

County of Brant Paris Master Servicing Plan Update

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1 Introduction

Paris is a Community located in southwestern Ontario, within the County of Brant (County) and in close proximity with the City of Brantford. The County is responsible for all municipal water production, treatment, transmission and distribution water mains, storage facilities, and pumping stations; wastewater treatment, sewers, forcemains and sewage pumping stations; as well as, stormwater sewers, drainage ditches, culverts, and stormwater management ponds.

The County owns, operates, maintains, and manages its water system, which may draw from three groundwater sources including the Gilbert Supply Facility, Telfer Supply Facility, and Bethel Supply Facility. The County employs the Ontario Clean Water Agency (OCWA) to operate, maintain, and manage the Paris Water Pollution Control Plant (Paris WPCP) and 6 sewage pump stations (SPS). The County owns and operates its stormwater system.

Since completion of the 2016 Paris Master Servicing Plan, there has been a substantial increase in development interest within the Paris Settlement Area Boundary (SAB), exceeding the original 2031 projections.

To balance the needs of growth with the protection and preservation of natural, environmental, and heritage resources, the County initiated the preparation of a Master Servicing Plan Update for water, wastewater, and stormwater services under the Municipal Engineers Association (MEA) Master Plan Class Environmental Assessment process.

The Paris Master Servicing Plan Update consists of a comprehensive Infrastructure Plan that addresses existing and growth-related needs for the County's water, wastewater, and stormwater systems. Additionally, the County wishes to adjust their current approach of assessing trunk infrastructure needs. Rather than the applicant assessing the need for trunk infrastructure upgrades on an individual development basis, the County will lead and coordinate the Infrastructure Plan to support the full buildout of the existing SAB.

The 2020 Master Servicing Plan Update is a critical component in the County's planning for growth and will provide the framework and vision for the management, expansion and funding of the water, wastewater, and stormwater servicing needs for the County to SAB buildout.

1.1 Study Area

The study area for the Paris Master Servicing Plan Update consists of the Town of Paris within the County of Brant. The existing Paris settlement area covers a total area of approximately 13 km² and a 2016 population of 12,310. The study area is shown in **Figure 1**.

Further details pertaining to the Paris Settlement area are summarized in **Technical Appendix 1**.

1.1.1 Natural Heritage

Figure 1 outlines the County natural heritage systems features and development constraints within Paris, as identified in the County’s Official Plan. The County of Brant’s Official Plan includes a set of objectives with respect to the protection, enhancement, and restoration of natural heritage features, areas and systems. Impacts to these areas were considered when developing and evaluating water, wastewater, and stormwater servicing policies and servicing recommendations.

Key objectives within the Official Plan (1.11.2.9), as they related to development, include:

- To direct development away from the County’s natural heritage features, areas, and systems.
- To prevent the development or site alteration of lands that are adjacent to Provincially significant natural heritage features, areas, and systems, including the diversity and connectivity of such features and functions, unless it can be demonstrated that there shall be no negative impacts on the features or their ecological functions.
- To promote the efficient and sustainable use of water resources, including practices for water conservation, sustaining water quality, and source water protection.

1.1.2 Cultural Heritage and Archaeology

The County encourages and supports heritage preservation. The Paris settlement area atmosphere has a great sense of continuity between the past and the present as defined by the rich heritage resources, cultural heritage landscapes, archaeological sites and commemorative monuments found in Paris and surrounding area. The Grand River is important as it has played a central role in the history of both First Nations and Euro-Canadian people.

1.1.3 Grand River Watershed Water Management Plan by Grand River Conservation Authority




The Grand River Conservation Authority manages water and other natural resources on behalf of 39 municipalities of the Grand River watershed. In partnership with the Grand River Conservation Authority's management partners, including the County of Brant, has developed the Water Management Plan. The goals of the plan are to:

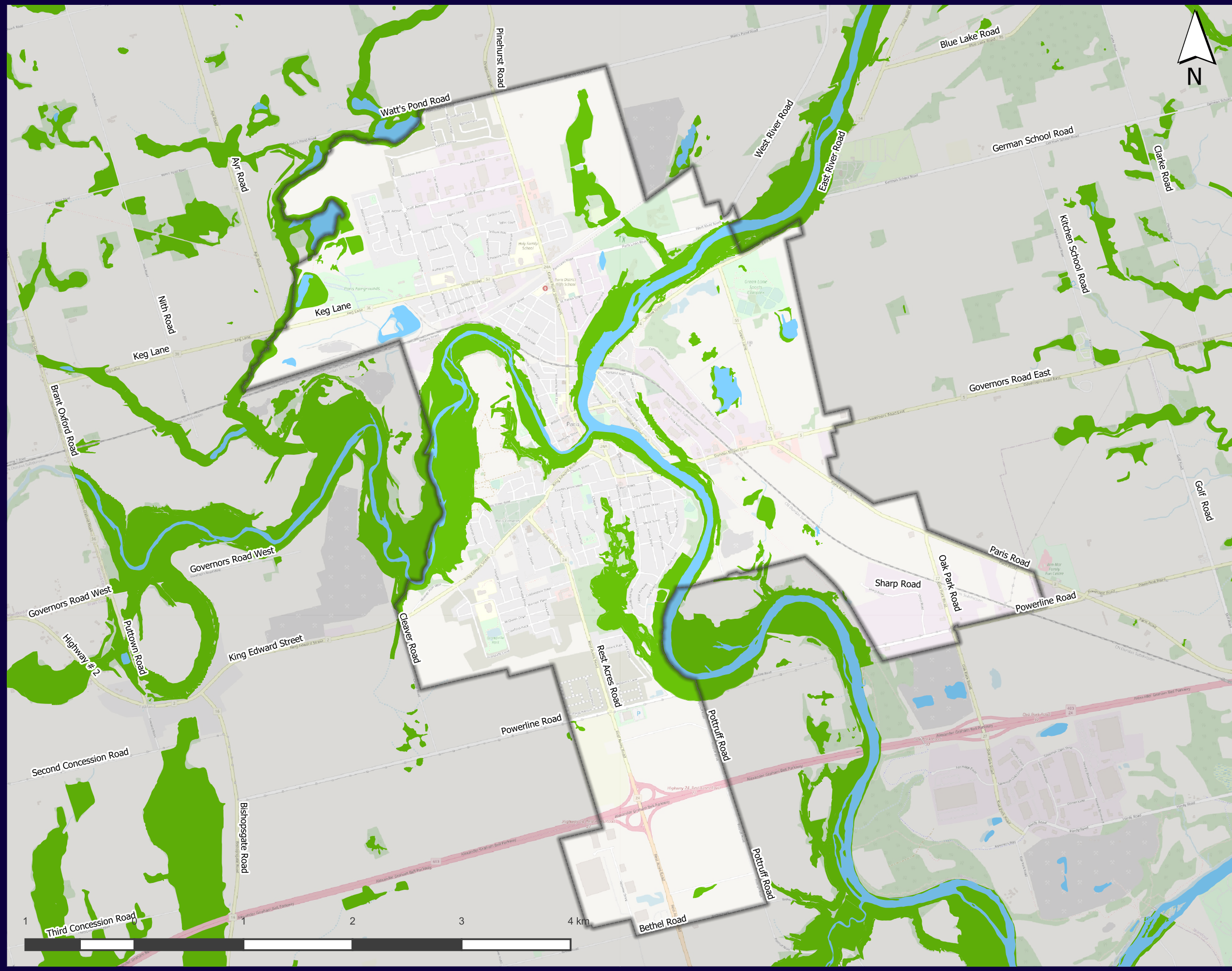
- Ensure sustainable water supplies for communities, economies and ecosystems;
- Improve water quality to improve river health and reduce the river's impact on Lake Erie;
- Reduce flood damage potential; and
- Increase resiliency to deal with climate change.

Consideration of the Water Management Plan goals and recommendations were considered when developing and evaluating water, wastewater, and stormwater servicing policies and servicing recommendations.

Figure 1:
Paris Master Servicing Plan
Study Area

Legend

-  Settlement Area Boundary
-  Bodies of Water
-  Natural Heritage Areas



1.2 Master Plan Objectives

The Master Servicing Plan Update comprehensively documents the development, evaluation, and selection of the preferred water, wastewater, and stormwater servicing strategies to meet the servicing needs of existing and future development to SAB Buildout.

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

- Review planning forecasts to SAB Buildout and determine the impacts on servicing needs for all water, wastewater, and stormwater infrastructure;
- Evaluate the ability of existing and planned water, wastewater, and stormwater infrastructure to efficiently and effectively service the County's existing users and anticipated growth;
- Undertake a comprehensive review and analysis for the water, wastewater, and stormwater servicing requirements;
- Address key servicing considerations as part of the development and evaluation of servicing strategies including:
 - Level of service to existing users and anticipated growth
 - Operational flexibility and system security and reliability
 - Mitigation of impacts to natural, social, and economic environments
 - Opportunity to meet policy statements, regulations, and technical criteria
 - Opportunity to optimize existing infrastructure and servicing strategies
 - Ensuring the strategies are cost effective
 - Support a development staging strategy
- Consider and develop sustainable servicing solutions with lifecycle considerations;
- Update the capital program cost estimate methodology, through use of updated industry trends and more detailed information from relevant County studies and projects, to provide appropriate capital cost estimates;
- Utilize the updated water and wastewater hydraulic models for the analysis of servicing alternatives;
- Establish a complete and implementable water, wastewater, and stormwater capital program;
- Provide extensive consultation with the public and stakeholders; and
- Complete the Master Servicing Plan Update in accordance with the Municipal Engineers Association (MEA) Class Environmental Assessment (EA) process for Master Plans.

2 Background and Planning Context

2.1 Related Studies and Background Information

Technical Appendix 1 provides detailed summary of the related studies and background information supporting the development of the Master Servicing Plan Update.

2.2 Planning Context

The County of Brant, as all cities and municipalities in Ontario, must operate within the administrative, legislative, and financial framework established by senior levels of government. The key provincial and federal initiatives that provide directives, and are considered within the master planning process, are summarized in **Technical Appendix 2**, and are outlined as follows:

- Ontario's A Place to Grow: Growth Plan for the Greater Golden Horseshoe
- Provincial Policy Statement
- County of Brant's Official Plan
- Planning Act
- Bill 13, Sustainable Water and Wastewater Systems Improvement and Maintenance Act
- Water Opportunities and Conservation Act
- Safe Drinking Water Act
- Clean Water Act
- Canadian Council of Ministers of the Environment's (CCME)
- Canada-wide Strategy for the Management of Municipal Wastewater Effluent
- CCME Wastewater System Effluent Regulations
- Canadian Environmental Protection Act – Inorganic Chloramines and Chlorinated Wastewater Effluents in Municipal Wastewater Effluent
- Ministry of the Environment Procedure F-5-1
- Conservation Authority Regulation and Policy

2.3 Class Environmental Assessment Process

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

There are generally four approaches to undertaking Master Plans under the Class EA process. The Master Servicing Plan Update was undertaken to comply with Approach 2 of Municipal Class EA Master Planning process. This approach involves the preparation of a Master Plan document at the conclusion of Phases 1 and 2 of the Class EA process, where the level of investigation, consultation, and analysis are sufficient to fulfill the requirements for Schedule A, A+, and select B projects. While Approach 2 provides the basis to support future investigations for select Schedule B and all identified Schedule C projects, they will require additional supporting information and decision making to proceed onto separate studies and continue to the Phase 3 and 4 of the Class EA process.

This **Master Servicing Plan Update** satisfies Phases 1 and 2 of the Class EA process by defining the relevant problems and opportunities, while identifying a preferred solution(s).

As a result, this **Master Servicing Plan Update** will be used to fulfill the requirements of all Schedule A, A+, and B recommended projects.

Further details on the Municipal Class Environmental Assessment are included in **Technical Appendix 2**.

2.3.1 Public Consultation

Public consultation is an important component and requirement of the master planning process, allowing the County to inform the public about the study and to obtain input from interested and affected parties during the study process.

The primary goals and objectives of the public consultation process is to:

- Present clear and concise information to stakeholders at key stages of the study process;
- Elicit community, regulatory, and County staff input; and
- Meet Municipal Class EA consultation requirements.

Technical Appendix 4 provides a detailed summary of the Master Servicing Plan Update Public Consultation materials.

2.4 Problem and Opportunity Statement

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

The Vision Statement is as follows:

“To establish a master plan to achieve cost effective water, wastewater, and stormwater systems that:

- Meets the needs of existing users, regulatory, and legislative requirements;
- Supports growth;
- Maintains or improves service levels;
- Improves system resiliency and operational flexibility; and,
- Considers the long-term financial viability of the systems.”

3 Existing System

3.1 Existing Water System

The County owns, operates, and maintains the Paris water system. This includes all production, pumping, storage, transmission, and distribution infrastructure; including local watermains, hydrants, and service connections. The Paris water system operates independently of all other municipal County water systems. **Figure 2** and **Figure 3** provide an overview of the Paris water system.




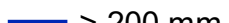




Due to the varying topography of the community around the Grand River and Nith River, the Paris water system is configured to operate under 4 pressure zones. System storage is provided by multiple storage facilities throughout Paris:

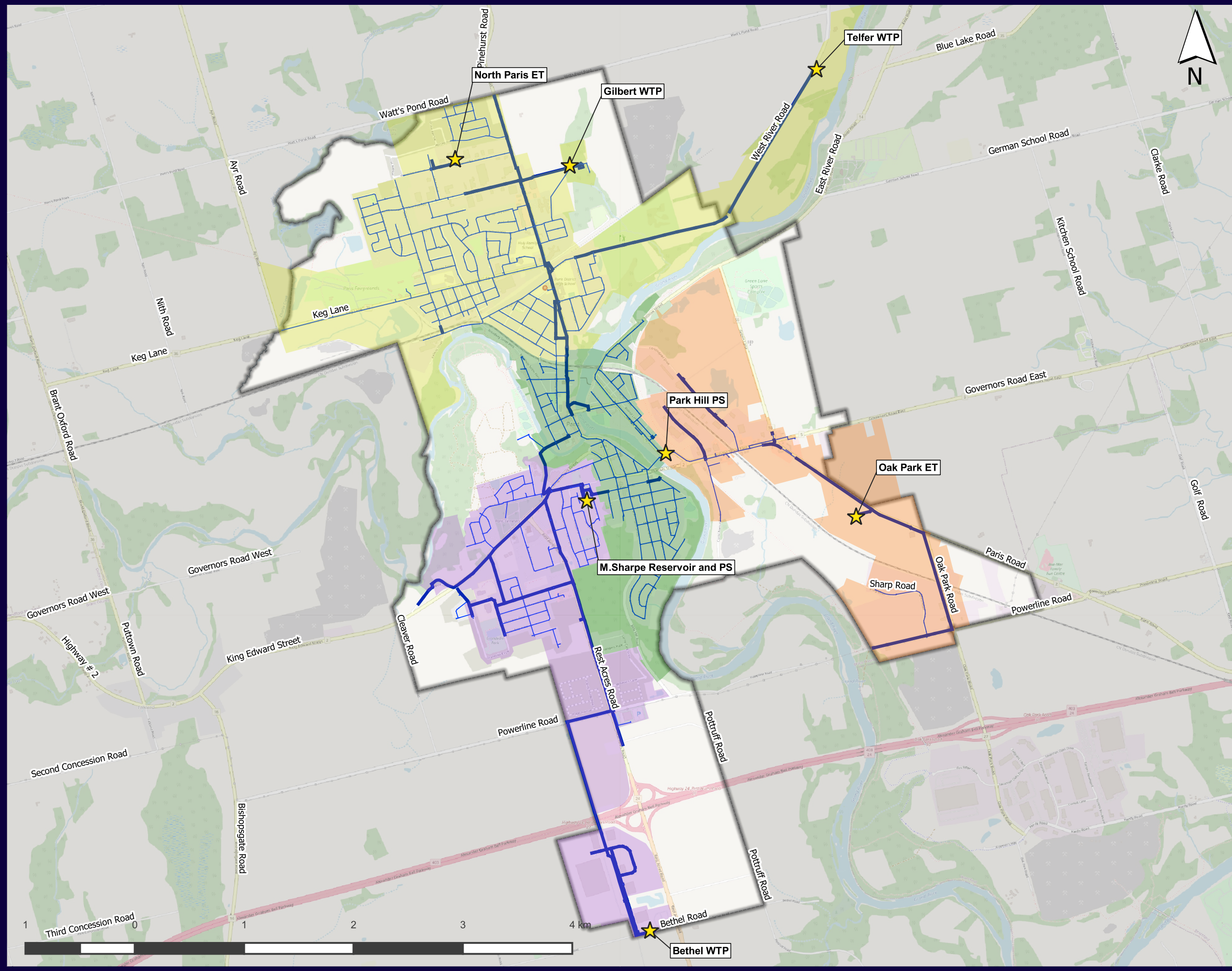
- Gilbert Reservoir providing pumped storage to Zone 1
- North Paris Elevated Tank (ET) providing floating storage to Zone 1
- Oak Park ET providing floating storage to Zone 4
- M. Sharpe Reservoir provides floating storage to Zone 2 and pumped storage to Zone 3.

Supply to the system is primarily provided by the Gilbert Wells located in Pressure Zone 1, with back-up supply provided by the Telfer Wells (Zone 1). The Bethel Wells located in Zone 3 are used to supplement and provide supply to the south end of Paris (Zone 3). Water from Zone 1 flows to Zone 2 through two pressure reducing valves (PRV) located on Baird Street and Grand River Street North. From Zone 2, water is pumped to Zones 3 and 4 via the M. Sharpe Pump Station (PS) and the Parkhill (PS), respectively.

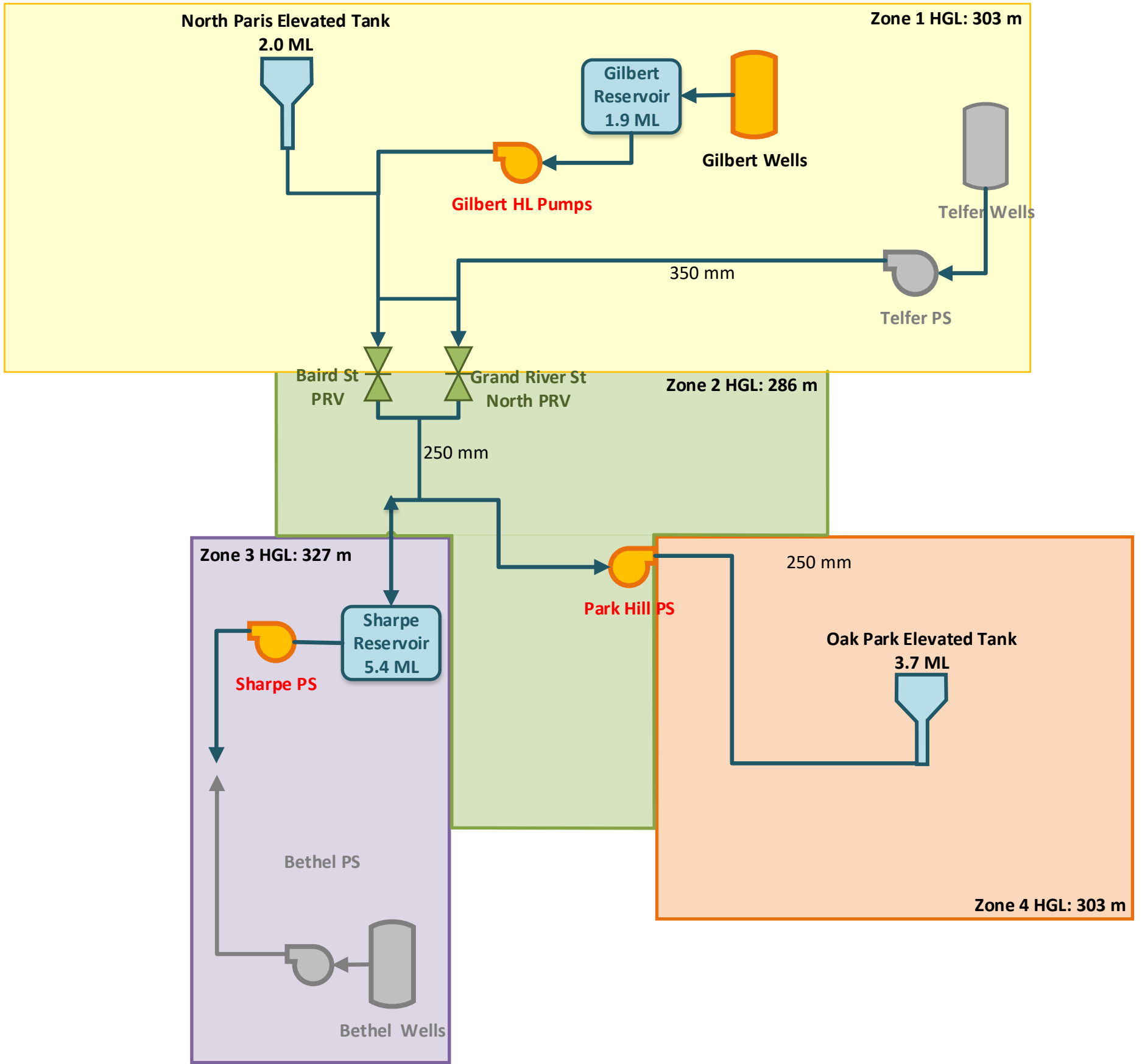
Figure 2:
Existing Water System

Legend

-  Settlement Area Boundary
-  Existing Facilities
- Existing Watermain**
-  ≤ 200 mm
-  > 200 mm
- Existing Pressure Zones**
-  1
-  2
-  3
-  4



*Existing water network based on 2018 data



Paris Master Servicing Plan

FIGURE 3: EXISTING SYSTEM SCHEMATIC

<p>Pressure Zone</p> <p>Zone 1 (235m – 265m)</p> <p>Zone 2 (220m – 259m)</p> <p>Zone 3 (244m – 285m)</p> <p>Zone 4 (244m – 269m)</p>	<p>PRV</p>	<p>Pump</p>	<p>Pump in "freshen up" mode</p>	<p>Not to Scale</p>
	<p>Reservoir</p>	<p>Well</p>	<p>Reservoir in "freshen up" mode</p>	
	<p>Elevated Tank</p>		<p>Well in "freshen up" mode</p>	



3.1.1 Water Facility Capacities

Table 1, Table 2, and Table 3 provide a summary of the existing firm capacities of all water facilities. A more detailed breakdown of facility capacities can be found in Technical Appendix 6.

Table 1: Existing Water Supply Capacities

Supply Wells	Pressure Zone	Firm Capacity (L/s)
Gilbert Wells	1	112.2
Telfer Wells	1	37.9
Bethel Wells	3	35/50*
Total Supply Capacity		185.1/200.1

* Bethel PTTW – 35 L/s and allows for up to 50 L/s in any 30 days in a calendar year. MDD Supply analysis completed using 50 L/s value.

Table 2: Existing Water Pump Station Capacities

Pumping	Pressure Zone	# of Pumps	Firm Capacity (L/s)
Gilbert WTP High Lift Pumps	1	3	170.8
Telfer Well Pumps	1	2	37.9
M. Sharpe Pumping Station	3	6	261.5
Bethel WTP High Lift Pumps	3	3	50*
Parkhill Pumping Station	4	2	30

* Bethel PTTW – 35 L/s and allows for up to 50 L/s in any 30 days in a calendar year. Peak flow capacity analysis completed using 50 L/s value

Table 3: Existing Water Storage Capacities

Storage	Pressure Zone	Effective Capacity (m ³)
Gilbert Reservoir	1	1,789
North Elevated Tank	1	2,000
M. Sharpe Reservoir	2, 3	5,169
Oak Park Elevated Tank	4	3,700

3.1.2 Water System Demands Overview

Table 4 and **Table 5** summarize the 2015 to 2017 billing and water production records. Currently the Paris system has an average day demand (ADD) of 52.3 L/s, including 30% non-revenue water (including approximately 9% accounted for usage), and a typical max day demand (MDD) peaking factor of 1.55.

Table 4: 2015 to 2017 Billing Records

Water Supplied		Average Day Demand (L/s)
Metered Demand	Residential	24.0
	Commercial	12.8
	Total	36.7
Non-Revenue Water	Accounted	4.6
	Unaccounted	11.0
	Total	15.6
Total Average Production		52.3

Note that existing employment usage is approximately 50% of residential usage.

Table 5: Water System Peaking Factor

Year	Average Day Demand (L/s)	Max Day Demand (L/s)	Peaking Factor
2015	58.8	76.7	1.3
2016	50.5	84.1	1.7
2017	48.6	82.2	1.7
Average	52.6	81.0	1.55

3.1.3 Existing Water Facility Capacity

Table 6, **Table 7**, and **Table 8** present the existing usage for pumping, storage, and supply facilities respectively; the existing supply, pumping, and storage facilities have sufficient capacity to meet existing demands.

Table 6: Existing Pumping Facility Usage

Pumping Facilities	Pumping Scenario (Pressure Zones)	Design Condition	Current Capacity Available for Use (L/s)	Current Required Design Flow (L/s)	2016 Capacity Utilization (%)
Gilbert Supply Facility	1, 2, 4	MDD	208.7	69.9	33%
Telfer Supply Facility					
M. Sharpe Pump Station	3	MDD+Fire	311.5	78.7	25%
Bethel Supply Facility*					
Parkhill Pump Station	4	MDD	30.0	6.7	22%

* Bethel PTTW – 35 L/s and allows for up to 50 L/s in any 30 days in a calendar year. Peak flow capacity analysis completed using 50 L/s value.

Table 7: Existing Storage Facility Usage

Storage Facilities	Pressure Zones	Current Available Storage (ML)	Current Required Storage (ML)	2016 Capacity Utilization (%)
Gilbert Reservoir	1	3.79	1.78	47%
North Elevated Tank				
M. Sharpe Reservoir	2, 3	5.17	1.71	33%
Oak Park Elevated Tank	4	3.70	0.86	23%

Table 8: Existing Supply Capacity Usage

Supply Facilities	Supply Scenario (Pressure Zones)	Current Available Firm Supply Capacity (L/s)	Current Required Supply (L/s)	2016 Capacity Utilization (%)
Gilbert Wells	1, 2, 4	150.1	69.9	47%
Telfer Wells				
Bethel Wells	3	50.0*	21.9	44%

* Bethel PTTW – 35 L/s and allows for up to 50 L/s in any 30 days in a calendar year. MDD Supply analysis completed using 50 L/s value

3.2 Existing Wastewater Collection System

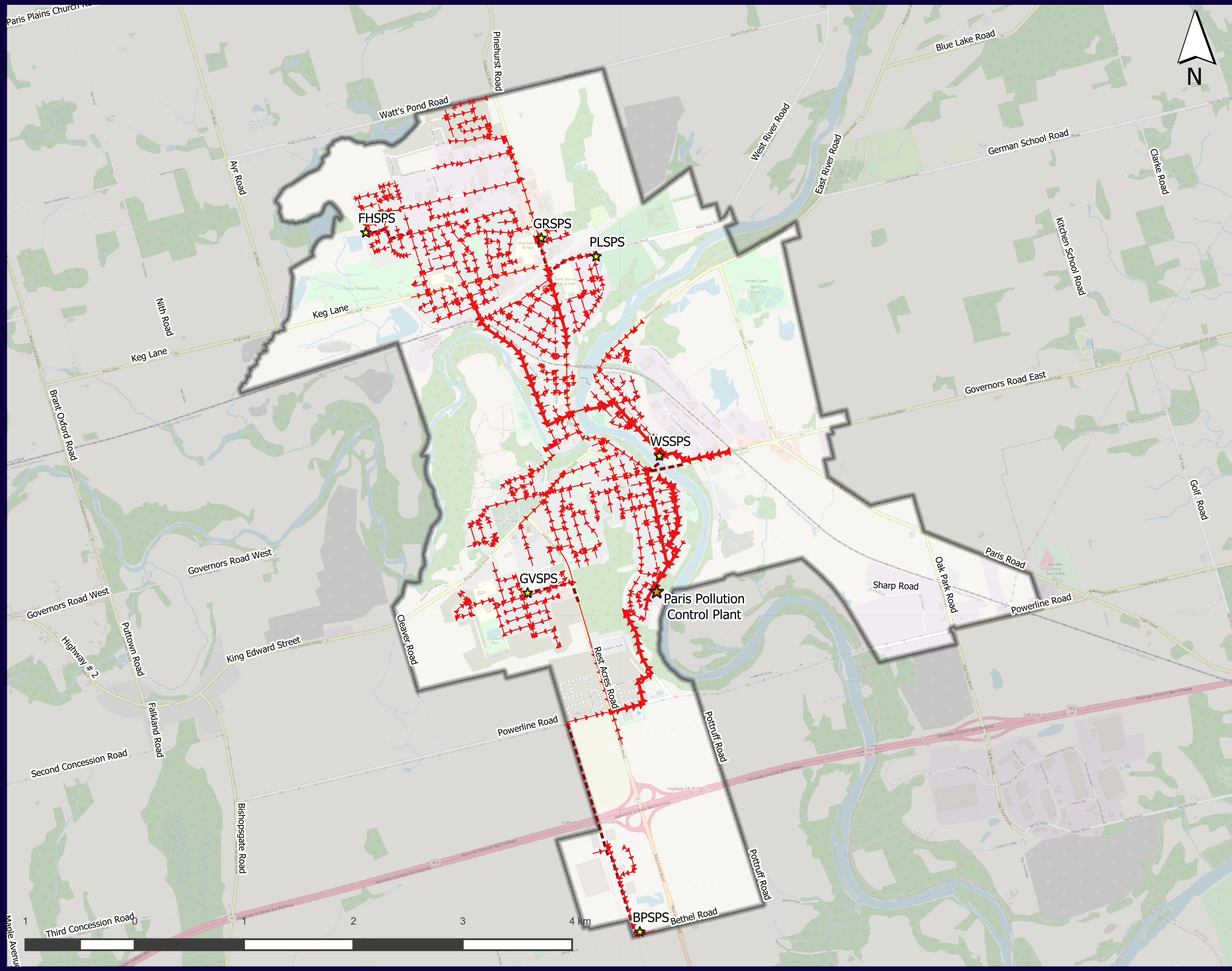
The County of Brant owns and maintains the Paris wastewater system, which includes the Paris Water Pollution Control Plant (Paris WPCP), six Sanitary Pumping Stations (SPS), corresponding forcemains and sewer mains. Operation of the Paris wastewater facilities is currently contracted to the Ontario Clean Water Agency (OCWA). **Figure 4** and **Figure 5** provide an overview of the wastewater system.

Wastewater flow is collected and conveyed, via a network of gravity sewer and SPS, to the Paris WPCP, where flow undergoes treatment before the treated effluent is discharged to the Grand River. The existing network also includes four sewer river crossings:

- Nith River Siphon at Mechanic Street
- Nith River Sewer at Grand River Street
- Grand River Siphon at William Street
- Grand River Street forcemain from Willow Street SPS

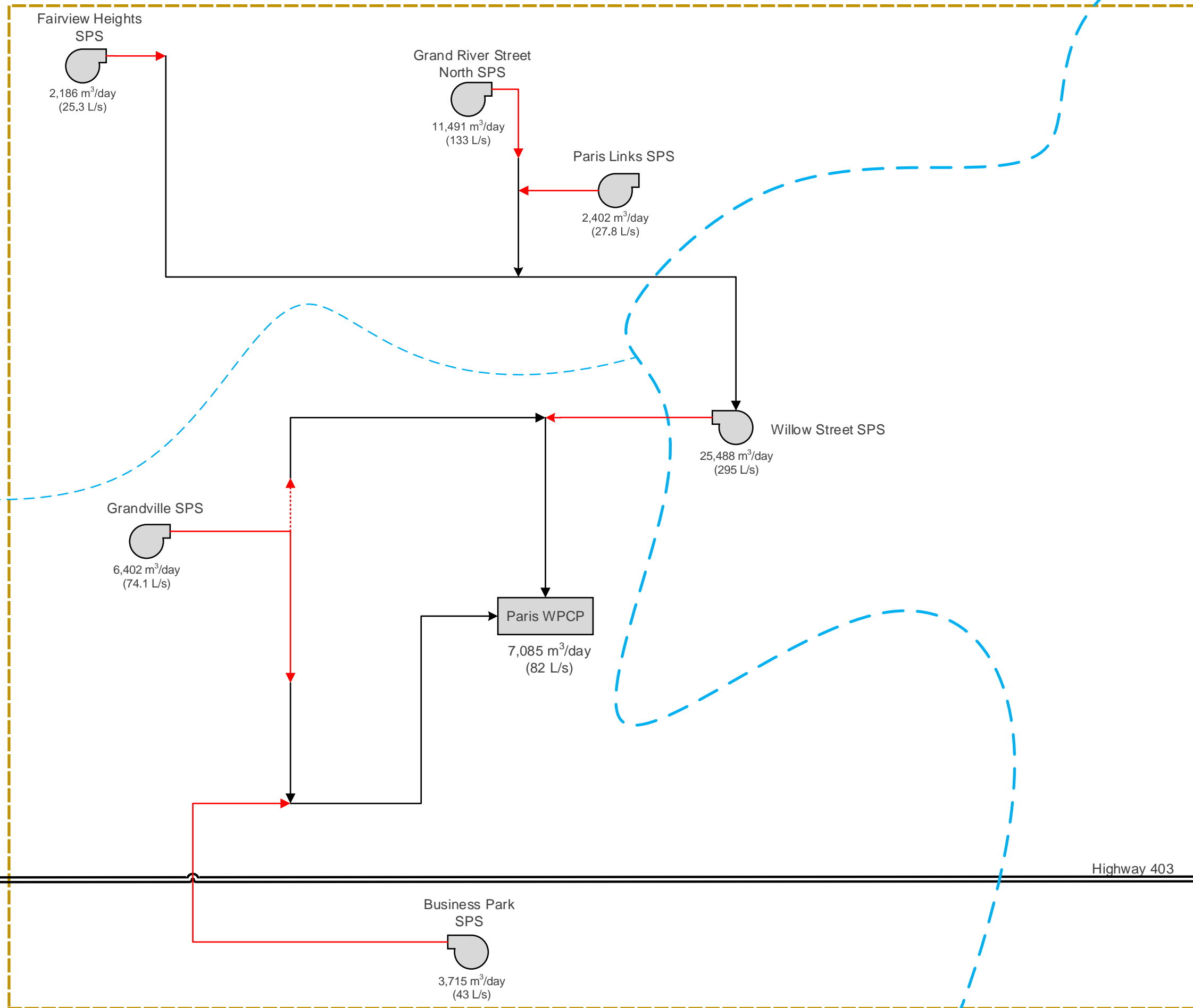
Currently, a significant portion of the East Paris area, which is serviced by municipal water, does not have existing municipal wastewater services. These lands have a total area of 189 ha and represent an existing water ADD of 2.1 L/s (181.4 m³/day). This includes residential and employment lands along the following roads:








- Willow Street, beyond 300 m east of Balmoral Street
- Consolidated Drive
- Curtis Ave North and South
- Paris Road
- Oak Park Road
- Powerline Road
- Sharp Road
- Dundas Street east, east of CN Bridge Overpass



**Figure 4 - Existing
Wastewater System**

- Legend**
- Settlement Area Boundary
 - Wastewater Assets**
 - ★ Pump Stations
 - ★ Water Pollution Control Plant
 - Sanitary Mains**
 - Existing Trunk Sewer
 - Existing Local Sewer
 - - - Existing - Forcemain



	Wastewater Treatment Plant		Trunk Gravity Mains
	Pumping Station		Water Feature
	Force Mains		Region Boundary
	Emergency Force Mains		

Firm Capacity refers as Largest Pump Out of Service

Figure 5:
Existing Wastewater Collection System Schematic

3.2.1 Wastewater Facility Capacity

Table 9 provides a summary of the existing firm capacities of all SPS facilities need to convey peak wet weather flows (PWWF). A more detailed breakdown of facility capacities can be found in **Technical Appendix 7**.

Table 9: Existing Wastewater Facility Capacity

Pumping	Number of Pumps	Firm Capacity (L/s)
Fairview Heights SPS	2	25.3
Paris Links Road SPS	2	28
Grand River Street SPS	3	133
Willow Street SPS	4	295
Grandville SPS	2	54
Brant 403 Business Park SPS	2	43

3.2.2 Wastewater Treatment Plant Flows

Paris wastewater flows are ultimately conveyed to the Paris WPCP which provides treatment. **Table 10** provides an overview of the Paris WPCP treatment processes and rated capacities.

Table 10: Treatment Facility

Plant Name	Paris Water Pollution Control Plant
Address	120 Race Street, Paris
Receiver	Grand River
Rated Capacity: Average Daily Flow	7,056 m ³ /day (82 L/s)
Rated Capacity: Peak Flow Rate (Wet Weather)	17,640 m ³ /day (204 L/s)
Key Processes	<ul style="list-style-type: none"> - extended aeration process - Muffin Monster Screen - comminutor - grit removal - aeration tanks - secondary clarifiers - effluent disinfection - aerobic digestion and biosolids dewatering using centrifuges

Table 11 summarizes the current average daily flows to the Paris WPCP; the existing average day flows going to the plant are 3,534 m³/day (40.9 L/s).

Table 11: Existing Treatment Plant Flows

Year	Average Day Flow (m ³ /day)	Capacity Utilization (%)
2015	3,352 (38.8 L/s)	47%
2016	3,421 (39.6 L/s)	48%
2017	3,819 (44.2 L/s)	54%
Average	3,534 (40.9 L/s)	50%

3.2.3 Existing Wastewater Facility Performance

Table 12 and **Table 13** present the existing usage for each SPS and the Paris WPCP; all existing SPS and the Paris WPCP have sufficient capacity to meet existing flows. It is noted that it is standard practice to maintain capacity utilization below 80% in pump station catchments that are expected to experience future increase in flows due to growth/intensification. In mature catchments with marginal to no anticipated future growth, a higher capacity utilization is acceptable.

Table 12: Existing Wastewater Facility Performance

Sewage Pumping Station (SPS) Facilities	Rated Firm Capacity (L/s)	Existing Design PWWF (L/s)	Existing Surplus / Deficit	2016 Capacity Utilization (%)
Fairview Heights SPS	25.3	16.2	9.1	64%
Paris Links Road SPS	28.0	9.7	18.1	35%
Grand River Street SPS	133.0	40.2	92.8	30%
Willow Street SPS	295.0	170.4	124.6	58%
Grandville SPS	54.0	18.8	35.2	35%
Brant 403 Business Park SPS	43.0	7.4	35.6	17%

Table 13: Existing Treatment Plant Capacity

Wastewater Treatment Facility	Rated Capacity: Average Day Flow (L/s)	Existing Design Flow (L/s)	Existing Surplus / Deficit	2016 Capacity Utilization (%)
Paris Water Pollution Control Plant	82.0	42.0	40.0	51%

3.3 Existing Stormwater System

The County owns, operates, and maintains the stormwater system within Paris. The stormwater system consists of storm sewers, culverts, storage tanks, and stormwater management ponds.

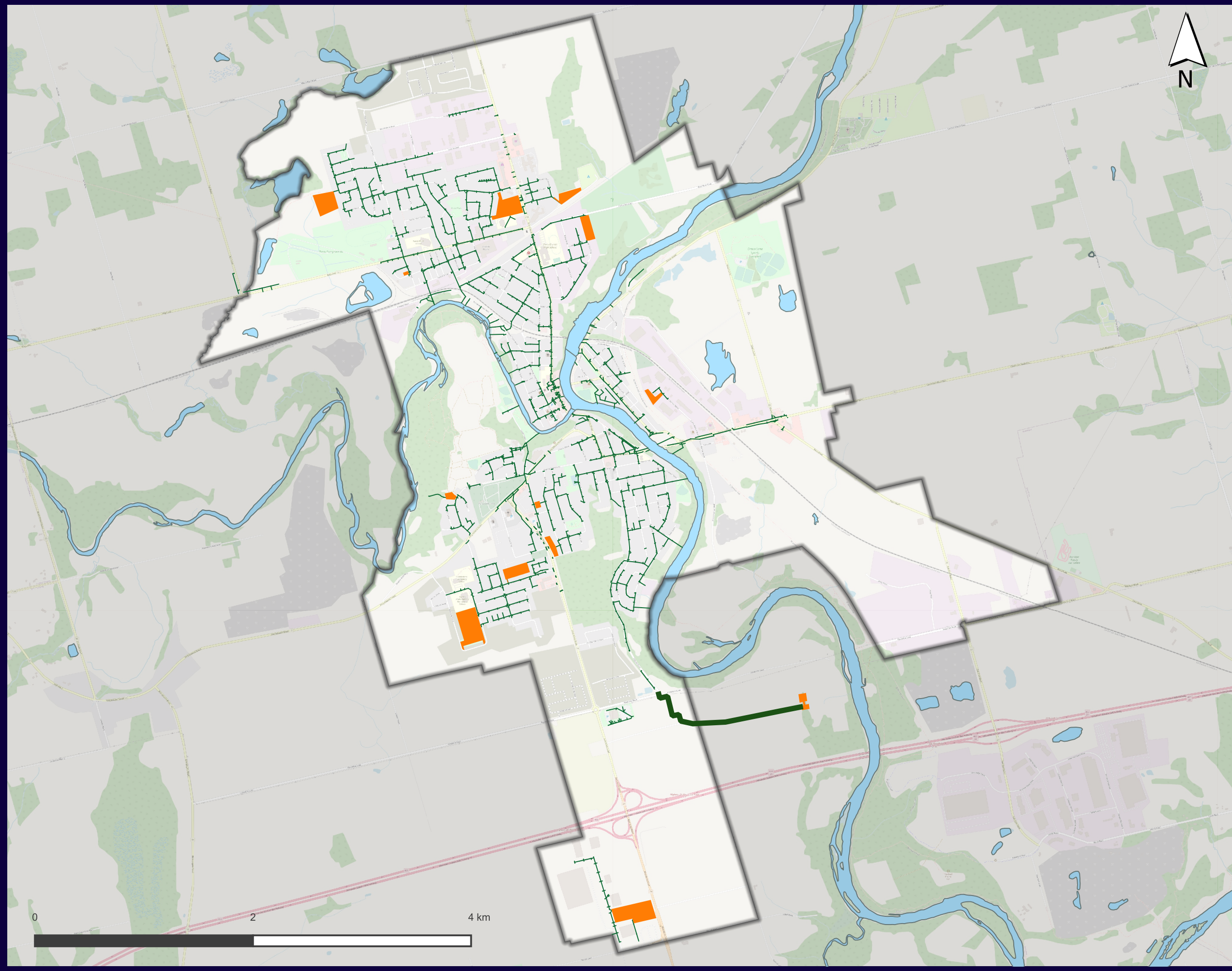
Paris lies within a significant location within the County of Brant – at the confluence of the Nith River and the Grand River. Drainage is provided locally by way of the two mentioned rivers, as well as small creeks like Whiteman’s Creek that intersects Rest Acres Road in the south, and Charlie’s Creek that crosses Watt’s Pond Road to the north. The storm sewer network provides local drainage throughout the community.

Figure 6 provides an overview of the stormwater system.

Figure 6:
Existig Stormwater System

Legend

- Stormwater
- Existing SWM Ponds
- Storm Sewers
- Gurney Outlet



4 Servicing Principles

The provision of safe and sustainable water, wastewater and stormwater services is an important issue to the public and to the municipalities planning, operating and maintaining the system. Execution of reasonable policies is essential to ensure proper planning. For this Master Servicing Plan Update, design principles were developed to support the vision statement, and guide the development of the servicing strategies, implementation of the system capital program, and operations and maintenance practices.

The principles are designed to:

- Provide direction for planning and identifying water, wastewater and stormwater servicing issues that may impact growth options;
- Provide direction for normal operation and maintenance of the water, wastewater and stormwater systems (the policies do not replace normal operation and maintenance procedures or best practices);
- Provide direction for development and evaluation of servicing strategies for the Master Servicing Plan Update;
- Ensure appropriate design and costing criteria, and consideration for the staging of infrastructure and development are utilized for developing and evaluating servicing strategies for this Master Servicing Plan;
- Provide direction for the development of a staging of development program;
- Ensure appropriate design and costing criteria are utilized for developing and evaluating servicing strategies for the Master Servicing Plan Update;
- Setting policies that are reasonable to implement; and,
- Setting policies that are robust, sustainable, and responsive to the potential impacts of climate change.

Although best management practices and criteria are updated over time, the context, intent and validity of the principles should remain intact.

Building on the problem and opportunity statement for the Master Servicing Plan Update, specific servicing principles were developed to guide and provide direction for the development and evaluation of servicing strategies. The servicing principles are outlined in detail in **Technical Appendix 3**.

4.1 Design Criteria and Level of Service Targets

In addition to developing servicing principles, the design criteria outline the methodology and values used to estimate growth related flows as well as the decision-making rationale related to infrastructure capacity and the trigger for upgrades.

The following summarizes the key design criteria and level of service targets utilized to evaluate system performance. **Technical Appendix 3** outlines the level of service objectives the design criteria for the water, wastewater and stormwater systems.

The County’s existing “Development and Engineering Standards” were used to estimate future water demands and wastewater flows and the level of service targets presented in **Table 14** were used to assess existing and future system performance.

Table 14: Level of Service Targets

System	Criteria		Objective
Water	Peaking Factor		1.8 (trunk facilities only)
	Pressure		40-100 psi
	Maximum Velocity		2 m/s
	Fire Flow Requirement	Residential	37.9 L/s for 1 hour (136 m ³)
		General Industrial, Commercial, Institutional, and Multi-Family Residential	56.8 L/s for 2 hours (409 m ³)
		Special Case Industrial*	75.8 L/s for 2 hours (546 m ³)
Wastewater	Design Wet Weather Flow Allowance (Rainfall Derived Inflow and Infiltration [RDII])		Existing – 10 Year Design Storm Growth - 0.23 (L/s/ha)
	Peaking Factor		Harmon’s Peaking Factor
	Hydraulic Grade Line (HGL) Target		1.8 m below ground level under 10-year storm
	d/D Target		Existing 1.0 under design RDII New 0.7 under design RDII

* Special Case Industrial fire flow requirement was applicable to three legacy entities (Paris Kitchens, Mitten Vinyl, and Liquid Air). All other ICI cases should be considered at 56.8 L/s with private supplement as required.

5 Growth Projections

The basis of the Master Servicing Plan Update is to identify the long-term servicing requirements to support the full buildout of the Paris Settlement Area Boundary (SAB) due to the general uncertainty in the long-term growth rate and the phasing and timing of individual development blocks. As such, project needs have been identified based on individual growth triggers within the new infrastructure's service area, instead of in construction years.

Growth projections for Paris were derived using the development and planning information provided by the County and correspond to the County's 2019 Development Charges By-law growth projections. **Table 15** provides a summary of the development status of growth parcels based on the development information provided by the County (March 26th, 2019). **Figure 7** presents the growth areas within Paris.













Table 15: Development Status of Growth Parcels

Development Status	Residential			Employment		Total
	Area (ha)	Average Day Demand/ Flow (L/s)	Population	Area (ha)	Average Day Demand/ Flow (L/s)	Average Day Demand/ Flow (L/s)
No Planning Act Application	95.3	13.1	3,760	295.6	65.0	78.1
Proposed – with Draft Plan	2.1	0.0	0	2.5	0.8	0.8
Before Local Planning Appeal Tribunal	123.8	7.5	2,155	0.0	0.0	7.5
Under Review	183.8	16.6	4,779	58.6	19.0	35.6
Proposed – with Draft Plan Approval	56.6	11.5	3,316	0.0	0.0	11.5
Registered	1.5	0.5	132	1.8	0.6	1.0
Under Construction	36.8	10.1	2,904	2.2	0.3	10.4
Total (within Settlement Area Boundary)	499.9	59.2	17,045	360.6	85.7	144.9

*Values in Table 2 are based on best available planning data as received by the County and are representative of February 2019 status.

Figure 7:
Growth Areas

Legend

-  Settlement Area Boundary
-  Urban Streets
- Development Status**
-  Before LPAT
-  Constructed
-  No Planning Act Application
-  Proposed - with DP
-  Proposed - with DPA
-  Registered
-  Under Construction
-  Under Review
-  Existing Septic Lands
- Growth Areas**
-  Growth Areas



*Planning data based on available 2019 data

5.1 Planning Scenarios

The following planning scenarios were developed as part of the Master Servicing Plan Update:

- **Capital Planning Horizon:** This scenario includes the full buildout of residential blocks within the SAB plus employment growth set at 50% of residential growth demands; this scenario maintains the existing residential to non-residential water demand split observed in 2015-2017 billing records.
- **SAB Buildout:** This scenario includes the full buildout of all residential and employment blocks within the SAB.

In the development of the recommended Capital Program, project needs triggered under the Capital Planning Horizon will be identified to assist in the long-term budgeting process. However, sizing recommendation of a Capital Planning Horizon project will take into consideration the servicing needs of the SAB Buildout scenario. A more detailed breakdown of growth numbers can be found in **Technical Appendix 5**.

5.1.1 Extension of Wastewater Servicing

Under all growth scenarios, the wastewater servicing strategies will consider existing full wastewater servicing to the existing un-serviced East Paris Lands.

5.1.2 Planning Scenarios – Growth Projections

Table 16 summarizes both planning scenario’s growth projections.

Table 16: Future Population Growth Based on Flow Projections

	Residential Growth (people)	Residential Growth (L/s)	Non-Residential Growth (L/s)	Septic Service Area (L/s)	Total Growth (L/s)**
Capital Planning Horizon	17,045	59.2	29.6	2.1	90.9
SAB Buildout	17,045	59.2	85.7	2.1	147.0

*Values in Table 4 are based on best available planning data as received by the County and are representative of February 2019 status.

** Includes Septic Service Area

6 Evaluation Process

The identification and evaluation of servicing options is a critical component of the master planning process because it enables a comprehensive review of a reasonable range of alternatives while documenting the process in a transparent manner. The evaluation process that has been undertaken is described in the following sections.

6.1 Objectives

The evaluation approach has been designed to ensure a logical and transparent process that can document the evaluation and decision making that will ultimately develop a defensible capital program. Sustainability principles were also considered in the development of the Master Servicing Plan Update and have been integrated within the four-point evaluation. Examples of such principles are:

- Making best use of existing infrastructure.
- Minimizing the cost of new infrastructure.
- Considering operation and maintenance costs to ensure financial sustainability.
- Ensuring the long-term reliability and security of the water, wastewater, and stormwater systems.

A detailed list of the servicing principles is provided in **Technical Appendix 3**.

6.2 Description of the Evaluation Process

A range of servicing concepts were established based on high level feasibility to meet the servicing requirements for the growth within Paris. For each servicing strategy, the evaluation of each criteria was completed using the following:

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

Each alternative was evaluated through the reasoned argument approach which provided a clear and thorough rationale of the trade-offs among the various options based on the anticipated impacts caused by various evaluation criteria and factors. The basis of this approach is to qualitatively evaluate the relative advantages, disadvantages, and impacts of each alternative against the established criteria. This process was intended to highlight why the preferred alternative was chosen through evaluation of technical, environmental, social/cultural, and financial criteria.

Detailed evaluation matrices supporting the evaluation of servicing options within the localized areas were developed and used for selection of preferred servicing for the Master Servicing Plan Update. The 4-point criteria and the evaluation considerations are described further in **Technical Appendix 3**.

7 Water System Servicing Strategy

This section summarizes the recommended needs and capital program; a further detailed breakdown of water system assessment and options evaluation is provided in **Technical Appendix 6**.

7.1 Future Growth – Water Demands

Table 17 summarizes the MDD under the future growth scenarios, Capital Planning Horizon and SAB Buildout, used to identify future infrastructure needs. Refer to **Technical Appendix 5** for details regarding future growth.

Table 17: Existing and Future Maximum Day Demands by Pressure Zone

Pressure Zone	Existing MDD (L/s)	Capital Planning Horizon MDD (L/s)	SAB Buildout MDD (L/s)
1	40.5 (3,499 m ³ /day)	76.7 (6,627 m ³ /day)	76.7 (6,627 m ³ /day)
2	22.7 (1,961 m ³ /day)	28.0 (2,415 m ³ /day)	28.0 (2,415 m ³ /day)
3	21.9 (1,892 m ³ /day)	108.8 (9,404 m ³ /day)	168.1 (14,552 m ³ /day)
4	6.7 (579 m ³ /day)	38.2 (3,303 m ³ /day)	81.2 (7,012 m ³ /day)
Total	91.7 (7,923 m³/day)	251.7 (21,748 m³/day)	353.9 (30,576 m³/day)

Servicing of the growth areas, requires the extension of the existing water distribution network, show in **Figure 8**.

**Figure 8:
Future Watermains**

Legend

□ Settlement Boundary

★ Existing Facilities

Watermain

— Existing Watermain (<=200 mm)

— Existing Watermain (>200 mm)

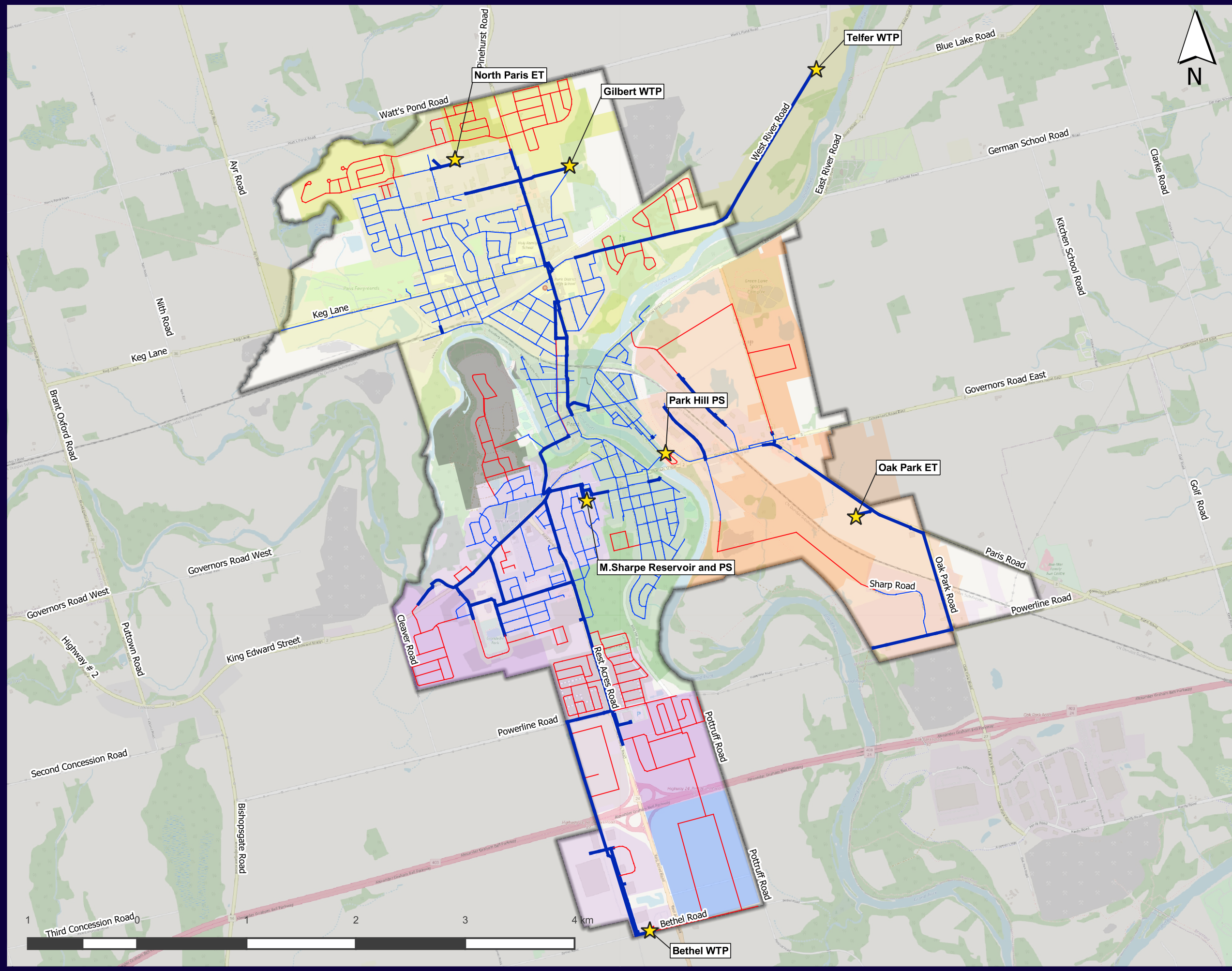
— Future Watermain

Existing Pressure Zones

- 1
- 2
- 3
- 4

Pressure Zone Extensions and Additions

- 1
- 2
- 3
- 4
- New Zone
- New Zone



*Existing water network based on 2018 data. Future watermains alignments subject to change.



7.2 Water Supply Needs

Figure 9 and **Table 18** present Paris’ existing supply capacity versus the long-term supply need. Based on the existing MDD supply firm capacity of 200.1 L/s (17,289 m³/day) and existing MDD of 91.7 L/s (7,923 m³/day), there is approximately 108.4 L/s (9,366 m³/day) of available supply capacity to support growth; corresponding to an equivalent population of approximately 11,531 people. Note that the Bethel PTTW is 35 L/s and allows for up to 50 L/s in any 30 days in a calendar year. The MDD supply analysis was completed using the 50 L/s value.

Based on the identified growth scenarios, the following additional supply capacity is needed:

- Capital Planning Horizon – Additional 51.6 L/s (4,458 m³/day) is required
- SAB Buildout – Additional 153.8 L/s (13,288 m³/day) is required

The capacity of the existing water supply facilities is not sufficient to accommodate projected growth for either growth scenario; as such, new supply options must be explored to facilitate development.

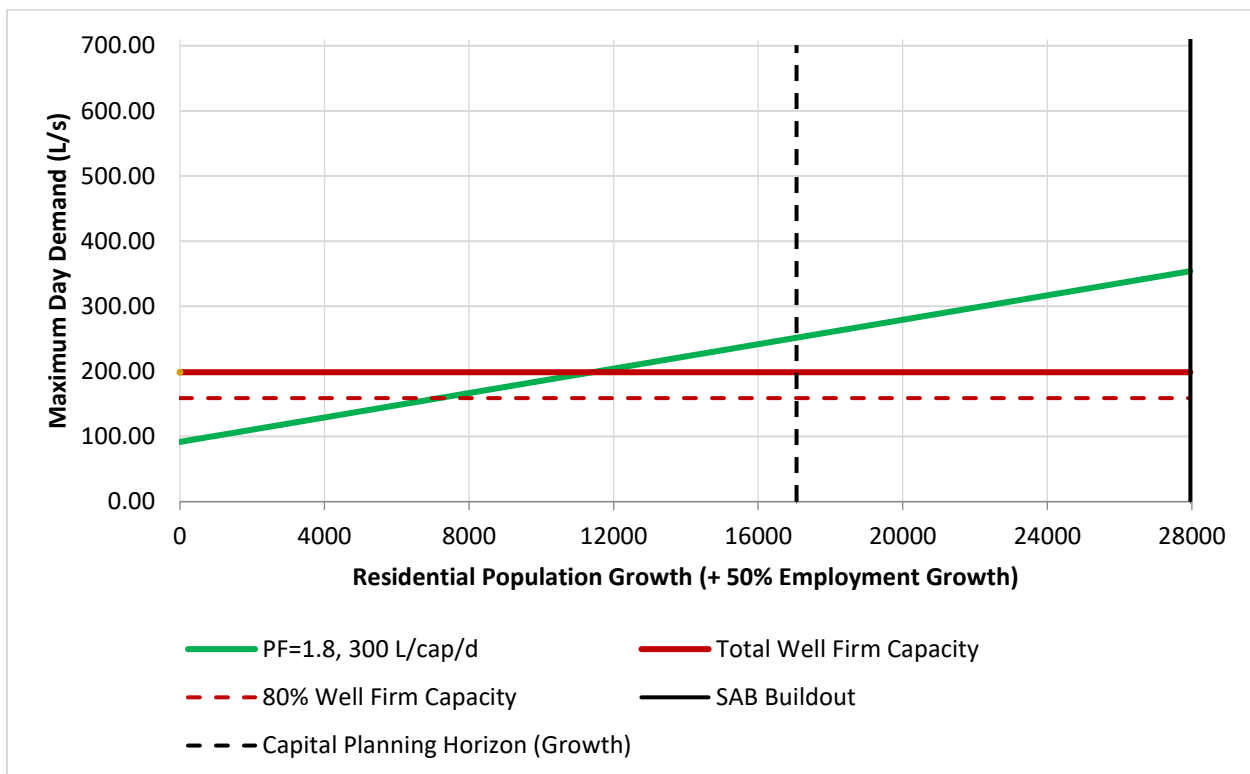


Figure 9: Growth Demands and Well Supply Capacity

Table 18: Supply Needs for Growth

	Existing Supply Firm Capacity (L/s)	Maximum Day Demand (L/s)	Supply / Deficit (L/s)	+% Supply Capacity
Current	200.1* (17,289 m ³ /day)	91.8 (7,932 m ³ /day)	108.4 (9,366 m ³ /day)	46%
Capital Planning Horizon		251.7 (21,747 m ³ /day)	-51.6 (4,458 m ³ /day)	126%
SAB Buildout		353.9 (30,577 m ³ /day)	-153.8 (13,288 m ³ /day)	177%

*Bethel PTTW – 35 L/s and allows for up to 50 L/s in any 30 days in a calendar year. MDD Supply analysis completed using 50 L/s value.

7.2.1 Supply Options

Five supply sources were initially considered to satisfy future demand needs, these options consist of the following:

- New groundwater supply:
 - Airport Aquifer
 - South Paris Unconfined Aquifer
 - North Paris Aquifer
- New surface water source via the Grand River or Nith River
- Purchase of water from the City of Brantford via a connection on Oak Park Road

A background review of each supply source is provided in **Technical Appendix 6**.

These five supply options were presented to County staff at a Servicing Options Workshop, and consensus was reached on the two most viable options – a north groundwater source (with a new treatment facility or consolidation and upgrades at the existing Gilbert Supply Facility) and/or the purchase of water from the City of Brantford. These two options were carried forward to support the supply and servicing options.

7.2.2 Water Supply Upgrade Needs and Cost

Table 19 summarizes projects and costs that will be required for each supply option.

Table 19: Required Projects and Estimated Costs for Supply Options

		North Groundwater	City of Brantford
Implementation Process		1) Complete Desktop Hydrogeological Review to Identify Potential Supply Options a) New Well Locations b) Increasing Withdrawal Rates from Existing 2) Complete Hydrogeological Investigation a) Test and Monitoring Well Drilling b) Pump Testing c) Analysis and Reporting 3) Schedule C Class EA a) Property Acquisition b) Permit to Take Water and Source Water Protection Plan 4) Detailed Design of Recommended Supply & Treatment 5) Construction of Recommended Supply & Treatment	1) Servicing and cost sharing agreement with the City 2) Design & Construction (transmission main) 3) Convert existing well facilities to chloramination (eventually for UBO)
Estimated Cost	Studies & EAs	\$0.75M	\$0.1M
	Design	\$0.5M	\$0.25M
	Construction	TBD \$5M-15M*	\$2.3M**

* Includes cost of new well house, watermain to integrate new supply, and treatment. Excludes pump capacity upgrades cost to the Gilbert High Lift Pumps.

** Includes cost of new watermain and chamber to integrate new supply

7.3 Water Preferred Servicing Strategy

The preferred water servicing strategy was developed to satisfy existing and growth areas within Paris to the SAB Buildout. The capital costs for each project within the preferred strategy was developed according to the costing methodology outlined in **Technical Appendix 10. Table 20** and **Figure 10** show the recommended projects for the Brantford supply option, and **Table 21** and **Figure 11** show the recommended projects for the north groundwater supply option.

7.3.1 Zone 1 - North Paris

For both supply options, Zones 1, 2, and 3 will continue to be supplied by the existing well facilities, which have sufficient capacity to support the projected Capital Project Horizon growth demands. Additional supply will be required to meet growth beyond the Capital Planning Horizon.

Currently, there are trunk capacity limitations within the existing Zone 1 and 2 network that limit the ability to supply the peak flows needed to support Zone 3 demands. As such, trunk watermain upgrades from the Gilbert PS to the M. Sharpe Reservoir are required. Additional Zone 1 upgrades on Woodslee Avenue are needed to optimize the operation of the North ET.

The recommended projects for the North Paris area are the same for both supply options, however, required diameters are larger for the north groundwater supply option.

7.3.2 Zone 2 - Downtown Paris

Due to the existing trunk capacity limitations within the existing Zone 1 and 2 network that limit the ability to supply the peak flows needed to support Zone 3 demands, trunk watermain upgrades from the Gilbert PS to the M. Sharpe Reservoir are required.

The recommended projects for the Downtown Paris area are the same for both supply options; however, the required diameters along Grand River Street North are larger for the north groundwater supply option due to the system configuration.

7.3.3 Zone 3 - West Paris

To support growth within Zone 3 and provide opportunity for future system looping; which is required to meet buildout demands in the area, watermain upgrades on King Edward Street and a new elevated tank are needed. The recommended projects for the West Paris area are the same for both supply options

7.3.4 Zone 3 - Southwest Paris

The ground elevations of the development southeast of Highway 403 and Rest Acres Road indicate that a new pressure zone will be required to maintain acceptable service pressures. System looping for this zone will be provide via a watermain on Bethel Road and a new Highway 403 crossing. The alignment of the Highway 403 crossing is currently unknown; however, there is opportunity to align the new watermain crossing with the tunnel through land owned by Telephone City Aggregates (TCA).

Further, a new 300 mm trunk watermain along Powerline Road east of Whiting Drive, and 300 mm looping through the development northeast of Highway 403 and Rest Acres Road will be needed.

The recommended projects for the Southwest Paris area are the same for both supply options

7.3.4.1 Nith Peninsula

Growth within the Nith Peninsula will ultimately be serviced via PRVs at the existing Gort Avenue and Baker Street watermains. The existing watermains on Gort Avenue and Baker Street from the Nith Peninsula development to connected to Dundas Street West will need to be upgraded to 200 mm.

Local servicing within the Nith Peninsula development area should be designed to accommodate the new 'Zone 5' servicing strategy.

7.3.5 Zone 4 - Trunk Watermain Updates

The recommended upgrades for Zone 4 (East Paris) are substantially different for the two supply options due to the location of the sources and the required configuration of the water system. The following subsections present the recommended upgrades for the Brantford supply option and the north groundwater supply option, respectively.

7.3.5.1 Brantford Supply Option – East Paris Recommended Upgrades

Upgrades to the existing Zone 4 trunk watermains are needed to support the Brantford supply source and to support the anticipated Zone 4 growth. Further, once the Branford connection is established, the existing Park Hill PS will no longer be required and can be decommissioned and replaced with a PRV to support Zone 4 to Zone 2 transfers.

7.3.5.2 North Groundwater Option – East Paris Recommended Upgrades

Parkhill PS is undersized compared to the Capital Project Horizon demand in Zone 4. When Parkhill PS reaches firm capacity, it will be decommissioned and a new watermain crossing of the Grand River will connect Zone 1 and 4, combining the pressure zones. The existing watermain along Paris Links Road will require upgrades to increase conveyance from Zone 1 to Zone 4 via the new river crossing. A new watermain on Green Lane in Zone 4 is required to service future and existing developments in Zone 4.

Table 20: Brantford Supply Option – Water Capital Planning Horizon Costs

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (ADD L/s)	Length (m)	Size/ Capacity	Total Component Estimated Cost
W-M-001	Zone 1 Trunk Main Grand River Street N (Scott to Paris Links)	Watermain upgrades on Grand River Street North from Scott Avenue to Paris Links Road to provide conveyance from Gilbert supply to the rest of the system	31.3	883 m	400 mm	\$1,837,000
W-M-002	Zone 1 Trunk Main Grand River Street N (Paris Links to Grand River PRV)	Watermain upgrades on Grand River Street North from Paris Links Road to Zone 2 (Grand River PRV) to provide conveyance from Gilbert supply to the rest of the system	31.3	716 m	400 mm	\$1,560,000
W-M-003	Zone 2 Trunk Main Grand River Street N (Grand River PRV to William St)	Watermain upgrades on Grand River Street North from Zone 1/2 border (Grand River Street PRV) to William Street to provide conveyance through Zone 2 from supply in Zone 1 to rest of the system	34.4	535 m	400 mm	\$3,585,000
W-M-004	Zone 2 Trunk Main Grand River Street N/S (William Street to Dundas Street West/Ball Street)	Watermain upgrades on Grand River Street North/South from William Street to Dundas Street West/Ball Street to provide conveyance through Zone 2 from supply in Zone 1 to rest of the system	34.4	1017 m	400 mm	\$4,828,000
W-M-007	Relocate Existing Baird PRV	Relocate Existing Baird PRV approximately 150 m south to address existing pressure issues	-	-	-	\$417,000
W-M-008	Zone 3 to Nith (Upgrades on Gort Avenue and Barker Street)	Upgrade on Gort Avenue and Barker Street from Dundas Street West to Nith Development. Includes two new PRV chambers at Gort Avenue and Barker Street	Nith	450 m	200 mm	\$1,421,000
W-M-010	Zone 3 Trunk Main Dundas Street W (M. Sharpe PS to King Edward Street)	Watermain upgrades from M. Sharpe Pump Station to King Edward Street along Dundas Street W. Will allow the pumping station to provide the required supply to Zone 3	28.6 (Zone 3)	451 m	400 mm	\$990,000
W-M-011A	Zone 2 Trunk Main on Main Street (M. Sharpe PS to Ball Street/Dundas Street East)	Watermain upgrades on Main Street from M. Sharpe to Ball Street/Dundas Street West to provide conveyance through Zone 2 from supply in Zone 1 to rest of the system.	58.9 (Zones 2 and 3)	894 m	500 mm	\$2,672,000
W-M-015	Zone 4 Trunk Main Paris Road (Green Lane to Oak Park Elevated Tank)	Watermain upgrades along Paris Road from Green Lane to Oak Park Road Elevated Tank to support new Brantford supply connection.	With Brantford connection	1034 m	400 mm	\$2,024,000
W-M-016	Zone 4 Trunk Main Paris Road and Oak Park Road (Oak Park Elevated Tank to future Brantford connection)	Watermain upgrades along Paris Road and Oak Park Road from the Oak Park Elevated Tank future Brantford connection to support new Brantford supply connection.	With Brantford connection	1444 m	400 mm	\$3,770,000

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (ADD L/s)	Length (m)	Size/ Capacity	Total Component Estimated Cost
W-M-019	Zone 4 Trunk Main Green Lane (Dundas Street East to approximately 370m south of East River Road)	New Watermain on Green Lane from Dundas Street East to approximately 370m south of East River Road (assumed end of development) to support local growth	With new developments	1370 m	250 mm	\$2,000,000
W-M-020	Zone 1 Trunk Main Grand River Street North (Scott Avenue to Woodslee Avenue)	Watermain upgrades on Grand River Street North from Scott Avenue to Woodslee Avenue with the purpose of improving operations of the North Paris Elevated Tank and to support system growth.	11.5	296 m	400 mm	\$611,000
W-M-021	Zone 1 Trunk Main Woodslee Avenue (Grand River Street N to Oak Avenue)	Watermain upgrades on Woodslee Avenue from Grand River Street North to Oak Avenue with the purpose of improving operations of the North Paris Elevated Tank and to support system growth.	11.5	1104 m	400 mm	\$2,038,000
W-M-022	Zone 3 Trunk Main King Edward Street (Hanlon Place to Cedar Street)	Watermain upgrades on King Edward Street from Hanlon Place to Cedar Street with the purpose of servicing of future developments	31.3 (Zone 3)	315 m	300 mm	\$621,000
W-M-023	Zone 3 Trunk Main King Edward Street (Cedar St to Misener Road W)	Watermain upgrades on King Edward Street from Cedar St to Misener Road W with the purpose of servicing of future developments	31.3 (Zone 3)	838 m	300 mm	\$1,551,000
W-M-024	Zone 3 Trunk Main Misener Road West	Watermain upgrades on Misener Road West with the purpose of providing additional system looping for Zone 3, and servicing of future developments	31.3 (Zone 3)	462 m	300 mm	\$902,000
W-M-025	Zone 3 Trunk Main through development southeast of King Edward and Cleaver Road	New watermain through development southeast of King Edward Street and Cleaver Road – continuation of watermain loop from W-M-022 and W-M-023 on King Edward Street and Misener Road West (to support future Paris expansion)	With new developments	919 m	300 mm	\$1,315,000
W-M-026	Zone 3 Trunk Main through development northeast of Highway 403 and Rest Acres Road (300mm)	New watermain on Powerline Road from Whiting Drive to Mile Hill Road, and watermain looping within development northeast of Highway 403 (Paris Meadows Subdivision) and Rest Acres Road (300mm)	With new developments	1202 m	300 mm	\$1,735,000
W-M-027	Zone 3 Trunk Main through development northeast of Highway 403 and Rest Acres Road (250mm)	Looping within development northeast of Highway 403 and Rest Acres Road (250mm)	With new developments	905 m	250 mm	\$1,298,000
W-M-028	Zone 3 Highway 403 crossing (approximately 550m east of Rest Acres Road/Highway 403)	Highway 403 crossing from development northeast of Highway 403 and Rest Acres Road to business park southeast of Highway 403 and Rest Acres Road	With new developments	550 m	250 mm	\$2,563,000

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (ADD L/s)	Length (m)	Size/ Capacity	Total Component Estimated Cost
W-M-029	Zone 3 Trunk Main through Business Park southeast of Highway 403 and Rest Acres Road	Looping in business park southeast of Highway 403 and Rest Acres Road	With new developments	985 m	250 mm	\$1,435,000
W-M-030	Zone 3 Trunk Main Bethel Road (Existing watermain to 150m east of Rest Acres)	Bethel Road from existing watermain to 150m east of Rest Acres Road to support new development	With new developments	377 m	250 mm	\$535,000
W-M-031	Zone 3 Trunk Main Bethel Road (150m east of Rest Acres to 200m west of Pottruff Road)	Bethel Road from 150m east of Rest Acres Road to approximately 200m west of Pottruff Road (development southeast of Highway 403 and Rest Acres Road) to support new development	With new developments	451 m	250 mm	\$638,000
W-M-033	Zone 3 Local Main Consolidated Drive (Willow Street to existing/proposed watermain on Consolidated Drive)	Potential local water connection to improve fireflow availability for residential areas north of CN Railway and east of the Grand River.	-	340 m	250 mm	\$475,000
W-D-001A	Decommissioning of Parkhill PS and replace with PRV	W-D-001A includes decommissioning of Parkhill PS. W-D-001B includes decommissioning of Parkhill PS and replacement with PRV to feed other zones from Brantford connection	With Brantford connection		N/A	\$500,000
W-S-001	New Zone 3 Elevated Tank	Elevated storage within Zone 3 to support growth demands	53.6		4 ML	\$6,378,000
W-SUP-001	Brantford Supply	Watermain connection from Brantford to Paris System	37.5		400 mm	\$2,289,000
Total						\$49,988,000

Figure 10:
Capital Planning Horizon
Brantford Supply

Legend

- Settlement Area Boundary
- Development Status**
- Before LPAT
- Constructed
- No Planning Act Application
- Proposed - with DP
- Proposed - with DPA
- Registered
- Under Construction
- Under Review
- Watermain**
- Existing < 250
- Existing >= 250 mm
- Future < 250 mm
- Upgrade (=250 mm)
- Upgrade (>250 mm)
- New (= 250 mm)
- New (> 250 mm)
- Facilities**
- Existing (No Change)
- Decommission
- New
- Upgrade

*Note: Capital Program does not include local 150mm and 200mm watermains.

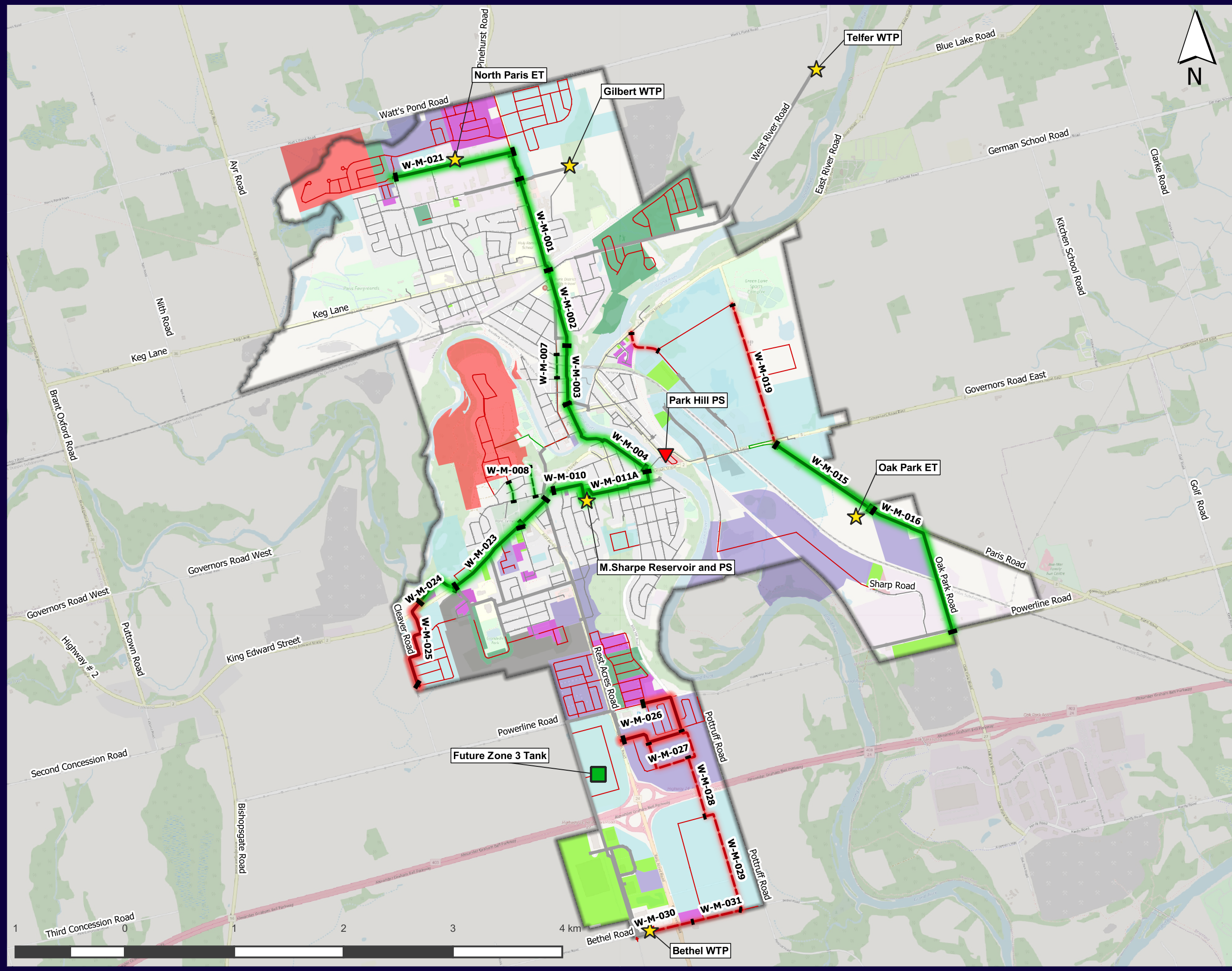


Table 21: North Groundwater Supply Option – Water Capital Planning Horizon Costs

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (Population Growth)	Length (m)	Size/ Capacity	Total Component Estimated Cost
W-M-001A	Zone 1 Trunk Main Grand River Street N (Scott to Paris Links)	Watermain upgrades on Grand River Street North from Scott Avenue to Paris Links Road to provide conveyance from Gilbert supply to the rest of the system	31.3	883 m	600 mm	\$2,804,000
W-M-002A	Zone 1 Trunk Main Grand River Street N (Paris Links to Grand River PRV)	Watermain upgrades on Grand River Street North from Paris Links Road to Zone 2 (Grand River PRV) to provide conveyance from Gilbert supply to the rest of the system	31.3	716 m	600 mm	\$2,366,000
W-M-003A	Zone 2 Trunk Main Grand River Street N (Grand River PRV to William St)	Watermain upgrades on Grand River Street North from Zone 1/2 border (Grand River Street PRV) to William Street to provide conveyance through Zone 2 from supply in Zone 1 to rest of the system	34.4	535 m	600 mm	\$4,648,000
W-M-004A	Zone 2 Trunk Main Grand River Street N/S (William Street to Dundas Street West/Ball Street)	Watermain upgrades on Grand River Street North/South from William Street to Dundas Street West/Ball Street to provide conveyance through Zone 2 from supply in Zone 1 to rest of the system	34.4	1017 m	500 mm	\$5,608,000
W-M-005A	Zone 1 Trunk Main Paris Links Road (Grand River Street N to West River Road)	New watermain on Paris Links Road from Grand River Street North to West River Road to provide conveyance from main Zone 1 trunk to the new Grand River crossing (W-M-006) and Zone 4.	10.4 (Zone 4)	1540 m	400 mm	\$3,049,000
W-M-006A	Zone 1 to 4 Grand River Crossing	New watermain Grand River crossing from West River Road to approximately 370m south of East River Road on Green Lane (assumed start of new development). This new crossing will eliminate the need for Parkhill PS, allow Zones 1 and 4 to operate as one zone, and increase security of supply	10.4 (Zone 4)	755 m	400 mm	\$5,840,000
W-M-007	Relocate Existing Baird PRV	Relocate Existing Baird PRV approximately 150 m south to address existing pressure issues	-	-	-	\$417,000
W-M-008	Zone 3 to Nith (Upgrades on Gort Avenue and Barker Street)	Upgrade on Gort Avenue and Barker Street from Dundas Street West to Nith Development. Includes two new PRV chambers at Gort Avenue and Barker Street	Nith	450 m	200 mm	\$1,421,000
W-M-010	Zone 3 Trunk Main Dundas Street W (M. Sharpe PS to King Edward Street)	Watermain upgrades from M. Sharpe Pump Station to King Edward Street along Dundas Street W. Will allow the pumping station to provide the required supply to Zone 3	28.6 (Zone 3)	451 m	400 mm	\$990,000
W-M-011A	Zone 2 Trunk Main on Main Street (M. Sharpe PS to Ball Street/Dundas Street East)	Watermain upgrades on Main Street from M. Sharpe to Ball Street/Dundas Street West to provide conveyance through Zone 2 from supply in Zone 1 to rest of the system.	58.8 (Zones 2 and 3)	894 m	500 mm	\$2,336,000

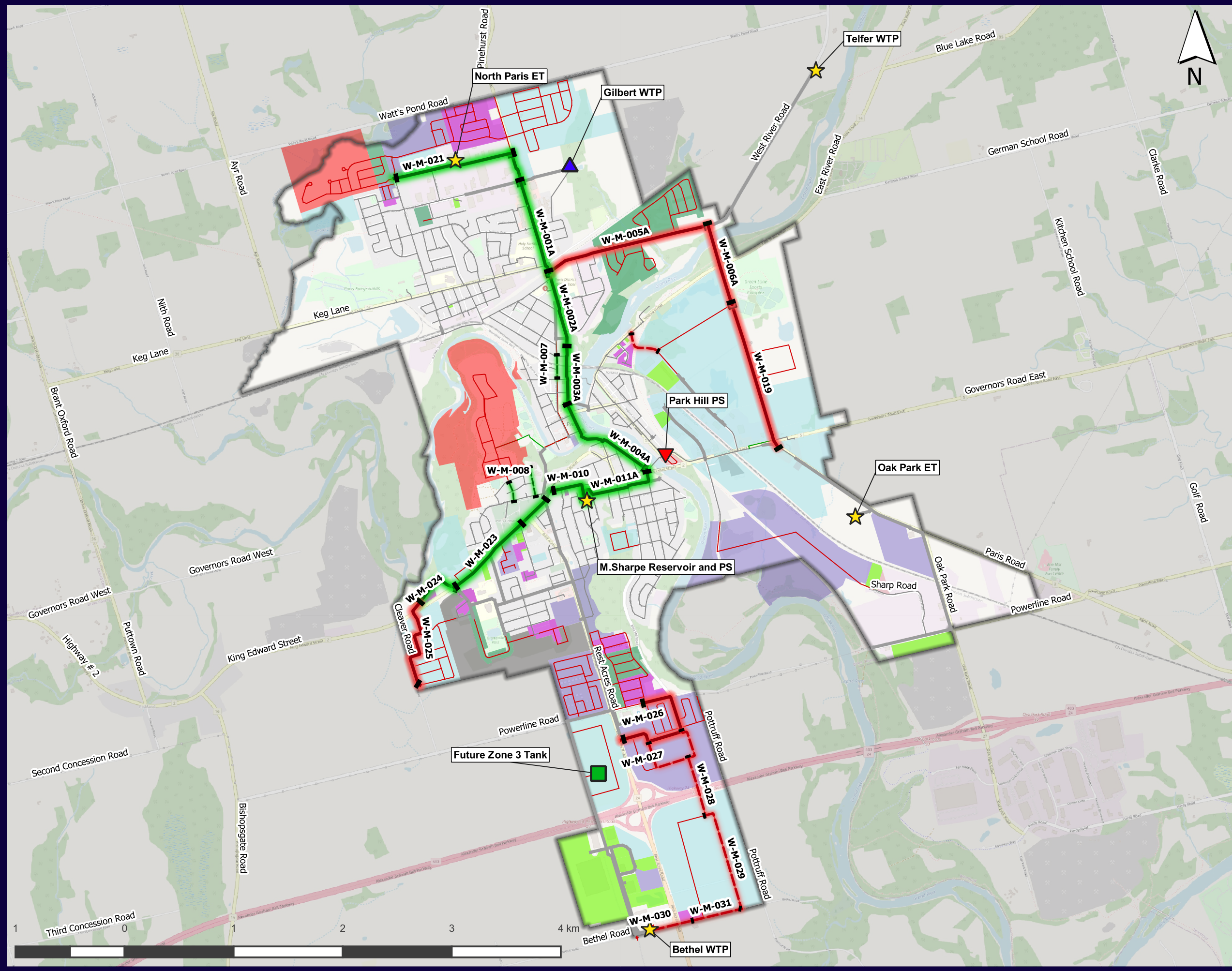
Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (Population Growth)	Length (m)	Size/ Capacity	Total Component Estimated Cost
W-M-019	Zone 4 Trunk Main Green Lane (Dundas Street East to approximately 370m south of East River Road)	New Watermain on Green Lane from Dundas Street East to approximately 370m south of East River Road (assumed end of development) to support local growth and Zone 1-4 connection	Zone 1-4 crossing or new development	1370 m	300 mm	\$2,022,000
W-M-020	Zone 1 Trunk Main Grand River Street North (Scott Avenue to Woodslee Avenue)	Watermain upgrades on Grand River Street North from Scott Avenue to Woodslee Avenue with the purpose of improving operations of the North Paris Elevated Tank and to support system growth.	11.5	296 m	400 mm	\$611,000
W-M-021	Zone 1 Trunk Main Woodslee Avenue (Grand River Street N to Oak Avenue)	Watermain upgrades on Woodslee Avenue from Grand River Street North to Oak Avenue with the purpose of improving operations of the North Paris Elevated Tank and to support system growth.	11.5	1104 m	400 mm	\$2,038,000
W-M-022	Zone 3 Trunk Main King Edward Street (Hanlon Place to Cedar Street)	Watermain upgrades on King Edward Street from Hanlon Place to Cedar Street with the purpose of servicing of future developments	31.3 (Zone 3)	315 m	300 mm	\$621,000
W-M-023	Zone 3 Trunk Main King Edward Street (Cedar Street to Misener Road W)	Watermain upgrades on King Edward Street from Cedar Street to Misener Road West with the purpose of servicing of future developments	31.3 (Zone 3)	838 m	300 mm	\$1,551,000
W-M-024	Zone 3 Trunk Main Misener Road West	Watermain upgrades on Misener Road West with the purpose of providing additional system looping for Zone 3, and servicing of future developments	31.3 (Zone 3)	462 m	300 mm	\$902,000
W-M-025	Zone 3 Trunk Main through development southeast of King Edward and Cleaver Road	New watermain through development southeast of King Edward Street and Cleaver Road – continuation of watermain loop from W-M-022 and W-M-023 on King Edward Street and Misener Road West (to support future Paris expansion)	31.3 (Zone 3)	919 m	300 mm	\$1,315,000
W-M-026	Zone 3 Trunk Main through development northeast of Highway 403 and Rest Acres Road (300mm)	New watermain on Powerline Road from Whiting Drive to Mile Hill Road, and watermain looping within development northeast of Highway 403 (Paris Meadows Subdivision) and Rest Acres Road (300mm)	With new developments	1202 m	300 mm	\$1,735,000
W-M-027	Zone 3 Trunk Main through development northeast of Highway 403 and Rest Acres Road (250mm)	Looping within development northeast of Highway 403 and Rest Acres Road (250mm)	With new developments	905 m	250 mm	\$1,298,000
W-M-028	Zone 3 Highway 403 crossing (approximately 550m east of Rest Acres Road/Highway 403)	Highway 403 crossing from development northeast of Highway 403 and Rest Acres Road to business park southeast of Highway 403 and Rest Acres Road	With new developments	550 m	250 mm	\$2,563,000

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (Population Growth)	Length (m)	Size/ Capacity	Total Component Estimated Cost
W-M-029	Zone 3 Trunk Main through Business Park southeast of Highway 403 and Rest Acres Road	Looping in business park southeast of Highway 403 and Rest Acres Road	With new developments	985 m	250 mm	\$1,435,000
W-M-030	Zone 3 Trunk Main Bethel Road (Existing watermain to 150m east of Rest Acres)	Bethel Road from existing watermain to 150m east of Rest Acres Road to support new development	With new developments	377 m	250 mm	\$535,000
W-M-031	Zone 3 Trunk Main Bethel Road (150m east of Rest Acres to 200m west of Pottruff Road)	Bethel Road from 150m east of Rest Acres Road to approximately 200m west of Pottruff Road (development southeast of Highway 403 and Rest Acres Road) to support new development	With new developments	451 m	250 mm	\$638,000
W-M-033	Zone 3 Local Main Consolidated Drive (Willow Street to existing/proposed watermain on Consolidated Drive)	Potential local water connection to improve fireflow availability for residential areas north of CN Railway and east of the Grand River.	--	340 m	250 mm	\$475,000
W-P-002A	Upgrade Gilbert PS	Pumping capacity upgrades to support increased supply capacity at Gilbert	57.3		440 L/s	\$3,929,000
W-D-001	Decommissioning Parkhill PS	Decommission Parkhill PS and replace with PRV. No longer need with new Zone 1 to 4 trunk main.	Zone 1-4 crossing		N/A	\$500,000
W-S-001	New Zone 3 Elevated Tank	Elevated storage within Zone 3 to support growth demands	53.6		4 ML	\$6,378,000
W-SUP-002	North Groundwater Supply	Includes cost of new north groundwater supply and consolidation of sources at Gilbert for treatment. Includes new well houses, raw watermains, and treatment. Excludes pump capacity upgrades cost to the Gilbert High Lift Pumps	37.5		293 L/s	\$5M - \$15M
Total						\$68,025,000

Figure 11:
Capital Planning Horizon
North GW Supply

- Legend**
- Settlement Area Boundary
 - Development Status**
 - Before LPAT
 - Constructed
 - No Planning Act Application
 - Proposed - with DP
 - Proposed - with DPA
 - Registered
 - Under Construction
 - Under Review
 - Watermain**
 - Existing < 250
 - Existing >= 250 mm
 - Future < 250 mm
 - Upgrade (=250 mm)
 - Upgrade (>250 mm)
 - New (= 250 mm)
 - New (> 250 mm)
 - Facilities**
 - Existing (No Change)
 - Decommission
 - New
 - Upgrade

*Note: Capital Program does not include local 150mm and 200mm watermains



8 Wastewater System Servicing Strategy

This section summarizes the recommended needs and capital program; a further detailed breakdown of wastewater system assessment and options evaluation is provided in **Technical Appendix 7**.

8.1 Future Growth – Wastewater Flows

Table 22 summarizes the planning scenarios, Capital Planning Horizon and SAB Buildout, growth projections; refer to **Technical Appendix 5** for more detail regarding future growth.

Table 22: Future Population Growth based on Flow Projections

	Residential Growth (People)	Non-Residential Growth (L/s)	Septic Service Area (L/s)
Capital Planning Horizon	17,045	29.6 (2,557 m ³ /day)	2.1 (181 m ³ /day)
SAB Buildout	17,045	85.7 (7,404 m ³ /day)	2.1 (181 m ³ /day)

8.2 Wastewater Treatment Needs

Table 23 and **Figure 12** presents the Paris WPCP's existing treatment capacity versus the long-term treatment needs. The Paris WPCP currently has adequate capacity to treat existing flows and does not experience overflows under high flows. Based on the existing average dry weather flow (ADWF) of 3,629 m³/day or 42 L/s, there is approximately 3,456 m³/day or 40 L/s of available treatment capacity to support growth; corresponding to an equivalent population of 11,518 people based on an average day demand of 300 L/cap/day.

Based on the identified growth scenarios, the following additional treatment capacity is needed:

- 4,225 m³/day (48.9 L/s) to meet the **Capital Planning Horizon** growth scenario
- 9,124 m³/day (105.6 L/s) to meet the **SAB Buildout**

Table 23: Treatment Needs for Growth

	Existing Facility Firm Capacity (L/s)	Average Day Flow (L/s)	Surplus/ Deficit (L/s)	+% Treatment Capacity
Current	82.0 (7,085 m ³ /day)	42.0 (3,629 m ³ /day)	40.0 (3,456 m ³ /day)	51%
Capital Planning Horizon		130.9 (11,310 m ³ /day)	-48.9 (-4,225 m ³ /day)	160%
SAB Buildout		187.6 (16,209 m ³ /day)	-105.6 (-9,124 m ³ /day)	229%

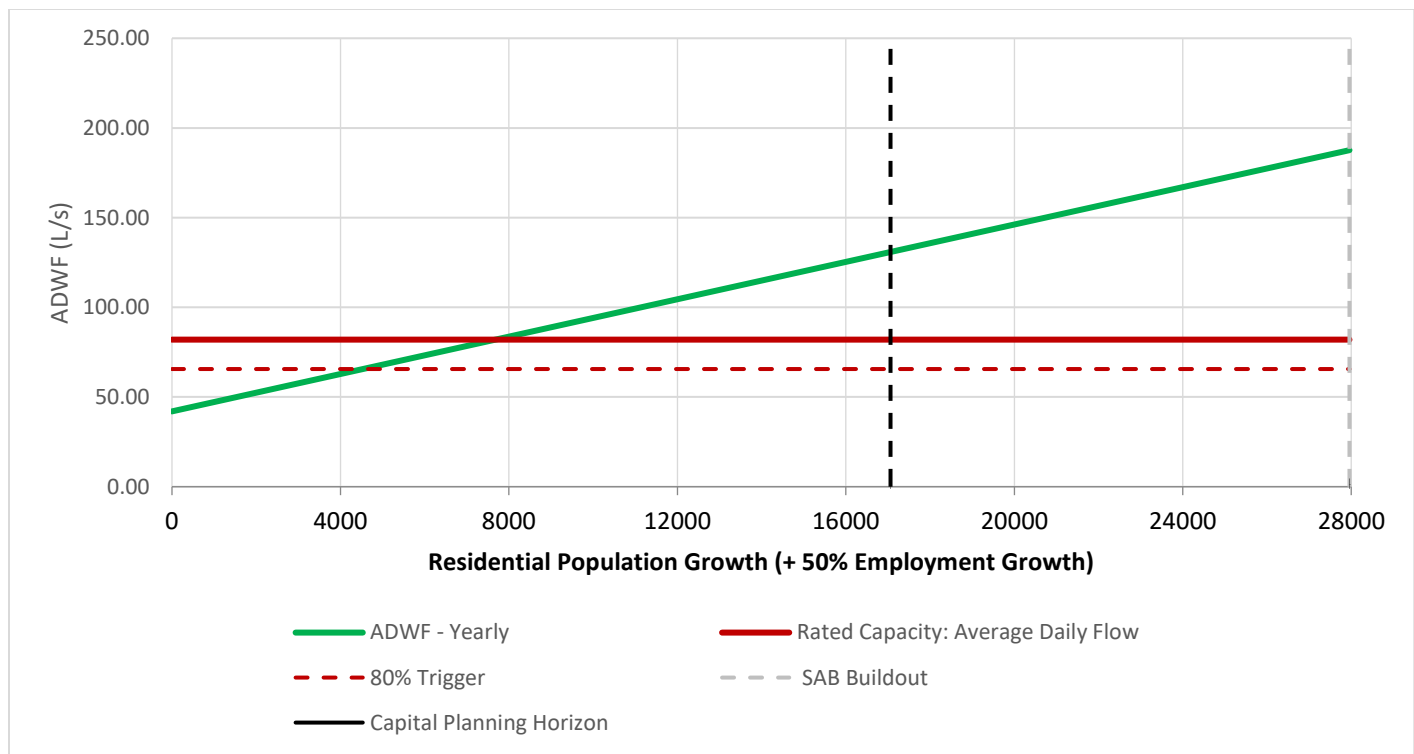


Figure 12: Projected Wastewater Flows

8.2.1 Wastewater Treatment Upgrade

The Paris WPCP is located on 4.23 hectares of County owned lands. The existing treatment facility occupies approximately 1.79 hectares leaving 2.44 hectares of land available for expansion. Currently, there are two treatment trains, comprised of an aeration tank and secondary clarifier tank which are each designed to treat 3,542 m³/day (41.0 L/s).

The Capital Planning Horizon flows are estimated to be 1.6 times greater than the Paris WPCP's current rated capacity. A phased approach is recommended for the expansion of the treatment plant. Additional treatment trains could be constructed, expanding the plant's capacity by 5,000 m³/day to 12,085 m³/day (140.0 L/s). Following the same approach, additional 5,000 m³/day trains can be constructed as required to meet the SAB Buildout flows, which is estimated to be 2.3 times greater than the existing capacity. Prior to any upgrades, the capacity of the existing secondary clarifiers should be reviewed with future expansion sized to treat appropriate flows. Due to the site's close proximity to residential properties, consideration must be given to odours emitting processes for any upgrades. The estimated flows and costs for the Paris WPCP are provided in **Table 24**.

No upgrades to the outfall are anticipated.

Table 24: Treatment Upgrade Costs

	Capital Planning Horizon	SAB Buildout
Rated Capacity: Average Day Flow (L/s)	82.0 (7,085 m ³ /day)	
Existing ADWF (L/s)	42.0 (3,629 m ³ /day)	
ADWF (L/s) Growth	88.9 (7,681 m ³ /day)	145.6 (12,580 m ³ /day)
Total ADWF (L/s)	130.9 (11,310 m ³ /day)	187.6 (16,209 m ³ /day)
Additional Treatment Capacity Required (L/s)	48.9 (4,225 m ³ /day)	105.6 (9,124 m ³ /day)
Proposed Total Treatment Capacity (L/s)	140.0 (12,085 m ³ /day)	198.0 (17,085 m ³ /day)
Cost	\$17 M	\$35 M

8.3 Wastewater Preferred Servicing Strategy

The preferred wastewater servicing strategy has been developed to satisfy the existing and growth areas within Paris to SAB Buildout. The capital costs for each project within the preferred strategy were developed according to the costing methodology outlined in **Technical Appendix 10. Table 25** and **Figure 13** show the recommended projects.

8.4 North Paris (Grand River SPS Service Area)

Within North Paris Area, 133 ha of residential and mixed-use development, is expected to be developed. The preferred servicing strategy consists of the servicing strategy identified through the Northwest Paris Master Servicing Study (MSS; SCS Consulting Group, 2014) and includes the following:

- New SPS and forcemain to support area northwest of Whitlaw Way and Macpherson Drive.
- Lands east of Grand River Street are serviced via gravity to new Grand River Street North Sewer.
- Upgrade Grand River Street North trunk sewer to accommodate North Paris growth flows.

8.5 Golf North

The Golf North development, located on the grounds of the previous Paris Grand Golf Course, have an anticipated residential population of 1,974 people for the Capital Planning Horizon, generating a PWWF of 31.9 L/s (2,756 m³/day). Sanitary servicing currently does not extend east of the existing Paris Links SPS (PLSPS). Based on local topography, flows from the Golf North development cannot be conveyed by gravity to the existing PLSPS. The preferred servicing strategy consists the following upgrades to build a new consolidated SPS and reuse the existing forcemain:

- New SPS to service both existing Paris Link SPS catchment and new development.
- Decommission existing Paris Links SPS and divert flows to new SPS.
- Construct new forcemain to existing Paris Link SPS and reuse existing forcemain.

8.6 Nith Peninsula

Development in the Nith Peninsula is expected to service a residential population of approximately 1,116 people. This equates to a PWWF of 33.0 L/s (2,851 m³/day). The preferred servicing strategy consists of conveying development flows via a new gravity connection through the Nith River siphon:

- Extend existing Laurel Street sewer through Lion's Park to allow a gravity connection.
- The existing PWWF at the Nith River siphon is 4.0 L/s (346 m³/day). The theoretical capacity of the north siphon is 40 L/s (3,456 m³/day) which is sufficient to accommodate existing and future flows.

8.7 West Paris

Development in West Paris consists of residential, employment, and mixed-use development, including an area of 100 ha. The preferred servicing strategy includes a new SPS at King Edward Street and Cleaver Road to service development West of the Grandville area. The new SPS and forcemain should be sized to accommodate Capital Planning Horizon flows, with expansion potential buildout beyond the SAB.

Additional costs are required to service all development for SAB Buildout in West Paris. Under SAB Buildout, the sewers along King Edward Street and Church Street from Hanlon Place to Grand River Street South have PWWF that are greater than 90% of pipe full. As development occurs, flow monitors should be installed to monitor these sewers and ensure they are sufficient for SAB Buildout.

8.8 Southwest Paris Business Park

The Business Park has an expected employment flow of 150.3 L/s (12,986 m³/day). A temporary SPS to service the Brant 403 Business Park is currently in operation and the forcemain associated with the SPS extends from the temporary SPS to an existing sewer at Powerline and Rest Acres Road. The preferred servicing strategy consist decommissioning the temporary SPS and build a new SPS at Bethel Road and Pottruff Road to service all existing and future Brant 403 Business Park developments.

It is recommended to install the new forcemain and gravity sewer along Bethel Road to accommodate SAB Buildout flows with space to accommodate a twin forcemain within the design until such a time that peak flows trigger the need for additional capacity.

The existing forcemain from the Business Park SPS to Powerline Road has sufficient capacity to accommodate the Capital Planning Horizon flows; however, the forcemain may need to be twinned to accommodate SAB Buildout flows.

This forcemain discharges to sewers along Powerline Road. These sewers also have sufficient capacity to service the Capital Planning Horizon; however, the sewers may experience surcharging under SAB Buildout PWWF. Based on the age of these sewers, and the limited surcharging under SAB Buildout, it is recommended that these sewers remain and flow monitoring should be completed in the future to monitor the forcemain and trunk sewer capacity.

8.9 South Paris – North of Highway 403

Development north of Highway 403 consists of residential, employment, and mixed-use land. Most of this development can be gravity fed to existing sanitary sewers. A new SPS will be required in the development southeast of Powerline Road and Rest Acres Road as indicated on draft plans. It is recommended to size the forcemain for SAB Buildout flows and design the SPS for Capital Planning Horizon flows with space to add additional capacity as it is needed.

8.10 East Paris

The East Paris area has an expected growth of residential population of 7,978 people, employment flow of 34 L/s (2,938 m³/day), and there is currently 189 hectares serviced by septic. To accommodate future flows, the sewer along Dundas Street East from the CN tracks to Willow Street was oversized. This allows for connections from future sewers along Dundas Street East, Curtis Avenue, Consolidated Drive, and Paris Road.

8.10.1 Curtis Avenue South Sewer

This servicing strategy identifies the need for a deep gravity sewer on Curtis Avenue South to maximize the serviceability of the remaining lands within the existing SAB. Based on preliminary concept plans and the existing land contours, the majority of the lands south of the SC Johnson Trail, can be serviced via gravity. However, based on existing ground contours, the southwestern limits of the development area may require a small local SPS. The need for this local SPS will be subject to the final grading plan.

It is also noted that preliminary concept plans identify potential development beyond the existing SAB. To service these additional lands, a local SPS would be required. Lands beyond the existing SAB are outside the growth planning projections.

8.10.2 Willow Street SPS

The Willow Street SPS has sufficient capacity for existing flows; however, the capacity will need to be increased to meet Capital Planning Horizon and SAB Buildout flows. Based on a review of the existing system, the existing wet well has sufficient capacity for future flows and upgrades require the installation of new pumps.

Additionally, the two 400 mm forcemains have sufficient capacity to meet SAB Buildout flows, assuming both forcemains can be operated simultaneously.

8.10.3 Grandville SPS

Development occurring around the Grandville area will be serviced by the Grandville SPS (GVSPS). Capacity upgrades will be required at the GVSPS to support this development. Provisions have already been created for a third pump to increase the station to a firm capacity of 74 L/s. The forcemain at GVSPS is sufficient to support existing and growth flows.

8.11 Sanitary Trunk Sewers

Sanitary trunk sewers generally have sufficient capacity for existing and SAB Buildout PWWF, however, potential capacity issues and sewer upgrade recommendations have been identified near the Paris WPCP.

Table 25: Wastewater Capital Planning Horizon Costs

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (ADWF L/s)	Length (m)	Size / Capacity	Total Component Estimated Cost
WW-D-001	Decommissioning of Paris Links SPS	Decommissioning of Paris Links SPS to be replaced by new SPS and forcemain in Golf North Development	With new development			\$367,000
WW-D-002	Decommissioning of Business Park SPS	Decommissioning of existing Business Park SPS to be replaced by new SPS and forcemain in Business Park	With new development			\$367,000
WW-FM-001	Northwest Development forcemain	New forcemain needed to support new SPS for development blocks Northwest of Whitlaw Way and Macpherson Drive in North Paris	With new development	675 m	200 mm	\$646,000
WW-FM-002	Golf North forcemain	New forcemain from the new Golf North SPS to the existing Paris Links SPS forcemain to support the Golf North Development and existing Paris Links catchment flows	With new development	675 m	250 mm	\$842,000
WW-FM-003A	King Edward Forcemain	New forcemain from King Edward Street SPS along King Edward Street to support west Paris development blocks. Forcemain sized to accommodate Capital Planning Horizon flows with space to allow for potential twinning for Ultimate Buildout flows.	With new development	850 m	150 mm	\$914,000
WW-FM-004A	Brant 403 Business Park forcemain	New forcemain from new SPS to existing Business Park SPS forcemain. Forcemain sized to accommodate Capital Planning Horizon flows with space to allow for potential twinning for Ultimate Buildout flows.	With new development	1150 m	250 mm	\$1,696,000
WW-FM-006	Northeast of Highway 403 and Rest Acres Road SPS forcemain	New forcemain from new SPS to Mile Hill Road in development block northeast of Highway 403 and Rest Acres Road	With new development	950 m	300 mm	\$1,026,000
WW-FM-007	East Paris forcemain	New forcemain from new East Paris SPS to high point along Paris Road	With new development	1500 m	200 mm	\$1,195,000
WW-SPS-001	North Development SPS	New sewage pumping station needed to support development blocks northwest of Whitlaw Way and Macpherson Drive	With new development		23 L/s	\$1,550,000
WW-SPS-002	Golf North Development SPS	New SPS needed to support Golf North Development. SPS will be sized to accommodate flows from existing Paris Links catchment.	With new development		45 L/s	\$2,569,000
WW-SPS-003	Grandville SPS Upgrades	Capacity upgrades required to support development in Grandville area. Install 3rd pump to increase firm capacity from 54 L/s to 74 L/s	10.4		20 L/s	\$601,000
WW-SPS-004A	King Edward SPS	New sewage pumping station needed to support West Paris development. SPS to be sized to accommodate Capital Planning Horizon Flows with additional space to allow for upgrades for Ultimate Buildout flows.	With new development		19 L/s	\$1,240,000

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (ADWF L/s)	Length (m)	Size / Capacity	Total Component Estimated Cost
WW-SPS-005A	New Business Park SPS	New SPS needed to support Business Park development. SPS to be sized to accommodate Capital Planning Horizon Flows with additional space to allow for upgrades for Ultimate Buildout flows.	With new development		54 L/s	\$3,032,000
WW-SPS-006A	SPS for Development northeast of Highway 403 and Rest Acres Road	New SPS needed to support development block northeast of Highway 403 and Rest Acres Road. Sized to accommodate Capital Planning Horizon flows with additional space to allow for upgrades for Ultimate Buildout flows.	With new development		30 L/s	\$1,746,000
WW-SPS-007A	East Paris SPS	New SPS at Powerline and Oak Road to service East Paris developments	With new development		12 L/s	\$720,000
WW-SPS-008	Willow Street SPS Upgrades	Pumping station capacity upgrades required to accommodate flows from north, west and east Paris developments	40.1		277 L/s	\$3,225,000
WW-SS-001	Grand River Street North Trunk Sewer	Sewer upgrades along Grand River Street North from Hartley Avenue to GRSPS to accommodate North Paris growth flows	With new development	1011 m	375 mm	\$2,014,000
WW-SS-002	Curtis Avenue Sewer	New sanitary sewer along Curtis Avenue from new East development to Dundas Street East sewer to accommodate East development	With new development	715 m	300 mm	\$734,000
WW-SS-003	Paris Links Road Sewer	New sanitary sewer from the Paris Links SPS (to be decommissioned) to the new Golf North Development local sewers to allow for decommissioning of existing Paris Links SPS	With new development	110 m	250 mm	\$195,000
WW-SS-004	King Edward Street (Cedar St to Hanlon Pl)	Sewer upgrades on King Edward Street from Cedar Street to Hanlon Place to accommodate flows from West Paris developments	4.7	321 m	300 mm	\$636,000
WW-SS-005	King Edward Street from new forcemain to Cedar St	New sanitary sewer along King Edward Street from new forcemain to existing sewers at Cedar Street to accommodate west Paris developments	With new development	770 m	300 mm	\$789,000
WW-SS-006	Sewer upsizing for development block west of Grandville	New sanitary sewer required for development block west of Grandville along Cleaver Road. Strategically upsize to accommodate future growth outside of existing SAB	With new development	470 m	300 mm	\$461,000
WW-SS-007	Bethel Road sewer	New sanitary sewer from Business Park SPS to new Business Park SPS along Bethel Road to allow for decommissioning of existing SPS	With new development	1150 m	375 mm	\$2,283,000
WW-SS-008	Paris Road Sewer	New sanitary sewer from new East SPS forcemain to Dundas Street East to accommodate southeast developments	With new development	1085 m	250 mm	\$1,316,000
WW-SS-009	Dundas Street East Trunk Sewer	New trunk sanitary sewer from Paris Road to existing Dundas Street East trunk sewer to accommodate East developments	With new development	460 m	375 mm	\$1,368,000

Capital Planning Horizon Master Plan ID	Name	Description	Upgrade Trigger (ADWF L/s)	Length (m)	Size / Capacity	Total Component Estimated Cost
WW-SS-010A	Race Street (Ball Street to Paris WPCP)	Sewer upgrades along Race Street from Ball Street to the Paris Water Pollution Control Plant to accommodate north, west and east development flows	33.8	236 m	900 mm	\$1,018,000
WW-SS-011A	Hillside Avenue (Easement to Race Street)	Sewer upgrades along Hillside Avenue from easement to Race Street to accommodate south and west development flows	23.4	153 m	525 mm	\$305,000
WW-SS-012A	Race Street (Hillside Avenue to Paris WPCP)	Sewer upgrades along Race Street from Hillside Avenue to the Paris Water Pollution Control Plant to accommodate south and west development flows	10.4	305 m	750 mm	\$910,000
WW-SS-013	Flow Split (Dundas Street West to Creeden Street)	Split the flows at Dundas Street West and Ball Street to accommodate north, west and east development flows	26.0	140 m	750 mm	\$449,000
WW-SS-014	Race Street (Race Street to Ball Street)	Sewer upgrades between Race Street and Ball Street to accommodate north, west and east development flows	15.6	8 m	750 mm	\$82,000
WW-SS-015	Consolidated Drive Sewer to Dundas Street East	New sanitary sewer from new East development to Dundas Street East to accommodate northeast development flows	With new development	675 m	300 mm	\$695,000
WW-SS-016	Consolidated Drive Sewer to Willow Street	New sanitary sewer from East development to Willow Street sewer to accommodate northeast development flows	With new development	570 m	300 mm	\$567,000
WW-TP-001	Paris Water Pollution Control Plant	Treatment plant capacity upgrades required to accommodate all development Capital Planning Horizon flows in Paris.	31.8	0 m	5 MLD	\$17,388,000
						\$52,946,000

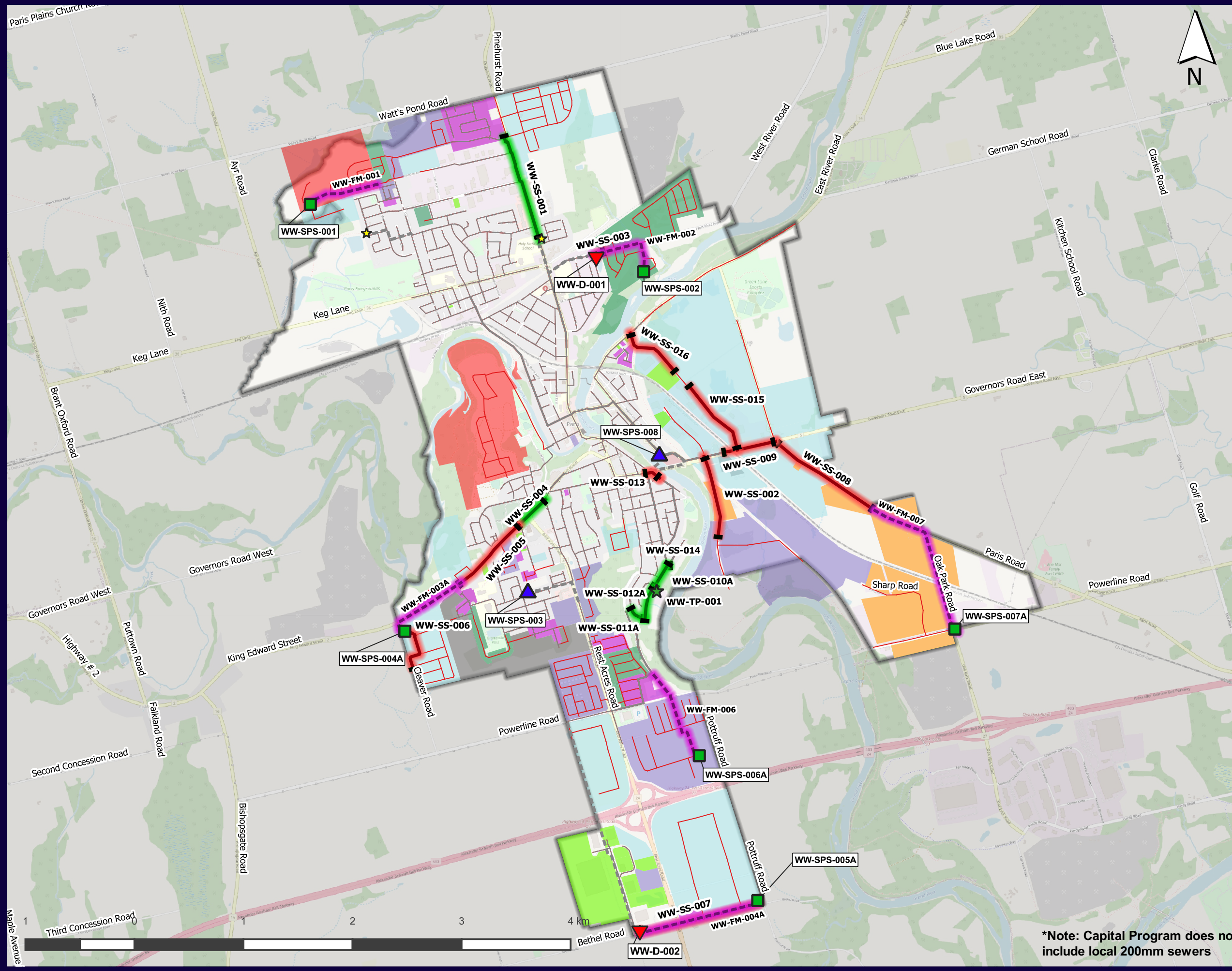


Figure 13 - Capital
Planning Horizon

Legend

- Settlement Area Boundary
- Development Status**
- Before LPAT
- Constructed
- No Planning Act Application
- Proposed - with DP
- Proposed - with DPA
- Registered
- Under Construction
- Under Review
- Existing Septic Lands
- Sanitary Mains**
- Existing - Trunk Sewer
- Existing - Local Sewer
- Existing - Forcemain
- Growth - Trunk Sewer
- Growth - Local Sewer
- Upgrade
- New
- Future - Forcemain (CPH)
- Facilities**
- Existing (No Change)
- Decommission
- New
- Upgrade
- Water Pollution Control Plant - Upgrades



*Note: Capital Program does not
include local 200mm sewers

9 Preferred Stormwater Servicing Strategy

Pending development within and around Paris, the County has required developers to submit site plans for review. Some lots have opted to combine their stormwater servicing efforts and have submitted site plans accordingly as the County's approach to stormwater management has changed from site specific stormwater management to area specific stormwater management. GM BluePlan GMBP has taken these submitted site plans into consideration when determining the stormwater servicing options. When necessary, consideration was given so that each sub-area of Paris had a designated emergency overflow route. As well, lots that were not located in direct proximity to a watercourse or natural heritage feature were flagged as causing a potential issue for obtaining a legal outlet. After consultation with the Grand River Conservation Authority (GRCA), it was determined that areas with direct proximity to the Grand River do not require quantity control and can directly discharge into the river. If there is an adjacent natural feature in this same area, the remainder of the flows must be directed to discharge directly into the natural feature to maintain water balance.

The lots within the growth areas were classified into five categories:

- Infill/already serviced
- No draft plan but opportunity for collaboration
- No draft plan, stormwater management likely managed independently
- Draft plans where stormwater management managed on-site
- Draft plans working together

Amongst these five categories, three major sub areas that did not have submitted draft plans at the time of this study were identified, and servicing options for these areas were created: East Paris, Southeast Paris, and South Paris as shown in **Figure 14**. Each of these subsections are described in detail in **Technical Appendix 8**.

Figure 14:
Stormwater Servicing Options

Legend

Stormwater

Existing SWM Ponds

Gurney Outlet

Storm Sewers

Future SWM Ponds

Potential SWM Facility

Future SWM Facility (per Draft Plan)

Growth Areas

Infil/Already Serviced

No Draft/Concept Plan but opportunity for collaboration

No Draft/Concept Plan, SWM likely managed independantly

Draft/Concept Plans where SWM managed on-site

Draft/Concept Plans working together

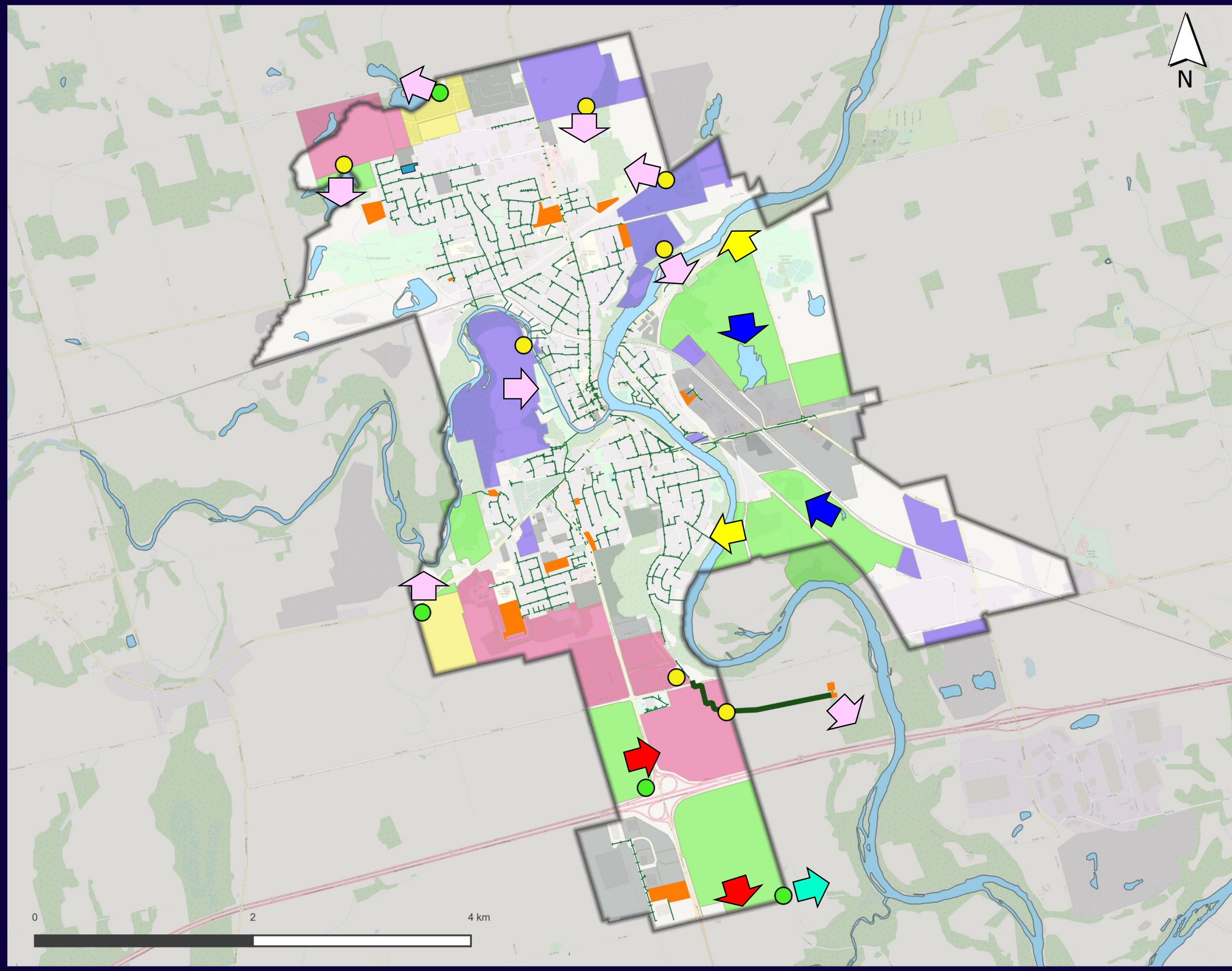
Clean water discharge to maintain water balance

Direct Discharge to Grand River/no quantity control

Direct outlet to natural feature

Possible Outlet Legality Issues

Emergency Overflow Route



10 Capital Program & Implementation

Technical Appendix 9 provides a detailed summary of the recommended capital program and implementation program. Highlighted in the provided capital program is as follows:

- Project Cost Breakdown
- Development Charge Contribution
- Project Timing and Triggers
- Area Servicing Costs