the notice's circulation in the Shoreline Beacon on March 4th. The Municipality will ensure the project information will be available at that time.
Brianna Tombs MNR Planning Intern Received via email on February 21st, 2025	Acknowledged receiving the notice of Commencement and provided an attached Information Package detailing the MNR's interests as a commenting agency and regulatory authority to issue authorizations, permits licencing and/or approvals. Provided if no MNR interests are identified based on the information contained in the package, there is no need to further circulate MNR as a commenting agency.	Comment was filed and noted on February 24th, 2025.
Brandi Walter SVCA Environmental Planning Coordinator Received via email on March 7th, 2025	The SVCA acknowledges receipt of the Notice of Commencement. An attachment was provided, stating that regulated areas are determined in accordance with the Conservation Authorities Act and O. Regulation 41/2. It is recommended that SVCA's online mapping tool be consulted for any proposed future development associated with the Master Plan. Additionally, the letter notes that an additional letter from the Local Risk Management Official (Carl Seider) may be required under the Clean Water Act regarding Drinking Water Source Protection.	Comments noted. A separate letter was sent to the local Risk Management Official as part of the agency mailout.

Review Agency	Comments	Action Taken
Dave Reynolds Chairperson-Leadership Committee Port Elgin and Saugeen Township Beachers Association Received Via Email on March 14th, 2025	A Stakeholder emphasized that stormwater must be addressed in the SSWWW Master Plan, as it is defined as “sewage” under the Ontario Water Resources Act. The Plan should include infrastructure for the collection, treatment, and disposal of both wastewater and stormwater, and clearly outline how stormwater management will be integrated into future planning, development, and financial policies. The comment also recommends incorporating Green Stormwater Infrastructure (GSI) and Low Impact Development (LID) approaches, such as rain gardens, permeable pavements, and rainwater harvesting, across public and private lands and municipal rights of way. Additionally, the Plan should consider water reuse options for non-potable purposes, aligning with the Provincial Policy Statement and A Place to Grow, which promotes water conservation. While specific regulations for water reuse are limited, several existing provincial standards and guidelines may apply. Given Saugeen Shores’ ongoing growth and the anticipated increase in stormwater runoff, the plan should review and incorporate best practices from other waterfront communities that have successfully mitigated stormwater impacts and improved water quality.	Stormwater is not within the scope of this Master Plan, and the Town has recently completed a Drainage Master Plan that addresses stormwater.

Review Agency	Comments	Action Taken
Clair Dodds Commissioner, Community Development County of Bruce Received Via Email on March 19th, 2025	Bruce County provided updated population projections and land demand forecasts for residential, and employment uses in Saugeen Shores, as outlined in the Good Growth Final Report (2022). County planning staff are available to support the SSWWW Master Plan update by answering questions and coordinating planning data. Assistance can be provided during regular planning check-in meetings or through direct engagement with BMROSS. Contact information for Corenna Smith, Senior Development Planner, was shared should BMROSS or the Town require further planning-related information. The County also requested advance notification of any proposed infrastructure projects located within or adjacent to Bruce County Road allowances.	Comment was filed and noted on April 7th, 2025.

7.4 Aboriginal Consultation

The Crown has a duty to consult with First Nation and Metis communities if there is a potential to impact Aboriginal or treaty rights. This requirement is delegated to project proponents as part of the Master Plan process, therefore the project proponent has a responsibility to conduct an adequate and thorough consultation with Aboriginal communities as part of the Master Plan. The project information was circulated to seven Aboriginal communities on February 13, 2025. They were asked to comment on the project on or before March 30, 2025.

The seven communities consulted included:

- Chippewas of Nawash Unceded First Nation,
- Chippewas of Saugeen First Nation,
- Saugeen Ojibway Nation (SON),

- Métis Nation of Ontario,
- Great Lakes Métis Council,
- Historic Saugeen Métis and
- Chippewas of Kettle and Stony Point First Nation.

Correspondence was subsequently forwarded to each community/ organization detailing the scope of the Master Plan and asking for input. Table 7.3 summarizes the correspondence with Aboriginal communities. Copies of the letters, notices and correspondence are included in Appendix C.

Table 7.3 – Aboriginal Consultation Log

To	From	Comments	Action Taken/Response
Chippewas of Nawash Unceded First Nation (via email) – Chief Gregory Nadjiwon, February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• No response.
Chippewas of Saugeen First Nation Chief Conrad Ritchie, (via email), February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• No response.
Saugeen Ojibway Nation (SON)- (via email)- Charlene Leonard, February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• No response.
Historic Saugeen Metis (via email), February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• Response filed and detailed below.
Metis Nation of Ontario (via email)- Consultation Email, February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• No response.

To	From	Comments	Action Taken/Response
Great Lakes Metis Council (via email)- Consultation Email, February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• No response.
Chippewas of Kettle and Stony Point First Nation (via email)- Chief Kimberly Bressette, February 13th, 2025	BMROSS	• Provided letter outlining project scope and map of the project area.	• No response.
BMROSS	Neala Macleod Farley, Coordinator, Lands, Water & Consultation Historic Saugeen Metis (HSM) Email received March 26th, 2025	• The email from HSM stated that their community would like to be involved with the project and remain informed as the EA and Master Plan become available for review. • The email detailed the primary interests of the HSM in regards to the project are the public consultation process, environmental, and (potential) archaeological assessment. • Additionally, they are interested in the outcomes as they relate to the well-being of the HSM community members.	• The HSM was added to the email list and comment was filed and noted.

To	From	Comments	Action Taken/Response
Saugeen First Nation (via email) – Melissa Snowden, May 20, 2025	BMROSS	• Introduction to BMROSS study team members and scope of work for the Master Plan.	• Suggested a site meeting to discuss the project as well as the Capital Planning Study being completed by Saugeen First Nation. Meeting for June 12, 2025, was subsequently organized.
Saugeen First Nation (via email) – Melissa Snowden, Pernell Jones and Lloyd Ritchie, June 26, 2025.	BMROSS	• Notes from June 12, 2025, meeting circulated.	• No response.
Metis Nation of Ontario (via email) – June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
Chippewas of Saugeen First Nation (via email) – Chief Conrad Ritchie June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
Chippewas of Nawash Unceeded First Nation (via email) – Chief Gregory Nadjiwon June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.

To	From	Comments	Action Taken/Response
Great Lakes Metis Council (via email) – Peter Coture June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
Historic Saugeen Metis (via email) – June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
SON Environmental Office (via email) – Charlene Leonard, Amber Debassige June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
Chippewas of Kettle and Stony Point First Nation (via email) – Chief Kimberly Bressette June 27, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
Saugeen First Nation (via email) – Melissa Snowden, Pernell Jones and Lloyd Ritchie, July 11, 2025	BMROSS	• Notice of the Public Information Centre (PIC) scheduled for July 17, 2025.	• No response.
Historic Saugeen Metis (via email) – July 18, 2025	BMROSS	• Copies of presentation boards from the July 17, 2025, PIC.	• No response.

7.4.1 Meeting with Saugeen First Nation

On June 12, 2025, Town of Saugeen Shores staff and BMROSS met with Saugeen First Nation staff at the Saugeen First Nation Pumphouse. Saugeen First Nation staff led a tour of the facility, reviewing the current water infrastructure servicing the community. The Saugeen First Nation Capital Planning Study was also discussed, which will look at water and wastewater servicing infrastructure. Presently, Saugeen First Nation utilizes septic systems for wastewater treatment. The group agreed the Master Plan should note the potential for providing wastewater servicing for Saugeen First Nation.

A copy of the meeting notes is included in Appendix C.

7.5 Public Information Centre

A Public Information Centre was held on Thursday July 17, 2025, from 6 PM to 8 PM at The Plex in Port Elgin. A notice of the meeting was placed in the local newspaper (Shoreline Beacon) for two weeks ahead of the meeting date. The Notice was also placed on the Municipal website, Engage Saugeen Shores website and circulated to stakeholders, First Nation and Metis communities.

Display boards outlining the Master Plan process, growth and development information, background on the current water and wastewater systems, reserve capacity analyses, and water and wastewater modeling results were available for attendees to review. Staff from BMROSS and Saugeen Shores were available to answer questions. A brief presentation outlining the material on the boards was also given. There were approximately 15 persons in attendance. Copies of the display boards are included in Appendix C.

Following the public information centre, four comments were received, one by email and three via the Engage Saugeen Shores web platform. The comments are summarized in Table 7.4.

Table 7.4 – Comments Received Following July 17, 2025, Public Information Centre

Member of Public	Comments	Action Taken
Resident Via Engage Saugeen Shores website, July 19, 2025	Noted the age of the nuclear family is over and some homes are now multi-generational. Stated there are 3 houses in their neighbourhood with 8 to 10 people living in them. Suggested that Saugeen Shores change water billing to include infrastructure charges in the rates, with the more water used the more you pay for the infrastructure. Suggested that large consumers may look to reduce usage, which would reduce stress on the system.	Biling rates are established through the Water and Wastewater Financial Plan and currently include bi-monthly capital contributions.
Resident Via Engage Saugeen Shores website, July 22, 2025	Sewers down 10th concession.	Future sewer collection routing will be modelled as part of the Master Plan.

Member of Public	Comments	Action Taken
Resident Via Engage Saugeen Shores website, July 25, 2025	Wants to see removal of fluoride from the water supply.	The scope of the Master Plan does not include an evaluation of treatment capabilities or technologies. No plans to add fluoride to the water system at this time.
Dave Reynolds, Chairperson – Leadership Committee, Port Elgin and Saugeen Township Beachers Association	The first one related to my email of March 14th, 2025, dealing with the designation of storm water collected in sewers as "sewage" under the Ontario Water Resources Act (OWRA). I raised this same issue when the Water and Wastewater Servicing Master Plan was last revised in 2020. The response in 2020 (which is the same response I received at the July 17th meeting) was that the Master Drainage Plan would cover this. Unfortunately, the Master Drainage Plan, which was updated in 2024, has made no reference to storm water being considered as sewage under OWRA other than a statement indicating that minor stormwater management projects are exempt from OWRA approval requirements. As there is no requirement to treat stormwater as sewage under the Master Drainage Plan then it must be covered under the Wastewater Master Plan. Though it would be handled differently in your report as it would not affect the sewage treatment plant, this report should acknowledge the need to improve the water quality prior to release by options such as those described in my March 14th, 2025, email, which I have attached.	The scope of the Master Plan includes only sanitary sewage, the sanitary sewage collection and treatment system and water treatment and distribution system. Stormwater is collected through a separate and distinct system from the sanitary sewage system and will not be addressed through this Master Plan. The 2020 Master Plan identified the sewage capacity requirements for the Gobles Grove area and the update will also include the capacity requirements for this area. At this time, water reuse of stormwater is not being considered as part of this Master Plan process.

Member of Public	Comments	Action Taken
	The second issue dealt with the capacity review of the sewage treatment plant. The presentation boards at the PIC described future areas which were included in the capacity review of the sewage treatment plant. Though this included future developments along County Road 25, it did not include the existing residential areas south of CR25. There has been talk of sanitary sewers in the Baker Subdivision area and along Saugeen Beach Road but these areas have not been included in your study under the longer term capacity study for the sewage treatment plant. We feel this area should be included. The third issue dealt with the consideration for Water Reuse, as per my March 14th email. When I asked about whether the Town was considering Water Reuse from the sewage plant I was advised this should be raised during the EA phase started for upgrading the facility. As Water Reuse of stormwater is also viable then the Master Wastewater Plan should at least delve into this issue as part of an overall strategy for the Town.	

7.6 Consultation Summary

The consultation program developed for this study was directed towards review agencies, potentially interested Aboriginal communities, and the public. Comments received were incorporated into this document and evaluation of alternatives, where applicable.

8.0 IMPLEMENTATION

8.1 General

The Master Plan identifies a number of future requirements for water and wastewater infrastructure. Upon approval of the Master Plan, the Town of Saugeen Shores may initiate the associated studies if required or proceed with implementing the identified solutions. Given there are a number of projects associated with growth related needs, the progression of development will determine when those projects are implemented. It is recommended that the Master Plan be reviewed on a regular basis to evaluate the accuracy of key assumptions (e.g. the rate of growth) and to confirm the continued suitability of the preferred solutions. The Master Plan should also be updated as required to address any significant changes in the environmental setting and/or local conditions.

8.2 Additional Studies Required

Future projects for the water and wastewater system are identified in Sections 4.9, 5.10 and 6.10. The projects identified included the following that will require an MCEA prior to implementation:

- Additional water storage – a Schedule B MCEA process is required to evaluate potential storage facility types and locations.

8.3 Master Plan Approval

The 2025 Water and Wastewater Servicing Master Plan Update was developed following Master Plan Approach 1, as set out in the MCEA document. For this study, the Master Plan process includes a broad investigation of infrastructure needs to support and guide future studies.

The Master Plan will be approved for implementation subject to adoption by the Council of the Town of Saugeen Shores. This Master Plan identifies future projects that will need to be considered on the progression of development.

8.4 Requirements for Master Plan Completion

The following activities are required in order to complete the formal MCEA process:

- Issue a Notice of Study Completion
- Make the Master Plan report available for public review in conjunction with the issuance of the Notice of Study Completion.
- Obtain feedback from the public, stakeholders, and agencies.
- Address any outstanding issues resulting from the Notice of Completion.
- Advise the Town and MECP when the process is complete.

8.5 Final Public Consultation

A Notice of Completion will be circulated to stakeholders, review agencies, local indigenous communities, and placed in local newspapers. The Notice will summarize the projects identified in the Master Plan and indicate the approval process associated with moving forward to implementation. It will also identify where the Master Plan report can be viewed.

8.6 Master Plan Recommendations

Table 8.1 provides a summary of recommended projects identified through this Master Plan. The table is organized in terms of identified priority. For more detailed descriptions, including probable costs, refer to Sections 4.9 and 4.10 for the Saugeen Shores DWS projects, Sections 5.10 and 5.11 for the Port Elgin sewage system, and Sections 6.10 and 6.11 for the Southampton sewage system.

Table 8.1 – Summary of Recommended Projects

ID	Capital Project Description	Priority
W1	**WTP Capacity Upgrades/Expansion**. Continue with Class EA to select an alternative to address capacity requirements of the Saugeen Shores WTP.	High
W2	**Additional Storage**. Class EA is recommended in 2026 to examine alternatives for increasing water storage.	High
SH-WW1	**WWTP Capacity Upgrades**. Complete construction of Phase 1 of the planned upgrades.	High
PE-WW1	**WWTP Improvements/Capacity Upgrade**. Continue with Class EA to select alternatives to address capacity of the headworks, asset rehabilitation upgrades, and operational improvements.	Medium
PE-WW3	**SPS 6 Upgrades**. Identify and complete upgrades needed for the station to operate at its rated capacity, in conjunction with or before PE-WW4.	Medium
PE-WW4	**Highland Street Flow Reversal**. Construct 600 mm diameter sanitary sewer on Highland Street from Green Street to Market Street.	Medium
W3	**Concession 10 Watermain Extension**. Construct 250 mm diameter watermain along Concession 10 from Lakeside Woods Crescent to Goderich Street.	Low, but subject to development timing
W4	**Summerside Watermain Extension 1**. Construct 250 mm diameter watermain along Bruce Street from Hawthorne Street to Concession 10.	Low, but subject to development timing
W5	**Summerside Watermain Extension 2**. Construct 200 mm diameter watermain along Waterloo Street from 225 m north of Mary Rose Avenue to Concession 10.	Low, but subject to development timing

ID	Capital Project Description	Priority
W6	**Bruce Road 17 Watermain Extension**. Construct 300 mm diameter watermain along Bruce Road 17 from Westlinks Drive to Sideroad 13/14.	Low, but subject to development timing
W7	**Sideroad 13/14 Watermain Extension**. Construct 300 mm diameter watermain along Sideroad 13/14 from Bruce Road 17 to 910 m south of Bruce Road 17.	Low, but subject to development timing
PE-WW2	**Wellington Street Capacity Evaluation**. Flow monitoring and confirming slopes/capacity of several 200 and 250 mm diameter sewers.	Low
PE-WW5	**SPS 8 Forcemain Extension**. Construct 200 mm diameter sanitary forcemain from Lehnen Street between Gustavus St and Green St, to the Port Elgin WWTP.	Low
PE-WW6	**Harbour Street Sewer Upgrades**. Construct 525 mm diameter sanitary sewer along Harbour Street from Izzard Street to just south of Green Street.	Low
SH-WW2	**SPS Flow Monitoring**. Monitoring of peak flow entering SPS 2, 3, and 5 to verify model results of estimated existing peak flows vs. rated capacities.	Low
SH-WW3	**SPS 1 Capacity Upgrade**. Initially, monitor actual flows relative to station capacity. Expand capacity for future design peak flow once impact from development warrants.	Low
SH-WW4	**SPS 2 Capacity Upgrade**. Complete only if findings of SH-WW2 warrant expansion.	Low
SH-WW5	**SPS 3 Capacity Upgrade**. Complete only if findings of SH-WW2 warrant expansion.	Low
SH-WW6	**SPS 5 Capacity Upgrades**. Complete only if findings of SH-WW2 warrant expansion.	Low

Notes: W# denotes a Saugeen Shores DWS project, PE-WW# denotes a Port Elgin sewage system project, and SH-WW# denotes a Southampton sewage system project.

9.0 SUMMARY

The Town of Saugeen Shores initiated an update to the Water and Wastewater Servicing Master Plan to investigate infrastructure needs and requirements relating to water and wastewater servicing in Port Elgin and Southampton. The intent of this Master Plan is to serve as the basis for, and support of, future infrastructure projects as identified through the study. The Master Plan followed the MCEA process, such that the requirements of Master Plan Approach 1 are met, including an inventory of existing environmental conditions, identification of problems and the evaluation of alternative solutions.

The Master Plan summarizes the existing environmental conditions within the study area, as well as the existing water and wastewater infrastructure. An analysis of existing population and projected future growth, based on existing forecasts, was also undertaken to understand future infrastructure requirements.

To assess water infrastructure needs, the Master Plan study included a review of the existing water supply, storage and distribution infrastructure within the Saugeen Shores DWS. This included an examination of existing water demands, potential future water demands, and reserve treatment and storage capacity. The existing WaterCAD® model was updated and reviewed to assess fire flows and pressures throughout the water distribution system. It was identified that additional water treatment supply and additional water storage is required to accommodate the current approved development and additional future growth. In this regard, the Class EA currently underway to assess treatment capacity expansion alternatives should be continued, and a Class EA to assess alternatives for implementing additional storage is recommended for commencement in 2026. Recommended watermain improvements are generally limited to new watermain to service development lands.

To assess wastewater infrastructure needs, the Master Plan study included a review of the existing wastewater treatment, sewage pumping, and sewage collection infrastructure in the communities of Port Elgin and Southampton. This included an examination of sewage flows from existing customers, projected flows from future development lands, and reserve pumping and treatment capacity. The existing SewerCAD® model was updated and reviewed to assess sanitary sewer capacities under peak flow conditions for current and future development scenarios. Upgrades to the Southampton WWTP headworks (i.e. Phase 1 of projects identified in a 2019 Class EA) have commenced and should be completed, with future works to include additional solids treatment and storage, and a potential re-rating as part of later phases. Additional wastewater projects identified include electrical upgrades at SPS 6, reversal of sewage flow along a portion of Highland Street, and flow monitoring at several SPSs to confirm actual vs. theoretical peak flows.

A consultation program was developed for this Master Plan and was directed towards stakeholders, the public, local indigenous communities, and provincial review agencies. Comments received related to specific water treatment processes, water billing, stormwater and water reuse. Through the consultation process, Saugeen First Nation, which currently obtains water from the Saugeen Shores Drinking Water System,

indicated a Capital Needs Study is currently underway. The Capital Needs Study will investigate future water and wastewater needs for Saugeen First Nation, which may or may not include additional requests for water and wastewater servicing from Saugeen Shores. For the purposes of this Master Plan, the potential for additional servicing requests from Saugeen First Nation, beyond current water servicing commitments, is acknowledged but has not been included in the reserve capacity calculations at this time.

The 2025 Water and Wastewater Servicing Master Plan Update has been completed in accordance with the planning and design process for Master Plans of the MCEA. For this study, the Master Plan process incorporated the completion of Phases 1 and 2 of the MCEA process. The Master Plan will be approved for implementation subject to adoption by the Council of the Town of Saugeen Shores.

All of which is respectfully submitted.



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