Maple Grove Water System Class EA

Addendum Report

Project Location:
Maple Grove, Cambridge ON

Prepared for:
Regional Municipality of Waterloo
150 Frederick Street
Kitchener ON

Prepared by:
MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

May 20, 2026

MTE File No.: 33591-101

Engineers, Scientists, Surveyors.

Contents

Tables

Figures

Appendices

1.0 INTRODUCTION

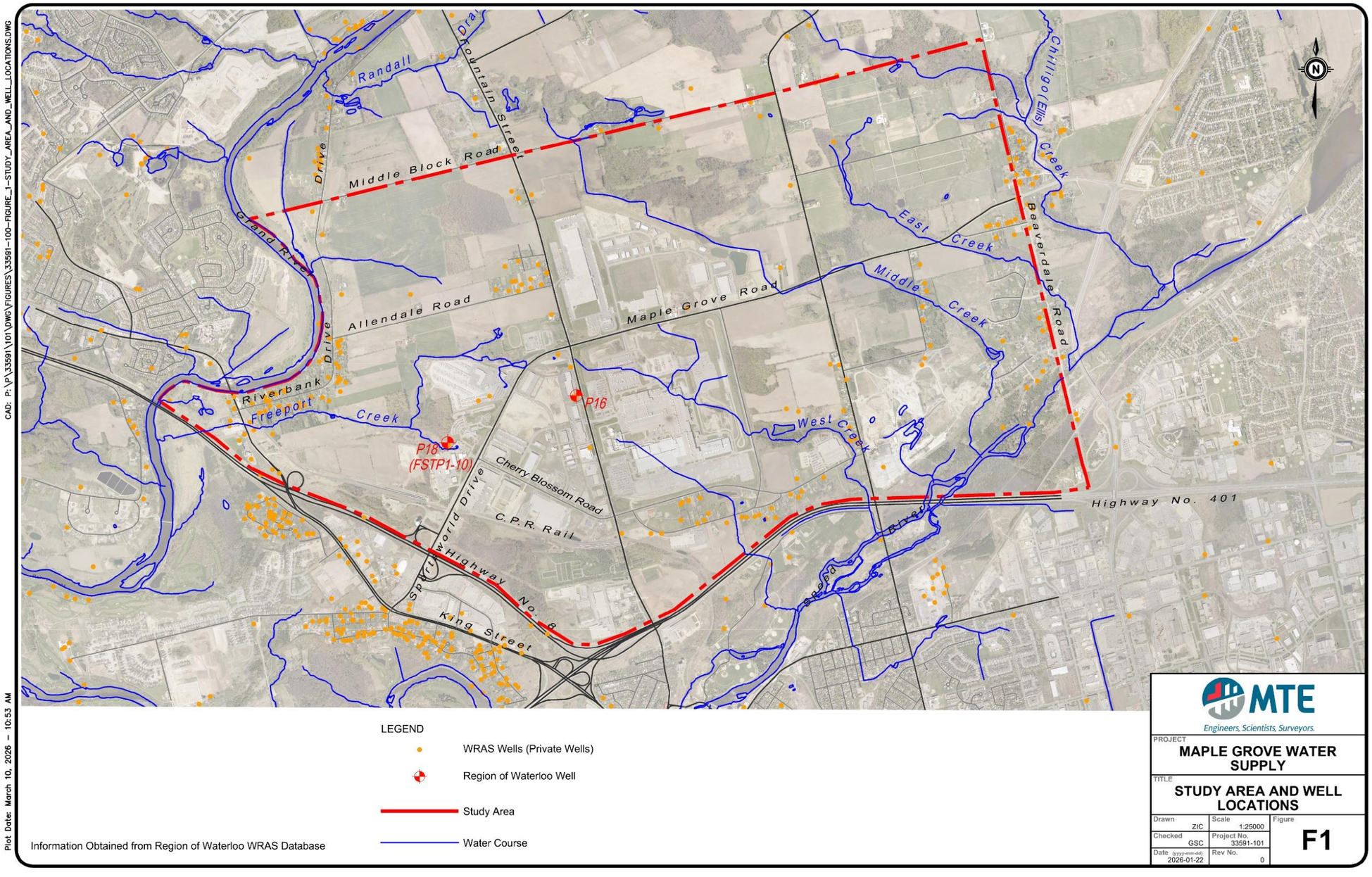
The Region of Waterloo (ROW) is responsible for the water supply for its seven local area municipalities, which represent a population of approximately 700,000 people. To appreciate the context of this Maple Grove Water System Class EA Addendum Report, a brief history is provided.

In June 2003, ROW Council approved the Regional Growth Management Strategy which outlines an overall strategic direction for the long-term management of growth within ROW to 2041 and identifies where, when and how future residential and employment growth will be accommodated. In 2005 the Province of Ontario enacted the Places to Grow Act, and in 2006 the Ministry of Public Infrastructure Renewal published the Growth Plan for the Greater Golden Horseshoe identifying the ROW as one of the "growth plan areas" with a growth plan forecast for ROW to grow to a population of 729,000 by 2031. In anticipation of this projected growth, ROW initiated the Integrated Urban System Groundwater Supply Optimization and Expansion Project (IUS Study) in 2005 to identify possible water sources. The IUS study proposed to develop an additional 22.9 million litres of water per day (MLD) from new and underutilized wells within the ROW's existing well fields and another 22.9 MLD from new areas.

One of the potential new groundwater source areas identified was the Fountain Street Well Field in the City of Cambridge. Groundwater testing completed as part of the IUS Study showed positive potential for additional water supply.

In 2009, ROW initiated a Schedule C Municipal Class Environmental Assessment (Class EA) study to determine the optimal water supply source in the Fountain Street Well Field. The Class EA was completed in 2014. The Study Area of the Class EA included production Well P16 and Test Well FSPT1-10 (henceforth referred to as Well P18). The Study Area and well locations are shown in **Figure 1.0**.

Figure 1 - Study Area and Well Locations



The Class EA identified several water supply scenarios. The preferred alternative solution and design concept, as documented in the 2014 Environmental Study Report (ESR), included:

- Retrofit of Well P16.
- Completion of Well P18 as a new supply well.
- Treatment of raw water at the P18 site. Raw water from Well P16 is to be pumped to P18 site, combined with raw water from P18, treated at the proposed Maple Grove Water Treatment Plant, and
- New watermain connection to the distribution system on Maple Grove Road.

Since completion of the 2014 ESR, the ROW has renewed interest in incorporating existing water supply sources into the IUS to address anticipated future water demand. Both Wells P16 and P18 are developed wells and have an estimated total sustained water supply rate of 83 litres per second (L/s). Neither well is currently in active service.

MTE Consultants Inc. (MTE) was retained by the ROW in February 2024 to complete an addendum to the Class EA (EA Addendum). Since the date of issuance of the Notice of Completion for the Class EA exceeds 10 years, *the proponent shall review the planning and design process and the current environmental setting to ensure that the project and the mitigation measures are still valid given the current planning context.*[1] This EA Addendum was prepared to satisfy this requirement.

1.1 Objectives

The objectives of this EA Addendum are to:

- Review the Class EA in the context of the current environmental, social, and economic environment.
- Compare the current conditions to those described during the Class EA.
- Verify that the preferred alternative design concept and recommended mitigation measures outlined in the Class EA remain valid.

1.2 The MCEA Process

The MCEA process is a proponent driven and project specific process established by the Municipal Engineers Association (MEA) to streamline the consultation process, while ensuring the requirements of the Environmental Assessment Act (2021) are met. The MCEA process includes completion of studies (e.g. natural environment, archeological) and consultation with the public and identified stakeholders. There are five (5) phases of the process, as outlined below:

- Phase 1: Problem/Opportunity Statement
- Phase 2: Development of Alternative Solutions
- Phase 3: Identification and Evaluation of Design Concepts
- Phase 4: Environmental Study Report
- Phase 5: Implementation

The MCEA process requires the following:

[1] Municipal Class Environmental Assessment, Municipal Engineers Association, March 2023

- Consultation with the public, review agencies, stakeholders, and Indigenous communities that have a potential to be affected by any proposed changes,
- Development of a reasonable number of alternatives,
- An evaluation of the alternatives to determine net advantage/disadvantage in accordance with a variety of criteria, and
- Documentation of the process, including all decision and evaluation processes, all consultation activities, and all communications provided and received.

A Schedule C Class EA is conducted for projects that involve the construction of new facilities and major expansions to existing ones and thus these projects undergo the full EA planning process. The Maple Grove Water System Class EA included the addition of a production well to the IUS and the construction of a Water Treatment Plant, thus a full EA planning process was undertaken. The Class EA was documented in the 2014 ESR completed by MTE.

1.3 Addendum Process

The Municipal Class Environmental Assessment (MCEA) process requires the preparation of an addendum to the Class EA should a 10-year period occur between filing of the ESR and commencement of construction and/or should any significant modification to the project (i.e. preferred alternative and design concept) be proposed or a change in environmental setting be encountered.

The mandates under the MCEA process for an addendum due to lapse of time include a review of the planning and design process as well as the current environmental setting to ensure that the project and the mitigation measures remain valid given the current planning context. The addendum shall also discuss any significant modifications to the project, describe the circumstances necessitating the change, the environmental implications of that change, and propose mitigation measures to address potential negative impacts.

Once completed, the addendum must be filed, alongside the ESR on the public record and a Notice of Filing of Addendum is to be published to advise potentially affected members of the Public and review agencies. In addition, a copy of the Notice of Filing of Addendum is to be sent to those who were notified while preparing the ESR.

A 30-calendar day review period is provided following the issuance of the Notice of Filing of Addendum for the Public and review agencies to provide comments on the proposed changes to the ESR.

1.4 Summary of Class EA

1.4.1 Phase 1: Problem/Opportunity Statement

The Class EA defined the problem statement:

> *The Provincial Places to Grow Act and the Region of Waterloo Growth Management Strategy will require additional water capacity in the sustainable water supply system. The Region of Waterloo has identified a potential high yield aquifer in the general area of Fountain Street and Maple Grove Road. This project will study the effects of collecting and distributing ground water from the Fountain Street and Maple Grove Road Area within the Waterloo Regional Integrated Water System and identify the preferred water supply configuration.*

The Study Area and location of Wells P-16 and P-18 are shown in **Figure 1.0.**

1.4.2 Phase 2: Development of Alternative Solutions

A 40-day constant rate pumping test was conducted to determine potential production yield of Well P18 ,Wells P16 and P18 combined, and raw water quality. Upon completion of the pumping test, it was determined that both Wells P16 and P18 would be suitable water supply sources. From the pumping test results, four alternatives were developed that would address the Problem Statement as summarized in **Table 1.2.2.**

Table 1.2.2 - Class EA Alternative Solutions

Alternative	Description
Alternative 1 Do Nothing	No improvements would be undertaken to address the problem statement. The new Well P18 water supply would not be brought online. No upgrades would be done to the Well P16 treatment system and ROW would continue to not utilize the supply available from Well P16.
Alternative 2 Rehabilitate Well P16 & Complete Well P18 as a Supply Well	Retrofit Well P16 well treatment process and combine it with the Well P18 groundwater supply for a total water supply of 83 L/s.
Alternative 3 Complete Well P18 as a Supply Well	Commission Well P18 and decommission Well P16 for a total supply of 60 L/s.
Alternative 4 Upgrade Well P16	Do not commission Well P18 and upgrade Well P16 treatment process for a total supply of 23 L/s.

Alternative 2 – Retrofit Well P16 and Complete Well P18 as a new supply well was selected in the Class EA as the Preferred Alternative.

1.4.3 Phase 3: Identification and Evaluation of Design Concepts

To refine the design details and implementation for the Preferred Alternative during the Class EA, four design concepts were developed as summarized in **Table 1.2.3**.

Table 1.2.3 - Class EA Design Concepts

Design Concept	Description
Design Concept 2a All Raw Water Treated at Well P16 Site	Raw water from Well P18 pumped to the Well P16 site to be combined with the supply from Well P16 to undergo further treatment before connecting into the existing distribution system on Fountain Street.
Design Concept 2b All Raw Water Treated at Well P18 Site	Raw water from Well P16 pumped to the Well P18 site to be combined with the supply from Well P18 to undergo further treatment before connecting into the existing distribution system on Maple Grove Road.

Design Concept 2c Treatment at both Wells P16 and P18 Sites	Raw water from Well P16 to be treated at the Well P16 site and connected into the existing distribution system on Fountain Street. Raw water from Well P18 to be treated at the Well P18 site and connected into the existing distribution system on Maple Grove Road.
Design Concept 2d Treatment at Freeport Water Tower Site	Raw water from Wells P16 and P18 to be sent via raw water transmission mains to the Freeport Water Tower site to undergo treatment before connecting into the exiting distribution system on Maple Grove Road.

Design Concept 2b was selected as the preferred concept. This concept was selected because:

- Centralized treatment allows for operational efficiency;
- Treatment is conducted at the larger water supply source site, which is more efficient and reliable;
- The location of the proposed Maple Grove Water Treatment Plant at the ROW Maple Grove Operations Centre is already serviced and ready-to-build, has sufficient space, is owned by ROW; and
- Design Concept 2b has the lowest capital and operating costs.

1.4.4 Phase 4: Environmental Study Report

A Notice of Completion was filed and the ESR was available for public review for 30 days from April 15, 2014 to May 14, 2014.

2.0 CHANGES IN ENVIRONMENTAL SETTING (2014-2025)

2.1 Property and Adjacent Property Uses

The two well sites (Wells P16 and P18) and the proposed Maple Grove Water Treatment Plant (WTP) site have not undergone any significant physical changes since 2014. The WTP site is located at the ROW Maple Grove Operations Centre immediately adjacent to Well P18.

Electrical power to the Well P16 site has been disconnected. The majority of on-site process and mechanical equipment is past its end of service life and would require replacement prior to restoring Well P16 into operation. The ROW has completed a condition assessment of the Well P16 building which should be reviewed/updated prior to connecting Well P16 into the WTP. The condition of the Well P16 building and site should be monitored for ongoing deterioration prior to connection. If such connection is delayed, repair or demolition of the building should be considered.

2.1.1 Potential Well Interference

The Class EA identified seven (7) private wells that may be subject to interference upon commencement of sustained water-taking from the Fountain Street Well Field. In addition to the seven wells identified during the Class EA, there are ten (10) new private wells within the Study Area and several unidentified wells with incomplete records which may be private water supply wells. These additional wells may also be subject to interference upon the commissioning of the Fountain Street Well Field.

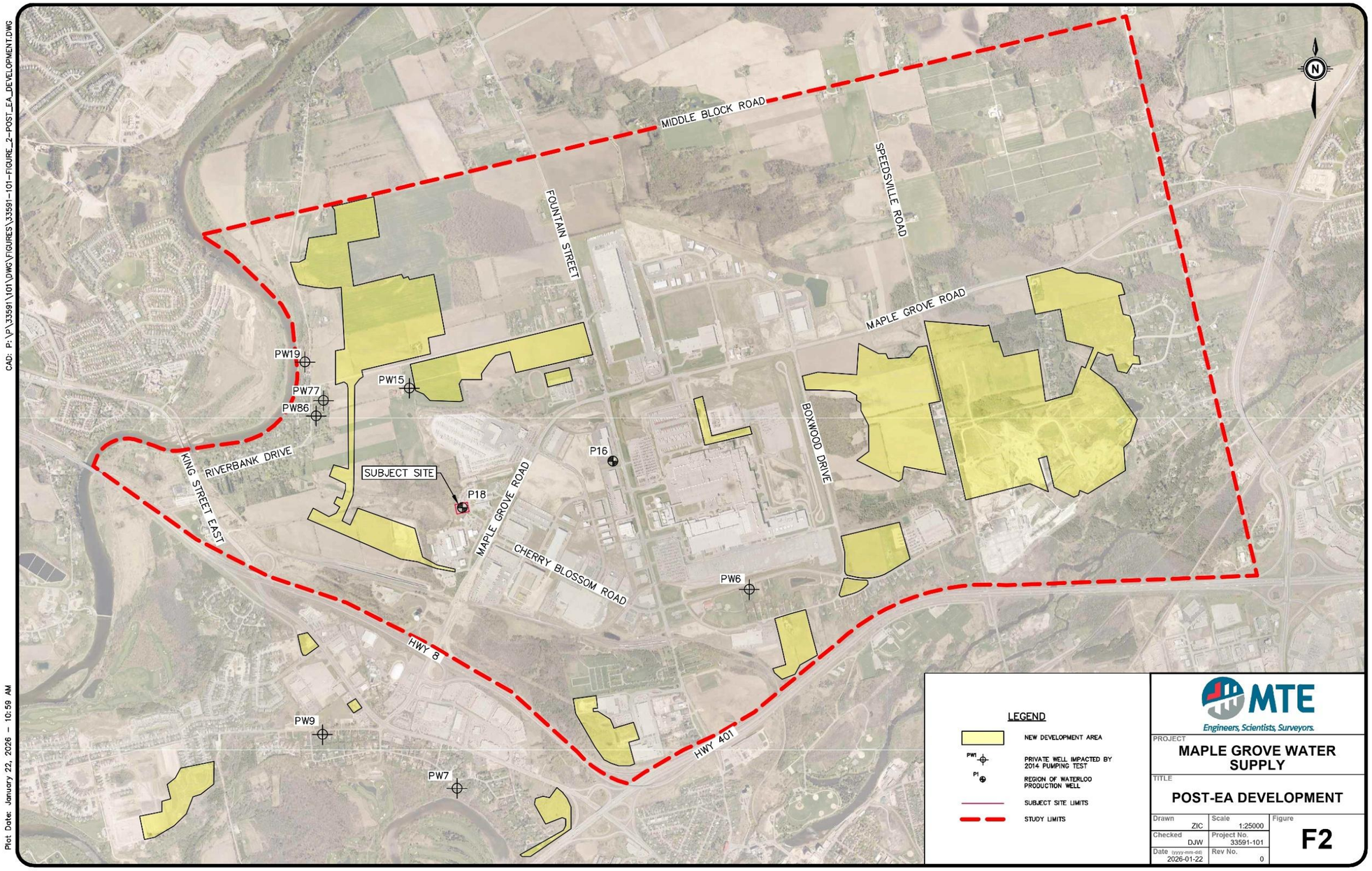
To further assess and categorize newly identified wells, it is recommended that the water well survey from the Class EA be updated. The data collected during the well survey will be analyzed to assess the potential for interference to occur at each well upon the commissioning of Well P18. If appropriate, mitigating measures should be identified and implemented prior to Well P18 commissioning. Post-commissioning well interference may be addressed in accordance with ROW's well interference complaint program which provides a robust response to well interference situations. The responses may include provision of a temporary water supply to the affected parties, financial compensation of costs, or conditions of the Permit to Take Water issued by the Ministry of the Environment Conservation and Parks (MECP). All wells are governed under the Ontario Water Resources Act.

Further information on the 10 private wells that were identified as part of the EA Addendum process are provided in Technical Memorandums 1 and 2, provided in **Appendix A** and **Appendix B**.

2.1.2 Other Considerations

New development in the Study Area and adjacent properties to the Wells P16 and P18 sites has occurred since completion of the Class EA. The new developments in the Study Area are shown on **Figure 2**. Continued development in the Study Area will extend municipal servicing and reduce the number of private wells relying on the aquifer.

Figure 2 - Post EA Development



2.2 Natural Environment

Background information on natural environment features outlines in the Class EA were provided by the local area municipalities, the Grand River Conservation Authority (GRCA), and the Ministry of Natural Resources (MNR), Guelph District. The Study Area has seven water courses, four significant wetland complexes, and an unevaluated wetland area. The water courses include; the Grand River, Speed River and five tributaries: West, Middle, and East Creeks, Ellis Creek, and Freeport Creek.

The Designated Natural Areas and Area of Natural and Scientific Interest (ANSI) within the Study Area are: the Maple Grove, West Creek, Speed River, and Ellis Creek wetland complexes, several woodlots, Freeport esker, and two licensed pit extraction areas in the lower end of the Middle Creek subwatershed.

The entire Study Area, as shown in **Figures 1 and 2**, was considered for the review of literature and background information during the Class EA; however, Natural Resource Solutions Inc. (NRSI) defined a refined area of focus to complete the detailed field studies. NRSI refined the area of focus to the potential zone of influence for the draw down cone of Well P18. This refined focus area was bounded to the north by Middle Block Road, south by King Street (Hwy 8) and Maple Grove Road, west by the Grand River and east by Fountain Street.

The Technical Report completed by NRSI concluded that there were no significant species, per Schedules 2 (Endangered Species), 3 (Threatened Species), and 4 (Special Concern Species) of O. Reg. 230/08 (Species at Risk in Ontario List). within the refined Study Area. The result of the survey indicated that both the Wells P16 and P18 sites were not within significant habitat areas and did not have any species at risk, significant species or species of interest within the site boundaries.

2.2.1 Source Water Protection

The Ontario Government passed the Clean Water Act (CWA) in 2006[2] to protect drinking water at its source throughout Ontario to ensure safe drinking water for all. Guided by the Lake Erie Region Source Protection Committee (LERSPC), the task of developing Source Water Protection Plans (SWPP) within the Grand River Watershed included the involvement of ROW among other stakeholders. Numerous technical groundwater and surface water studies identified how vulnerable regional aquifers are to contamination and identified four important categories for protection: Wellhead Protection Area (WHPA), Highly Vulnerable Aquifers (HVA), Significant Groundwater Recharge Area (SGRA), and Intake Protection Zone (IPZ). These studies formed the basis of the Approved Grand River Assessment Report[3]. The first three of these categories are directly pertinent to the Fountain Street Well Field. There is no IPZ required for the Fountain Street Well Field since it is a groundwater source.

An amendment to the Municipal Engineers Association (MEA) Class EA guidance, approved on October 7, 2015, requires that Municipal Class EA projects comply with the CWA policies set out in local SWPP. As such, this legislative change has occurred since the original Class EA was completed and filed in 2014. The amendment mandates that Class EAs assess the impact of Source Protection policies on affected parties and integrate technical work related to vulnerable areas concurrently with the Class EA process.

[2] Ministry of the Environment, 2006
[3] Grand River Source Protection Area – Assessment Report, 2025, Chapter 8: Region of Waterloo.

The Class Environmental Assessment, for the new Well P18, was completed in 2014 and has been incorporated into the Grand River Source Protection Plan (GRSPP)[4]. Several policy tools are provided by CWA for implementation of the policies to address the prescribed drinking water threats identified in O. Reg. 287/07.

Wellhead Protection Areas and Vulnerability Scoring

The Fountain Street Well Field is in the northwestern portion of the City of Cambridge and is comprised of two municipal wells identified as Wells P16 and P18. The Grand River Source Protection Area Assessment Report (June 2025) identifies vulnerable areas and water quality threats for Wells P16 and P18. The land area intrinsic vulnerability encompassing Wells P16 and P18 WHPAs is rated low. Both municipal wells are screened within the deep confined overburden aquifer identified by the Ontario Geological Survey as the Pre-Catfish Creek Sands and Gravels (AFD1)[5].

Approved WHPAs for Wells P16 and P18 have been delineated and are incorporated into the approved Grand River Source Protection Plan. Wells P16 and P18 are identified primarily with a Wellhead Vulnerability Level 2 and Level 4 score respectively, in those areas identified as "New Development Area" (**Figure 2**), which indicates a relatively low vulnerability of municipal water supplies to contamination within the specified Time-of-Travel zones. In 2019, there were 17 significant drinking water threats on eight (8) properties identified for this well field[6]. Municipalities implement Source Water Protection policies to protect existing and future sources of municipal drinking water. Source Water Protection policies include, for example, land use planning conditions, prescribed instrument policies, prohibition policies, as well as education and outreach programs[7]. Ongoing protection and monitoring is being implemented by the ROW.

In addition to delineating WHPAs, the GRSPP requires the delineation of areas that may pose a potential water quantity threat, which are defined as WHPA-Q1 and WHPA-Q2. A WHPA-Q1 zone is the area where the quantity of water supplying the municipal well(s) could be affected by other water takings. A WHPA-Q2 zone is defined as the area where the quantity of water supplying the municipal well(s) could be affected by modified activities that reduce recharge to the target municipal aquifer(s). The Fountain Street Well Field largely falls outside both WHPA-Q1 and WHPA-Q2 areas[8].

The Fountain Street Well Field is subject to approved Wellhead Protection Areas under the Grand River Source Protection Plan, where source protection policies are implemented to protect the municipal drinking water supply Wells, P16 and P18. The ROW is in compliance with the Clean Water Act, and the requirements of the 2015 MEA Class EA guidance have been satisfied. Accordingly, no additional source water protection measures or assessments are required as part of the EA Addendum.

2.2.2 Groundwater Under the Direct Influence (GUDI) of Surface Water

In 2019, the MECP released a draft GUDI Terms of Reference (TOR) assessment update entitled, "Terms of Reference for Determination of Minimum Treatment for Municipal Residential Drinking Water Systems Using Subsurface Raw Water Supplies". This draft TOR is in the process of being fully implemented by the Ministry. Accordingly, MTE reviewed the requirements of the draft TOR with respect to the Class EA.

[4] Grand River Source Protection Plan – Source Protection Plan Volume II, Chapter 10, 2025.
[5] Bajc and Shirota, 2007, pp. 30.
[6] Grand River Source Protection Area – Assessment Report, 2025, Section 8.5.4, pp.8.5-88.
[7] Grand River Source Protection Plan – Source Protection Plan Volume I, 2025.
[8] Grand River Source Protection Area – Assessment Report, 2025, Chapter 19.

The TOR provides guidance for the enhanced treatment of viruses and bacteria (i.e. protozoa) through removal and/or inactivation. The TOR categorizes water supply sources into categories (groundwater, GUDI with effective filtration, and GUDI) prescribing conditions and minimum levels of treatment for pathogens. The TOR does not propose changes to the methodology on GUDI assessments.

Part of the scope of work conducted in the Class EA was to evaluate Wells P16 and P18 to determine if they are GUDI wells. The monitoring conducted during the 2010 40-day pumping test included raw water quality testing for bacteria, turbidity, and continuous particle measurements. Based on MTE's hydrogeological assessment in 2014, Wells P16 and P18 were deemed to be non-GUDI wells in accordance with the Hydrogeological Study to Examine Groundwater Sources Potentially Under Direct Influence of Surface Water (MECP, 2001).

MTE has reviewed the 2014 GUDI Assessment in light of the TOR and confirmed that the 2014 GUDI Assessment is still valid. Both Wells P16 and P18 have been demonstrated to be non-GUDI. Further discussion on this assessment is provided in **Appendix A** – Maple Grove Water System Class Environmental Assessment Addendum Background Information Review.

2.2.3 Well Testing and Rehabilitation

Class EA

In April 2011, as part of the Class EA, Well P16 was rehabilitated through EnerJet treatment and airlift development to remove crustation and fouling and to complete mechanical swabbing of the well. The rehabilitation activities were successful at removing fouling and scaling of the well screen and associated gravel pack. The variable step tests performed indicated no significant change in efficiency pre- and post-rehabilitation.

In May 2011, as part of the Class EA, a 40-day pumping test of Well P18 was initiated at 60 L/s. Well P16 was started at Day 25 of the 40-day pumping test at 10 L/s and increased to 23 L/s at Day 33 of the 40-day pumping test. Days 33 to 40 were completed at combined 83 L/s.

The results of the long-term pumping test indicated that long term pumping from Well P18 at 60 L/s was sustainable. Pumping of Well P16 was added at Day 33 for a combined pumping rate of 83 L/s and maintained for seven (7) days until the end of the testing program for Wells P16 and P18. The 2011 pumping test program during the Class EA concluded that the deep aquifer appeared to be able to sustain a yield of 83 L/s.

The two municipal wells, Wells P16 and P18, have remained dormant since testing was completed in 2011. In September 2024, MTE and Lotowater Technical Services conducted a testing program consisting of a short-term pumping test at each well. The purpose of this testing program was to confirm the water capacity (23 L/s – Well P16, 60 L/s – Well P18) and raw water quality from Wells P16 and P18, and to report on any substantive changes from testing completed during the Class EA. The data collected as part of this scope of work is discussed further in letter report *Wells P16 and P18 2024 Pumping Test and Rehabilitation* (MTE, April 11, 2025), included in **Appendix C.** The letter report includes a comparison between the current raw water quality from Wells P16 and P18 and raw water quality data collected in 2011.

Neither Well P16 nor Well P18 revealed concerns during the 2024 pumping test program. Both wells responded similarly to the pumping test performed during the Class EA. The observed capacity of Wells P16 and P18 during the short-term 2024 pumping test was similar to that observed during the 40-day test completed in 2011. The raw water quality results for Well P18 were comparable to the 2011 results. The Well P16 water quality was degraded in 2024 compared to that found in 2011 with higher concentrations of total dissolved solids (TDS),

hardness, iron, manganese, sodium and chloride. The water quality results for both wells are discussed further in Section 3.0.

2.3 Cultural Environment

Identified heritage features in the Class EA were 1.5 km Wells P16 and P18.

A Stage 1 archaeological assessment was completed as part of the Class EA. There were no significant findings within the Study Area.

3.0 CHANGES TO PROJECT: REVIEW OF DESIGN BASIS

3.1 Drinking Water Quality Regulations

The latest amendments to the Ontario Drinking Water Quality Standards (ODWQS), along with aesthetic objectives (AOs) and Operational Guidelines (OGs) were made in 2016[9]. The amendments revised the Maximum Acceptable Concentration (MAC) for dioxin and furan, ethylbenzene, selenium, tetrachloroethylene, toluene, trihalomethanes, and xylenes. Schedule 3 (Radionuclides) was also revoked and substituted.

Health Canada has published or re-affirmed MAC and Aesthetic Objectives / Operational Guidelines (AO/OG) for several parameters since 2014 in its Guidelines for Canadian Drinking Water Quality (Health Canada Guidelines)[10] that differ from the ODWQS. In the past, the ODWQS have been modified based on changes to the Health Canada Guidelines, thus the Guidelines are shown for illustrative purposes. The ODWQS are the governing standards for water quality in Ontario. Of the parameters analysed from the water samples of Wells P16 and P18, **Table 3.1** illustrates the differences between the Health Canada Guidelines and ODWQS for parameters with updated values since 2014.

Table 3.1 - ODWQS and Health Canada Guidelines Comparison for parameters with updated values since 2014

Parameter	Year of updated value	Health Canada Guidelines		Year of updated value	ODWQS	
		MAC	AO/OG		MAC	AO/OG
		mg/L	mg/L		mg/L	mg/L
Aluminum (Al)	2021	2.9	0.1	2006		0.1
Copper (Cu)	2019	2	1	2006		1
Iron (Fe)	2024		0.1	2006		0.3
Lead (Pb)	2019	0.005		2003	0.01	
Manganese (Mn)	2019	0.12	0.02	2006		0.05

[9] Ministry of the Environment, O.Reg. 169/03
[10] Guidelines for Canadian Drinking Water Quality, Summary Tables, October 2024

Parameter	Year of updated value	Health Canada Guidelines		Year of updated value	ODWQS	
Selenium (Se)	2014	0.05		2018	0.01	
Strontium (Sr)	2019	7		N/A		

Ontario has not established MACs for Al, Cu, Mn, or Sr and it is not clear if or when it will modify the ODWQS for these parameters.

The 2019 draft GUDI TOR suggested that changes to the Disinfection Procedures for drinking water will likely be implemented in the future. The suggested changes affect the disinfection requirements for groundwater, such that 4-log inactivation of viruses would be required rather than 2-log inactivation. The implementation timeline for this change is not yet known.

3.2 Well Water Quality

Water from Wells P16 and P18 was sampled and analysed for bacteria, metals, anions, general chemistry, nutrients, pharmaceuticals, volatiles, dioxins and furans, and organics during the 2011 well testing, as part of the Class EA. The water in both wells contained no e-coli, total coliforms, pharmaceuticals (nitrilotriacetic acid – NTA), volatiles, dioxins and furans, and organics. Samples were collected from Well P16 post-rehabilitation.

Water from Wells P16 and P18 was sampled and analyzed for anions and nutrients, metals, and general chemistry during the 2024 well pump tests and rehabilitation. Samples were collected from Well P16 post-rehabilitation.

The 2011 and 2024 sampling events indicated that water from Well P16 did not contain concentrations that exceeded any parameter analysed with a ODWQS MAC. In both the 2011 and 2024 sampling events, water from Well P16 exceeded the ODWQS AO/OG for four and five parameters, respectively, as listed in **Table 3.2**.

Table 3.2 - Well P16 Water Quality: 2011 and 2024 Comparison

Parameter	ODWQS AO/OG (mg/L)	2011 Concentration (mg/L) – during 40-day Test	2024 Concentration (mg/L)
Hardness	80-100	390 - 426	602 - 610
TDS	500	490 - 570	982 - 1030
Chloride	250	58 - 71	332 - 348
Iron	0.3	0.22 – 0.64	0.98 - 1.3
Manganese	0.05	0.10 – 0.13	0.153 - 0.175

The 2011 and 2024 sampling events indicated that water from Well P18 did not contain concentrations exceeding any parameter analysed with a ODWQS MAC. In both 2011 and 2024

sampling events, water from Well P18 exceeded the ODWQS AO/OG for hardness and iron, as listed in **Table 3.3.**

Table 3.3 - Well P18 Water Quality: 2011 and 2024 Comparison

Parameter	ODWQS AO/OG (mg/L)	2011 Concentration (mg/L)	2024 Concentration (mg/L)
Hardness	80-100	268 - 306	276 -280
Iron	0.3	0.41 – 0.49	0.64 – 0.66

The well water quality analytical results are included in the letter report provided in **Appendix C**. Further discussion on the well water quality is included in Technical Memorandum 1 provided in **Appendix A**.

3.3 Water Treatment Implications

The Class EA recommended that the water from the combination of Wells P16 and P18 be treated for iron and manganese in a WTP located adjacent to Well P18. The treatment methods recommended were chemical oxidation and pressurized filtration with backwash capabilities. The concentrations of iron and manganese in the well waters collected during the 2024 sampling events indicate the recommended treatment method is still appropriate. Chemical oxidation and pressured filtration are suitable technologies to reduce the iron and manganese concentrations to below the ODWQS AO values based on the current water quality and is currently adopted by the ROW at many of its other WTPs

Hardness, TDS, and chloride are not required to be treated in municipal water treatment systems. Elevated hardness concentrations in ROW drinking water is common typically affecting aesthetics at elevated concentrations.

As noted in **Section 3.1**, 4-log inactivation of viruses may be required in the future for groundwater. This is an increased treatment requirement from the 2-log inactivation required at the time of the Class EA. The additional inactivation can be achieved by providing longer contact time with the chlorine in the treated water reservoir downstream of the filtration process. As a result, the treated water reservoir will be larger than anticipated in 2014.

This treatment modification would be required and implemented regardless of which of the Class EA Alternatives were selected as the Preferred Alternative during the EA Addendum. No new environmental impacts result from the proposed treatment modifications that would not otherwise be required under the other Class EA Alternatives. As such, the Preferred Alternative is not subject to reassessment based on the changes to the treatment process.

3.4 Status of Design Concept

3.4.1 WTP Capacity and Preferred Alternative

The well testing and rehabilitation undertaken in 2024 confirmed the capacities of Wells P16 and P18 at 23 L/s and 60 L/s, respectively. These capacities were initially determined during the Class EA. Thus, there is no change to the recommended WTP capacity.

Similarly, the Preferred Alternative remains unchanged from what was outlined in the ESR. The preferred Design Concept to implement the Preferred Alternative, as discussed in Section 1.2.3, was described in the ESR as follows:

- *The completion of FSTP1-10* (Well P18) *as a full production well;*
- *The construction of a treatment building at the FSTP1-10* (Well P18) *well site to contain a primary and secondary chlorine disinfection system, pressurized filters, pumps, blowers and all auxiliary equipment to provide a treated water supply sized to accommodate Wells P16 and FSTP1-10* (Well P18) *groundwater supply for a total flow rate of 83 L/s;*
- *Connection to sanitary sewer system for filter backwash;*
- *Well P16 pump sized to accommodate a flow rate of 23 L/s;*
- *Installation of a raw water transmission main between P16 and FSTP1-10* (Well P18) *sized to accommodate a flow rate of 23 L/s ; and*
- *Installation of a watermain between the FSTP1-10* (Well P18) *treatment building and the existing 600 mm diameter Regional trunk watermain on Maple Grove Road.*

The Preferred Alternative recommends development of Wells P16 and P18 with a WTP discharging into the existing distribution system on Maple Grove Road. As such, this new water supply would form part of the Mannheim Service Area within the IUS.

Based on the review of the Class EA and the work conducted as part of the EA Addendum, the Preferred Alternative is still recommended. . However, the following modifications to the implementation of the Preferred Alternative have been identified:

- Due to the challenging Well P16 water quality observed in 2024, it is recommended to defer Well P16 commissioning pending further study and identification of mitigating actions; and
- Defer installation of a raw water transmission main between Well P16 and WTP with future installation timing to coincide with Well P16 commissioning.

3.4.2 Water Treatment Plant Design Concept

There have been no changes to the Preferred Alternative, however, MTE has updated the layout of the WTP site, building and reservoirs based on current design standards to confirm the feasibility of the Preferred Alternative. Note that the design concept is subject to confirmation and revision during subsequent design phases. The enclosed **Figures 3 and 4** indicate that it is feasible to implement the Preferred Alternative on the originally proposed site.

3.4.2.1 Site Plan

Figure 3 provides the conceptual site plan. In addition to the watermains, shallow servicing (storm sewers, electricity, and communications) will be provided for the WTP. As described in Section 3.4, Well P16 connection will be deferred. Specific site design considerations such as vehicle access to WTP and potential well house at Well P18 will be addressed during the design phase of the project.

3.4.2.2 Water Treatment Process

Figure 4 shows a potential layout for the WTP building including the treatment equipment; chemical storage; reservoirs; washroom; and electrical room. The WTP will include chlorine dosing equipment for oxidation of iron and manganese as well as providing disinfection. A

horizontal, greensand plus pressure filter will be provided similar to another ROW installation. The filter will be backwashed on a regular basis and the backwash will be allowed to settle such that the supernatant can be recovered and re-used. The settled solids will be pumped from the settling tank to the sanitary sewer.

The WTP will have a separate tank for backwash water supply so that near-continuous operation of the treatment system can be achieved without interruptions to facilitate backwashing. Separate tanks will also be provided for raw water oxidation; backwash settling; and treated water chlorine contact time.

Pumps will be provided to facilitate filtration, backwashing, sludge disposal, backwash water recovery, and discharge into the water distribution system.

4.2.2.3 Sanitary and Storm Sewers

Occasionally during maintenance activities, it is necessary to operate the well(s) or the treatment system without discharging the water into the distribution system. These maintenance activities generate unusable water that must be disposed as a precautionary measure. Accordingly, outlets will be provided to discharge this water, pending quality, into the storm sewer or the sanitary sewer.

4.2.2.4 Capital Cost Estimate

A capital cost estimate for the design concept is presented in **Appendix D**. This estimate is current as of 2026.

Figure 3 - Conceptual Site Plan

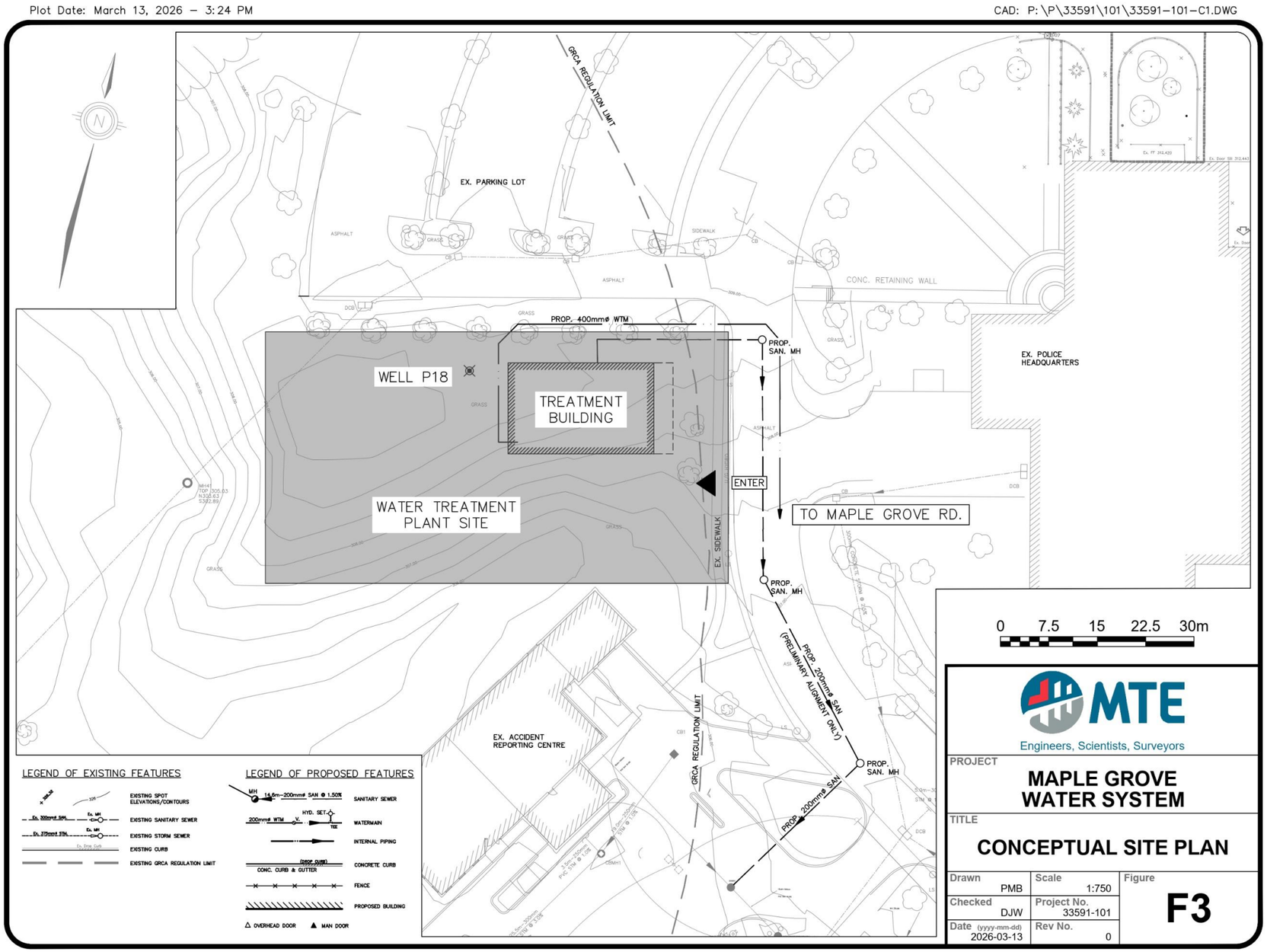
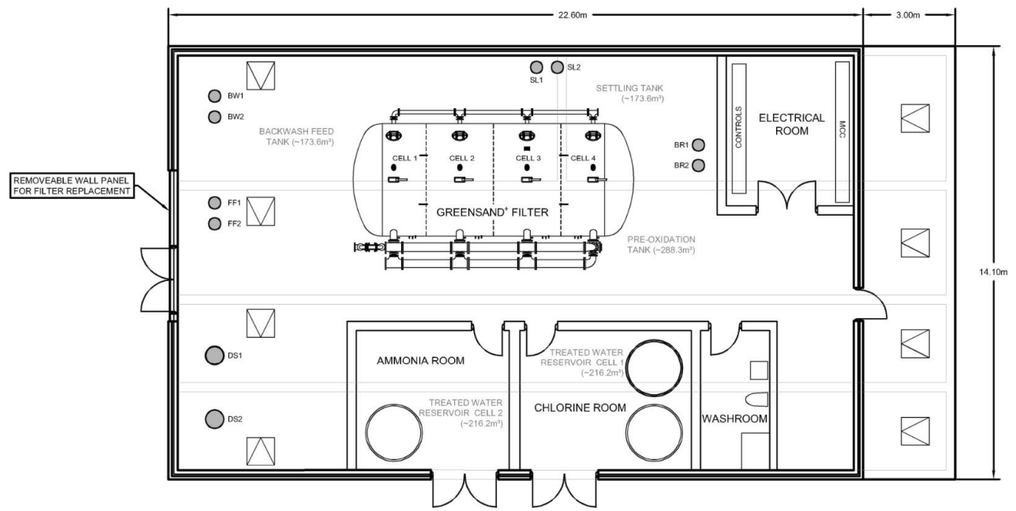
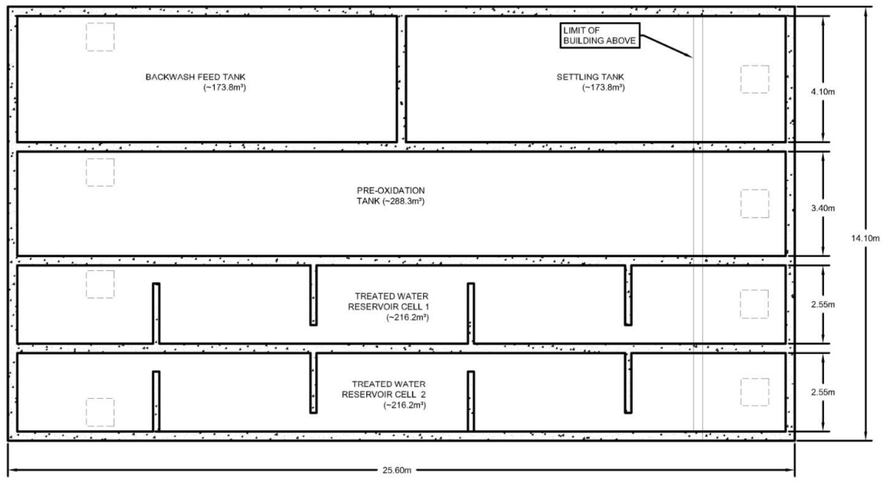


Figure 4 - Conceptual Building Layout

Plot Date: March 13, 2026 – 11:43 AM

CAD: P:\P\33591\101\33591-101-P1.DWG





LEGEND OF PROPOSED FEATURES

- PUMP
- ACCESS HATCH
- CHEMICAL STORAGE

Engineers, Scientists, Surveyors.

PROJECT	MAPLE GROVE WATER SUPPLY
TITLE	CONCEPTUAL BUILDING LAYOUT
Drawn: ZIC	Scale: 1:200
Checked: DJW	Project No.: 33591-101
Date (yyyy-mm-dd): 2026-01-16	Rev No.: 0
	Figure: F4

4.0 CLIMATE CHANGE

The ESR completed in 2014 did not directly consider the impacts of climate change. The MECP has since published the Consider Climate Change in the Environmental Assessment Process Guide (2017) which provides the Ministry's expectation for considering climate change in the preparation, execution, and documentation of environmental assessment studies and processes.

The following mitigation and adaptation strategies are for consideration for inclusion as design features during the detailed design phase of the project.

4.1 Climate Change Mitigation

Climate change mitigation are the measures taken to reduce the project's expected production of greenhouse gas (GHG) emissions and impacts on carbon sinks. The project's GHG emissions can be defined as operating carbon (emitted during the operation of the WTP) and embodied carbon (emitted during the manufacturing and construction of the WTP). A WTP's operating carbon consists of direct emissions from combustion of fossil fuels on site (e.g., gas for space heating) and indirect emissions from consuming energy that was generated from off-site combustion of fossil fuels (e.g., electricity generated from gas power plants).

4.1.1 Direct Emissions

Direct emissions can be mitigated by reducing the heating demand on site through increased insulation, demand-controlled heating, solar thermal pre-heat for ventilation and heat recovery ventilators. Direct emissions may be reduced or eliminated by selecting electricity-based heating using heat pumps. Groundwater maintains a relatively consistent temperature, thus the incoming water is stable for a water source heat pump. Heat from the incoming water could potentially be extracted by the heat pumps in winter to provide space heating to the plant and heat from the building rejected to the incoming water in the summer to provide efficient space cooling.

4.1.2 Indirect Emissions

Indirect emissions can be mitigated by reducing the electricity consumption on-site through energy efficiency measures such as selecting high efficiency motors for the pumps, utilizing variable speed drives on pumps, and decreasing backwashing frequency. Optimizing operations by reducing high-lift pump operation during filter backwash cycles can also be considered to reduce the peak energy demand of the WTP.

As the operating carbon of a facility is reduced through energy efficiency measures and fuel switching, the embodied carbon is the majority of a facility's lifetime GHG emissions and has the greatest impact as it is entirely emitted before the facility is operational. Concrete and steel are the largest contributors to a building's embodied carbon content, and this is especially true for WTPs. Adjustments in specifications for these materials can have major reduction in a WTP's embodied carbon. Specifications could include requirements that the steel be manufactured by electric arc furnaces on a low emissions power grid. This would result in less carbon emissions than traditional oxygen furnaces. Similarly, the embodied carbon content of concrete can be reduced by up to 50% by different mixing methods, recycled aggregate, reduced cement levels, controlled particle size distribution, and using concrete as a finishing material. Inclusion of these elements within the preferred design concept may be evaluated at the detailed design stage.

Impacts on carbon sinks are landscape changes that affect the removal or storage of carbon dioxide from the atmosphere. Construction of the WTP could alter the landscape's ability to store carbon or remove carbon dioxide from the atmosphere. Mitigation measures to reduce the impact of this project on carbon sinks may include preserving green space during construction and tree planting after construction is complete.

4.2 Climate Change Adaptation

Climate change adaptation refers to the resilience or vulnerability of the Maple Grove WS to changing climatic conditions. Impacts of climate change on municipal water and wastewater projects include property-specific concerns such as flooding and system-wide impacts on water demand and electricity consumption.

Other potential changes to the Maple Grove WS because of climate change include:

- Increased concentrations of sodium and chloride in aquifers due to road salting in developed areas in proximity to the wells
- Reduced recharge of groundwater due to increased frequency and/or intensity of drought events
- Increased solids and particulate matter in groundwater due to changes in aquifer recharge. This can affect settling and filtration processes.

5.0 SUMMARY OF ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION MEASURES

The Class EA stated that significant environmental impacts were not anticipated. It recommended some mitigation measures to reduce construction related impacts. These mitigation measures are listed in **Table 5.1**. They have been reviewed, modified, and supplemented as necessary based on the findings of the EA Addendum.

Table 5.1 - Impact and Mitigation

Potential Impacts	Mitigation Measures
Traffic Management	An access route to and from the construction sites will be designated and all construction vehicle traffic will be restricted to this route. In addition, public access to the construction sites will be restricted and appropriate signage will be posted at the entrance to the work sites and, where necessary, a barrier or gate with a lock installed. Notices of proposed construction works and potential traffic impacts will be sent to the public and local business. Close coordination with existing regional land users will also be required.
Traffic Management	It is not anticipated that there will be any major traffic delays or detours required to complete the proposed works. However, for any construction works within the right-of-ways of Maple Grove Road or Fountain Street (i.e. raw watermain installation, service connections), the Contractor will be required to complete a Traffic Management Plan in accordance with Ontario Traffic Manual - Book 7, including appropriate barriers and signage. Traffic management within the Regions Maple Grove complex will be required.

Potential Impacts	Mitigation Measures
Archaeology	Although, the Stage 1 Archaeological Assessment completed as part of this EA did not identify any archaeological and/or historical resources present in the Study Area, if resources are discovered during the performance of construction work, the performance of the work in the area of the discovery will halt. The Ministry of Culture (Archaeological Unit) will be notified for an assessment of the discovery. Work in the area of the discovery would not resume until cleared to do so by the Ministry.
Noise-Vibration	Construction operation working hour restrictions are not anticipated since the surrounding area is primarily industrial and there are no residential homes in proximity to the proposed works. However, the contractor will be required to adhere to local noise by-laws.
Contamination of Soils Through Spills and Leaks	This can be avoided by ensuring that fuel storage, refueling and maintenance of construction equipment is properly handled and does not occur in or directly adjacent to watercourses/bodies, or Well P18. For example, fuels, oils, chemicals and other toxic substances will be stored in areas far from surface waters, positive drainage areas and wetlands. Water used to clean trucks, chutes, and mixers will not be allowed to enter surface waters. Contingency plans must be prepared before projects begin for the control and clean-up of a spill. The construction supervisor will consult regulatory agencies in determining emergency clean-up operations in the event of an accidental spill. The setting of the Well P18 site is located on a high point and the proposed site operations around the well with respect to water treatment maintenance is not likely to include large chemicals that would be a risk to the water supply.

Potential Impacts	Mitigation Measures
Sediment Deposition	Preparation of an erosion and sediment control plan will ensure grading, drainage and structural operations during construction prevents sedimentation of sensitive areas. This plan should be reviewed by the Ministry of Natural Resources and Grand River Conservation Authority and be consistent with the recommendations contained within the MECP "*Guidelines for Evaluation Activities Impacting Water Resources*." The plan should include the following: • Rock checks (OPSD 219.210) or silt fence flow checks (OPSD 219.190) should be placed in all ditches flowing toward watercourses and immediately upstream of the discharge into a watercourse. • The integrity of all sediment trapping devices should be monitored regularly (weekly and following rain events) and properly maintained. Such structures should be removed only after the soils of the construction areas have been stabilized and then only after the trapped sediments have been removed. • Any areas disturbed by construction will be restored and stabilized as soon as practically possible. All excavated material requiring stockpiling should be placed in predetermined locations. The perimeters of stockpiles should be encircled with silt fencing according to OPSD 219.110. • Excess silt fence, straw bales and rip-rap should be maintained on site, prior to the commencement of grading operations and throughout the duration of construction, in case of emergency (sediment spill, etc.). • Post construction; restore areas affected with plantings of native trees and shrubs that would complement the existing conditions of the wetland as soon as possible.

Potential Impacts	Mitigation Measures
Well Monitoring	Ongoing water level and water quality monitoring at select monitoring locations within the Study Area will be implemented as part of this project. Exact monitoring locations will be determined based on previous investigations, proposed development within the study area and the existing monitoring well network within the regional aquifer. This will allow for the collection of water level data in the aquifer prior to the development of the Well P18 water supply. The monitoring should include the continuous taking of water level measurements using electronic data loggers supplemented by periodic collection of manual measurements. Once the Well P18 water supply is developed, monitoring may include: • Water level measurements • Annual water quality sampling for general chemistry, including manganese, iron, and hardness • Water quality monitoring as required under Ontario Regulation 170/03.
Well P16 Water Quality	Due to the observed deterioration of the Well P16 water quality, it has been determined that mitigation measures should be identified, evaluated and implemented if feasible prior to bringing Well P16 on-line. As such Well P16 and the raw watermain have been deferred pending these mitigating measures. Such mitigating measures may include well rehabilitation or drilling a replacement well. The replacement well would be screened within the overburden at a depth that provides more separation to the bedrock. Pending well yield and water quality, the replacement well should be completed with a permanent pump and its discharge directed via a new raw watermain to the WTP adjacent to Well P18.
Private Wells	To further assess and categorize these new wells, it is recommended that the water well survey from the Class EA be updated to include these wells. The data collected during the well survey should be analyzed to assess the potential for interference to occur at each well upon the commissioning of Well P18. If appropriate, mitigating measures should be identified and implemented prior to Well P18 commissioning. Post-commissioning well interference will be addressed in accordance with ROW's well interference complaint program which provides a robust response to well interference situations.

6.0 RECOMMENDATIONS AND FUTHER CONSULTATION

This EA Addendum will be filed with the ESR on the public record and a Notice of Filing of Addendum will be published to advise the public and review agencies.

A project mailing list was developed identifying review agency stakeholders. A copy of the final Contact list is provided in **Appendix E**. In addition to agency notification, notification will be provided to private well owners including those referenced in Section 2.1.1 and identified in Technical Memorandum 1 (**Appendix A**).

As there have not been substantive changes to the Class EA, as identified in the findings of the EA Addendum, public and agency consultations regarding the EA Addendum are not mandatory, but notification is planned alongside public posting of Addendum documents. MTE recommends the Region proceed to Phase 5: Implementation of the Class EA, including detailed design of the Maple Grove WTP.

All of which is respectfully submitted,

MTE Consultants Inc.

Dave Wilhelm, P.Eng.
Director, Water/Wastewater
519-743-6500
DWilhelm@mte85.com

Gemma Charlebois, M.A.Sc., P.Eng.
Manager, Design
519-743-6500
GCharlebois@mte85.com

DJW:GXC:zeg

https://mte85.sharepoint.com/sites/33591-101/Shared Documents/06 Reports/EA Addendum Report/April 29_2026 Submission/DOCS_ADMIN-#5296025-v3-C2023-43_Maple_Grove_WS_Class_EA_Addendum_Report_-_FINAL_20 May 2026.docx