SCOPED SERVICING STUDY

INDUSTRIAL DEVELOPMENT
0 & 8673 EIGHTH LINE

TOWN OF HALTON HILLS
REGION OF HALTON

PREPARED FOR:

MAPLE MIST DEVELOPMENT CORP. C/O

TRINISON MANAGEMENT CORP.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
211 YONGE STREET, SUITE 600
TORONTO, ON M5B 1M4

JUNE 2025

CFCA FILE NO. 2742-7218

CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	December 3, 2024	First Submission
Rev.1	January 31, 2025	Revised First Submission
Rev.2	June 25, 2025	Second Submission

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Maple Mist Development Corp. c/o Trinison Management Corp. (the Owner) to prepare a Scoped Servicing Study in support of an Official Plan Amendment (OPA) to expand the Urban Boundary for the subject property located at 0 and 8673 Eighth Line, in the Town of Halton Hills (Site). This report identifies opportunities for servicing of the proposed development lands with municipal infrastructure and outlines general requirements of the Town of Halton Hills, Halton Region, and Conservation Halton.

1.1 Background Documents

The following documents were reviewed and referenced throughout the preparation of this report:

Town of Halton Hills

i. Pre-Consultation / Development Review Committee Meeting Notes – April 11, 2024 (D00ENQ24.016 – 0 & 8073 Eighth Line)

ii. Premiere Gateway Phase 2B EA – Water and Wastewater Area Servicing Plan - September 2023

iii. Eighth Line Environmental Assessment - Environmental Study Report, July 2023 by R.J. Burnside & Associates Ltd.

iv. Town of Halton Hills Stormwater Management Policy – March 2009

v. MECP Stormwater Management Planning and Design Manual – March 2003

vi. Town of Halton Hills Subdivision Manual - 1999

Halton Region

vii. Halton Region Water and Wastewater Linear Design Manual, version 5 October 2019 – it is understood that changes will be made in January 2025. Once the updated version is available, it will be reviewed.

viii. The Regional Plan, Official Plan for the Halton Region Planning Area, Office Consolidation May 16, 2024, including maps 1-6

ix. 2022 Development Charges Background Study for Water, Wastewater, Roads & General Services Development Charges, December 15, 2021

x. 2022 Development Charges Update Water/Wastewater Technical Report, September 2021 by GM BluePlan

xi. Report no: FN-12-22 – Final 2022 Water, Wastewater, Roads and General Services Development Charges (DC) Proposals

xii. 1200 mm Wastewater Main on Eighth Line from Steeles Avenue to 0.19 km North of Steeles Avenue – Rev.4, by HATCH date of December 2022 (Contract No. S-3126B-21)

xiii. Halton Region Wastewater Development Capital Implementation Plan (2017-2031)

xiv. Halton Region 2011 Water and Wastewater Master Plan

Conservation Halton

xv. Conservation Halton Guidelines for Stormwater Management Engineering Submissions

xvi. Conservation Halton Guidelines for Wetland Water Balance Assessments

Provincial Policies

i. Ministry of the Environment, Conservation and Parks – updated July 2024

2.0 Subject Lands

2.1 Site Description

The subject lands comprise the western half of Lot 4 Concession 9 in the Town of Halton Hills. The Site is comprised of two contiguous parcels: Parcel No. 1 (0 Eighth Line) with a site area of 20.5 ha, and Parcel No. 2 (8673 Eighth Line) with a site area of 20.7 ha.

The orientation used in this report considers Eighth Line running in a north-south direction. Parcel No.1 covers the north portion of the subject lands, while Parcel No. 2 covers the south portion of the subject lands. The subject lands are bound by Eighth Line to the west and private properties (agricultural lands) to the north, east, and south. The Site is located in a predominantly agricultural area and adjacent to a New Employment Area known as the Premier Gateway Employment Area. It should be noted that Eighth Line is owned by the Town.

Per the Region of Halton Official Plan (May 2024), the Site is situated at the northern limit of Halton's Regional Urban Boundary which was recently expanded to include up to Lot 3 Concession 9. The Urban Boundary previously only included up to Lot 1 Concession 9, which is the part of the Premiere Gateway Phase 2B. Refer to Appendix A for the Site location identified on Map 1C of the Regional Official Plan.

2.2 Existing Site Conditions

The existing Site is undeveloped agricultural field; no buildings or structures occupy the Site. A watercourse traverses from north to southwest which crosses Eighth Line via a culvert. This watercourse is a tributary of the Middle Sixteen Mile Creek and is regulated by Conservation Halton. At the south limit of the Site is a woodlot. Per Conservation Halton mapping, the woodlot and portions of the on-site drainage system are considered as wetlands. Refer to Appendix A for Site location identified on Conservation Halton mapping.

2.3 Proposed Development

An application for Official Plan Amendment is being advanced for the purpose of expanding the urban boundary. The proposed development therefore is intended for the subject lands to be used for employment purposes. It is expected that a re-channelization of the watercourse will be incorporated in order to minimize the impact of flooding conditions within the Site and maximize the developable area. Re-channelization will occur under a separate future development approval process.

In support of the proposed development, the proposed site employment projections have been prepared to ensure consistency with the Premier Gateway Phase 2B Employment Area (November 2021) threshold of 25 jobs per net hectare. Therefore, based on an estimated net area of 34.46 hectares, the Site is estimated to generate approximately 862 jobs.

3.0 Water Servicing

The Region of Halton is responsible for the operation and maintenance of the public water supply and treatment system within the Town of Halton Hills. These subject lands will require connection to the municipal water system for inclusion within the urban boundary. This section discusses the existing and proposed water network as well as opportunities for extending water infrastructure to service the subject lands.

3.1 Existing and Planned Water Network

There is currently no water infrastructure along the Site frontage of Eighth Line and therefore no immediate water servicing is available to the Site. In accordance with Figure 4 of the Water Development Capital Implementation Plan (2017-2031) from the Premiere Gateway Phase 2B EA – Water and Wastewater Area Servicing Plan (September 2023), the following infrastructure is in closest proximity to the subject site:

- Existing 400 mm diameter watermain on Eighth Line north of the site, terminating at 10 Side Road.
- Existing 300 mm watermain on Eighth Line extending from Steeles Avenue and terminating 60 m north of the intersection of Eighth Line and Steeles Avenue. DC Project (6643) watermain to the south along the future Premiere Gateway Phase 2B road.
- DC Project (7507, 6611) watermain to the north along No. 10 Side Road.
- DC Funded (6607/7506) watermain to the west along Trafalgar Road.

Refer to Appendix B for the Site location identified on Figure 4 and the PGP2B Water Servicing Plan.

3.2 Water Extension for Site Servicing

As the 2024 Regional Official Plan has extended the urban boundary up to the southern limit of the Site, it is reasonable to conclude that the future 300 mm watermain on Eighth Line (up to north limit of Lot 1) will therefore be extended up to the north limit of Lot 3. Further extending this watermain along the Lot 4 site frontage in Eighth Line is the most logical approach for water supply to the subject lands.

This watermain extension northward along Eighth Line to the subject site, referred to as Option 1, without further extension can accommodated the 'dead-end' in the following ways:

i. Option 1a - watermain in Eighth Line to be outfitted with a temporary blow-off valve and/or auto-flusher system.

ii. Option 1b – dependent on the nature of the site development, provide a looped system through the subject lands with at least two connections to the Eighth Line watermain.

In either option, the main in Eighth line could be designed and constructed in such a way to account for future northward extension for servicing of external developments and looped interconnection with other municipal infrastructure.

Refer to Appendix B for Option 1a and 1b depicted on Figure 4 and the PGP2B Water Servicing Plan.

3.3 Future Watermain Looped Interconnection

There are also viable options for further extension and interconnection to provide a looped system to existing or future municipal infrastructure beyond the extension to the subject lands. These Options are considered 'future interconnections' which would provide redundancy to the site water extension noted in Section 3.2 as well as provide servicing availability to external lands.

The future interconnections are described as Options 2 and 3 as follows:

i. Option 2 – continue extension along Eighth Line to No. 5 Side Road, then west along No. 5 Side Road to Trafalgar Road watermain (900 mm dia). Total additional length is approximately 2.1 km.

ii. Option 3 – continue extension along Eighth Line northward to No 10. Side Road watermain (600 mm). Total additional length is approximately 3.8 km.

It is noted that Option 2 is preferable to Option 3 due to overall less total length and infrastructure requirements as well as connection to a larger diameter main in Trafalgar Road. All Options are subject to watermain network modelling. The Options identified represent feasible strategies for servicing the subject lands and future interconnection with water infrastructure for inclusion within the urban boundary. Refer to Appendix B for Options 2 and 3 depicted on Figure 4 and the PGP2B Water Servicing Plan.

3.4 Estimated Site Water Demands

The Premier Gateway Phase 2B Employment Area Report and the Region of Halton 2022 Development Charges Background Study were used to estimate the proposed water demands for employment land use. An average day flow of 225 L/emp/day, maximum day peaking factor of 1.9 and peak hour factor of 3.0 were used as outlined in the study to determine the Site's water demand. The results are summarized below in Table 1, with detailed calculations provided in Appendix B.

Table 1: Site Water Demands

Total Area (ha)	Estimated Jobs	Average Daily Demand(L/s)	Maximum Daily Demand (L/s)	Peak Hour Demand (L/s)
34.46	1028	2.24	4.26	6.73

As shown in Table 1, the proposed development will have a total average daily demand of 2.24 L/s, maximum daily demand of 4.26 L/s and peak hourly demand of 6.73 L/s.

4.0 Sanitary Servicing

The Region of Halton is responsible for the operation and maintenance of the public wastewater (sanitary) collection and treatment system within the Town of Halton Hills. The subject lands will require connection to the municipal system for inclusion within the urban boundary. This section discusses the existing and proposed sanitary network in the vicinity of the subject lands for site servicing.

4.1 Existing Sanitary Network

Halton Region is constructing a 1200 mm wastewater sewer along Eighth Line, of which the subject lands have direct frontage. The sewer is identified as DC Project 6569/7550 and traverses southward from No. 10 Side Road (Georgetown) to Steeles Avenue (Halton Hills). The sewer along the Site frontage is approximately 13 to14 m deep at a slope of 0.35%, per the design drawings prepared by Hatch. There is one manhole (MH25) being constructed along the Site frontage, which is approximately 185 m from the Site's southern limit and 330 m from the Site's northern limit along Eighth Line. The sewer is scheduled to be commissioned in 2025 per the Region's documentation.

It is understood that this sewer is intended primarily as a trunk sewer for wastewater conveyance from Georgetown to the Mid-Halton WWTP, as the Georgetown WWTP is planned to be decommissioned. This sewer is also intended to service "new Greenfield growth areas in southwest Georgetown" as described in the 2022 DC Update W/WW Technical Report. It is also noted that this sewer was originally sized to be 900 mm diameter as per the 2017 DC Program but was increased to 1200 mm diameter as part of detailed design efforts in 2020/2021 which accounted for constructability. Refer to Appendix C for relevant extracts from the 2022 DC report and FN-12-22.

It is also noted that the Premiere Gateway Phase 1B and 2B do not connect or discharge to the 1200 mm diameter Eighth Line sanitary sewer and are generally serviced by local sewers to Steeles Avenue. See Appendix C for sanitary servicing plan of the PGP2B in context to the Site location.

4.2 Proposed Sanitary Servicing

Subject to the future Site Plan configuration, the Site will be serviced with local sanitary sewers (200 to 300 mm diameter) at typical (shallow) depths as per the Halton Region Linear Design Manual standards. As the Site has direct access to Eighth line, there is opportunity to discharge to the 1200 mm diameter trunk sewer for conveyance of all site flows to the Mid-Halton WWTP.

Due to the size and depth of the trunk sewer, it is not expected that a direct connection to the deep pipe will be practical, however, the following options can be explored:

iii. Direct connection to MH25 along the site frontage. All Site flows to be internally conveyed to a single pipe for one connection to MH25.

iv. Construction of a 'local' small diameter shallow sewer along Eighth Line which would service all development lands on both sides of Eighth Line. Sewer to either have multiple connections to existing trunk sewer manholes or convey along entirely of Eighth Line for single trunk connection prior to Steeles Avenue.

Both options represent feasible strategies for servicing the subject lands with wastewater infrastructure and for inclusion within the urban boundary.

4.3 Estimated Sanitary Demands

The Premier Gateway Phase 2B Employment Area Report and the Region of Halton 2022 Development Charges Background Study were used to estimate the proposed sanitary design flows for the Site. The latest design criteria has been used to complete the demand calculations, which is from the DC Study. Per the study, a unit sewage flow of 310 L/emp/day (employment areas) was used to estimate average sanitary flow rate generated. An infiltration flow and a peak flow factor calculated using the modified Harmon Formula were applied to the unit sewage flow to obtain the total estimate design sewage flow from the Site.

A summary of the results is presented in Table 2 and detailed calculations are provided in Appendix C.

Table 2: Site Sanitary Demands

Site Area (ha)	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Sanitary Flow (L/s)
34.46	3.09	3.07	9.50	9.86	19.35

As shown in Table 2, the development will have a total sanitary flow of 19.35 L/s.

5.0 Stormwater Management

The Site is located within the Town of Halton Hills and includes a tributary of Sixteen Mile Creek which is regulated by Conservation Halton. It is understood that, per comments made by Conservation Halton, a Subwatershed Study (SWS) will be required as part of a Secondary Plan process for a broader geographic area. Conservation Halton will be re-engaged at such a time to confirm the requirements of the SWS.

The remainder of this section is to outline our understanding of the general stormwater criteria for the subject lands and outline possible strategies and solutions which could be implemented on-site.

5.1 Stormwater Management Criteria

Development of the subject lands is typically required to adhere to the Conservation Halton Guidelines for Stormwater Management Engineering Submission and Town of Halton Hills Stormwater Management Policies as outlined below:

- Water Quality Control: Treatment of runoff to meet MECP Enhanced Standards (80% long-term average TSS Removal);
- Water Quantity Control: Provide post-development to pre-development peak flow control by meeting the unitary storage and discharge criteria as determined in future SIS;
- Erosion Control: Provide erosion control by meeting the unitary storage and discharge criteria as determined in the future SIS with a minimum detention time of 24-hours;
- Thermal Mitigation: Ensure maintenance or enhancement of stream base flow temperatures by mitigating thermal impacts of stormwater runoff; and

- Water Balance: Maintain pre-development annual infiltration levels by providing mitigation measures to infiltrate clean stormwater for site-based water balance and feature based water balance.

5.2 Existing Drainage Conditions

The Site topography generally slopes from northeast to southwest following the existing watercourse, with a total elevation drop of approximately 10 m. A high ridge exists along the eastern portion of the Site which acts as a drainage divide between the on-site watercourse and the East Sixteen Mile Creek, which runs between Eighth and Ninth Line. Approximately 80% of the Site area drains to the on-site watercourse and the remaining 20% drains to the East Sixteen Mile Creek located externally to the Site. Refer to Appendix A for site location identified on Conservation Halton mapping.

The creek enters a roadside ditch along the east side of Eighth Line which becomes lined with gabion stone baskets. Runoff is then conveyed to twin 1.6 m x 1.1 m Arch CSP culverts which cross Eighth Line and continues as natural watercourse to the west. These culverts were identified in the Eighth Line EA by R.J. Burnside as 'CULVERT 3, SID 60/C'. As per the EA, they have capacity for a 10-year event and overtop during a 25-year event, with a recommendation to "increase to 1.88 m x 1.26 m CSP Arch pipe" as part of the EA road improvement works. The EA also states there is "consideration for realigning the watercourse to remove the 90-degree bend… to advise on culvert alignment and resizing". Refer to Appendix D for extracts from the Eighth Line EA.

5.3 Quantity and Quality Controls

Subject to further future studies such as the SWS for the broader geographic area, the Site will be required to provide on-site quantity and quality controls to restrict post-development flows to pre-development levels at every storm event and provide adequate treatment of stormwater quality. Site quantity and quality controls may take the form of one or a combination of the following practices:

- Underground storage; in pipes, chambers, or other structures
- Building rooftop storage
- Oil-grit separators or media filtration units
- Train-treatment approach

Depending on the configuration of the Site Plan, the stormwater quantity controls may comprise a mix of private site and public land (i.e.: Right-of-Way) controls.

5.4 Water Balance

The water balance requirement will be determined through future works in the SIS and hydrogeological investigations. Water balance targets are typically met through implementation of Low Impact Development (LID) Best Management Practices (BMP) such as:

- Enhanced swales
- Infiltration galleries/soak-away pits
- Bioretention/rain garden areas
- Permeable pavers
- Rainwater harvesting and re-use (i.e.: irrigation, toilet-flushing)

Feasibility of site-specific LIDs will be investigated at a further design stage.

6.0 Fiscal Impact Discussion

As identified in the sections above, providing adequate servicing to the subject lands for inclusion within the urban boundary does not require significant new or additional infrastructure. The lands currently have access to a Regional sanitary/wastewater sewer in Eighth Line, therefore, only additional watermain is required.

It is assumed that Regional watermain will be installed within Eighth Line along Lots 1 and 2 to the current urban boundary limit which abuts the subject lands, therefore only a minimal extension in Eighth Line along the Lot 3 site frontage (~100-300 m) would be required. The additional watermain extension could then be used for servicing lands on both the east and west sides of Eighth Line, approximately 80-90 ha total, and create a uniform northern urban boundary limit along Concessions 7, 8, and 9.

This cost for this additional watermain infrastructure could also be further reduced by including it within the construction scope for the servicing extension along Lots 1 and 2. The benefit of an additional 80-90 ha of serviced lands is therefore realized at the cost of an additional 100-300m of watermain. This watermain extension will also continue to provide the ability for future northward extension and interconnection to either Trafalgar Road or No. 10 Side Road, and the servicing of all associated lands.

7.0 Conclusion

The subject lands are immediately adjacent to the in-effect settlement area, which was recently expanded through the implementation of ROPA 49. Through this Scoped Servicing Study, it has been demonstrated that the subject lands have the opportunity and availability to be reasonably serviced with planned municipal sanitary and watermain infrastructure anticipated through planned Regional infrastructure projects. As such, the proposed development achieves the associated planning requirements, including those in Provincial Planning Statement (2024) Section 2.3.2, which are necessary in the consideration of urban boundary expansions. The Site will also include stormwater management practices to meet required targets which will be set out in a future Subwatershed Study for the broader area. It is therefore appropriate to extend the Urban Boundary further northward to include the subject lands.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

M. Findlay

Maggie Findlay, P.Eng.
Project Engineer, Land Development

C.F. CROZIER & ASSOCIATES INC.

Rob Babic, P.Eng.
Project Manager, Land Development

/mf

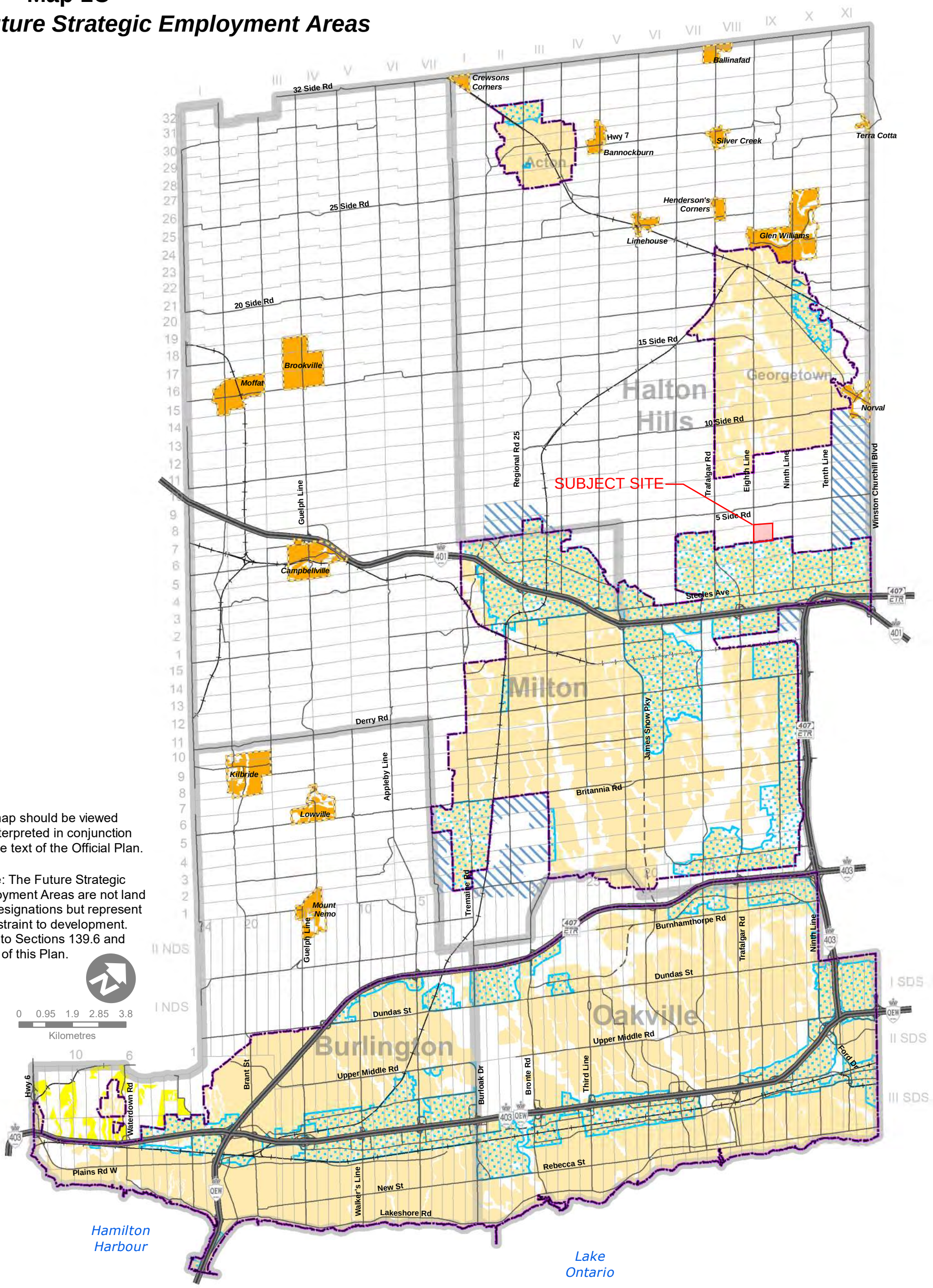
J:\2700\2742 - Maple Mist Development Corp. co Trinison Management Corp\7218 - 8673 Eighth Line\Reports\Civil\FSR&SWM\2025.06.25_Scoped Servicing Report\2025.06.25_8673_Scoped Servicing Report.docx

APPENDIX A

Background Documents

Map 1C

Future Strategic Employment Areas

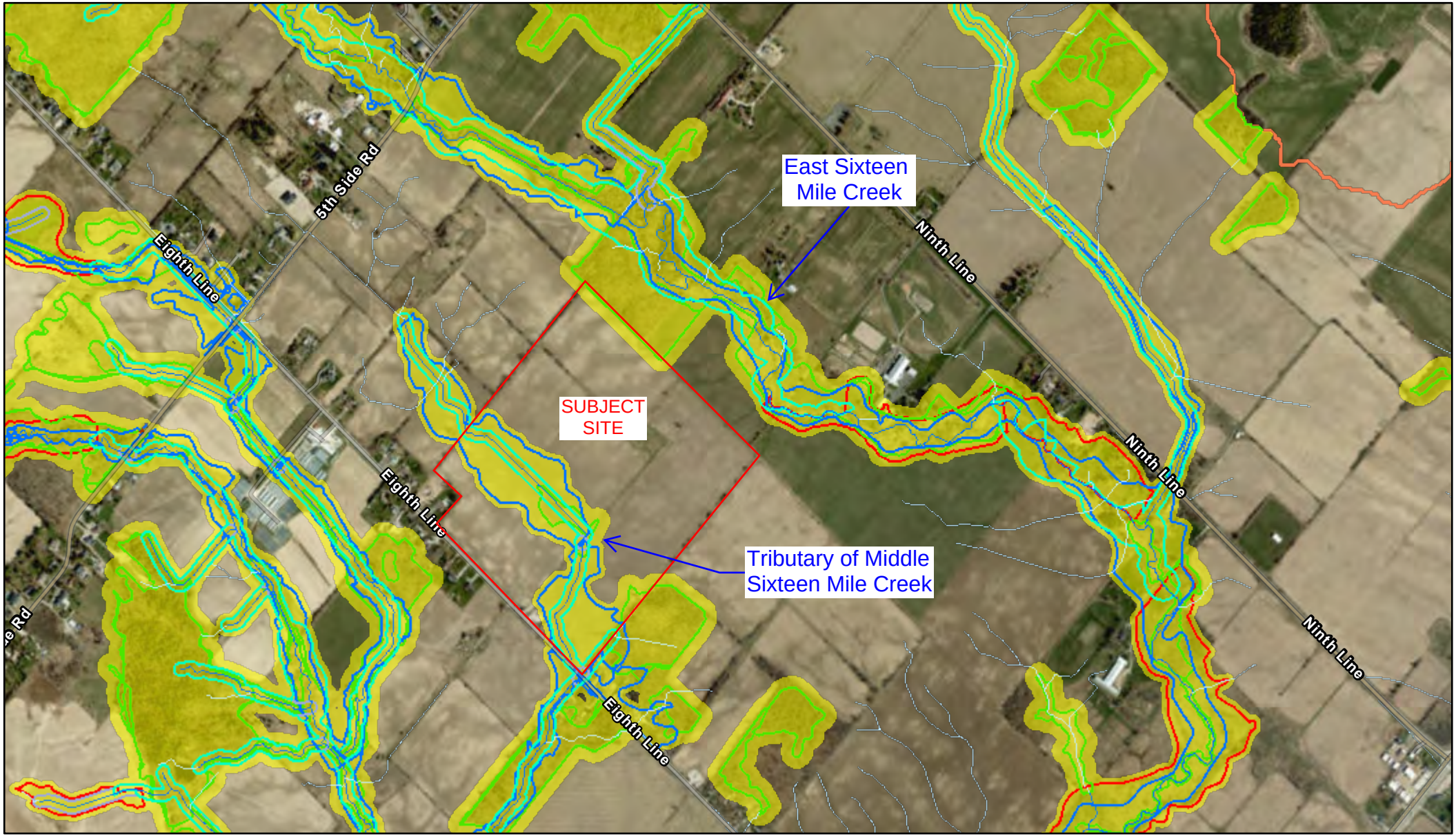


This map should be viewed and interpreted in conjunction with the text of the Official Plan.

* Note: The Future Strategic Employment Areas are not land use designations but represent a constraint to development. Refer to Sections 139.6 and 139.7 of this Plan.

May 16, 2024

Conservation Halton Regulation Mapping



11/20/2024, 3:21:00 PM

- Approximate Regulation Limit
- Waterflow
  - Non-Regulated
  - Regulated
  - Shoreline 100 year Flood Elevation Hazard
  - Shoreline Dynamic Beach Hazard
- Shoreline Hazard
- Stable Top of Bank (STOB) Hazard
- Wetland Hazard
- Spill Zone Hazards
- Floodplain Hazard
- Headwater Floodplain Hazard
- Meander Belt Hazard
- Consult Conservation Halton
- Spill Arrows
- Spill Lines
- ANSI TYPE
  - ANSI, Earth Science
- ANSI, Life Science
- Candidate ANSI, Earth Science
- Candidate ANSI, Life Science
- ESAs (Hamilton, Halton)
- NEC Planning Areas
  - Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Urban Area
- Conservation Halton

1:18,056

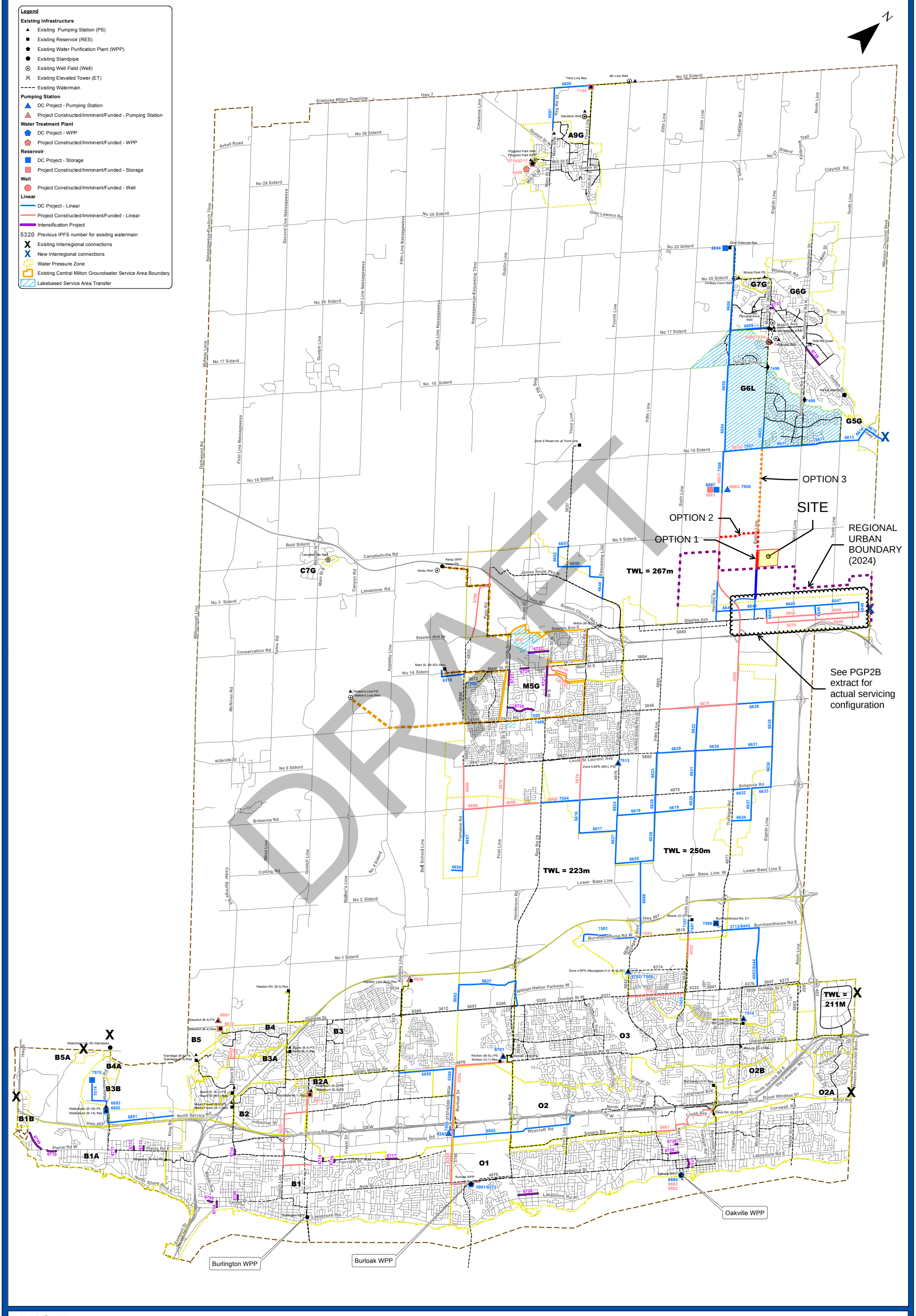
0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Conservation Halton, 2023

APPENDIX B

Water Servicing & Demand Calculations



2017 Development Charges
Water and Wastewater
Technical Report

Halton Region
Water Development Capital Implementation Plan (2017-2031)
Figure 4

715027-9-W
October, 2016
Data Source: Halton Region
Scale: 1:55,134 | NAD 1983 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B

Proposed water servicing for the PGEA P2B Lands is consistent under the Current Pressure Zone Boundary Alignment as well as the Ultimate Pressure Zone Boundary Realignment. PGEA P2B Lands are located within the following Pressure Zones:

- Current Pressure Zone Boundary Alignment: Zone M5L
- Ultimate Pressure Zone Boundary Realignment: Zone 250

Halton Region planned DC transmission watermains not directly required to service PGEA P2B have not been included as part of the proposed solution to provide for future flexibility [illegible]he DC transmission watermains running along Ninth Line and Tenth Line. [illegible]nsition Projects include:

- Halton IPFS 6643 - 400mm diameter east-west mid-block watermain, west of Ninth Line
- [illegible]S 6647 – 400mm diameter east-west mid-block watermain, east of Tenth Line
- [illegible]S 6648 – 400mm diameter north-south watermain, west of Winston Churchill Boulevard

Halton IPFS 4985 substantially completed and in operation

OPTION 3 INTERCONNECTION ALONG EIGHTH LINE TO No. 10 SIDE RD.

OPTION 2 INTERCONNECTION ALONG 5 SIDE RD TO TRAFALGAR

OPTION 1- EXTENSION OF WATERMAIN ALONG EIGHTH LINE SITE FRONTAGE

OPTION 1a - DEAD-END w/ BLOWOFF

OPTION 1b - INTERNAL SITE LOOP

SUBJECT SITE

EXPECTED EXTENSION OF 300mm WM TO NEW REGIONAL URBAN BOUNDARY

REGIONAL URBAN BOUNDARY (2024)

Development fronting Eighth Line can be serviced by local 300mm diameter watermain approved as part of PGEA P1B ASP

Local 300mm dia. watermain required to service PGEA P2B properties near Winston Churchill Blvd. Existing Winston Churchill Blvd. crowded infrastructure corridor with ex. Region of Peel infrastructure. Opportunity to realign local 300mm Dia. Watermain in this area to new internal road within PGEA P2B (and outside of Winston Churchill ROW).

Local 300mm dia. watermain loop along north limit of site and local road required to service properties north of Natural Heritage System

Local watermain recommended as part of PGEA P1B ASP

Halton IPFS 3844 and 5948 – 600mm dia. DC Watermain Project previously approved and funded and suspended to incorporate results of EA Studies related to GTA West Corridor
From existing 600mm dia. Watermain to Halton / Peel emergency interconnection

Halton IPFS 6646 – 400mm dia. Component of DC Watermain Project constructed along Tenth Line connecting to Steeles Ave. 600mm dia. Watermain

Trafalgar Rd
Eighth Line
Ninth Line
Tenth Line
Winston Churchill Blvd
Hornby Rd
Trafalgar Road
Steeles Ave
Steeles Ave W
Existing 900 mm
900 mm (Existing)
300 mm
Proposed PGEA P1B
Proposed 300 mm
Prop. 300 mm
IPFS 6645 Proposed 400 mm
IPFS 6645 - Proposed 400 mm
IPFS 6644 Proposed 400 mm
IPFS 6646
Existing 600 mm
IPFS 3844 - Proposed 600mm
IPFS 5948 – Proposed 600mm
Existing Halton/Peel Emergency Interconnect
Highway 407
Hwy 407
TOWN OF MILTON
CITY OF MISSISSAUGA
TOWN OF HALTON HILLS
CITY OF BRAMPTON
Hwy 401
0 0.5 1 km

DRAFT

Water Infrastructure

- Pumping Station (PS)
- Storage
- Treatment
- Feeder Main (Diameter >= 400mm)
- Local Watermain (Diameter < 400mm)

General Features

- Premier Gateway Phase 2B
- Highway
- Major Road
- Local Road
- Property Parcel
- Municipal Boundary
- Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

Preferred Land Use

- Natural Heritage System
- Prestige Industrial Area
- Residential Special Policy Area
- Supportive Commercial
- Headwater Drainage Feature
- Buffer for Existing Residential Use
- Cultral Heritage Resource
- Minimum Distance Separation

Figure 4-3

Proposed Water Servicing Solution for PGEA P2B

November 2021
720010-004
Projection EPSG:26917

Project: 8673 Eighth Line
Project No.: 2742-7218
Date: 2024-12-19
Designed By: MF
Checked By: RB

WATER DEMAND CALCULATIONS

Region of Halton

Total Development Area:	34.46	ha
Occupancy:	Employment	
Equivalent Population Density:	25	jobs/ha
Total:	862	jobs
Max Day Factor:	1.9	
Peak Hour Factor:	3.0	
Average Daily Demand:	225	L/emp/day

Total Area (ha)	Estimated Jobs	Average Daily Demand (L/s)	Max Daily Demand (L/s)	Peak Hour Demand (L/s)
34.46	862	2.24	4.26	6.73

References

Per Preliminary Concept Plan dated March 2024

Per Premiere Gateway Phase 2B Employment Area (November 2021)

Per 2022 DC Background Study, Region of Halton - Table B-1 Water Demand Criteria

APPENDIX C

Sanitary Servicing & Calculations

Legend

Existing Wastewater Infrastructure
- Wastewater Pumping Station (WWPS)
- Wastewater Treatmentl Plant (WWTP)
- GravitySewer
- Forcemain

DC Projects

Linear
- DC Project - Sewer
- DC Project - Forcemain
- Project Constructed/Imminent/Funded - Sewer
- Project Constructed/Imminent/Funded - Forcemain
- Intensification Project - Sewer

Pumping Station
- DC Project - WWPS
- Project Constructed/Imminent/Funded - WWPS
- Intensification - WWPS

Plant
- DC Project - WWTP
- Project Constructed/Imminent/Funded - WWTP
- WWTP Drainage Area
- Lakebased Service Area Transfer
- Regional Boundary

Acton WWTP

Georgetown WWTP

SITE

Milton WWTP

Mid-Halton WWTP

Oakville SE WWTP

Oakville SW WWTP

Skyway WWTP

2017 Development Charges
Water and Wastewater
Technical Report

Halton Region
Wastewater Development Capital Implementation Plan (2017-2031)
Figure 6

715027-8-WW
December 2016
Data Source: Halton Region
Scale: 1:55,000 | NAD 1983 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B

SUBJECT SITE

Servicing to development north of Natural Heritage System will require watermain crossings of environmental features to south or west to connect to PGEA P2B local sewers or the proposed Eighth Line Trunk Sewer

- It is anticipated that development areas within the northeast will require future development of Future Strategic Employment Areas to the north to support the construction costs of wastewater infrastructure crossing the environmental features

Proposed Local Sewers west of the GTA West Corridor can convey flows to the Region's Planned Steeles Avenue Trunk Sewer or directly to HH#3 WWPS / Eighth Line Trunk Sewer (outlet located 50m west of the Proposed Collector Road)

If the GTA West Corridor is released for Employment use, sewers can convey flows east or west to Local Gravity Sewer Network

- GTA West Corridor is the natural high-point within the PGEA P2B Study Area and upstream sewers can be constructed to outlet to downstream sewers

Development fronting Winston Churchill Blvd. will require proposed 250mm/300mm Dia. Sewer running south on Winston Churchill Blvd. or parallel alignment on nearby internal local road

Proposed Local Sewers east of the GTA West Corridor can convey flows to the Region's Planned Steeles Avenue Trunk Sewer outletting to the Planned HH#4 WWPS

Development fronting Eighth Line can be serviced by local sewer connections to proposed Eighth Line Trunk Sewer MHs

IPFS 7550 Eighth Line Trunk Sewer to be commissioned in 2025

Proposed local sewers connecting to the Planned Region Trunk Sewer are required to service properties fronting Steeles Avenue

- Halton Region does not permit direct service connections to Trunk Sewers

HH#3 WWPS to be decommissioned after commissioning of Eighth Line Trunk Sewer in 2025

PGEA P2B lands can be serviced by the Region's current servicing strategy that includes Planned Projects 3863, 3864, 3865 and 4648 (HH #4WWPS, inletting trunk sewer, forcemain and downstream gravity sewer outletting to HH#3 WWPS / Eighth Line/Trafalgar Trunk Sewer.

- Alternatively, the PGEA lands can be serviced by a Steeles Avenue East-West Trunk Sewer across the entire length of the PGEA P2B Study Area
- An alternative Trunk Sewer Solution would include a proposed open/cut and tunnelled 525mm/600mm sewer that can be constructed at 0.1% to 0.2% to discharge to the existing HH#3 WWPS as well as the proposed Eighth Line/Trafalgar Rd. Trunk Sewer

Wastewater Infrastructure
- Sewage Pumping Station (SPS)
- Trunk Sewer (diameter >= 450mm)
- Local Sewer (diameter < 450mm)
- Forcemain

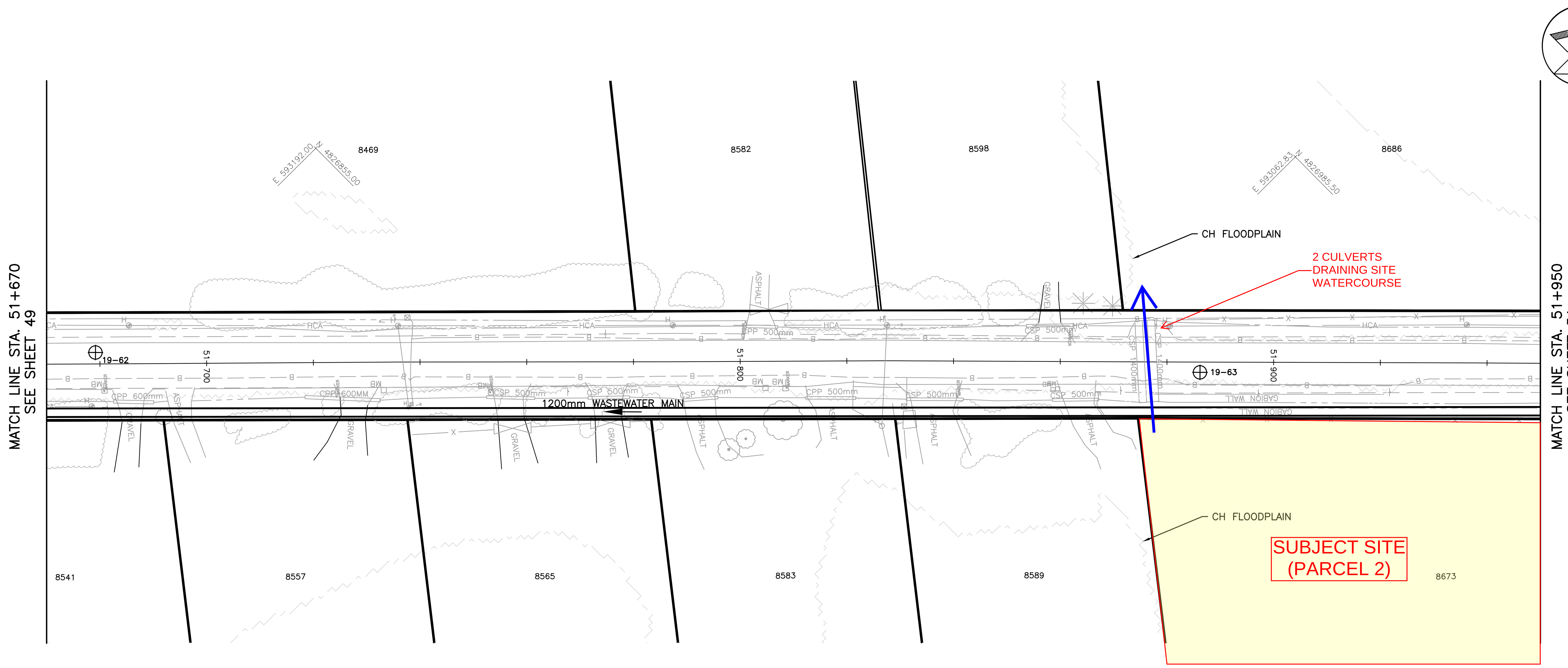
General Features
- Premier Gateway Phase 2B
- Highway
- Major Road
- Local Road
- Property Parcel
- Municipal Boundary
- Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

Preferred Land Use
- Natural Heritage System
- Prestige Industrial Area
- Residential Special Policy Area
- Supportive Commercial
- Headwater Drainage Feature
- Buffer for Existing Residential Use
- Cultral Heritage Resource
- Minimum Distance Separation

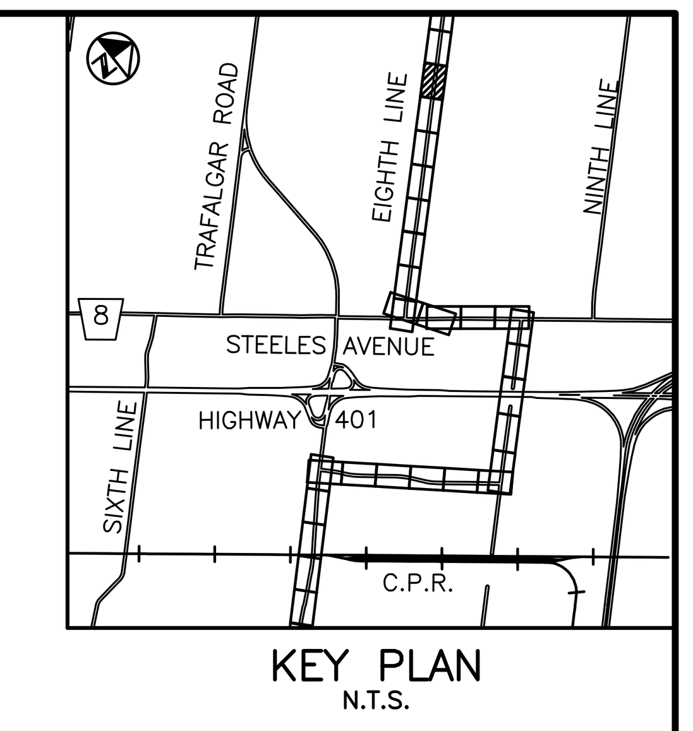
Figure 5-3

Proposed Wastewater Servicing Solution for PGEA P2B

November 2021
720010-006
Projection EPSG:26917



EIGHTH LINE



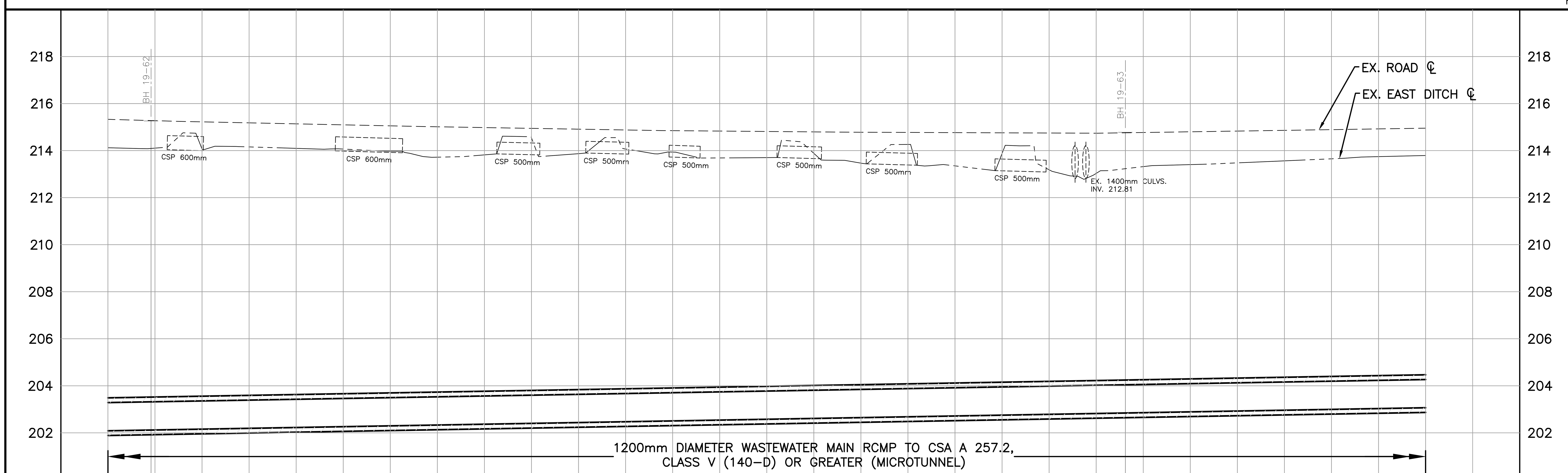
LEGEND

⊕BH EX. BOREHOLE

NOTE:

1. BOREHOLE LOCATIONS ARE SHOWN IN PLAN AND PROFILE FOR REFERENCE PURPOSES ONLY. FOR GEOTECHNICAL DATA PLEASE REFER TO THE GEOTECHNICAL BASELINE REPORT PREPARED BY THURBER ENGINEERING LTD. AND HATCH LTD., DATED DECEMBER 2020, AND THE GEOTECHNICAL DATA REPORT PREPARED BY THURBER ENGINEERING LTD., DATED NOVEMBER 2020.

REFER TO SHEET 4 FOR GENERAL NOTES
REFER TO SHEET 7 FOR TUNNEL SUPPORT DETAILS
REFER TO SHEET 68 FOR MAINTENANCE HOLE DETAILS



℄ ELEVATIONS	215.27	215.18	215.09	215.01	214.95	214.88	214.83	214.80	214.77	214.76	214.74	214.80	214.86	214.92
SANITARY INVERTS	201.46 ← 570.38m @ 0.35% → 203.46													
CHAINAGE	51+680	51+700	51+720	51+740	51+760	51+780	51+800	51+820	51+840	51+860	51+880	51+900	51+920	51+940

NO	DATE	BY	REVISIONS	MANU	CAD
4	DEC. 2022	N.L.	EIGHTH LINE SEWER REALIGNMENT		X
	JUN. 2021	N.L.	ISSUED FOR CONSTRUCTION		X
	JAN. 2021	N.L.	ISSUED FOR TENDER		X

DESIGN	N.L.	CH'KD	M.M.	DATE JUNE 2021
DRAWN	D.K.	CH'KD	N.L.	
SCALE 1:500 HORIZ. 1:100 VERT.				REFERENCES
REGIONAL — SEE COVER SHEET FOR REGIONAL ACCEPTANCE				FIELD NOTES

CONSULTANT STAMP — LICENSED PROFESSIONAL ENGINEER N. L. J. LISCIO 100181711 2022-12-22 PROVINCE OF ONTARIO

CONSULTANT STAMP — LICENSED PROFESSIONAL ENGINEER R. J. OFORI 100173099 2022-12-22 PROVINCE OF ONTARIO

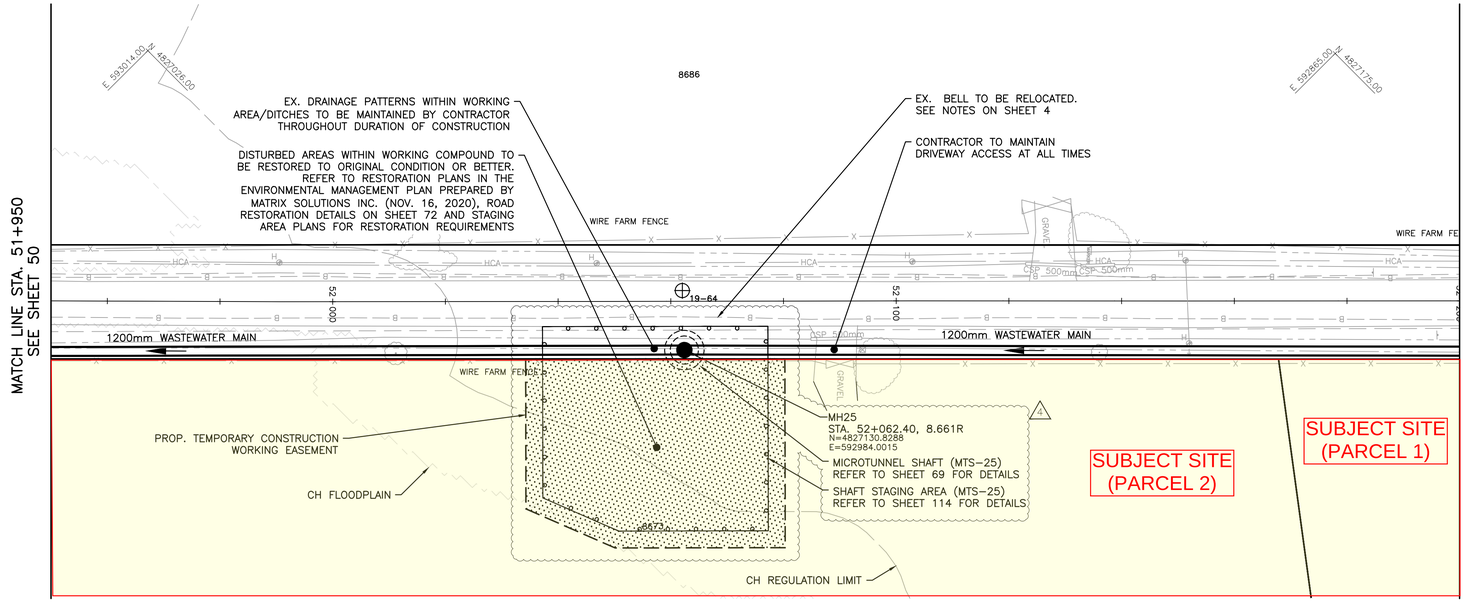
HATCH

Halton REGION

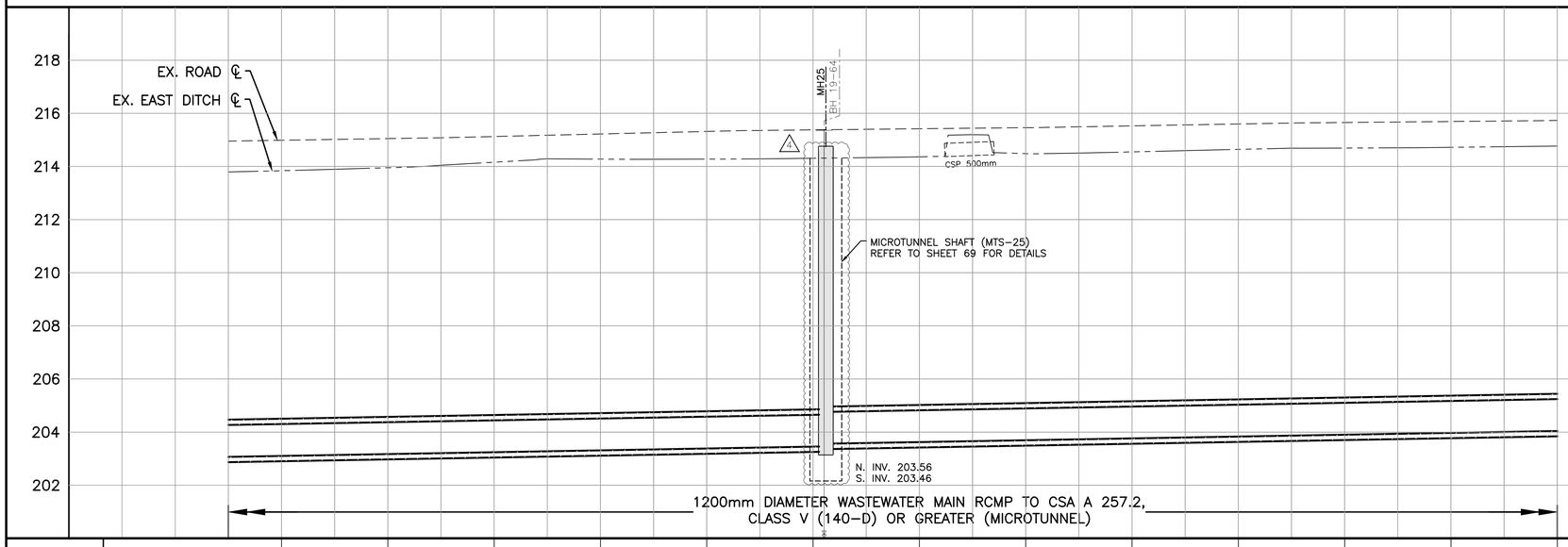
1200mm WASTEWATER MAIN ON
EIGHTH LINE
FROM 1.65km NORTH OF STEELES AVENUE
TO 1.93km NORTH OF STEELES AVENUE
STA. 51+670 TO STA. 51+950
IN THE TOWN OF HALTON HILLS

CONSULTANT FILE NO. H-353278(PP508)
REGIONAL DRAWING NO.
CONTRACT NO. S-3126B-21
DRAWING NO. SHEET 50 OF 137

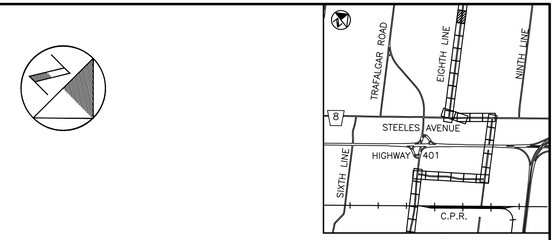
S-3126B-21 50 OF 137
Drawing: C:\PWWORKING\HI\HATCHGLOBAL_WASE96091\D0131191\PP505 - PP508.DWG
Layout Tab: PP508 Time: 05:39:57 PM
Date: 12/19/2022



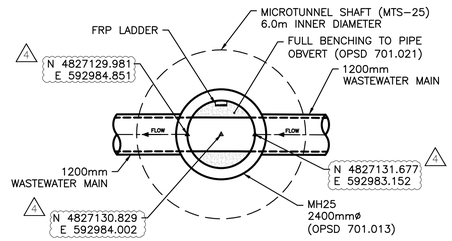
EIGHTH LINE



℄ ELEVATIONS	214.98	215.05	215.13	215.22	215.32	215.37	215.42	215.46	215.53	215.60	215.65	215.69	215.73	℄ ELEVATIONS
SANITARY INVERTS	201.46	570.38m @ 0.35%				203.46 / 203.56	589.85m @ 0.35%						205.63	SANITARY INVERTS
CHAINAGE	51+960	51+980	52+000	52+020	52+040	52+060	52+062.40	52+080	52+100	52+120	52+140	52+160	52+180	52+200	CHAINAGE



KEY PLAN
N.T.S.



MH25 BENCHING DETAIL
SCALE 1:100

LEGEND

⊕BH EX. BOREHOLE

NOTE:

1. BOREHOLE LOCATIONS ARE SHOWN IN PLAN AND PROFILE FOR REFERENCE PURPOSES ONLY. FOR GEOTECHNICAL DATA PLEASE REFER TO THE GEOTECHNICAL BASELINE REPORT PREPARED BY THURBER ENGINEERING LTD. AND HATCH LTD., DATED DECEMBER 2020, AND THE GEOTECHNICAL DATA REPORT PREPARED BY THURBER ENGINEERING LTD., DATED NOVEMBER 2020.

REFER TO SHEET 4 FOR GENERAL NOTES
REFER TO SHEET 7 FOR TUNNEL SUPPORT DETAILS
REFER TO SHEET 68 FOR MAINTENANCE HOLE DETAILS

NO	DATE	BY	REVISIONS	MANU	CAD
4	DEC. 2022	N.L.	EIGHTH LINE SEWER REALIGNMENT		X
2	NOV. 2021	N.L.	REVISED MTS-24 & MTS-25 LOCATIONS		X
	JUN. 2021	N.L.	ISSUED FOR CONSTRUCTION		X
	JAN. 2021	N.L.	ISSUED FOR TENDER		X

DESIGN	N.L.	CH'KD	M.M.	DATE JUNE 2021
DRAWN	D.K.	CH'KD	N.L.	

SCALE 1:500 HORIZ. 0 5 10 20
1:100 VERT. 0 1 2 4

REFERENCES

REGIONAL

SEE COVER SHEET FOR REGIONAL ACCEPTANCE

FIELD NOTES

CONSULTANT STAMP

CONSULTANT STAMP

HATCH

Halton REGION

1200mm WASTEWATER MAIN ON
EIGHTH LINE
FROM 1.93km NORTH OF STEELES AVENUE
TO 2.18km NORTH OF STEELES AVENUE
STA. 51+950 TO STA. 52+200
IN THE TOWN OF HALTON HILLS

CONSULTANT FILE NO. H-353278(PP509)

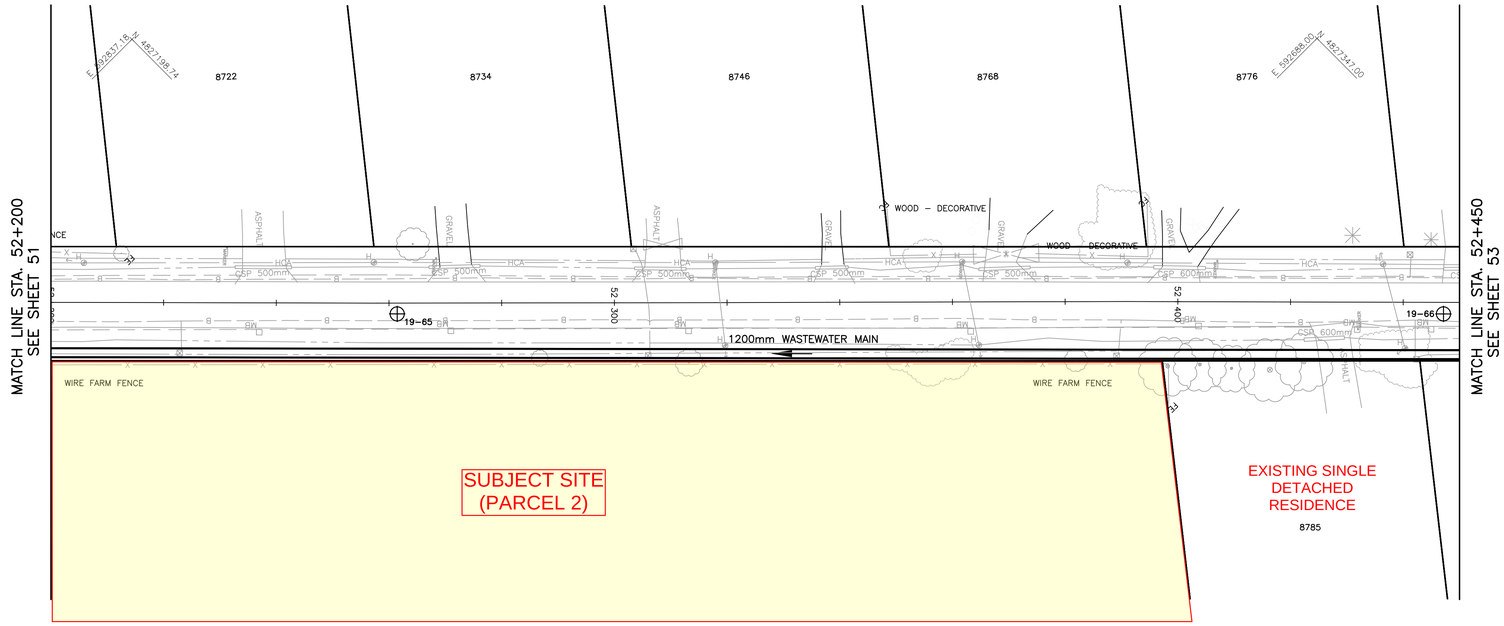
REGIONAL DRAWING NO.

CONTRACT NO. S-3126B-21

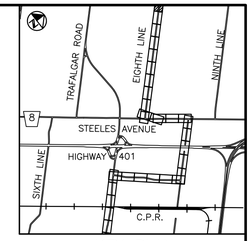
DRAWING NO. SHEET 51 OF 137

S-3126B-21 51 OF 137

Drawing: C:\PWORKING\H\HATCHGLOBAL_WSE96091\DD13119\VPP509 - PP512.DWG
Layout: PP512
Date: 12/20/2022 Time: 12:23:38 PM



EIGHTH LINE



KEY PLAN
N.T.S.

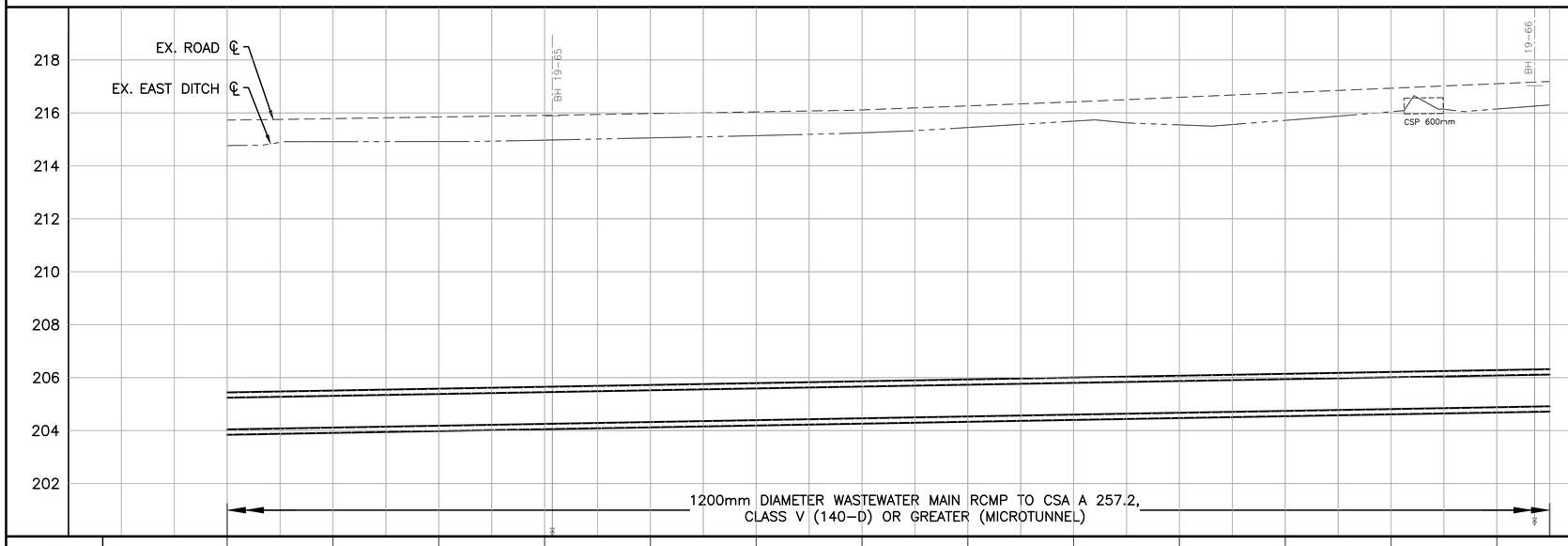
LEGEND

⊕BH EX. BOREHOLE

NOTE:

1. BOREHOLE LOCATIONS ARE SHOWN IN PLAN AND PROFILE FOR REFERENCE PURPOSES ONLY. FOR GEOTECHNICAL DATA PLEASE REFER TO THE GEOTECHNICAL BASELINE REPORT PREPARED BY THURBER ENGINEERING LTD. AND HATCH LTD., DATED DECEMBER 2020, AND THE GEOTECHNICAL DATA REPORT PREPARED BY THURBER ENGINEERING LTD., DATED NOVEMBER 2020.

REFER TO SHEET 4 FOR GENERAL NOTES
REFER TO SHEET 7 FOR TUNNEL SUPPORT DETAILS
REFER TO SHEET 68 FOR MAINTENANCE HOLE DETAILS



℄ ELEVATIONS	215.73	215.78	215.85	215.91	215.97	216.04	216.11	216.27	216.42	216.59	216.76	216.93	217.10	℄ ELEVATIONS
SANITARY INVERTS	203.56	589.85m @ 0.35%											205.63	SANITARY INVERTS
CHAINAGE	52+200	52+220	52+240	52+260	52+280	52+300	52+320	52+340	52+360	52+380	52+400	52+420	52+440	CHAINAGE

NO	DATE	BY	REVISIONS	MANU	CAD
4	DEC. 2022	N.L.	EIGHTH LINE SEWER REALIGNMENT		X
	JUN. 2021	N.L.	ISSUED FOR CONSTRUCTION		X
	JAN. 2021	N.L.	ISSUED FOR TENDER		X

DESIGN	N.L.	CH'KD	M.M.	DATE JUNE 2021
DRAWN	D.K.	CH'KD	N.L.	
SCALE 1:500 HORIZ. 0 5 10 20 / 1:100 VERT. 0 1 2 4				REFERENCES
REGIONAL				FIELD NOTES
SEE COVER SHEET FOR REGIONAL ACCEPTANCE				

CONSULTANT STAMP

LICENSED PROFESSIONAL ENGINEER
N. L. A. LISCIO
100161711
2022-12-22
PROVINCE OF ONTARIO

CONSULTANT STAMP

LICENSED PROFESSIONAL ENGINEER
R. J. OFORI
100173099
2022-12-22
PROVINCE OF ONTARIO

HATCH

Halton REGION

1200mm WASTEWATER MAIN ON
EIGHTH LINE
FROM 2.18km NORTH OF STEELES AVENUE
TO 2.43km NORTH OF STEELES AVENUE
STA. 52+200 TO STA. 52+450
IN THE TOWN OF HALTON HILLS

CONSULTANT FILE NO.	REGIONAL DRAWING NO.
H-353278(PP510)	
CONTRACT NO. S-3126B-21	DRAWING NO. SHEET 52 OF 137

S-3126B-21 52 OF 137

Drawing: C:\PWWORKING\H\HATCHGLOBAL_WSE396091\D013119\PP509 - PP512.DWG
Layout: PP510
Date: 12/19/2022 Time: 05:44:16 PM

Key components of the Milton Wastewater Servicing Strategy from 2023 to 2031 are:

- South Tremaine WWPS and Forcemain – servicing areas generally west of Regional Road 25 and south of Britannia Road, including Milton Education Village.
- Trunk wastewater main infrastructure along Fifth Line and Lower Baseline.
- Lower Baseline WWPS and Forcemains – servicing growth areas in Georgetown, Halton Hills 401 Corridor and Milton (Trafalgar Corridor and south of Britannia Road).
- Local infrastructure upgrades to meet flow projections related to intensification growth.

Georgetown Wastewater Servicing Strategy

- Georgetown is currently serviced exclusively by the stream-based Georgetown WWTP.
- Upon completion of the lake-based trunk wastewater main infrastructure, the Georgetown WWTP will be decommissioned, and the service areas can be transferred to the Mid-Halton WWTP catchment area.
- New Greenfield growth areas in southwest Georgetown will be serviced by the lake-based trunk wastewater main infrastructure.

Key components of the Georgetown Wastewater Servicing Strategy from 2023 to 2031 are:

- New WWPS and forcemain to pump flows from Greenfield growth areas in southeast Georgetown.
- Decommissioning of the Georgetown WWTP, and lake-based infrastructure: trunk wastewater mains, WWPSs and forcemains along Fifth Line and Lower Base Line.

Acton Wastewater Servicing Strategy

- The Wastewater strategy for Acton is to maintain conveyance to the Acton WWTP via existing and upgraded trunk wastewater mains and WWPSs.

Key components of the Acton Wastewater Servicing Strategy from 2023 to 2031 are:

- Service updates at the Agnes Street WWPS and Black Creek wastewater mains.

calculations in the 2017 W/WW Technical Report are based on pro-rata share of flows.

- Similarly, the twin 900 mm diameter forcemains (Project 8035) has a nominal 5% BTE share based on the principle of incremental upsizing, and not a 23% BTE share if pro-rata flows were considered. BTE calculation for Project 8035 should be revised to reflect pro-rata flow share.
- BTE calculations should be revised to reflect pro-rata shares based on flow, not on incremental upsizing, and apply a consistent approach for all projects.
- We estimate the BTE reflecting pro-rata share of the linear infrastructure projects in 2022 DC program would increase Region of Halton contributions by approximately **$25M**. This does not include the additional Georgetown existing resident flows that we believe should be included, as identified in Item #6.

15) The 2017 DC Program funded the 900 mm diameter wastewater sewer on Trafalgar Road from HWY 401 to Georgetown. A significant change to the sewer size and depth occurred post-2017 DC Program, as part of detailed design in 2020/2021. The increased funding requirements of the sewer upsize are not reflected in the 2022 W/WW Technical Report – how is the additional cost of sewer upsizing being funded?

- The 2017 DC program funded a 900 mm diameter trunk wastewater sewer on Trafalgar Road from Steeles Road to 10th Sideroad (Project IDs 7549/7550).
- The 900 mm diameter sewer was upsized to a 1200 mm diameter sewer, and deepened through the detailed design process in 2020/2021, following the 2017 DC program.
- There was no BTE component to the 900 mm wastewater sewer in the 2017 DC program, and it was fully funded by growth DCs (~ $35M).
- *Has the Region of Halton revised this project funding (Project ID: 7549, 7550, 7552) outside the 2017 and 2022 DC program to include BTE?*
- *If so, was the BTE calculation to fund sewer upsizing from 900 mm diameter to 1200 mm diameter based on pro-rata share of flow and subject to the same public input as a Development Charge update?*
- *If the BTE calculation was not updated for this sewer upsizing, how is the sewer upsizing and deepening being funded?*
- If the upsized sewer is still fully funded by growth, the capacity created by the upsizing should be available for more growth, not existing residents tributary to the Georgetown WWTP.
- To be clear, DSEL is not suggesting infrastructure should have been sized smaller in past DC programs, but instead suggesting it should be funded appropriately

16) Additional clarity needed for Benefit to Existing (BTE) calculation in the 2022 W/WW Technical Report for Mid-Halton WWTP Upgrade.

Responses to Questions and Points of Clarification from BILD

Question	Comment from BILD	Response / Point of Clarification
15)	The 2017 DC Program funded the 900 mm diameter wastewater sewer on Trafalgar Road from HWY 401 to Georgetown. A significant change to the sewer size and depth occurred post-2017 DC Program, as part of detailed design in 2020/2021. The increased funding requirements of the sewer upsize are not reflected in the 2022 W/WW Technical Report - how is the additional cost of sewer upsizing being funded? • The 2017 DC program funded a 900 mm diameter trunk wastewater sewer on Trafalgar Road from Steeles Road to 10th Sideroad (Project IDs 7549/7550). • The 900 mm diameter sewer was upsized to a 1200 mm diameter sewer, and deepened through the detailed design process in 2020/2021, following the 2017 DC program. • There was no BTE component to the 900 mm wastewater sewer in the 2017 DC program, and it was fully funded by growth DCs (~ $35M). • Has the Region of Halton revised this project funding (Project ID: 7549, 7550, 7552) outside the 2017 and 2022 DC program to include BTE? • If so, was the BTE calculation to fund sewer upsizing from 900 mm diameter to 1200 mm diameter based on pro-rata share of flow and subject to the same public input as a Development Charge update? • If the BTE calculation was not updated for this sewer upsizing, how is the sewer upsizing and deepening being funded? • If the upsized sewer is still fully funded by growth, the capacity created by the upsizing should be available for more growth, not existing residents tributary to the Georgetown WWTP. • To be clear, DSEL is not suggesting infrastructure should have been sized smaller in past DC programs, but instead suggesting it should be funded appropriately.	The 2022 Development Charges Update Water/Wastewater Technical Report did not cover funding requirements or re-calculation of projects outside of the 2022 Development Charges Program. The proposed trunk sewers along Eighth Line (projects 7549/7550) are not part of the 2022 DC Program, and as such, changes that occurred during the detailed design process were not included in the 2022 DC Technical Report. During detailed design, a review of constructability considerations identified a preferred size of 1200mm for the Eighth Line Trunk Sewer along the full alignment, rather than the originally contemplated 900mm / 1050mm to. The decision was made based on constructability and did not translate into an increase in overall cost for the project. The additional capacity available through the larger pipe size has therefore been derived through no additional investment from the development community.

Project: 8673 8th Line
Project No.: 2742-7218
Date: 2024-12-19
Designed By: MF
Checked By: RB

SANITARY FLOW CALCULATIONS

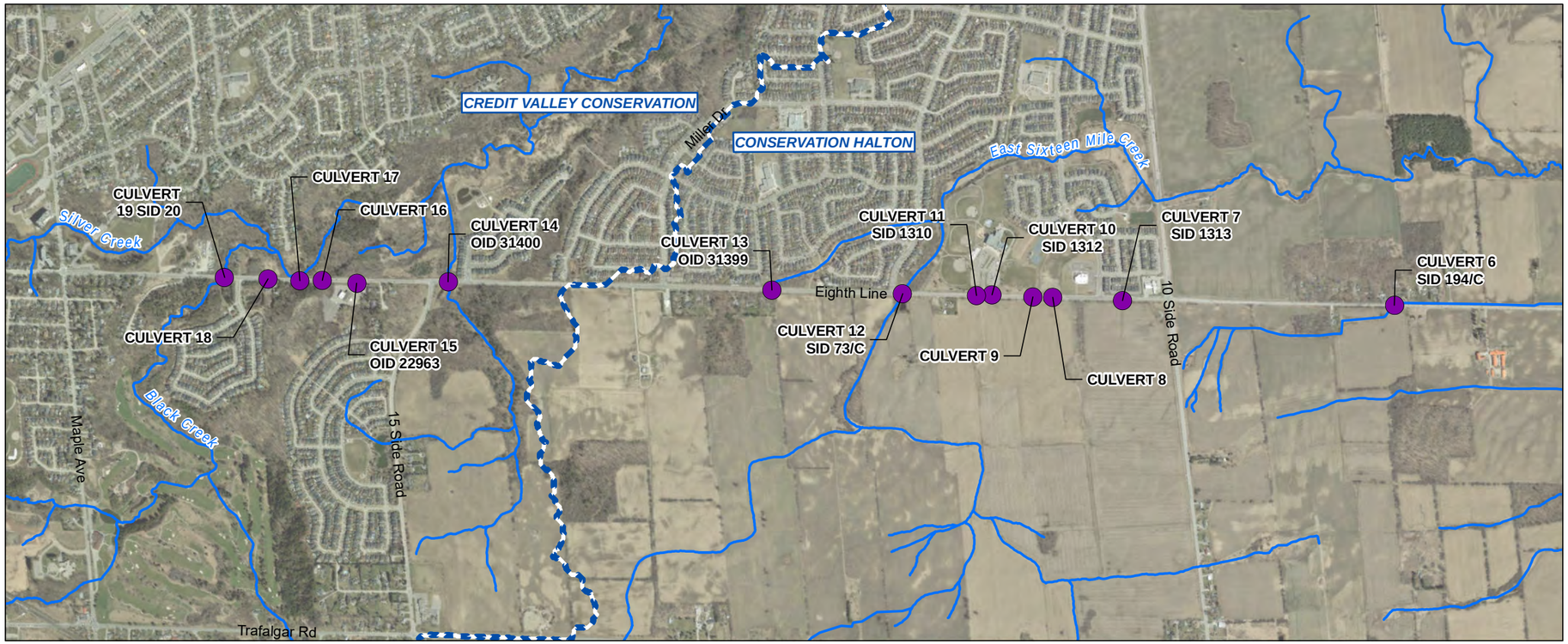
Region of Halton

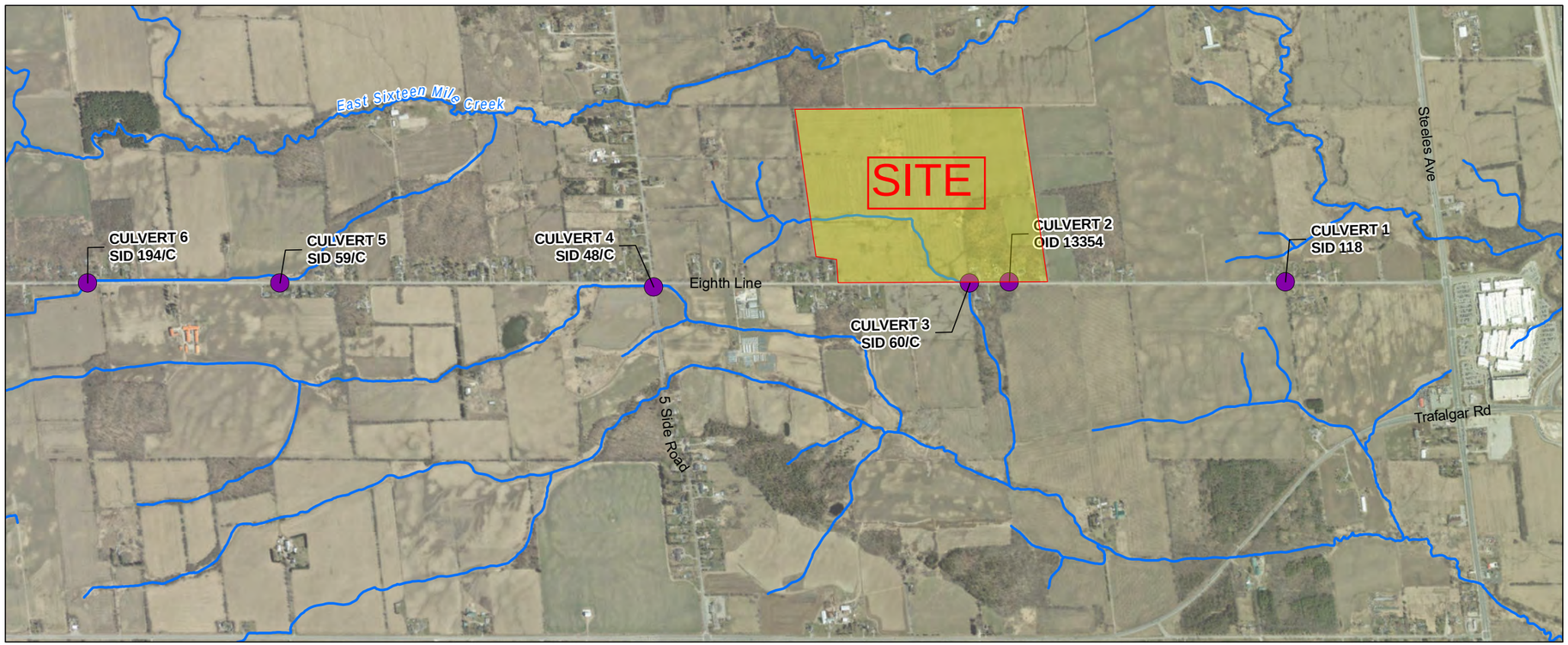
			References
Total Development Area:	34.46	ha	Per Preliminary Concept Plan dated March 2024
Occupancy:	Employment		Premiere Gateway Phase 2B Employment Area (November 2021)
Equivalent Population Density	25	jobs/ha	
Total Population:	862	jobs	
Peak Wastewater Flow Factor (M_e):	$0.8 * (1 + \frac{14}{4 + \sqrt{P}})$		Per 2022 DC Background Study, Region of Halton - Table B-3 Water Demand Criteria
where,	P= population in thousands		
Me:			
Peaking Factor Site	3.07		
Unit Sewage flow:	310	L/emp/day	Per Halton Region Water and Wastewater Linear Design Manual, 2019 (Section 3.2.2, Table 3-2)
Infiltration Flow:	0.000286	m^3/ha/s	

Area (ha)	Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Sanitary Flow (L/s)
34.5	3.09	3.07	9.50	9.86	19.35

APPENDIX D

Stormwater Management





- Culvert Location (With Culvert ID and Town Structure ID or Town Object ID)
- Watercourse (MNRF)
- Conservation Authority Boundary

Sources:

1. Ministry of Natural Resources and Forestry, © Queen's Printer for Ontario.
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Town of Halton Hills.

Disclaimer:

R.J. Burnside & Associates Limited and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983 CSRS	
Coord. System: NAD 1983 CSRS UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Page Orientation: 44.9°	Scale Factor: 0.99960

Grid North

0 250 500 750 1,000 1,250 1,500

Metres

BURNSIDE

Client

TOWN OF HALTON HILLS

Figure Title

EIGHTH LINE EA

ROAD CROSSING
CULVERT LOCATIONS

Drawn	Checked	Date	Figure No.
CD	JV	2022/09/12	8.4
Scale		Project No.	
1:20,000		300043880	

File Path: \\elmo\Shared Work Areas\043880 (8th Line EA)\06_GIS\MapCartoESRI\043880 Road Crossing Culvert Locations.mxd Print Date: 2022/09/12 Time: 02:28 PM

Table 8.3: Culvert Assessment Summary (Hydraulic)

ID	Watercourse Name	Existing Pipe	Current Capacity (Without Freeboard)	Proposed Capacity (Freeboard)	Recommendation
1	N/A	0.90 m dia. CSP	25-Year	50-Year (0.26 m)	Replace with 1.0 m dia. CSP, extend to 30 m.
2	N/A	0.60 m dia. HDPE	Extend to 30 m. Culvert 2 is not at a low-point, it appears to have been installed to provide relief for downstream Culvert 3. Without detailed grading, it is not clear how much runoff is conveyed through the culvert. At Detailed Design, hydraulic connectivity with Culvert 3 should be investigated.		
3	Middle 16 Mile Creek Trib.	Twin 1.6 m Span x 1.1 m Rise Arch CSP	10-Year	25-Year (0.41 m) 50-Year (0 m)	Culvert overtops during 25-Year. Proposed to increase to 1.88 m x 1.26 m CSP Arch and extend to 30 m.
4	Middle 16 Mile Creek Trib.	2.55 m Span x 0.65 m Rise Conc. Box	5-Year	25-Year (0.66 m) 50-Year (0.26 m)	Replace with 4.2 m Span x 0.9 m Rise Concrete Box to meet conveyance criteria and improve existing flooding conditions. Extend to 38 m.
5	N/A	1.4 m dia. CSP	100-Year	50-Year (0.40 m) 100-Year (0.23 m)	Culvert has capacity for the 25-Year. Proposed extension only.
6	East 16 Mile Creek Trib.	1.5 m Span x 0.8 m Rise Elliptical CSP	>2-Year	25-Year (0.31 m) 50-Year (0.25 m)	Replace with 2.7 m Span x 0.9 m Rise Concrete Box to meet conveyance criteria. Construct berm at upstream inlet to direct flows to culvert without spilling to the south. At Detailed Design, hydraulic connectivity with Culvert 5 should be investigated.
7	N/A	0.60 m dia. CSP	Minor extensions as necessary to accept external drainage. Culverts 6 through 10 connect to an existing bypass pipe that conveys 10-year flows through the Fernbrook Phase 3 subdivision (VG SWS). The existing culverts have sufficient capacity to convey the 10-year storm.		
8	N/A	0.45 m dia. Conc.			
9	N/A	0.45 m dia. Conc.			

12.1.1.4 Socio-Economic Environment

Air Quality and Noise

- Vegetation barriers will be considered by the Town during the detailed design phase of the project; however, vehicle sightline considerations for traffic safety will be prioritized.
- A complaint response protocol for nuisance impacts including dust emissions and construction noise will be prepared and implemented prior to construction.

12.1.1.5 Cultural Environment

Archaeology and Cultural Heritage

- Stage 2 Archaeological Assessment shall be completed for the project areas that exhibit archaeological potential. Stage 3 Archaeological Assessment shall be completed for three areas that retain Cultural Heritage Value. These three areas include the two cemeteries on the north side of the Eighth Line and Steeles Avenue intersection as well as three sites on the west side of Eighth Line north-west of Argyll Road.
- The Cultural Heritage Assessment Report will be updated with a confirmation of impacts of the undertaking on the cultural heritage resources identified within and / or adjacent to the study area and will recommend appropriate mitigation measures. Provincial guidelines should be consulted for advice and further heritage assessment work should be undertaken as necessary.
- Should future work require an expansion of the study area then a qualified heritage consultant shall be contacted to confirm the impacts of the proposed work on potential heritage resources.
- MCFN to be kept informed regarding the future stages of the archaeological assessments.
- HDI to be kept informed regarding the future stages of the archaeological assessments.
- HWN to be kept informed regarding the future stages of the archaeological assessments.

12.1.1.6 Area-specific Commitments

Culvert 3

Consideration for realigning the watercourse to remove the 90-degree bend will be made during detailed design through the engagement of a fluvial geomorphologist to advise on culvert alignment and sizing. A realignment can be considered if recommended through the geomorphology and grading assessments.