Water and Wastewater Area Servicing Plan

For the Premier Gateway Phase 1B Employment Area in the Town of Halton Hills

Final Report

Prepared by

GM BluePlan for:

Halton Region

Project No. 717029

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GM BluePlan ENGINEERING

Guelph | Owen Sound | Listowel | Kitchener | London | Hamilton | GTA

Royal Centre, 3300 Highway No. 7, Suite 402, Vaughan, ON L4K 4M3 P: 416-703-0667

www.GMBluePlan.ca

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1 Introduction

Halton Region ("the Region") initiated the Water and Wastewater Area Servicing Plan (ASP) for the Premier Gateway Phase 1B Employment Area (PGEA P1B) in Halton Hills in 2017 to identify and evaluate water and wastewater servicing alternatives and recommend a servicing solution. The Water and Wastewater ASP will support the Premier Gateway Employment Area (PGEA) in Halton Hills, which is designated as an urban area, a natural heritage system as well as an Employment Area in the Region's Official Plan.

The PGEA will serve as a key employment growth area including industrial, office, commercial and institutional services. The completion of this Water and Wastewater ASP for the PGEA P1B in Halton Hills is a critical step in the development of a key employment area by the Region and the Town of Halton Hills.

The key objectives of this Water and Wastewater ASP are to:

- Develop a comprehensive servicing strategy to meet the requirements of PGEA P1B that can cost-effectively be constructed.
- Provide a defensible framework and implementation plan for servicing of the PGEA P1B.
- Provide justification and recommendations for timing and phasing of new Regional and local infrastructure.
- Build on previous studies and create a forward-looking document to support Halton Hills that aligns with infrastructure planning across the Region.

1.1 Proposed Development

The Premier Gateway Employment Area (PGEA) is an important designated employment area in the Town of Halton Hills ("the Town") located in the Milton/Hwy 401 corridor. The PGEA is located along Steeles Avenue north of Highway 401, west of Winston Churchill Blvd, and east of Esquesing Line. The PGEA consists of four distinct Phases: 1A, 1B, 2A and 2B. The Area Servicing Plan will focus on Phase 1B of the PGEA.

The ASP study area lies within the PGEA in the Town of Halton Hills and includes the "Existing" Phase 1B area, as well as approximately 75 ha of "Replacement" employment lands currently outside the Urban Area in "Lot 2"". These lands, former Esquesing Township, are directly north of the existing Phase 1B area along Hornby Road between Sixth Line and Eighth Line.

The majority of the study area is currently classified as agricultural land, with smaller portions of the land designated to forest, rural residential, golf course and commercial/office. As identified in ROPA 38, the study area is within the Greenbelt boundary and contains parts of the Natural Heritage System consisting of watercourses (e.g. creeks) and potentially significant woodlands. There are also areas of natural hazard due to the existing flood plains.

ROPA 47 "An Amendment to Address a Shortfall of Employment Lands in the Town of Halton Hills' Premier Gateway Employment Area", adopted on April 18, 2018 by Regional Council, incorporates the Lot 2 lands into the Urban Area to be planned and developed for future employment uses. The Lot 2 lands established through ROPA 47 have been identified as the "replacement" employment lands addressing the shortfall previously established through ROPA 43 – "Halton Peel Boundary Area Transportation Study / Greater Toronto Area West Corridor Protection". On May 8, 2018, the Ministry of Municipal Affairs filed an appeal of ROPA 47. The

Ministry's letter states that the Region's decision to adopt ROPA 47 fails to conform and conflicts with the Growth Plan for the Greater Golden Horseshoe (2017) on the basis that it constitutes a settlement area boundary expansion.

The study area and environmental features are shown in **Figure 1-1**.

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

General Features

- Phase 1B (Lot 1)
- Phase 1B (Lot 2)
- Municipal Boundary
- Property Parcel
- Proposed Roads
- Highways
- Regional and Major Roads
- Local Roads

Environmental Features

- Wooded Areas
- Creeks, Rivers and Waterbody
- Greenbelt Plan Boundary

Phase 1B (Lot 2)
"Replacement Lands"

Phase 1B (Lot 1)
"Within Existing Urban Area"

Sixth Line
Hornby Road
Trafalgar Road
Eighth Line
Proposed Collector 1 Option 2
Proposed Collector 2
Proposed Collector 3
Steeles Avenue
Highway 401
Halton Hills
Milton

0 500 Meters

Figure 1-1
Study Area

BluePlan ENGINEERING

November, 2018
717029-G-005
NAD 1983 UTM Zone 17N

1.2 Timing and Phasing

It is documented throughout the Town of Halton Hills Official Plan that the planning horizon for the PGEA Phase 1B Lot 1 and Lot 2 lands is 2021. The Town has also indicated that there has been preliminary discussion with landowners / proponents for potential development for areas within Lot 1; and it is anticipated that development of areas of Lot 1 will occur concurrently with the required planning processes (zoning by-law amendments, functional servicing plans, etc.). There is no status for any potential development within the PGEA Phase 1B lands, and timing will be dependent on economic conditions and market forces, as well as the incorporation of the replacement employment lands into the urban boundary. Proposed water and wastewater infrastructure will be coordinated together with stormwater infrastructure and road improvements recommended as part of the Town of Halton Hills Premier Gateway Employment Area Phase 1B Secondary Plan.

The Town has noted that the intention is for both Lot 1 and Lot 2 lands to be concurrently made available for development; however, the appeal of ROPA 47 may delay the incorporation of the Lot 2 lands into the Urban Area and consequently compel a phased approach to development (with only Lot 1 lands initially being developed).

1.3 Consultation with Region Staff and Town of Halton Hills

In the preparation of the ASP, several key meetings were held and are summarized below:

- Project Initiation Meeting – August 31, 2017
- Planning Meeting – January 17, 2017
- Project Review Meeting – May 25, 2018
- Infrastructure Servicing Review Meeting – June 25, 2018
- Project Team Meeting – July 31, 2018

1.4 Interim Servicing

This Report has been prepared to provide Halton Region with a proposed plan for the water and wastewater servicing of the PGEA P1B in Halton Hills. The primary objective of the analysis was the provision of servicing to both Lot 1 and Lot 2 lands aligning with the respective Secondary Plans' 2021 planning horizons.

The analysis also identified opportunities to service Lot 1 development without impacting Lot 2 lands that may not be incorporated into the Urban Area prior to development proceeding.

Interim servicing of Lot 1 development can be easily extended to service the entire Phase 1B PGEA once Lot 2 lands are incorporated.

1.5 Organization of Report

The ASP Report documents the comprehensive process undertaken to identify, evaluate and recommend a preferred water and wastewater servicing strategy for the Halton Hills PGEA Phase 1B study area. The Report is organized as follows:

- **Section 1 – Introduction**

  An introduction to the study, description of study area, study purpose and objectives, and the report outline.

- **Section 2 – Background Study Context**

Provides the background plans, related studies, legislative and policy planning context, water and wastewater servicing principles and policies relevant to the Halton Hills PGEA Phase 1B Water and Wastewater ASP.

- **Section 3 – Land Use and Best Planning Estimates**

  Outlines the existing land use and environmental conditions, future planned land use, and population and employment growth forecasts for the Halton Hills PGEA Phase 1B area.

- **Section 4 – Water**

  Baseline description of the existing water system, estimated water demands, assessment of existing infrastructure capacity and development of servicing strategies.

- **Section 5 – Wastewater**

  Baseline description of the existing wastewater system, estimated wastewater flows, assessment of existing infrastructure capacity and development of servicing strategies.

- **Section 6 – Phasing, Timing and Cost Estimate**

  Identifies the phasing / timing and cost estimate of capital projects to service the PGEA Phase 1B area, taking into consideration the system-wide needs.

- **Section 7 – Conclusion**

  Summarizes the servicing solution for the study area and lists the capital upgrades and improvements recommended.

2 Relevant Documents and Studies

2.1 Halton Region

2.1.1 Halton Region Official Plan (2016)

The Halton Region Official Plan (OP) provides policies for the Region and all its municipalities including the Town of Halton Hills. The OP also includes strategies and objectives related to Regional growth and development through to the year 2031.

According to the Regional Structure map, the northern part of the study area (Lot 2) is currently designated as *Agricultural Area* while the southern part of the study area (Lot 1) is designated as an *Employment Area* within the Urban Area. The OP defines an employment area as:

"…areas designated for clusters of business and economic activities including, but not limited to, manufacturing, warehousing, offices and associated retails and ancillary facilities".

Regional Official Plan Amendment (ROPA) 43 – HPBATS/GTA West Corridor Protection identified a corridor protection area to be protected for the *Halton Peel Boundary Area Transportation Study / Greater Toronto Area West Corridor Study Area* through the Towns of Halton Hills and Milton until the completion of the GTA West Corridor Environmental Assessment study. The area protected is generally bounded by Winston Churchill Boulevard to the east, No. 10 Side Road to the north, Eight Line to the west and Steeles Avenue to the south.

ROPA 47 – An Amendment to Address a Shortfall of Employment Lands in the Town of Halton Hills' Premier Gateway Employment Area addresses the shortfall of employment lands in the Town of Halton Hills. The Town identified the requirement for "Replacement Lands" to address the shortfall triggered by the GTA West Corridor EA protection area, and supply demand for pre-2021 employment lands. Lands north of the PGEA in Halton Hills have been identified for inclusion in the Urban Area as Employment Lands. These lands (also referred to as "Lot 2") consist of approximately 75 ha and are generally bounded by Eighth Line to the east, Sixth Line to the west and Steeles Avenue to the south.

On February 9, 2018, the Ministry of Transportation (MTO) announced that the Province would not proceed with completing the environmental assessment for a proposed highway in the GTA West corridor. However, at the same time, the Province announced that a new study – the Northwest GTA Corridor Identification Study – would be undertaken by MTO and the Independent Electricity System Operator (IESO) to identify a smaller corridor that will be protected for future infrastructure needs.

As part of the Northwest GTA Corridor Identification Study, MTO and IESO have identified a study area which continues to require protection. The study area continues to cover a significant amount of land within the eastern portion of the PGEA. The corridor protection required for the Northwest GTA Corridor Identification Study precludes any ability for the Town and Region to comprehensively plan for the employment lands east of Eight Line. As a result, the need for additional employment lands in the Town remains.

2.1.2 Sustainable Halton Water and Wastewater Master Plan (2011)

In 2011, Halton Region completed the Sustainable Halton Water and Wastewater Master Plan (SHWWMP) to support Regional implementation of the Official Plan Amendment (ROPA 38/39) based on the Region's Bests Planning Estimates (June 2011). The Master Plan provided a Region-wide water and wastewater servicing strategy to accommodate growth from 2011 to 2031.

Halton Region, with support from local municipalities, updated their planning data to 2031 as part of the Master Planning process.

The key water servicing components for the Milton/Halton Hills 401 Employment Corridor are:

- Serviced by Zone M5L located along Steeles Avenue
- Water supply is lake based. Pumping stations pump the water north to Milton/Halton Hills 401 Corridor

Servicing of the PGEA is reliant on the following water and wastewater capital projects identified in the Region's Development Capital Plan (as outlined in the 2017 Development Charges (DC) Update Technical Report (detailed below)):

- Infrastructure upgrades maximizing use of existing capacity
- New Zone 4/5 boundary
- Second spine up Trafalgar Rd alignment and third spine along Neyagawa Blvd
- Burloak WPP and Oakville WPP water supply capacity expansion
- Addition of Zone 5 Pumping Station (at Zone 4 Reservoir) and transmission for additional feed to 401 Corridor
- Integration of Zone 5 infrastructure providing Milton supply security

The key wastewater servicing components for the Milton/Halton Hills 401 Employment Corridor are:

- Located along Steeles Avenue
- Wastewater flows conveyed to the southern Mid-Halton WWTP

Wastewater servicing strategies for this area includes implementation of the following:

- Additional capacity is required at Mid-Halton WWTP
- Two (2) existing wastewater pumping station (along Steeles Ave) – minimize sewer depth and transfer flows along Steeles Ave to the existing Milton Gravity system to the south.
- Eastern area will continue to pump wastewater flows to existing infrastructure to the west. In the future, flows will be diverted south when the Eighth Line/Trafalgar Trunk Sewer is constructed.
- Convey flows to the Highway 25 trunk sewer

2.1.3 2017 Water & Wastewater Development Charges Update

The 2017 DC Update Water and Wastewater Technical Report was completed in September 2016 to update the 2012 DCs and includes a number of technical updates to the SHWWMP and its associated Capital Implementation Plan. The report provides the basis for developing costs and capital implementation timing of water and wastewater projects required to service population and employment growth across Halton Region from 2017 to 2031 using 2011 Best Planning Estimates (BPEs).

The following summarizes the water and wastewater servicing recommendations made under the 2017 DC Update that are relevant to the PGEA P1B study area:

Water Servicing Recommendations

- Realignment of water pressure zone boundaries in the Town of Milton and the Town of Oakville (Zones 3, 4, and 5) to optimize customer water pressure in these areas.

Significant Water Projects (2017-2031):

- Oakville/Milton Water Pressure Zone Realignment (Zones 3, 4, 5) and alterations to Neyagawa, Fourth Line and Eighth Line Pumping Stations (Region IPFS IDs 7509, 7513, 7514)
- Construction of Zone 4 (Future Zone 250) Twin 900mm diameter trunk watermains along Trafalgar Road from Britannia Road to new Zone 4 (Future Zone 250) Reservoir (SH Region IPFS ID 4985)
- 400mm diameter watermain along Hornby Road (Zone M5L / Future Zone 250) (Region IPFS ID 6641)
- 400mm diameter watermain from Hornby Road to Trafalgar Road (Zone M5L / Future Zone 250) (Region IPFS ID 6642)
- 400mm diameter watermain from Trafalgar Road to approximately 400m east of Eight Line (Zone M5L / Future Zone 250) (Region IPFS ID 6643)
- 400mm diameter watermain from Steeles Avenue to approximately 300m north (Zone M5L / Future Zone 250) (Region IPFS ID 6644)

Wastewater Servicing Recommendations

Significant Wastewater Projects (2017-2031):

- Georgetown Eighth Line/Trafalgar Trunk Sewer (Region IPFS ID 6569/7550, 6572/7552, 6573/7553, 6574/7554, 6575/7555, 6576/7529, 6577/7530)
- Decommission of Halton Hills #3 WWPS

2.2 Town of Halton Hills

2.2.1 Premier Gateway Employment Area Phase 1B Secondary Plan Study

The Premier Gateway Employment Area Phase 1B Secondary Plan was completed in June 2018. The Secondary Plan constitutes Amendments No. 31A (Lot 1 lands) and No. 31B (Lot 2 lands) to the Town of Halton Hills' Official Plan. The Secondary Plan identifies employment land use designations Prestige Industrial Area and Business Commercial Area, as well as the Residential Special Policy Area. The Residential Special Policy Area is an overlay to the Prestige Industrial Area designation and recognizes locations where there are existing residential uses which might not redevelop in the short term.

The employment target for the Secondary Plan area at full build out is 2700 jobs. The planning horizon year for the employment land uses established in the Secondary Plan is 2021. The policies of the plan are intended to address a 20-year time frame.

Key guiding principles and policy items include:

- Provide for significant employment growth on full municipal services that can accommodate large and small-scale employment uses;

- Respect the existing low density residential and institutional uses within and adjacent to the Secondary Plan area and recognize their right to continue to exist but prohibit new residential uses and restrict institutional uses, recognizing that the primary and long-term use of the area is for employment; and,
- Ensure that the full urban infrastructure necessary to support the employment uses and to supply municipal services to existing residential uses is provided in a timely manner in advance of, or in conjunction with, new development.

For the purposes of this study, Proposed Collector Road 1 Option 2 was assumed to be the preferred option for the Proposed Collector 1 road. Proposed Collector Road 1 Option 2 borders Lot 1 and Lot 2 and can be constructed as part of Lot 1 development.

2.2.2 Premier Gateway Scoped Subwatershed Study – Phase 2: Impact Assessment and Management Strategy (2017)

A Scoped Subwatershed Study was completed in support of the PGEA Phase 1B Secondary Plan Study in order to define and establish the constraints and opportunities within the Premier Gateway Lands related to the terrestrial and aquatic ecology, stream systems, and surface water and groundwater resources (quantity/quality).

A Phase 1 Study Area Characterization and a Phase 2 Impact Assessment and Management Strategy were completed.

Key findings related to the PGEA P1B Area Servicing Plan include:

- The installation of water and sewer infrastructure can lead to the interception of shallow groundwater flow along the backfilled material altering shallow groundwater flow paths and creating leakage into sanitary and storm sewers.
- Installation of infrastructure below the water table leads to the potential need for dewatering during construction and post construction and a decrease in groundwater levels.
- Infrastructure construction may encounter more extreme hydraulic conditions, as described in the characterization, which have the potential for significant upward gradients, for transmittal of large quantities of groundwater and the potential for significant groundwater level reductions during dewatering. The depth of this hydraulically confined system may vary across the site and depth and local hydraulic characteristics need to be confirmed.

2.2.3 Premier Gateway Secondary Plan – Water and Wastewater Servicing Functional Servicing Plan (2017)

A Functional Servicing Plan (FSP) was completed in support of the PGEA Phase 1B Secondary Plan Study to review the existing water and wastewater services accessible to the site, confirm their capacity, and describe servicing concepts for the site.

The FSP assumed a proposed employment population of 8,307 (which aligns with the SHWWMP 2031 employment projection for both Phase 1B and Phase 2B development lands).

Water and wastewater design criteria used were based on the design criteria set out in Halton Region's Water and Wastewater Linear Design Manual.

Servicing strategies were developed using the Region's water and wastewater models based on growth projections to 2031. It was recommended that "Halton Region's water distribution system and wastewater collection system have sufficient capacity to support the development of the Premier Gateway Secondary Plan lands with connections at the boundary of the site."

2.2.4 Town of Halton Hills Official Plan

The Town of Halton Hills Official Plan (OP) provides policies for the Town of Halton Hills related to the Town's growth and development through to the year 2031. The OP relates to all lands within the Town of Halton Hills.

According to the OP, the PGEA Phase 1 is divided into six land designations: prestige industrial area, gateway area, green lands, major parks and open space area, private open space area, and Phase 1B Employment. A key objective of the Phase 1B Employment Area designation is to accommodate employment growth to the 2021 planning horizon.

All development shall proceed based on full municipal services. The Region of Halton is responsible for the extension of municipal water and wastewater services.

Town of Halton Hills Official Plan Amendment No. 30 – Premier Gateway Employment Area – Replacement Employment Lands identified up to 75 hectares of additional land for employment uses to be added within the Town's Urban Area adjacent to the Phase 1B Premier Gateway Employment Area. Like ROPA 43, this was to replace the shortfall of employment lands within the Town to the 2021 planning horizon, as a result of lands being lost to corridor protection for the Greater Toronto Area West/Halton-Peel Boundary Area Transportation Study (GTA West/HPBATS).

Draft Official Plan Amendment No. 31A – Premier Gateway Phase 1B Secondary Plan establishes a Secondary Plan for the southern portion of the Premier Gateway Phase 1B Employment lands (Lot 1 lands currently within the urban boundary)

Draft Official Plan Amendment No. 31B – Premier Gateway Phase 1B Secondary Plan establishes a Secondary Plan for the northern portion of the Premier Gateway Phase 1B Employment lands (Lot 1 lands currently outside of the urban boundary)

The Town adopted OPA No. 31A and OPA No. 31B in June 2018 to establish Secondary Plans for the southern portion of the PGEA Phase 1B lands (Lot 1) (located within the Town's Urban Area) and the northern portion of the PGEA Phase 1B lands (Lot 2) (located outside of the urban boundary (to be added to the Town's Urban Area through OPA No. 30). It is noted in both OPAs that the Secondary Plan study encompassed and comprehensively studies lands both within Lot 1 and Lot 2, the Secondary Plan was separated into two separate OPAs in order not to delay the development of Lot 1 lands that are already incorporated within the Urban Area.

2.2.5 Halton Region Report LPS60-18 - Extension of Municipal Services Outside of the Urban Area Boundary in Hornby

On May 23, 2018, Halton Region approved Report LPS60-18, which recommended the extension of municipal water servicing to residents located outside of the Urban Area in Hornby. A new watermain is to be extended along Sixth Line from Steeles Avenue to approximately 1,250m north of Steeles Avenue to service residences fronting Sixth Line on the east side, and the existing watermain along Hornby Road north of Steeles Avenue is to be extended to service residences

fronting Hornby Road on the west side, directly south of the intersection of Hornby Road and Trafalgar Road.

Residents in the Hornby area have raised long-standing concerns about negative impacts on their private wells due to the disruption of the aquifer relating to the installation of underground infrastructure. While many rural residential properties in this area have been or are planned to be incorporated into the Urban Area, and therefore eligible for urban services, other properties remain outside of the Urban Area and continue to have significant issues with a permanent, secure and consistent water supply from private wells.

The Region determined that there was sufficient information available to demonstrate that given the long-standing and significant impact to the aquifer has resulted in a long-standing 'large scale failure' consistent with the Urban Services Guidelines. Region Report LPS-60-18 recommended that municipal water services be extended to affected properties within Hornby to address the large-scale failure. The project is planned for construction in 2019.

3 Land Use and Planning Projections

3.1 Land Use

3.1.1 Existing

The existing land use within the PGEA P1B study area currently consists of largely vacant lands, agricultural lands and a few areas of commercial and residential uses. Most commercial properties are located along Steeles Avenue, while residential rural areas are located along Hornby Rd, Sixth Line and Eight Line.

3.1.2 Future

The PGEA is an important area within the Regional Official Plan. The objective of the PGEA is to ensure the availability of land to accommodate projected employment growth and support Halton Region's economy. The PGEA P1B contains areas that are designated as Prestige Industrial Area with the intention to form an economically competitive and attractive employment area.

The permitted uses within this area will be limited to mainly employment such as industrial uses, business and professional offices, and some other facilities that do not cause or are likely to cause air pollution, offensive odours, ground or water pollution, or noise in excess of current regulations. New residential uses are prohibited within the PGEA P1B area. However, Official Plan Amendment 10 to the Town of Halton Hills Official Plan identified existing concentration of rural residential developments, which are unlikely to redevelop in the short term for employment uses. The PGEA P1B Secondary Plan stablished a Residential Special Policy Area which will govern the redevelopment of these areas.

3.2 Planning Estimates and Growth Assumptions

3.2.1 Best Planning Estimates (BPEs)

Halton Region Best Planning Estimates (BPEs) Data from June 2011 are generally used to determine the current and future water and wastewater servicing needs in the Region. This data is geographically distributed by Traffic Survey Zone (TSZ) and Small Geographic Units (SGUs) and contains approved population and employment projections for the Region up to the year 2031 consistent with the Region's Official Plan.

Figure 3-1 shows the SGUs associated with the PGEA Phase 1B Water and Wastewater Area Servicing Plan.

3.2.2 Premier Gateway Phase 1B Secondary Plan Area - Growth Assumptions

For the Lot 1 lands located within the Urban Area in ROPA 38, the planning forecasts provided by the Region were based on the 2011 BPEs consistent with the SHWWMP. A detailed breakdown of the Region's BPEs and SGU splits for Lot 1 can be found in **Appendix A**.

For the Lot 2 lands located outside of the Urban Area in ROPA 38, the Region provided forecasts that will meet the ROPA 47 target (addressing the shortfall previously established through ROPA No. 43). The PGEA Phase 1B Secondary Plan Area assumed that Lot 2 lands will develop with the same density as the combined phases 1B and 2B of the PGEA.

A detailed breakdown of the PGEA Phase 1B Secondary Plan Employment Growth Assumptions can be found in **Appendix A**.

The PGEA Phase 1B Secondary Plan Growth Projections are summarized Table 3-1.

Table 3-1: PGEA Phase 1B Secondary Plan Employment Growth Projections

PGEA Phase 1B Lands	2031 Projections				
	Res	Com	Ind	Ins	Total ICI
Lot 1	163	537	2,115	41	2,693
Lot 2	0[1]	374	1,518	87	1,979[1]
Total	**163**				**4,672**

Lot 1 and Lot 2 are shown on Figure 1-1.

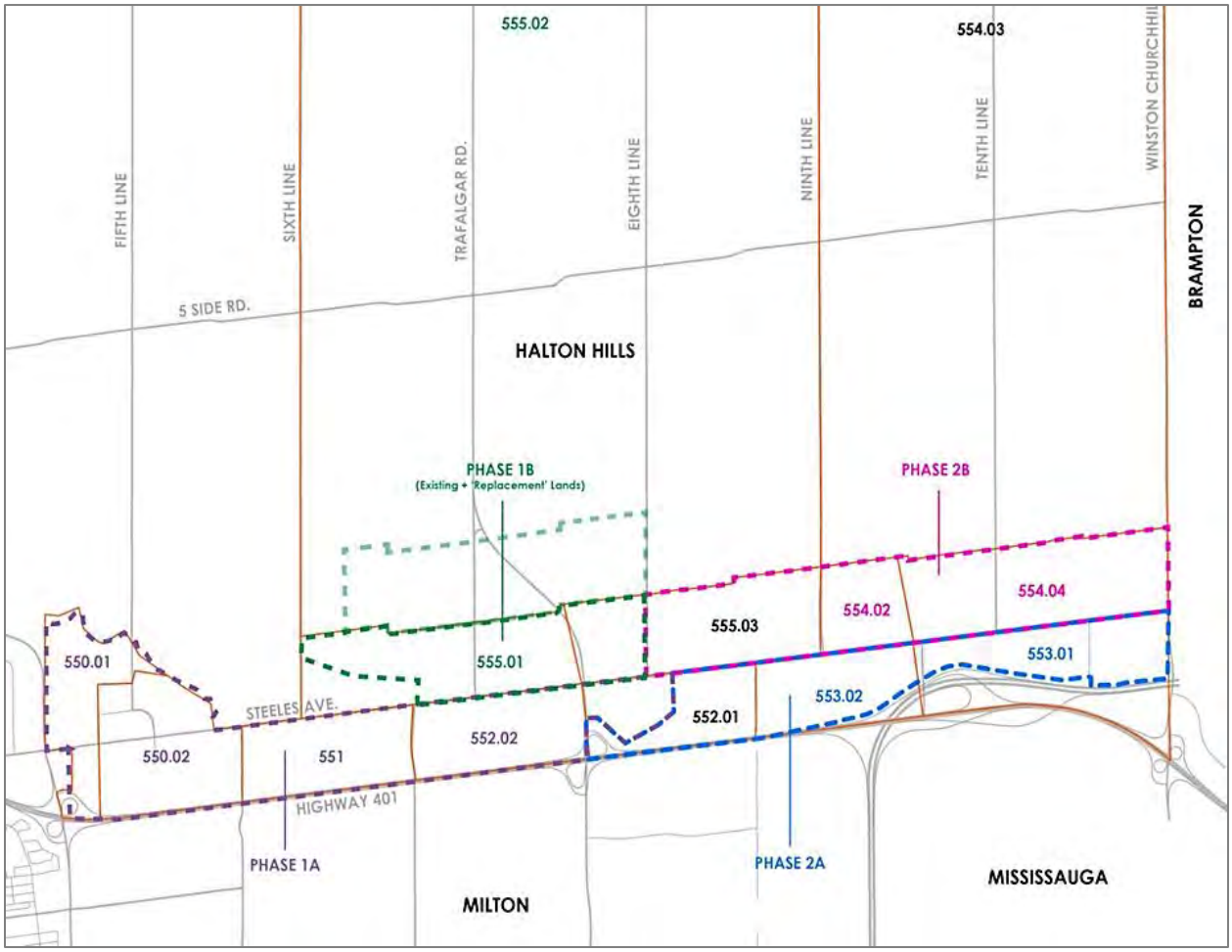


Figure 3-1: Halton Hills Premier Gateway Employment Area Phases & SGU Boundaries

3.2.3 Town of Halton Hills Projections

The Town's OPA No. 31A (Lot 1 lands Secondary Plan), and OPA No. 31B (Lot 2 lands Secondary Plan) identified the Town's employment targets for full buildout of the PGEA Phase 1B lands. The Secondary Plan employment targets are summarized in Table 3-2.

Table 3-2: Town of Halton Hills Full Build Out Employment Targets

PGEA Phase 1B Lands	Full Buildout Employment Targets
	Total ICI
Lot 1	2,700
Lot 2	1,800
Total	**4,500**

It is noted in the Secondary Plan schedules of OPA No. 31A and OPA No. 31B that the planning horizon for the employment land uses is 2021.

The Town has also indicated that there are landowners / proponents for potential development for areas within Lot 1 that have had extensive discussions with the Town; and it is anticipated that development of areas of Lot 1 will occur concurrently with the required planning processes (zoning by-law amendments, functional servicing plans, etc.)

Input from the Town was utilized to better inform the ASP (recognizing that potential developments do not yet have any status, and therefore consideration must be given to all development alternatives allowed for in the Secondary Plan).

3.2.4 Planning Projections Comparison

For the purpose of this analysis, the planning projections for the PGEA Phase 1B provided by the Region were compared with the Town's Secondary Plan Employment Targets. The comparison is summarized in Table 3-3.

Table 3-3: Comparison of Halton BPEs and Town of Halton Hills Employment Targets

PGEA Phase 1B Lands	PGEA P1B Secondary Plan Employment Growth Projections	Town of Halton Hills Full Buildout Employment Targets	Difference
Lot 1	2,693	2,700	-7
Lot 2	1,979	1,800	+181
Total	**4,672**	**4,500**	**+172**

The comparison shows a marginally difference between the PGEA P1B employment projections and the Town of Halton Hills Employment Targets.

The PGEA Phase 1B Area Servicing Plan is based on the Region's planning projections.

4 Water

4.1 Existing Water System

Three (3) water treatment plants provide potable water for Halton Region's lake-based service areas: Burlington WTP, Oakville WTP and Burloak WTP. Halton Region's water transmission and distribution network is interconnected throughout Burlington and Oakville; however, the Oakville WTP and Burloak WTPs are the main supply sources to the Milton/Halton Hills lake-based area. PGEA P1B lies predominantly within the existing Milton Zone 5 (M5L) pressure zone whose boundaries have recently been reviewed. The "replacement" employment lands are currently outside of Halton Region's urban area and outside of pressure Zone M5L.

4.1.1 Current Pressure Zone Boundary Alignment and the Proposed Ultimate Pressure Zone Boundary Realignment

Due to existing and potential future level of service challenges, pressure zones 3, 4 & 5 boundaries have recently undergone extensive review. This review and analysis has resulted in the recommendation to realign the pressure zones boundaries within the existing Oakville and Milton zones 3, 4 & 5. New pressure zones will be created and will be referred to based on their proposed top water level (TWL). These zones are 211 m, 223.5 m and 250 m. The boundaries for Milton Zone M5L (TWL 267 m) have also been modified. The PGEA P1B study area generally lies at the lower elevations within the existing M5L pressure zone where high pressures can occur during certain conditions. Upon commissioning of the Ultimate Pressure Zone Boundaries Realignment, the study area will lie completely within pressure zone TWL 250 m.

The existing and future pressure zone of the HH PGEA P1B lands is summarized in Table 4-1.

Table 4-1: HH PGEA P1B Lands Existing and Future Water Pressure Zone

Existing Pressure Zone	Future Pressure Zone (After Commissioning of Region Ultimate Pressure Zone Boundary Realignment)
Zone M5L	Zone 250

Several areas along Steeles Avenue within or in proximity of the Phase 1B of the PGEA are currently being serviced by the existing Milton Zone M5L. A major interconnection watermain in the study area was recommended as part of the SHWWMP along Trafalgar Road to connect the existing lake-based water system to the new Zone 250 m reservoir. The proposed Zone 250 m reservoir will service the future growth in pressure Zone 250 m, including the developments in the PGEA. Additionally, some distribution watermains have been proposed to service the growth in the Milton/401 corridor as part of the SHWWMP and the 2017 DC Update. The Area Servicing Plan will further validate the need for these projects where applicable, and will refine the sizing, alignment and phasing opportunities of the infrastructure.

4.1.2 Pumping and Storage

Currently the area is serviced from the west through a PRV located along Steeles Avenue (at James Snow Parkway). This is the sole supply to the HH PGEA lands. The proposed Zone 250 400mm diameter watermain running along Hornby Road between Trafalgar Road and Steeles Avenue (in the Region's current capital program (Region IPFS 6641)) will provide the area with additional security of supply. The proposed Hornby Road watermain will connect the existing

Steeles Avenue watermain with the Zone 250 900mm diameter trunk watermain that will run along Trafalgar Road. This will provide the area with additional supply from Neyagawa BPS and the new Trafalgar Road Zone 4 / Zone 250 Reservoir.

It has been documented through the Region's Ultimate Pressure Zone Boundary Realignment project as well as the 2017 DC Update that in 2031, the new Trafalgar Road Zone 4 Reservoir is projected to be marginally deficient to supply Zone 250 storage requirements. Projected 2031 storage requirements for Zone 250 range between 46 MLD (based on the DC Update Study) and 48 MLD (based on the Ultimate Zone Boundary Realignment Work). The new Trafalgar Road Zone 4 Reservoir will have a capacity of 45 MLD. The Region continues to monitor the demand projections for the Zone and potential for storage deficiencies.

4.1.3 Region's Timing and Development Charges Projects

Zone M4L Twin 900mm diameter feedermains running along Trafalgar Road from Britannia Road to the site of the new reservoir are currently being constructed.

The proposed Ultimate Zone Boundary Realignment will convert the feedermains from the existing M4L to the future Zone 250 pressure zone providing opportunities for connections of the feedermain to the area distribution infrastructure.

A 400mm diameter watermain running along Hornby Road from Steeles Avenue to Trafalgar Road is also proposed. After the commissioning of the Region's Ultimate Pressure Zone Boundary Realignment, this proposed 400mm diameter watermain will connect the existing 600mm diameter Steeles Avenue watermain to the new 900mm diameter Trafalgar Road feedermain. The three watermains are all to be future Zone 250 infrastructure.

Table 4-2 summarizes the Region's planned water infrastructure projects for the area with timing.

Table 4-2: Region Area Water Projects

Region Project ID	Project Description	Timing	Timing Reference	Pressure Zone	
				Current Pressure Zone Boundary Alignment	Ultimate Pressure Zone Boundary Alignment
4985	900 mm WMs on Trafalgar Rd from Britannia Rd to new Zone 4 Reservoir (Zone M4L / Zone 250)	Under Construction -		M4L	250
6641	400 mm WM on Hornby Rd from Steeles Ave to Trafalgar Rd (Zone 250) (HHS)	2025	2019 Budget and Business Plan (Development Capital Plan)	-	250
7774	Extension of WM outside of Urban Area Boundary in Hornby	2019	2019 Budget and Business Plan (Halton Report No. LPS60-18)	M5L	250

The existing system and planned water projects for the area are shown in Figure 4-1.

Planned timing for construction for Project 6641 – 400 mm diameter watermain on Hornby Road is year 2025 (as set out in the Region's current Capital Plan (outlined in the Region's 2019 Budget and Business Plan)).

Construction of the 400mm watermain on Hornby Road will allow for full servicing of Lot 1 and Lot 2 lands within the area, as well as provide security of supply for the area. Based on the benefit that this watermain will provide to the area, it is recommended that the Region considers opportunities to advance the planned start of construction date for this project to align with the timing of development for the PGEA lands.

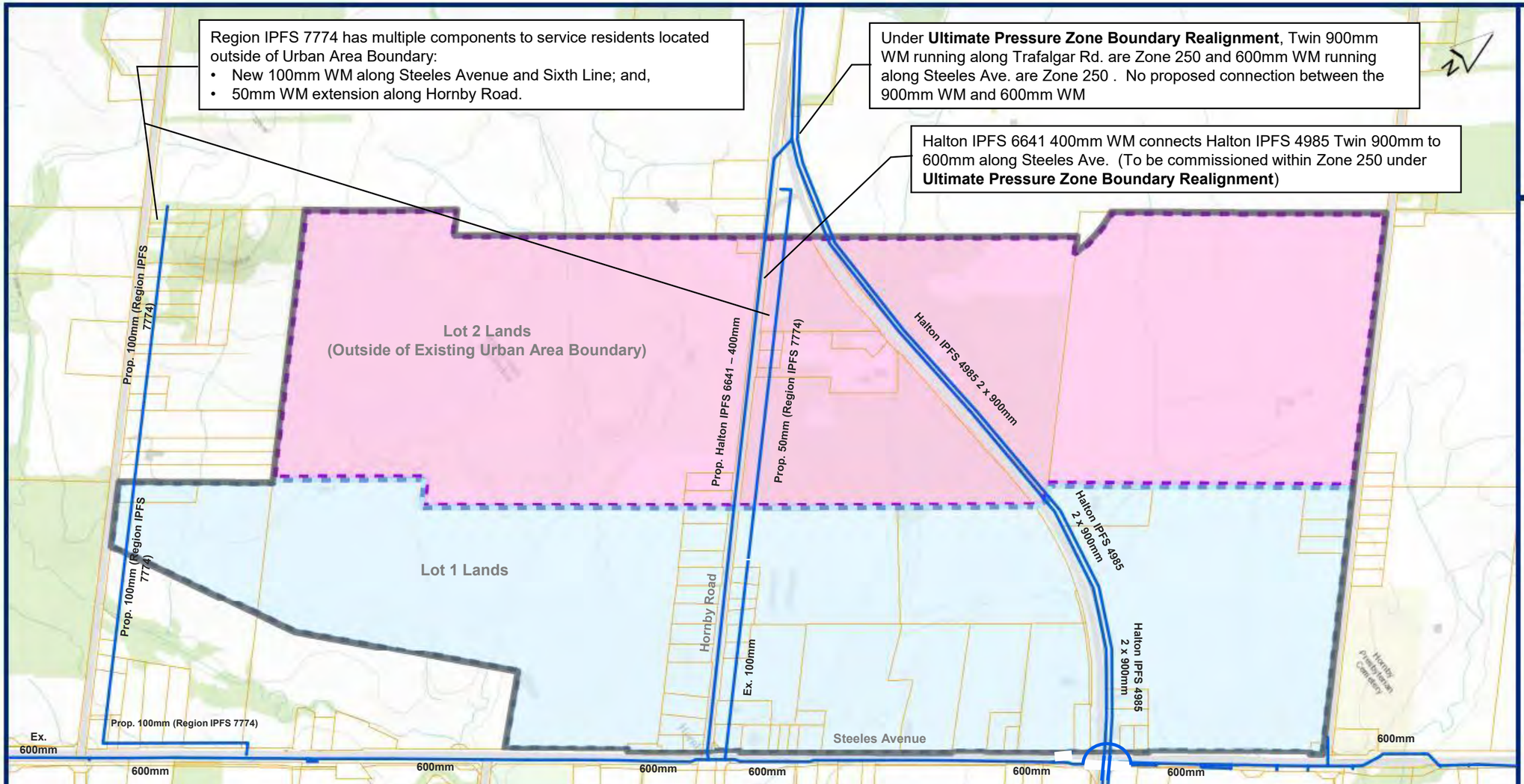
Under the Ultimate Pressure Zone Boundary Realignment, the 400mm diameter watermain running along Hornby Road will serve as an important connection between the twin 900mm diameter watermains running along Trafalgar Road and the existing 600mm watermain running along Steeles Avenue. The project will improve security of supply providing a connection of the separate network areas under the newly created Pressure Zone 250.

Region Projects 6642 - 400 mm WM in the 401-growth corridor north of Steeles from Hornby Rd to Trafalgar Rd (Zone M5L) and 6643 - 400 mm WM in the 401-growth corridor north of Steeles from Trafalgar Rd to approximately 400m east of 8th Line (Zone M5L) (between Trafalgar Road and Eighth Line) were determined not to be required to service the study area.

Region IPFS 7774 has multiple components to service residents located outside of Urban Area Boundary:
- New 100mm WM along Steeles Avenue and Sixth Line; and,
- 50mm WM extension along Hornby Road.

Under **Ultimate Pressure Zone Boundary Realignment**, Twin 900mm WM running along Trafalgar Rd. are Zone 250 and 600mm WM running along Steeles Ave. are Zone 250 . No proposed connection between the 900mm WM and 600mm WM

Halton IPFS 6641 400mm WM connects Halton IPFS 4985 Twin 900mm to 600mm along Steeles Ave. (To be commissioned within Zone 250 under **Ultimate Pressure Zone Boundary Realignment**)



Region Project ID	Project Description	Timing	Timing Reference	Pressure Zone	
				Current	Ultimate
4985	900 mm WMs on Trafalgar Rd from Britannia Rd to new Zone 4 Reservoir (Zone M4L / Zone 250)	Under Construction		M4L	250
6641	400 mm WM on Hornby Rd from Steeles Ave to Trafalgar Rd (Zone 250) (HHS)	2025	2018 Budget and Business Plan	-	250
7774	Extension of WM outside of Urban Area Boundary in Hornby	2019	2019 Budget and Business Plan	M5L	250

Ultimate Pressure Zone Boundary Realignment is scheduled to be commissioned in 2021

Projects currently in the Region's Development Capital Program that based on this analysis are not critical to servicing PGEA Phase 1B lands:

- Region Project IPFS 6642 - 400 mm WM in the 401 growth corridor north of Steeles from Hornby Rd to Trafalgar Rd; and,
- Region Project IPFS 6643 – 400mm WM in the 401 growth corridor north of Steeles from Trafalgar Rd to approximately 400m east of 8th Line

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Features

- Existing Watermain / Planned Watermain Projects

General Features

- Phase 1B (Lot 1)
- Phase 1B (Lot 2)
- Municipal Boundary
- Property Parcel
- Highways
- Regional and Major Roads

Watermain alignments are shown schematically.

Figure 4-1
Area Existing Water Network and Planned Region Water Projects

BluePlan

February, 2019
717029-W-005
NAD 1983 UTM Zone 17N

4.2 Estimated Water Demands

4.2.1 Design Criteria

For the PGEA Phase 1B ASP the recommendation is to use the design criteria developed for the 2017 DC Update. 2017 DC Update Design Criteria was assumed to be the best information available as Halton has developed this design criteria based on a comprehensive review of the water and wastewater design criteria using 2011-2015 demand and flow data and updated estimates of actual population and employee numbers based on the 2011 census. At the time of the DC Update, the Region expressed that the revised criteria were representative of existing and ongoing system measures to reduce I/I and lost water (which will offset the need to upsize trunk infrastructure).

The recommended design criteria for the PGEA Phase 1B proposed water demands is summarized in Table 4-3.

Table 4-3: Water Design Criteria

Design Criteria	Design Criteria	Design Criteria Reference
Residential	265 lpcd	Based on Design Criteria from the 2017 DC Update
Industrial	295 lpcd	Based on Design Criteria from the 2017 DC Update
Commercial	175 lpcd	Based on Design Criteria from the 2017 DC Update
Institutional	220 lpcd	Based on Design Criteria from the 2017 DC Update
Max Day (lake based) PF	1.9	Based on Design Criteria from the 2017 DC Update
Peak Hour PF	3	Based on Design Criteria from the 2017 DC Update

Since approximately 80% of the employment in the study area is classified as industrial, and there is some uncertainty on where all the different types of employment are going to occur, it is recommended that the Industrial design criteria be applied for the projection of employment water demands (as well as wastewater flows) throughout the study area. This a conservative and reasonable approach that provides flexibility with regards to the future employment development in the study area.

Design criteria for water system components is summarized in Table 4-4.

Table 4-4. Water Design Criteria for Water System Components

Component	Design Criteria	
Feedermains	Flow capacity	Convey maximum day demand while achieving water velocity requirements
Local Watermains	Flow capacity	Convey the greater of: • Maximum day demand plus fire flow demand, or • Peak hour demand while achieving water velocity requirements
Pumping Stations	With adequate zone storage available	Supply maximum day demand to zone and all subsequent zones

Component	Design Criteria	
	Without adequate storage available	Supply peak hour demand to zone and maximum day demand to all subsequent zones
Storage Facilities	Equalization (A)	25% of maximum day demand
	Fire (B)	Largest expected fire in zone (based on land use)
	Emergency (C)	25% of (A + B)
	Total Volume	= A + B + C
Fire Flow	Residential Flow	5,500 L/min for 2 hours @ minimum 140 kPa (20 psi)
	Minimum Employment Flow (Industrial / Commercial / Institutional)	15,000 L/min for 3 hours @ minimum 140 kPa (20 psi)
System Pressures	Minimum and maximum operating conditions	280 kPa (40 psi) to 700 kPa (100 psi)

For pressure zones with sufficient storage volume, water supply requirements are based on the maximum day demands (MDD). For pressure zones without floating storage, water supply requirements are based on peak hour demands. Transmission mains are required to convey the total pumping capacity of the receiving pumping station and the upper zone reservoir.

4.2.2 Water Demands

Consistent practice in the SHWWMP and 2017 DC Update is to develop water demands using existing conditions + growth demands. Existing conditions plus growth demands within the PGEA Phase 1B lands is derived from the 2017 DC Update and can be summarized as follows:

- Lot 1 demands are based on the Region's BPEs for the SGUs located within the study area (555.01 and the portion of 555.03 west of Eighth Line); and the associated demand design criteria.
- Lot 2 demands are based on jobs for the 80.5 ha area being developed with the combined Phase 1B and Phase 2B density (24.6 jpha). The proportion of commercial, industrial and institutional employment (and associated demands) will be determined in the future and will align with the ROPA No. 47 targets (addressing the shortfall previously established through ROPS No. 43).

Lot 1 and Lot 2 demands are effectively the same as those included in the 2017 DC Update Study. Total demands will remain the same, with some realignment within Zone 5 (under the Current Pressure Zone Boundary Alignment) and Zone 250 (under the Ultimate Pressure Zone Boundary Alignment). Based on this, the analysis, evaluation and recommendations from the 2017 DC Update for Zone 4 can be carried forward.

Water demands for Lot 1 and Lot 2 lands are summarized in Table 4-5.

Table 4-5: Total Water Demands for the PGEA Phase 1B Lands

PGEA Phase 1B Development Area	Total Average Day Demand (ADD) (L/s)	Total Maximum Day Demand (MDD) (L/s)
Lot 1	9.2	17.5
Lot 2	6.8	12.9

Comparison of the Region and Town's population and employment projections for the area is summarized in Section 3.2.

4.3 Water Servicing Review and Needs Assessment

Assessment of the existing water system included review of existing GIS asset data, current Region water model and most recent available design and construction drawings. Hydraulic modelling was undertaken to confirm the existing water infrastructure demand and capacity.

4.4 Strategy Development and Evaluation

The preferred servicing strategy is based on supplying water to the PGEA Phase 1B area under the current zone alignment (study area located within Zone 5) as well as under the proposed zone realignment (study area located within Zone 250).

Per the Region's current Development Capital Program, the ultimate pressure zone boundary realignment is anticipated to be completed within the same timeframe as development of the PGEA Phase 1B lands. Based on this, two scenarios were considered:

1. Current Pressure Zone Boundary Configuration; and,
2. Ultimate Pressure Zone Boundary Configuration.

Consideration of full development of the PGEA Phase 1B lands under both zone boundary configurations ensures that development can proceed independent of the Ultimate Pressure Zone Boundary Realignment. As noted in Section 2.2.1, the Secondary Plan anticipates availability of servicing for development to occur in any part of the Lot 1 or Lot 2 lands by 2021.

The strategy also considers the Region's proposed extension of water servicing to existing area residents located outside of the Urban Area.

For the purposes of this study, Proposed Collector Road 1 Option 2 was assumed to be the preferred option for the Proposed Collector 1 road. Proposed Collector Road 1 Option 2 was determined to be the preferred option as it borders Lot 1 and Lot 2 and can be constructed as part of Lot 1 development (within the existing Urban Boundary). Proposed water infrastructure for this westernmost area of the PGEA Phase 1B lands follows the Proposed Collector 1 Option 2 alignment.

4.4.1 Selection of Preferred Solution

The preferred servicing strategy incorporates the following infrastructure recommendations:

Under Current Pressure Zone Boundary Alignment (Prior to Commissioning of Ultimate Pressure Zone Boundary Realignment)

Under the current pressure zone alignment (PGEA P1B within Zone 5):

- Supply from the existing Zone 5 600mm diameter watermains running along Steeles Avenue; with,
- Six (6) connections to the proposed local distribution watermains at the intersections of:
    - Steeles Avenue and Fifth Line;
    - Steeles Avenue and Proposed Collector Road 2;
    - Steeles Avenue and Hornby Road;
    - Steeles Avenue and Proposed Collector Road 3;
    - Steeles Avenue and Trafalgar Road; and,
    - Steeles Avenue and Eighth Line.

Employment Lands fronting on Hornby Rd. that develop under the Current Pressure Zone Boundary Alignment can be supplied by 300mm watermain from future internal roads that connect to proposed 300mm diameter watermain running along proposed collector roads. The 100mm / 50mm WM along Hornby Rd. will not be available for servicing of Employment Lands.

It is not recommended that a 300mm diameter watermain be constructed along Hornby Road. A 300mm diameter local watermain running along Hornby Road in combination with the planned 400mm diameter watermain (to be constructed after commissioning of the Ultimate Zone Boundary Realignment) will provide excessive watermain capacity for the area and resultant water quality concerns. Also, space within the Hornby Road right-of-way is limited (there is an existing 100mm diameter watermain running along Hornby Road that will remain) and room for the proposed 400mm diameter watermain must be accounted for.

The Region currently has a policy to allow the Regional development-related projects to be designed and constructed by the development industry which may result in the construction of a project that was not identified in the current or prior years' capital budget. This policy excludes design and construction of major road connections to the Regional road system.

Council approval is required in the event that Regional funding is not available in the current capital budget Council. The developer will be required to enter into an agreement with the Region and initially fund and secure the work(s) (i.e. design and construction). The developer will not be reimbursed (up to the upset limit identified in the agreement) until the budget is approved and the financing is available under an approved financing plan as determined by the Regional Treasurer.

As noted above in Section 4.1.2, construction of the 400mm watermain on Hornby Road will allow for full servicing of Lot 1 and Lot 2 lands within the area, as well as provide security of supply for the area.

If constructed under the current pressure zone alignment, the proposed 400mm watermain on Hornby Road will be a Zone 5 watermain and cannot be connected to the Zone 4 twin 900mm diameter watermains running along Trafalgar Road. The connection between Region project 6641 (Hornby Road 400mm watermain) and Region project 4985 (Trafalgar Road 900mm watermains) can be completed after the commissioning of the Region's Ultimate Pressure Zone Boundary Alignment).

The preferred servicing strategy under the current pressure zone alignment (prior to the commissioning of the Region's Ultimate Pressure Zone Boundary Realignment) is shown in Figure 4-2.

If constructed under the **Current Pressure Zone Boundary Alignment**, the proposed 400mm watermain on Hornby Road will be a Zone 5 watermain and cannot be connected to the Zone 4 twin 900mm diameter watermains running along Trafalgar Road. The connection between Region project 6641 (Hornby Road 400mm watermain) and Region project 4985 (Trafalgar Road 900mm watermains) can be completed after the commissioning of the Region's **Ultimate Pressure Zone Boundary Alignment**).

Proposed WM alignment assumed to follow Proposed Collector 1 Option 2 (allows for watermain construction as part of Lot 1 Development)

Connection between Prop. 300mm dia. WM and Region IPFS 7774 – 50mm dia. WM could be considered to provide looping / security of supply

Employment Lands fronting on Hornby Rd. that develop under the **Current Pressure Zone Boundary Alignment** can be supplied by:

- proposed 300mm diameter watermains that ultimately connect to the proposed 300mm diameter watermains that will run along Proposed Collector Road 2 or Proposed Collector Road 3; and/or,
- proposed 400mm diameter watermain along Hornby Road (Region Project 6641) - if available.

The 100mm / 50mm WM along Hornby Rd. will not be available for servicing of Employment Lands.

The Region currently has a policy to allow for the Hornby Rd. 400mm diameter watermain to be designed and constructed ahead of schedule by the development industry (Council approval is required).

Connection between Prop. 300mm dia. WM and Region IPFS 7774 – 100mm dia. WM could be considered to provide looping / security of supply.

Under **Current Pressure Zone Boundary Alignment**, the Prop. 300mm dia. WM running through Lot 1 and Lot 2 lands is to be supplied exclusively from Ex. Zone M5L 600mm dia. WM running along Steeles Avenue. No connection to Halton IPFS 4985 900mm WM.

Under **Current Pressure Zone Boundary Alignment**, Halton IPFS 4985 Twin 900mm WM running along Trafalgar Rd. are Zone M4L WM and 600mm WM running along Steeles Ave. are Zone M5L. There is no connection between the 900mm WM and 600mm WM

Proposed Collector 1 Option 1 (Assumed Not Preferred Option)
Proposed WM Easement
Proposed Collector 1 Option 2
Proposed Collector 2
Proposed Collector 3
Hornby Road
Steeles Avenue
Hornby Glen Golf Course
Hornby Presbyterian Cemetery
100mm (Region IPFS 7774)
Provisional 400mm (Region IPFS 6641)
Prop. 50mm (Region IPFS 7774)
Prop. 100mm (Region IPFS 7774)
Ex. 100mm
Halton IPFS 4985 2 x 900mm
300mm
600mm
Highway 401
Halton Hills
Milton
0
420
Meters
Sources: Esri, HERE, DeLorme, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

- Existing Watermain / In Construction Watermain Projects
- Proposed Local Watermain

General Features

- Phase 1B (Lot 1)
- Phase 1B (Lot 2)
- Municipal Boundary
- Property Parcel
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Watermain alignments are shown schematically.

Figure 4-2
Preferred Water Servicing
Current Pressure Zone Boundary Alignment

BluePlan

April, 2019
717029-W-005
NAD 1983 UTM Zone 17N

After Commissioning of Ultimate Pressure Zone Boundary Realignment

Under the proposed Ultimate Pressure Zone Boundary Realignment (PGEA P1B falls within Zone 250):

- Supply from the existing Zone 250 600mm diameter watermains running along Steeles Avenue with connections to the local distribution system at all locations noted above (except at Hornby Road); and,
- Supply from the proposed Zone 250 400mm diameter watermain running along Hornby Road (from the 600mm diameter watermain along Steeles Avenue to the 900mm diameter watermain running along Trafalgar Road), with connection to the local distribution system at Proposed Collector Road 2.

Under the Ultimate Pressure Zone Boundary Realignment, Region IPFS 6641 400mm diameter watermain can be commissioned along Hornby Rd. as a distribution main and available to supply Employment Lands fronting on Hornby Road. Per Halton Region's Water and Wastewater Linear Design Manual; for pipe diameters 400 mm, the Region can deem the main a transmission or distribution main. It is recommended that the Region deem Project IPFS 6641 a distribution main.

After commissioning of the 400mm diameter watermain along Hornby Road, Employment Lands in the area may be serviced by watermains on internal roads connecting to either the 300mm WM along the proposed collector roads or the 400mm WM on Hornby Rd. The 100mm / 50mm WM along Hornby Rd. will not be available for servicing of Employment Lands.

The preferred water servicing strategy after commissioning of the Ultimate Pressure Zone Boundary Alignment is shown in Figure 4-3.

Development in any part of Lot 1 or Lot 2 lands can proceed **under the Ultimate Pressure Zone Boundary Realignment**

Proposed WM alignment assumed to follow Proposed Collector 1 Option 2 (allows for watermain construction as part of Lot 1 Development)

Connection between Prop. 300mm dia. WM and Region IPFS 7774 – 50mm dia. WM could be considered to provide looping / security of supply

Under **Ultimate Pressure Zone Boundary Realignment**, Region IPFS 6641 400mm WM will be commissioned along Hornby Rd. as a distribution main and available to supply Employment Lands fronting on Hornby Rd. (if required).

Employment Lands in the area may be serviced by watermains on internal roads connecting to either the 300mm WM along the proposed collector roads or the 400mm WM on Hornby Rd.

Region IPFS 6641 400mm WM along Hornby Rd. will also serve as an important connection between the IPFS 4985 900mm WM running along Trafalgar Rd. and the existing 600mm WM running along Steeles Ave. The project will improve redundancy of feeds providing a connection of the separate network areas

The 100mm / 50mm WM along Hornby Rd. will not be available for servicing of Employment Lands.

Connection between Prop. 300mm dia. WM and Region IPFS 7774 – 100mm dia. WM could be considered to provide looping / security of supply.

Under **Ultimate Pressure Zone Boundary Realignment**, the Prop. 300mm dia. WM running through Lot 1 and Lot 2 lands is still to be supplied exclusively from 600mm dia. WM running along Steeles Avenue. No connection to Halton IPFS 4985 900mm WM.

Under **Ultimate Pressure Zone Boundary Realignment**, Halton IPFS 4985 Twin 900mm WM running along Trafalgar Rd. and 600mm WM running along Steeles Ave. is Zone 250. There is no connection between the 900mm WM and 600mm WM

Proposed Collector 1 Option 1 (Assumed Not Preferred Option)
Proposed WM Easement
Proposed Collector 1 Option 2
Proposed Collector 2
Proposed Collector 3
Hornby Road
Steeles Avenue
Prop. Halton IPFS 6641 – 400mm
Prop. 50mm (Region IPFS 7774)
Ex. 100mm
Halton IPFS 4985 2 x 900mm
100mm (Region IPFS 7774)
300mm
600mm
Hornby Glen Golf Course
Hornby Presbyterian Cemetery
Highway 401
Halton Hills
Milton
0
440
Meters

Sources: Esri, HERE, DeLorme, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

- Existing Watermain (Post 2025 timeframe)
- Proposed Local Watermain

General Features

- Phase 1B (Lot 1)
- Phase 1B (Lot 2)
- Municipal Boundary
- Property Parcel
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Watermain alignments are shown schematically.

Figure 4-3
Preferred Water Servicing

Future Ultimate Pressure Zone Boundary Realignment

BluePlan ENGINEERING

May, 2019
717029-W-005
NAD 1983 UTM Zone 17N

4.4.2 Water Distribution Modelling Analysis

The Region's InfoWater model was utilized to analyse the servicing scheme for the PGEA Phase 1B lands under 2031 conditions. As noted in the Secondary Plan, full build out of the area is anticipated for 2021. The following scenarios were run for the analysis of the PGEA Phase 1B:

- Maximum Day Demand (MDD);
- Peak Hour Demand (PHD); and,
- Maximum Day Demand plus Fire Flow (MDD+FF)

Proposed water demands for PGEA Phase 1B were added to the Region's InfoWater model. It was recognized that this would provide a conservative analysis as future PGEA water demands have already been included within the Region's model as part of the distribution of water demands by SGU. This analysis approach was selected as there was limited information available detailing the distribution of SGU loads by demand node within the Region's model. If analysis by this more conservative approach showed deficiencies, then a more detailed determination of the allocation of water demands within the area was to be carried out.

Model results show that along Hornby Road under interim conditions (Current Pressure Zone Boundary Configuration and before commissioning of the proposed 400mm diameter Hornby Road watermain) there is not sufficient available fire flow to service proposed employment development fronting Hornby Road from the existing 100mm diameter watermain or the proposed 50mm diameter watermain extension along Hornby Road (Region Project 7774). Available fire flow is less than 40 L/s in some areas. If development along Hornby Road is to proceed under interim conditions, fire flow servicing for industrial and commercial land can be supplied from:

- proposed 300mm diameter watermains that ultimately connect to the proposed 300mm diameter watermains that will run along Proposed Collector Road 2 or Proposed Collector Road 3; and/or,
- proposed 400mm diameter watermain along Hornby Road (Region Project 6641) - if available.

Timing and availability of the proposed 400mm Hornby Road watermain is detailed above in Section 4.4.1.

Water model results the proposed servicing for the PGEA P1B are detailed further in **Appendix C.**

4.4.3 Additional Design Considerations

As noted in Section 4.1.2, it has been documented through the Pressure Zone Realignment project as well as the 2017 DC Update study that in 2031, the new Trafalgar Road Zone 4 Reservoir is projected to be marginally deficient to supply Zone 250 storage requirements. Projected 2031 storage requirements for Zone 250 range between 46 and 48 MLD and the new Trafalgar Road Zone 4 Reservoir will have a capacity of 45 MLD. The Region continues to monitor the demand projections for the Zone and potential for storage deficiencies.

As noted in Section 2.2.5, the Region is constructing an extension of municipal water servicing to residents located outside of the Urban Area in Hornby (Region IPFS 7774). This project is planned for construction in 2019. The potential connection between proposed 300mm diameter

watermains servicing the PGEA Phase 1B lands and the new 100mm/50mm diameter watermain servicing residents in Hornby could be considered. Connection of the proposed 300mm diameter watermains to the proposed 100mm/50mm diameter watermain servicing the specified residential properties in Hornby can provide security of supply as well as some water quality benefits from potential looping. This can be reviewed further during the development application / detailed design phase of the proposed 300mm diameter watermains to be constructed along Proposed Collector Roads and the Region's proposed 400mm diameter watermain to be constructed along Hornby Road.

4.4.4 Local Service Watermains

The proposed preliminary alignment of local watermains follows the Secondary Plan proposed road alignments. It is assumed that the proposed road network was thoroughly considered through the Secondary Plan process and it is important that the preferred servicing strategy adheres to the proposed road alignment to allow for construction within municipal right-of-ways where possible. It is expected that there will be opportunity for watermain installation and improved looping and security of supply through future internal roads that will be established as part of the development application process. Looping watermain along future internal roads is encouraged.

5 Wastewater

5.1 Existing System

The Premier Gateway Phase 1B study area lies within the Mid-Halton Wastewater Treatment Plant (WWTP) catchment area. Existing wastewater flows in the study area and surrounding areas are collected through sewers along Steeles Avenue, which convey flows to two (2) sewage pump stations: Halton Hills #3 Wastewater Pumping Station (WWPS) and Halton Hills #2 WWPS. From these two stations, wastewater flows are conveyed west to Halton Hills #1 WWPS and ultimately conveyed south through a series of trunk sewers and pump stations (the Miller Way Trunk Sewer and Mid-Block WWPS) discharging at the Mid-Halton WWTP.

5.1.1 Region's Timing and Development Charges Projects

A major trunk sewer (Eighth Line/Trafalgar Trunk Sewer) was identified in the SHWWMP to service growth within Halton Hills, specifically by extending the lake-based wastewater service area to the southern lands of Georgetown. This trunk sewer will be located at the east boundary of the study area with potential to service some of the development in the Phase 1B of the PGEA.

Additionally, the 2017 DC Update identified a project to decommission Halton Hills #3 SPS and free up capacity in the downstream infrastructure (Halton Hills #1 SPS, Halton Hills #2 SPS, and internal Milton sewer network). The surplus capacity in the system downstream of Halton Hills #3 after decommissioning will be evaluated with the purpose to service the growth planned for the Phase 1B of the PGEA.

Table 5-1 summarizes the Region's planned wastewater infrastructure projects for the area with timing.

Table 5-1: Region Area Wastewater Projects

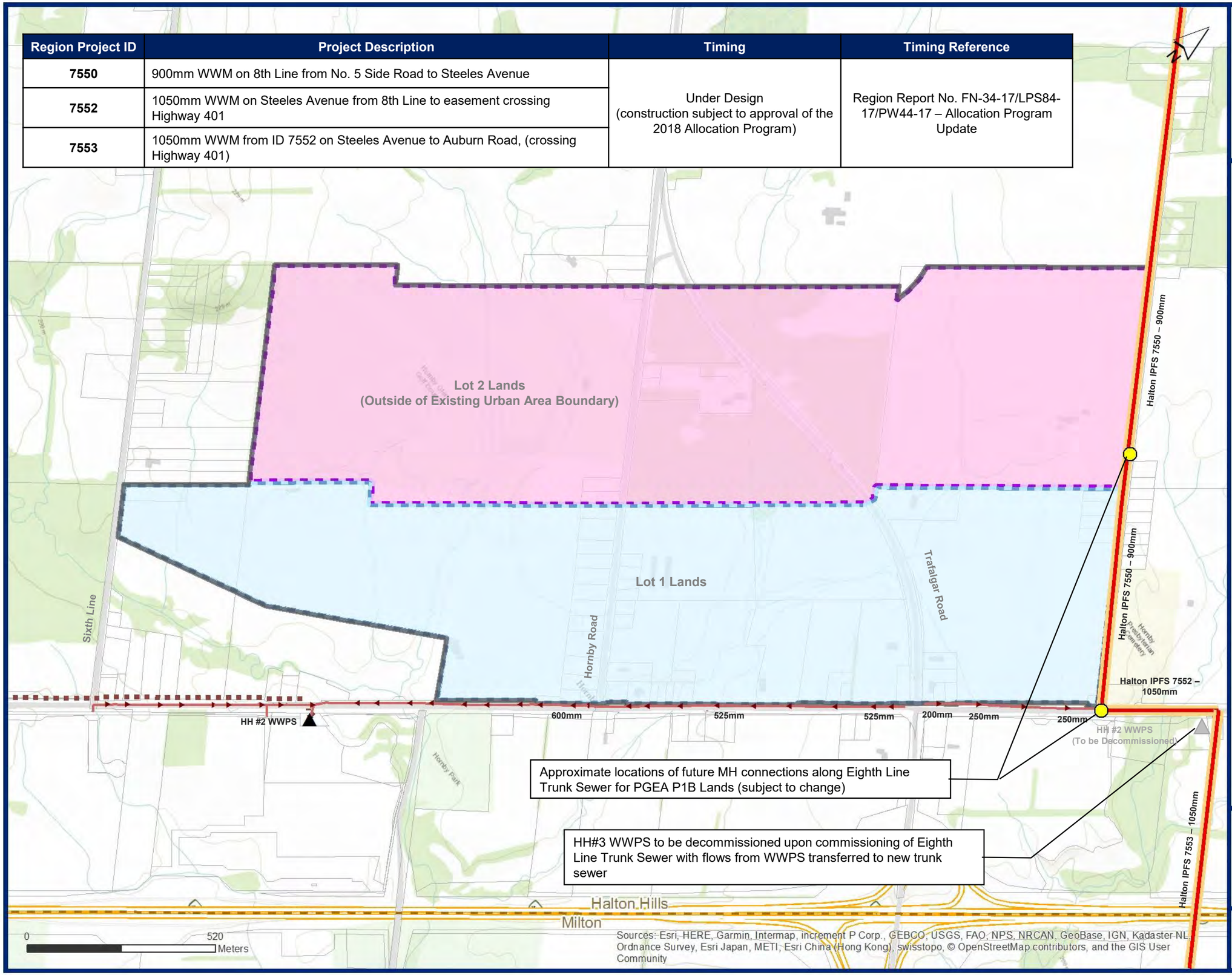
Region Project ID	Project Description	Timing	Timing Reference
7550	900mm WWM on 8th Line from No. 5 Side Road to Steeles Avenue	Under Design (construction subject to approval of the 2018 Allocation Program)	Region Report No. FN-34-17/LPS84-17/PW44-17 – Allocation Program Update
7552	1050mm WWM on Steeles Avenue from 8th Line to easement crossing Highway 401		
7553	1050mm WWM from ID 7552 on Steeles Avenue to Auburn Road, (crossing Highway 401)		

Design of the Eighth Line/Trafalgar Trunk Sewer is currently underway. Financing for construction of the Eighth Line/Trafalgar Trunk Sewer is subject to a Regional Council approved Allocation Program. For more information on the Allocation Program, please refer to FN-34-17/LPS84-17/PW44-17 – Allocation Program Update.

Also considered was the scenario where the Eighth Line/Trafalgar Trunk Sewer is not commissioned prior to development proceeding within the Lot 1 and Lot 2 lands. Flows from PGEA P1B lands located east of Trafalgar Road will be conveyed east to HH #3 WWPS and then west to HH#2 WWPS, and HH#1 WWPS (rather than to the Eighth Line/Trafalgar Trunk Sewer).

The existing system and planned wastewater projects for the area are shown in Figure 5-1.

Region Project ID	Project Description	Timing	Timing Reference
7550	900mm WWM on 8th Line from No. 5 Side Road to Steeles Avenue	Under Design (construction subject to approval of the 2018 Allocation Program)	Region Report No. FN-34-17/LPS84-17/PW44-17 – Allocation Program Update
7552	1050mm WWM on Steeles Avenue from 8th Line to easement crossing Highway 401		
7553	1050mm WWM from ID 7552 on Steeles Avenue to Auburn Road, (crossing Highway 401)		



Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Wastewater Infrastructure

- Wastewater Pumping Station
- Proposed Manhole (approximate location)
- Existing Gravity Sewer
- Existing ForceMain
- Proposed Eighth Line Trunk Sewer

General Features

- Phase 1B (Lot 1)
- Phase 1B (Lot 2)
- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Sewer alignments are shown schematically.

Figure 5-1
Area Existing Wastewater System and Planned Region Wastewater Projects

BluePlan ENGINEERING

May, 2019
717029-WW-004
NAD 1983 UTM Zone 17N

5.2 Wastewater Design Criteria and Flows

5.2.1 Wastewater Design Criteria

As noted under Section 4.2.1, it is recommended that the design criteria developed for the 2017 DC Update be utilized for this ASP. 2017 DC Update Design Criteria was assumed to be the best information available. At the time of the DC Update, the Region expressed that the revised criteria were representative of existing and ongoing system measures to reduce I/I (which will offset the need to upsize trunk infrastructure).

The recommended design criteria for the PGEA Phase 1B proposed wastewater flows for Treatment Plant and Collection System are summarized in Table 5-2 and Table 5-3.

Table 5-2: Wastewater Design Criteria (Treatment Plant)

Design Criteria	Average Flow	Design Criteria Reference
Residential	360 lpcd	Based on Design Criteria from the 2017 DC Update
Industrial	405 lpcd	Based on Design Criteria from the 2017 DC Update
Commercial	245 lpcd	Based on Design Criteria from the 2017 DC Update
Institutional	305 lpcd	Based on Design Criteria from the 2017 DC Update

Table 5-3: Wastewater Design Criteria (Collection System)

Design Criteria	Dry Weather Flow	
Residential	215 lpcd	Based on Design Criteria from the 2017 DC Update
Industrial	240 lpcd	Based on Design Criteria from the 2017 DC Update
Commercial	145 lpcd	Based on Design Criteria from the 2017 DC Update
Institutional	180 lpcd	Based on Design Criteria from the 2017 DC Update

Since approximately 80% of the employment in the study area is classified as industrial, and there is some uncertainty on where all the different types of employment are going to occur, it is recommended that the Industrial design criteria be applied for the projection of employment water demands and wastewater flows in the study area. This a conservative approach and provides flexibility about the future employment development in the study area.

Design criteria for wastewater system components is summarized in Table 5-4.

Table 5-4. Design Criteria for Wastewater System Components

Component	Design Criteria	
Local Sewers	Roughness Coefficient	n = 0.013 for PVC sewers (based on Halton Engineering Design Guidelines for Area Servicing Plans)
	Capacity	Peak flow (Q) versus Sewer full flow capacity ($q_{manning}$) less than 85% (based on criteria established for Halton 2017 Development Charges Water and Wastewater Background Study).

5.2.2 Wastewater Flows

Consistent practice in the SHWWMP and 2017 DC Update is to develop wastewater flows using existing conditions + growth flows. Existing conditions plus growth flows within the PGEA Phase 1B lands is derived from the 2017 DC Update and can be summarized as follows:

- Lot 1 flows are based on the Region's BPEs for the SGUs located within the study area (555.01 and the portion of 555.03 west of Eighth Line); and the associated demand design criteria.
- Lot 2 flows are based on jobs for the 80.5 ha area being developed with the combined Phase 1B and Phase 2B density (24.6 jpha). The proportion of commercial, industrial and institutional employment (and associated demands) will be determined in the future and will align with the ROPA No. 47 targets (addressing the shortfall previously established through ROPS No. 43).

Lot 1 and Lot 2 flows are effectively the same as those included in the 2017 DC Update. Total flows will remain the same, with some realignment within the Mid-Halton WWTP catchment (based on ROPA 47 planning projection adjustments). Adjustments to planning projections based on ROPA 47 targets are outlined in Section 3.2.2. The treatment plant-level wastewater analysis, evaluation and recommendations from the 2017 DC Update can be carried forward as the realignment of flows is entirely within the Mid-Halton WWTP catchment area.

5.3 Wastewater Servicing Review and Needs Assessment

Assessment of the existing wastewater system included review of existing GIS asset data, current Region wastewater model (InfoSewer) and most recent available design and construction drawings. Hydraulic modelling was undertaken to confirm the existing wastewater flows, capacity and potential required infrastructure upgrades.

5.4 Strategy Development and Evaluation

The preferred servicing strategy is based on conveying portions of the flows from the PGEA Phase 1B to:

- existing sanitary sewers located on Steeles Avenue (draining towards HH #2 WWPS); and,
- the proposed Eighth Line/Trafalgar Trunk Sewer.

All alternative wastewater servicing strategies were considered under two scenarios:

1. Prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer (portion of the PGEA Phase 1B lands drain to the east outletting to HH #3 WWPS, and ultimately through HH #2 WWPS, HH#1 WWPS, Miller Way Trunk Sewer, Mid-Block WWPS and outletting at the Mid-Halton WWTP.
2. After commissioning of the Eighth Line/Trafalgar Trunk Sewer (portion of the PGEA Phase 1B lands drain to the east outletting to the proposed Eighth Line/Trafalgar Trunk Sewer and ultimately to the Mid-Halton WWTP).

For the purposes of this study, Proposed Collector Road 1 Option 2 was assumed to be the preferred option for the Proposed Collector 1 road. Proposed Collector Road 1 Option 2 borders Lot 1 and Lot 2 and can be constructed as part of Lot 1 development. Proposed wastewater infrastructure for this area follows Proposed Collector 1 Option 2.

5.4.1 Review of Available Capacity Under Scenario 1 Prior to Commissioning of the Eighth Line/Trafalgar Trunk Sewer

A review of the available capacity of the Miller Way Trunk Sewer and the Mid-Block WWPS was undertaken as part of the study. The review considered the most conservative scenario – 1. Prior to Commissioning of the Eighth Line/Trafalgar Trunk Sewer. Under Scenario 1, all wastewater flows from the PGEA Phase 1B outlet to either HH #2 WWPS or HH#3 WWPS (which pumps to HH #2 WWPS) and ultimately through HH#1 WWPS, Miller Way Trunk Sewer, Mid-Block WWPS and outlets at the Mid-Halton WWTP

Through previous work, including the SHWWMP, there were concerns noted with regard to potential capacity issues downstream of the Halton Hills PGEA P1B lands. At the time of previous analyses, there was uncertainty around timing of development within the Milton Business Park II lands, and under some proposed development scenarios, interim conveyance of flows to the Mid-Block SPS from lands outside of the proposed catchment area would be required.

The Milton Business Park II lands (also know as the Derry Green Corporate Business Park Area) is located in the Milton Urban Expansion Area and is generally bounded by Highway 401 and the middle branch of Sixteen Mile Creek to the north, Sixth Line to the east, the Centre Tributary of the Middle Branch of Sixteen Mile Creek to the south and James Snow Parkway to the west.

Since the timing of the SHWWMP, development plans and timing for the Milton BP II lands have been revised, and there are no additional interim wastewater flows from outside of the Mid-Block WWPS catchment area that drain to the Mid-Block pumping station. The capacity review was undertaken in order to confirm that additional interim wastewater flows from outside of the Mid-Block WWPS catchment area are not draining to the pumping station (resulting in existing / future capacity being exceeded).

The following flow scenarios were reviewed at HH#3 WWPS, HH#2 WWPS, HH#1 WWPS, Miller Way Trunk Sewer and the Mid-Block WWPS:

- 2016 and 2031 Design Flows (Halton Region Sanitary Design Sheet with BPEs and Collection System Design Criteria);
- 2016 and 2031 Region Model Runs (with BPEs and Collection System Design Criteria); and,
- Existing Peak Wet Weather Flows + Calculated Growth Flows (existing measured peak wet weather flow + difference in 2016 and 2031 DWF in Region's hydraulic model).

Table 5-5 summarizes the existing and future flows and capacities at key WWPS downstream of the PGEA P1B lands.

Table 5-5: Existing and Future Flows and Capacity at Key Downstream WWPS

WWPS	Existing				Future			
	Firm Capacity	Average Flow	Peak Flow (Provided)	2016 Peak Flow (Model)	Ultimate Capacity	2016 – 2031 Growth Peak Flows	2031 Peak Flow (Model & Spreadsheet)	Ex. Peak Flow (Provided) + Growth Flows
HH #1	280 L/s (2 Pumps + 1 Standby)	6.1 L/s – 14 L/s	60 L/s	63 L/s	503 L/s (4 Pumps)	116 L/s – 162 L/s	159 L/s – 213 L/s	176 L/s – 222 L/s
HH #2	160 L/s (3 Pumps)	3.1 L/s – 12 L/s	44 L/s	40 L/s	390 L/s (3 Pumps + 1 Standby	109 L/s - 133 L/s	129 L/s – 149 L/s	153 L/s – 177 L/s
HH #3	64 L/s (2 Pumps)	1.3 L/s – 6.4 L/s	11 L/s	20 L/s	To be decommissioned after commissioning of Eighth Line/Trafalgar Trunk Sewer			
Mid-Block WWPS	1,215 L/s (3 Pumps + 1 Standby)	93 L/s – 152 L/s	783 L/s	747 L/s	1,215 L/s (3 Pumps + 1 Standby)	≥ 142 L/s	≥ 869 L/s	≥ 925 L/s

Sources for the Capacities and Flows noted in Table 5-5 are detailed further in the Sanitary Design Sheet (Reference: SGUs / WW Flow Distribution from 2017 DC Update Background Study / Model) in **Appendix E**.

The intent of this analysis was to capture the full range of potential upgrade requirements / outcomes. Under the three scenarios, peak flow does not exceed Ultimate capacity at any WWPS. The range of estimates show future flows are less than ultimate capacity for HH#1, HH#2 and Mid-Block WWPS. HH#3 WWPS will be decommissioned after commissioning of the Eighth Line/Trafalgar Trunk Sewer.

5.4.2 Alternative Wastewater Servicing Strategies

Three alternative wastewater strategies were considered:

- Alternative 1 (Status Quo) – Maintain existing drainage areas as is. The existing sewers running west along Steeles Avenue have not been constructed at sufficient depth to convey flows from the north (Lot 2) portion of the PGEA Phase 1B development.
- Alternative 2 (Conveyance Primarily Towards West) – Conveyance of all flows, where capacity and depth allow, towards the existing 525mm / 600mm diameter sewers running west along Steeles Avenue (outletting to Halton Hills #2 WWPS). A portion of the study area located near the east limit (fronting on Eighth Line) will still be required to drain to the HH #3 WWPS / new Eighth Line/Trafalgar Trunk Sewer.

- Alternative 3 (Area West of Trafalgar Road West Towards HH# 3 WWPS, Area East of Trafalgar Road East Towards HH #3 / Eighth Line/Trafalgar Trunk Sewer) - Conveyance of flows from the portion of PGEA Phase 1B west of Trafalgar Road to the existing 525mm / 600m diameter sewers running west along Steeles Avenue (outletting to HH #2 WWPS). Conveyance of all flows, where depth allows, from the portion of PGEA Phase 1B east of Trafalgar Road to the east to HH #3 WWPS / proposed Eighth Line/Trafalgar Trunk Sewer).
    - Flows from Lot 1 lands located east of Trafalgar Road can be effectively conveyed to HH #3 WWPS. Flows from Lot 2 lands located east of Trafalgar Road cannot be effectively drained to the HH #3 WWPS. The existing 200mm - 300mm diameter sewers running east along Steeles Avenue between Trafalgar Road and HH #3 WWPS are undersized and have not been constructed at a great enough depth to convey flows from Lot 2 lands east of Trafalgar Road along Proposed Collector 3, Trafalgar Road and Steeles Avenue.
    - Flows from Lot 1 lands located east of Trafalgar Road can be effectively conveyed to the Eighth Line/Trafalgar Trunk Sewer. Flows from Lot 2 lands located east of Trafalgar Road can be conveyed to the Eighth Line/Trafalgar Trunk Sewer where depth allows. At existing grades, the western portion of the Lot 2 lands located east of Trafalgar Road (near the north-south tributary) cannot be effectively drained towards the proposed Eighth Line/Trafalgar Trunk Sewer. Flow by gravity to the east is already draining against the grade of the area's existing topography and conveying flows from the lower elevation lands located near the tributary the depth of the proposed sewer along Proposed Collector Road 3 to nearly 10 metres.

These alternatives all retain flows from the PGEA Phase 1B lands within the Mid-Halton WWTP catchment area (i.e. there is no change to the 2017 DC Update analysis results and recommendations at the treatment plant level for the Mid-Halton WWTP).

5.4.3 Selection of Preferred Solution

The preferred solution is **Alternative 3** (Area West of Trafalgar Road West towards HH# 3 WWPS, Area East of Trafalgar Road East towards HH #3 / Eighth Line/Trafalgar Trunk Sewer). This alternative was selected as preferred as it best utilizes the proposed Eighth Line/Trafalgar Trunk Sewer and ultimately frees up some capacity from the HH #2 WWPS, HH #1 WWPS, Miller Trunk Sewer and Mid-Block WWPS.

The preferred wastewater servicing incorporates the following infrastructure recommendations:

Prior to Commissioning of the Eighth Line/Trafalgar Trunk Sewer

As noted in Section 5.1.1, financing for construction of the Eighth Line/Trafalgar Trunk Sewer is subject to a Regional Council approved Allocation Program. Development of the PGEA Phase 1B lands may precede the commissioning of the Eighth Line/Trafalgar Trunk Sewer. Under this scenario the preferred servicing strategy will be as follows:

The entire portion of Lot 2 lands as well as Lot 1 lands located west of Trafalgar Road (including all lands fronting along Trafalgar Road) drain to the west, conveying flows to the existing 525mm / 600mm diameter sanitary sewer running west along Steeles Avenue (outletting to HH #2 WWPS) at four (4) intersection locations:

- Steeles Avenue and Proposed Collector Road 2;
- Steeles Avenue and Hornby Road;
- Steeles Avenue and Proposed Collector Road 3; and,
- Steeles Avenue and Trafalgar Road.

If Lot 2 lands develop prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer, then flows from Lot 2 lands located east of Trafalgar Road could be conveyed west along Proposed Collector 3.

Lot 1 lands located east of Trafalgar Road drain to the east outletting to HH #3 WWPS, conveying flows to the existing sewers running east along Steeles Avenue draining to HH#3 WWPS at one (1) intersection location:

- Steeles Avenue and Eighth Line.

The preferred wastewater servicing strategy prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer is shown in Figure 5-2.

Peak wastewater flows at each of the outlets are summarized in Table 5-6.

Table 5-6: PGEA Phase 1B Peak Flows by Outlet (Prior to Commissioning of Eighth Line/Trafalgar Trunk Sewer)

PGEA Phase 1B Outlet	Peak Flow (L/s)	Description of Downstream Outlet
Steeles Ave. and Eighth Ln.		
• East from Steeles Ave.	10 L/s	Ex. 300mm sewers to HH #3 WWPS
• South from Eighth Ln.	4 L/s	Ex. 300mm sewers to HH #3 WWPS
Sub-Total to HH#3 WWPS	**14 L/s**	**HH#2 WWPS**
Steeles Ave. and Trafalgar Rd.	2 L/s	Ex. 525mm – 675mm sewers to HH #2 WWPS
Steeles Ave. and Proposed Collector Rd. 3	27 L/s	Ex. 525mm – 675mm sewers to HH #2 WWPS
Steeles Ave. and Hornby Rd	12 L/s	Ex. 600mm – 675mm sewers to HH #2 WWPS
Steeles Ave. and Proposed Collector Rd. 2	14 L/s - 45 L/s	Ex. 675mm sewers to HH #2 WWPS
Steeles Ave. and Sixth Line North	0 L/s – 32 L/s	Ex. 375mm sewers to HH#2 WWPS
Sub-Total to HH#2 WWPS	**~86 L/s**	**HH#1 WWPS**
Total (to HH#3 WWPS, HH#2 WWPS, HH#1 WWPS)	**~100 L/s**	**Ultimately West to Miller Way Trunk Sewer**

Peak flows from PGEA Phase 1B lands and the associated impacts on downstream pumping stations are shown in Table 5-7.

Table 5-7: PGEA Phase 1B Peak Flows Impacts to Downstream Pumping Stations (Prior to Commissioning of Eighth Line/Trafalgar Trunk Sewer)

WWPS	Firm Capacity	Existing Peak Flow (Provided)	Additional Flow from PGEA Phase 1B	Peak Flow with PGEA Phase 1B
HH #1	280 L/s (2 Pumps + 1 Standby)	60 L/s	100 L/s	160 L/s
HH #2	160 L/s (3 Pumps)	44 L/s	100 L/s	144 L/s
HH #3	64 L/s (2 Pumps)	11 L/s	14 L/s	25 L/s
Mid-Block WWPS	1,215 L/s (3 Pumps + 1 Standby)	783 L/s	100 L/s	883 L/s

Peak wastewater flows from PGEA Phase 1B will not exceed the firm capacities of the downstream wastewater pumping stations.

Development Lands West of Proposed Collector 2

The range in peak flows outletting to existing sewers along Steeles Avenue at the Proposed Collector Road 2 and Sixth Line North intersections reflects the different phasing options for Lot 1 lands located between Sixth Line North and Proposed Collector 2.

If development phasing from Lot 1 Lands near Sixth Line North proceeds from east to west, flows are recommended to be conveyed west through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and then south along Proposed Collector 2 to the existing 675mm sanitary sewers that flow west along Steeles Avenue. The 675mm diameter Steeles Avenue sewer eventually outlets to HH #2 WWPS. The existing sewer along Steeles Avenue at Proposed Collector 2 has sufficient capacity and has been constructed at sufficient depth to convey flows from Lot 1 and Lot 2 lands located between Sixth Line North and the Greenlands feature that is located immediately west of Proposed Collector 2.

If development phasing from Lot 1 Lands located between Sixth Line North and Proposed Collector Road 2 proceeds from west to east, flows are recommended to be conveyed west through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 then south along Sixth Line North to the existing 375mm sanitary sewer that flows east along Steeles Avenue. The 375mm diameter Steeles Avenue sewer eventually outlets to HH #2 WWPS. The existing sewer along Steeles Avenue at Sixth Line North has capacity to convey flows from Lot 1 and Lot 2 lands located between Sixth Line North and the Greenlands feature that is located immediately west of Proposed Collector 2. The existing 375mm diameter sewers along Steeles Avenue have been constructed at sufficient depth to convey flows from most of the Lot 1 and Lot 2 lands located west of Proposed Collector 2. Based on existing ground elevations, there may not be sufficient cover for sewers constructed east of the Potential Greenlands Relocation feature in the area. Potential Greenlands Relocation features are as set-out in the Secondary Plan for the area and are assumed to be areas that may be developable. Regrading around the Relocation feature during development construction can improve sewer cover to allow for conveyance of flows to a

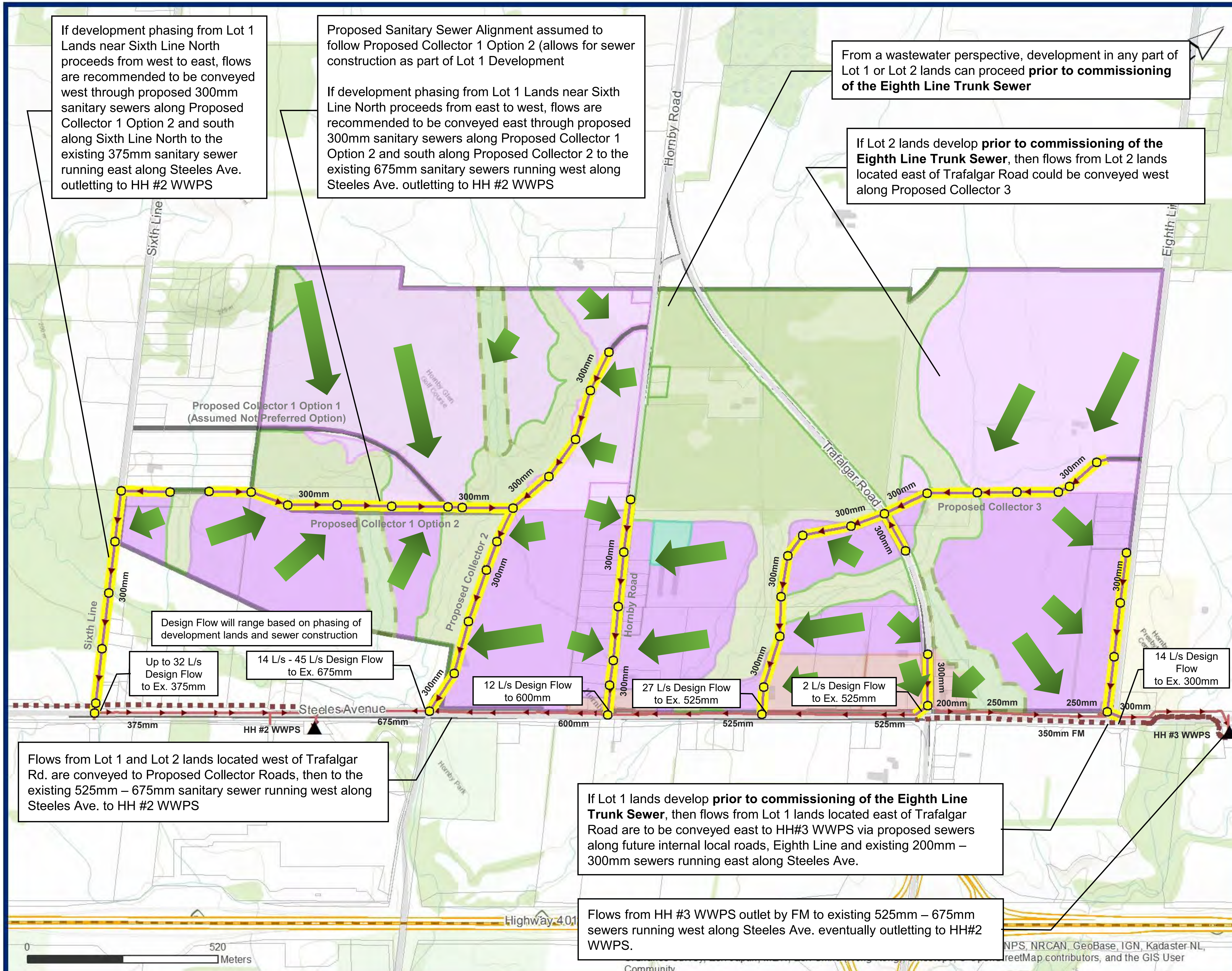
Sixth Line North sewer from all Lot 1 and Lot 2 lands located west of Proposed Collector 2 Greenlands feature.

Development Lands East of Trafalgar Road Fronting on Steeles Avenue

There are existing 200mm / 250mm diameter sanitary sewers running along Steeles Avenue east from Trafalgar Road to HH #3 WWPS. There are potential future development scenarios where PGEA P1B lands fronting on Steeles Avenue will require wastewater servicing along the north frontage of Steeles Avenue between Trafalgar Road and Eighth Line and provision should be made for utilization of the existing 250mm diameter sewers along Steeles Avenue to convey flows to the east. The existing 250mm diameter sewers located near the Eighth Line intersection have been installed along Steeles Avenue at depths ranging from five to seven metres. Downstream of the Eighth Line intersection, the existing sewer is 300mm diameter.

It is anticipated that costs would be too excessive to replace this sewer with an upgraded 300mm diameter sanitary sewer in order to meet the requirements set out in Halton Region's Water and Wastewater Linear Design Manual. Analysis shows that there is sufficient capacity within the existing 250mm diameter sewers to convey existing and proposed flows from the portion of PGEA P1B lands fronting on Steeles Avenue. The preferred method for conveyance of wastewater flows from properties fronting on Steeles Avenue remains through new internal sewers that meet the Region's minimum 300mm diameter requirement, eventually outletting to larger diameter sewers located west of Eighth Line.

Prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer, flows from the entire portions of both Lot 1 and Lot 2 lands are ultimately conveyed to through HH #2 WWPS, HH#1 WWPS, Miller Way Trunk Sewer, Mid-Block WWPS and outlet at the Mid-Halton WWTP.



Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Wastewater Infrastructure

- ▲ Wastewater Pumping Station
- ● Proposed Manhole (approximate location)
- Proposed Local Gravity Sewer
- Existing Gravity Sewer
- ■ ■ ■ Existing ForceMain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- 🟥 Business Commercial (BCA)
- 🟧 Cemetery
- 🟦 Enhancement Area (E)
- 🟩 Greenlands
- 🟩 Greenlands - Potential Relocation
- 🟪 Prestige Industrial (PIA)
- 🟪 Proposed Prestige Industrial (PPIA)
- Direction of Potential Development Wastewater Flows

Sewer alignments are shown schematically.

Figure 5-2
Preferred Wastewater Servicing
Prior to Commissioning of Eighth Line Trunk Sewer

GM BluePlan

May, 2019
717029-WW-004
NAD 1983 UTM Zone 17N

After Commissioning of the Eighth Line/Trafalgar Trunk Sewer

If the Eighth Line/Trafalgar Trunk Sewer is commissioned prior to the development of the Lot 2 lands located east of Trafalgar Road, then flows from the Lot 2 lands located east of Trafalgar Road can be conveyed to the Eighth Line/Trafalgar Trunk Sewer. An outlet manhole for these lands should be considered, to be located at:

- the intersection of Eighth Line and Proposed Collector Road 3

If development of Lot 2 lands located east of Trafalgar Road precedes the commissioning of the Eighth Line/Trafalgar Trunk Sewer, then flows from Lot 2 lands located east of Trafalgar Road will continue to be conveyed to the west as noted above - primarily through a 300mm diameter sewer constructed along Proposed Collector Road 3, outletting to the existing 525mm diameter sewer running west along Steeles Avenue.

Lot 1 lands located east of Trafalgar Road will drain to the east outletting to the Eighth Line/Trafalgar Trunk Sewer. Existing 200mm – 300mm diameter sewers running east along Steeles Avenue between Trafalgar Road and Eighth Line will remain and continue to be available to convey flows from Lot 1 developments. Existing sewers along Steeles Avenue as well as proposed 300mm diameter sewers along Eighth Line will be transferred to outlet to the new Eighth Line/Trafalgar Trunk Sewer when HH #3 WWPS is decommissioned.

An Eighth Line/Trafalgar Trunk Sewer outlet manhole for flows from Lot 1 lands located east of Trafalgar Road is to be constructed at the intersection of:

- Steeles Avenue and Eighth Line

The portion of Lot 1 and Lot 2 lands located west of Trafalgar Road (including all lands fronting along Trafalgar Road) will continue to drain to the west similar to prior to the commissioning of the Eighth Line/Trafalgar Trunk Sewer (as noted above). The sewers will outlet to the existing 525mm / 675mm diameter sewers running west along Steeles Avenue and outletting to HH #2 WWPS.

The preferred wastewater servicing strategy after commissioning of the Eighth Line/Trafalgar Trunk Sewer is shown in Figure 5-3.

Peak wastewater flows at each of the outlets are summarized in Table 5-8.

Table 5-8: PGEA Phase 1B Peak Flows by Outlet (After Commissioning of Eighth Line/Trafalgar Trunk Sewer)

PGEA Phase 1B Outlet	Peak Flow (L/s)	Description of Downstream Outlet
East to Proposed Eighth Ln. Trunk Sewer		
Steeles Ave. and Eighth Ln.		
• East from Steeles Ave.	10 L/s	Proposed Eighth Ln. Trunk Sewer (MH at Steeles Ave. and Eighth Ln.)
• South from Eighth Ln.	4 L/s	Proposed Eighth Ln. Trunk Sewer (MH at Steeles Ave. and Eighth Ln.)
Proposed Collector Rd. 3 and Eighth Ln.[1]	10 L/s	Proposed Eighth Ln. Trunk Sewer

PGEA Phase 1B Outlet	Peak Flow (L/s)	Description of Downstream Outlet
		(MH at Proposed Collector Rd. 3 and Eighth Ln.)
Total (East to Proposed Eighth Ln. Trunk Sewer)	**~24 L/s**	**Proposed Eighth Ln. Trunk Sewer**
West to Ex. Steeles Ave. Trunk Sewers		
Steeles Ave. and Trafalgar Rd.	2 L/s	Ex. 525mm – 675mm sewers to HH #2 WWPS
Steeles Ave. and Proposed Collector Rd. 3	17 L/s	Ex. 525mm – 675mm sewers to HH #2 WWPS
Steeles Ave. and Hornby Rd	12 L/s	Ex. 600mm – 675mm sewers to HH #2 WWPS
Steeles Ave. and Proposed Collector Rd. 2	14 L/s - 45 L/s	Ex. 675mm sewers to HH #2 WWPS
Steeles Ave. and Sixth Line North	0 L/s – 32 L/s	Ex. 375mm sewers to HH#2 WWPS
Sub-Total to HH#2 WWPS	**~76 L/s**	**HH#1 WWPS**
Total (to HH #2, HH #1)	**~76 L/s**	**Ultimately West to Miller Way Trunk Sewer**

[1]Assumes that commissioning of the Eighth Line/Trafalgar Trunk Sewer precedes development of Lot 2 lands located east of Trafalgar Road.

Peak flows from PGEA Phase 1B lands and the associated impacts on downstream pumping stations are shown in Table 5-9.

Table 5-9: PGEA Phase 1B Peak Flows Impacts to Downstream Pumping Stations (After Commissioning of Eighth Line/Trafalgar Trunk Sewer)

WWPS	Firm Capacity	Existing Peak Flow (Provided)	Additional Flow from PGEA Phase 1B	Peak Flow with PGEA Phase 1B
HH #1	280 L/s (2 Pumps + 1 Standby)	60 L/s	76 L/s	136 L/s
HH #2	160 L/s (3 Pumps)	44 L/s	76 L/s	120 L/s
Mid-Block WWPS	1,215 L/s (3 Pumps + 1 Standby)	783 L/s	76 L/s	859 L/s

Peak wastewater flows from PGEA Phase 1B will not exceed the firm capacities of the downstream wastewater pumping stations.

Flows to Steeles Avenue and Proposed Collector 2 and flows to Steeles Avenue and Sixth Line North will be the same as prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer.

Conveyance of flows from Lot 1 lands fronting on Steeles Avenue located east of Trafalgar Road are also discussed above under the same section.

Inverts of the proposed Eighth Line/Trafalgar Trunk Sewer were based on preliminary design information provided by the Region. Assumed inverts and proposed outlet manhole locations are summarized in Table 5-10.

Table 5-10: Assumed Inverts of Eighth Line/Trafalgar Trunk Sewer (at PGEA Phase 1B Outlet Manhole Locations)

Location of Eighth Ln. Trunk Sewer Outlet Manhole	Assumed Inv. Of Eighth Ln. Trunk Sewer (m)	Source
Proposed Collector Rd. 3 and Eighth Ln. (Approx. 720m north of Steeles Ave.)	~200.7m	Preliminary Design Information provided by Halton Region
Steeles Ave. and Eighth Ln.	195.8m	

The western portion of Lot 2 lands located east of Trafalgar Road are at existing elevations that allow for more efficient conveyance to the 300mm sewer flowing west along Proposed Collector Road 3.

Outletting lands from this area to the Eighth Line Trunk Sewer would deepen the sewer running east along Proposed Collector Road 3 from ~6.5m to ~9m. This is not recommended at this time.

The direction for this section of sewer along Proposed Collector Road 3 is dependent on the timing of the Eighth Line Trunk Sewer. If the Eighth Line Trunk Sewer is available, it is recommended that this section convey flows east.

If this section must be constructed prior to commissioning of the Eighth Line Sewer to support development in Lot 2, then this section would convey flows permanently west (as per Figure 5-2).

If Lot 2 lands east of Trafalgar Road develop **after commissioning of the Eighth Line Trunk Sewer**, then flows from Lot 2 lands located east of Trafalgar Road are recommended to be conveyed east along Proposed Collector 3 and outlet to the Eighth Line Trunk Sewer.

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 3

Hornby Road

Trafalgar Road

Sixth Line

Eighth Line

Steeles Avenue

Highway 401

Milton

Hornby Glen Golf Course

300mm

375mm

675mm

600mm

525mm

200mm

250mm

Halton IPFS 7550 – 900mm

Halton IPFS 7552 – 1050mm

Halton IPFS 7553 – 1050mm

HH #2 WWPS

Up to 32 L/s Design Flow to Ex. 375mm

Design Flow will range based on phasing of development lands and sewer construction

14 L/s - 45 L/s Design Flow to Ex. 675mm

12 L/s Design Flow to 600mm

17 L/s Design Flow to Ex. 525mm

2 L/s Design Flow to Ex. 525mm

10 L/s Design Flow to Prop. 900mm

Eighth Ln. Trunk Inv. ~200.7m

14 L/s Design Flow to Prop. 1050mm

Eighth Ln. Trunk Inv. 195.8m

If development phasing from Lot 1 Lands near Sixth Line North proceeds from west to east, flows are recommended to be conveyed west through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and south along Sixth Line North to the existing 375mm sanitary sewer running east along Steeles Ave. outletting to HH #2 WWPS

Proposed Sanitary Sewer Alignment assumed to follow Proposed Collector 1 Option 2 (allows for sewer construction as part of Lot 1 Development

If development phasing from Lot 1 Lands near Sixth Line North proceeds from east to west, flows are recommended to be conveyed east through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and south along Proposed Collector 2 to the existing 675mm sanitary sewers running west along Steeles Ave. outletting to HH #2 WWPS

HH#3 WWPS to be decommissioned upon commissioning of Eighth Line Trunk Sewer with flows from WWPS transferred to new trunk sewer

0 520 Meters

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Wastewater Infrastructure

- Wastewater Pumping Station
- Proposed Manhole (approximate location)
- Proposed Local Gravity Sewer
- Existing Gravity Sewer
- Existing ForceMain
- Proposed Eighth Line Trunk Sewer

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Direction of Potential Development Wastewater Flows

Sewer alignments are shown schematically.

Figure 5-3
Preferred Wastewater Servicing
After Commissioning of Eighth Line Trunk Sewer

BluePlan ENGINEERING

May, 2019
717029-WW-004
NAD 1983 UTM Zone 17N

5.4.4 Wastewater Collection Modelling Analysis

The Region's InfoSewer model was utilized to analyse the servicing scheme for the PGEA Phase 1B lands under 2021 and 2031 conditions. As noted in the Secondary Plan, full build out of the area is anticipated for 2021.

Proposed wastewater loads for PGEA Phase 1B were added to the Region's InfoSewer model. It was recognized that this would provide a conservative analysis as future PGEA wastewater loads have already been included within the InfoSewer model as part of the distribution of wastewater loads by SGU. This analysis approach was selected as there was limited information available detailing the distribution of SGU loads by manhole within the Region's model. If analysis by this more conservative approach showed deficiencies, then a more detailed determination of the allocation of wastewater loads within the area was to be carried out.

Modelling analysis demonstrated that the PGEA Phase 1B lands can be effectively serviced by the preferred servicing strategy prior to and after commissioning of the Eighth Line/Trafalgar Trunk Sewer. Model runs showed that peak flow (Q) versus sewer full flow capacity ($q_{manning}$) will be less than 85% for all local sewers within PGEA Phase 1B. The Eighth Line/Trafalgar Trunk Sewer as well as trunk sewers along Steeles Avenue fronting the PGEA Phase 1B lands were also shown to have sufficient capacity. The 200mm to 250mm diameter sewers along Steeles Avenue, located east of Trafalgar Road were also found to have capacity for future wastewater flows from PGEA Phase 1B lands. As these existing sewers are smaller than the Region's minimum 300mm diameter required for industrial land uses, future development wastewater flows proposed to discharge to these sewers should be reviewed in detail to ensure that there is sufficient capacity. The detailed review can be completed as part of the development application process.

Halton Region's sanitary sewer design sheet was also utilized to check calculations for all proposed sanitary sewers within the PGEA Phase 1B lands.

Model results for PGEA Phase 1B area are shown in **Appendix E**.

Wastewater catchment areas, modelling results, sanitary sewer design sheets and proposed sewer profiles are detailed further in **Appendix E**.

5.4.5 Additional Design Considerations

In order to provide for the full range of development opportunities for Lot 2 lands located east of Trafalgar (and more specifically the potential regrading of lands in this area to convey all flows to the east towards the Eighth Line/Trafalgar Trunk Sewer), it is recommended that design of the Eighth Line/Trafalgar Trunk Sewer accommodate the peak flows from all of Lot 2 lands located east of Trafalgar Road.

As noted above in Section 5.4.2, the western portion of the Lot 2 lands located east of Trafalgar Road (near the north-south tributary) cannot be effectively drained towards the proposed Eighth Line/Trafalgar Trunk Sewer (based on the existing grades of the lands). Flow by gravity to the east is already draining against the grade of the area's existing topography and conveying flows from these lower elevation lands located near the tributary will increase the depth of the proposed east-flowing sewer along Proposed Collector Road 3 to nearly 10 metres. At this depth, the outlet invert of a proposed sewer along Proposed Collector Road 3 will be below the proposed obvert of the Eighth Line/Trafalgar Trunk Sewer (based on an obvert of proposed invert of ~200.7m + ~900mm = 201.6m). Proposed grading of the lands for development may increase elevations in

the area and further review of the conveying flows from the west portion of Lot 2 lands located east of Trafalgar Road could be considered under this scenario.

It is reasonable to expect that regrading will be completed to increase the lower elevation areas of Lot 2 developable lands located east of Trafalgar Road. Regrading localized sections to increase low elevations up to one metre may provide benefit to the potential development lot yields, stormwater management system and decrease costs to construct the wastewater system. Detailed evaluation of the cost benefits of regrading will need to be completed as part of the development process and potential drainage of the wastewater flows from this area to the Eighth Line/Trafalgar Trunk Sewer should continue to be considered as an option.

Based on this recommendation, and the design flows noted in Section 5.4.3, flows from the PGEA Phase 1B development to be accommodated by the Eighth Line/Trafalgar Trunk Sewer are summarized in Table 5-11.

Table 5-11: Design Flows from the Halton Hills PGEA P1B to be Accommodated by the Eighth Line/Trafalgar Trunk Sewer

Location of Eighth Ln. Trunk Sewer Outlet Manhole	Peak Flow from PGEA P1B Lands to Be Accommodated by Eighth Line/Trafalgar Trunk Sewer (L/s)	Note
Proposed Collector Rd. 3 and Eighth Ln. (Approx. 720m north of Steeles Ave.)	19 L/s	Based on Preferred Servicing Strategy with Accommodation for Conveyance of All Flows from Developable Lot 2 Lands Located East of Trafalgar Road
Steeles Ave. and Eighth Ln.	14 L/s	Based on Preferred Servicing Strategy
Total (to Eighth Line/Trafalgar Trunk Sewer)	**~33 L/s**	

5.4.6 Local Sanitary Sewers

The proposed preliminary alignment of wastewater sewers follows the Secondary Plan proposed road alignments. As noted in Section 4.4.4, it is assumed that the proposed road network was thoroughly considered through the Secondary Plan process and it is important that the preferred servicing strategy adheres to the proposed road alignment. This will best allow for construction within municipal right-of-ways (and negate the requirement for easements or property taking). It is expected that future internal roads may allow for variation on wastewater servicing alignments and opportunity to ultimately convey wastewater flows to the Eighth Line/Trafalgar Trunk Sewer should be encouraged.

6 Phasing Timing and Cost Estimate

6.1 General

It is noted in the Secondary Plan schedules of OPA No. 31A (Lot 1 Secondary Plan) and OPA No. 31B (Lot 2 Secondary Plan) that the planning horizon year for the employment land uses is 2021.

There are landowners / proponents for potential development for areas within Lot 1 have had extensive discussions with the Town, and it is anticipated that development of areas of Lot 1 will occur concurrently with the required planning processes (zoning by-law amendments, functional servicing plans, etc.) It should be noted that no potential development within the PGEA P1B yet has status.

In January 2018, the Region provided estimates for draft phasing of persons and jobs based on current BPEs for the study area. The phasing estimates were updated in July 2018. The Region has noted that phasing is expected to be directed by the requirements of the Town's OPAs and availability of servicing.

6.2 Water

6.2.1 Demands

It is expected that demands within the PGEA P1B area will follow development commencing for the area fronting onto Steeles Avenue and progressing north, with build-out of Lot 1 lands in advance of the build-out of Lot 2 lands. However, with the planning horizon year noted as 2021 in both OPA No. 31A (Lot 1) and OPA No. 31B (Lot 2), it is expected that water servicing will be available for the entire PGEA P1B study area by this time. This effectively requires that consideration be made for demands across the entire study area to potentially come online under a single (initial) phase. The single (initial) phase includes Lot 1 lands fronting Hornby Road as servicing can be provided through developer front-ending of the planned 400mm diameter Hornby Road watermain or through servicing along future internal local roads, connecting to proposed watermains to be constructed on the proposed collector roads.

As noted in Section 1.1, The Lot 2 lands established through ROPA 47 have been appealed on the basis that it constitutes a settlement area boundary expansion, and timing for approval of development within Lot 2 lands may follow commencement of development throughout Lot 1 lands. Servicing of Lot 1 demands ahead of Lot 2 lands being developed has been considered.

6.2.2 Phasing and Timing of Infrastructure Components

It is anticipated that water infrastructure will be required to service an initial phase of development of PGEA P1B lands that proceeds under the following conditions:

- Secondary Plan for Lot 1 Lands is approved;
- Secondary Plan for Lot 2 Lands is delayed by ongoing appeal of ROPA;
- Current Pressure Zone Boundary Alignment remains in place (as commissioning of Ultimate Pressure Zone Boundary Realignment continues to be progressed, but timing of commissioning is extended to beyond 2021);

  - Region Project IPFS 6641 – 400mm diameter watermain along Hornby Road from Steeles Avenue to Trafalgar Road is not commissioned / available to connect to; and,

- Region Project IPFS 7774 – Extension of watermain to residents located outside of Urban Area Boundary in Hornby is constructed and commissioned as set out in Region Report No. LPS60-18.

The preferred water servicing strategy for the HH PGEA P1B can be easily adapted to this phasing. Supply of the Lot 1 lands will come from the existing Zone 5 600mm diameter watermains running along Steeles Avenue. Looping / security of supply along the proposed collector roads will be available to most development within Lot 1.

Under the initial phase, development of areas fronting along Hornby Road will require servicing (and available fire flow) from:

- proposed 300mm diameter watermains that ultimately connect to the proposed 300mm diameter watermains that will run along Proposed Collector Road 2 or Proposed Collector Road 3; and/or,

- proposed 400mm diameter watermain along Hornby Road (Region Project 6641) - if available.

The proposed 400mm diameter watermain is planned for construction in 2025 (after commissioning of the future Ultimate Pressure Zone Boundary Realignment. The Region has a policy that will allow for a developer to construct the project ahead of schedule (as outlined in Section 4.4.1). The existing 100mm / proposed 50 mm diameter watermains running along Hornby Road will not have sufficient capacity to service Employment development.

Phasing of the preferred water servicing strategy for development of Lot 1 lands only is shown in Figure 6-1.

Employment Lands fronting on Hornby Rd. that develop under the **Current Pressure Zone Boundary Alignment** can be supplied by:

- proposed 300mm diameter watermains that ultimately connect to the proposed 300mm diameter watermains that will run along Proposed Collector Road 2 or Proposed Collector Road 3; and/or,
- proposed 400mm diameter watermain along Hornby Road (Region Project 6641) - if available.

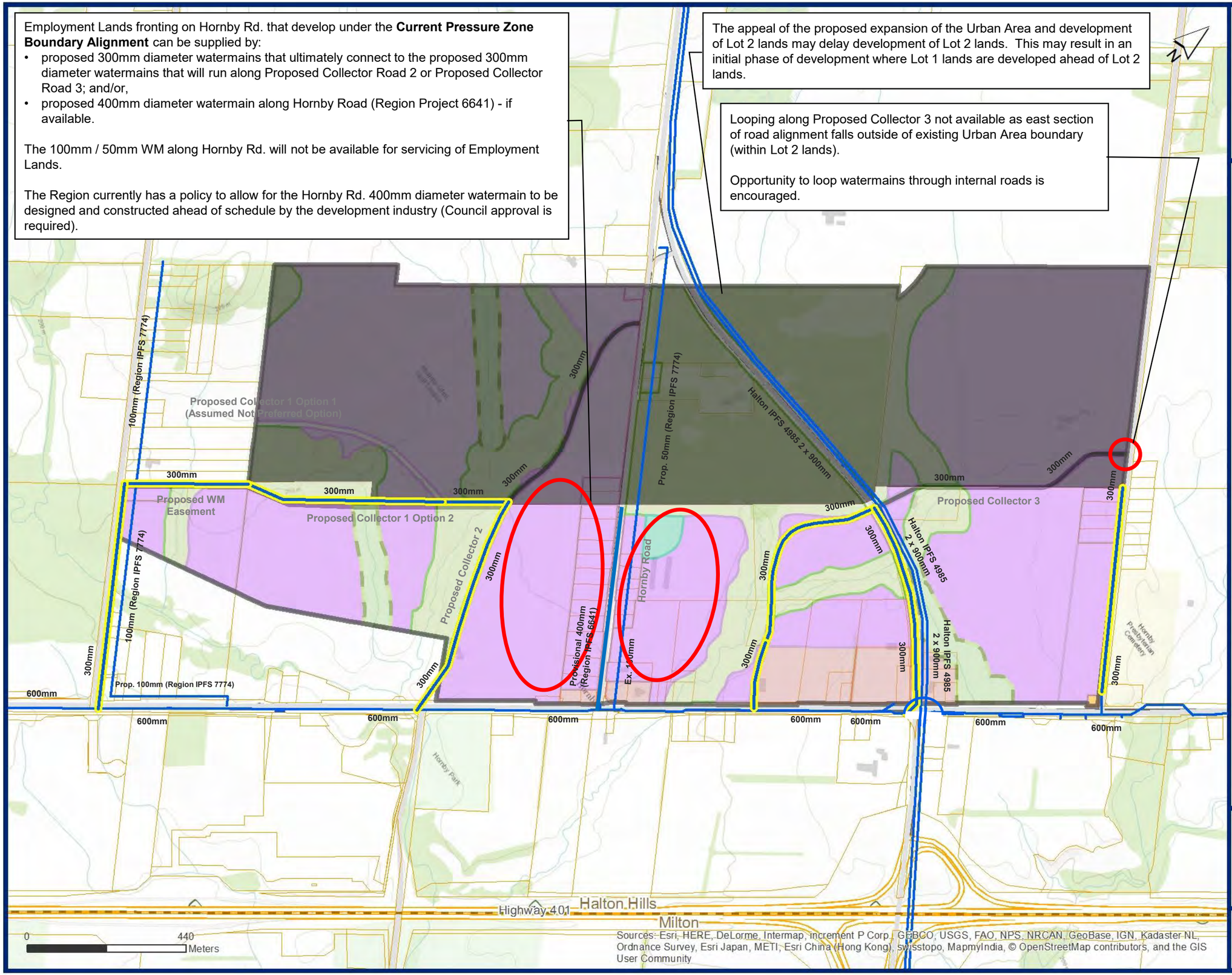
The 100mm / 50mm WM along Hornby Rd. will not be available for servicing of Employment Lands.

The Region currently has a policy to allow for the Hornby Rd. 400mm diameter watermain to be designed and constructed ahead of schedule by the development industry (Council approval is required).

The appeal of the proposed expansion of the Urban Area and development of Lot 2 lands may delay development of Lot 2 lands. This may result in an initial phase of development where Lot 1 lands are developed ahead of Lot 2 lands.

Looping along Proposed Collector 3 not available as east section of road alignment falls outside of existing Urban Area boundary (within Lot 2 lands).

Opportunity to loop watermains through internal roads is encouraged.



Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Features

- Existing Watermain / In Construction Watermain Projects
- Proposed Local Watermain

General Features

- Phase 1B (Lot 1)
- Phase 1B (Lot 2)
- Municipal Boundary
- Property Parcel
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Watermain alignments are shown schematically.

Current Pressure Zone Boundary Alignment

Figure 6-1
Initial Phasing of Preferred Water Servicing

April, 2019
717029-W-005
NAD 1983 UTM Zone 17N

6.2.3 Cost Estimate

Preliminary cost estimates were prepared based on current unit costs and methodologies used in the 2017 DCs for water and wastewater infrastructure (provided in **Appendix F**) and indexed to 2018 dollars based on the Statistics Canada Quarterly Non-Residential Construction Price Statistics (most recent update Q4 2017). Unit costs were applied based on size or required capacity of the proposed infrastructure and potential constraints (watercourse crossings, construction within an existing ROW (Steeles Avenue), etc.) It expected that all watermains will follow future road right of ways. Estimated costs are summarized in Table 6-1.

Table 6-1. Cost Estimate for Proposed Water Infrastructure

Component	Cost Estimate (2018$)
Region Project 6641 - 400 mm WM on Hornby Rd from Steeles Ave to Trafalgar Rd (Zone 250) (Development Charges Eligible)	$1.95 M
Local Distribution Watermain (Direct Developer Cost)	$6.85 M
Sub-Total Construction	**$8.80 M**
Construction Contingency (10% of Construction Sub-Total)	$0.88 M
Total Construction	**$9.67 M**
Property / Easement Requirements [1]	$0.07 M
Study (Geotech, Hydrogeologic, Etc.) Requirements (7% of Total Construction)	$0.68 M
Engineering Contingency (15% of Total Construction)	$1.45 M
Total Cost	**$11.88 M**
[1] Easement along north limit of Lot 1 lands required between Sixth Line and Proposed Collector Road 1 Option 2	

Based on the above cost breakdown, the total cost is approximately $11.88 Million.

Additional categorization was undertaken to establish the DC eligible share of the capital improvements according to the current DC policy framework outlined in the 2017 DC Update.

The majority of the water improvements are watermains internal to the development, sized below 400mm diameter and do not meet the requirements under the current Local Service Policy to constitute a DC eligible project.

6.3 Wastewater

6.3.1 Flows

Similar to for the water demands, it is expected that demands within the PGEA P1B area will follow development commencing for the area fronting onto Steeles Avenue and progressing north. With the planning horizon year noted as 2021 in both Town OPAs for the area, it is expected that

wastewater servicing will be available for the entire PGEA P1B study area by this time. This effectively requires that consideration be made for wastewater flows across the entire study area to potentially come online under a single (initial) phase.

Consideration has also been made for the development of Lot 1 lands ahead of Lot 2 lands. This is based on the prospect that development within the Lot 2 lands may be delayed by the appeal that the ROPA detailing Lot 2 lands constitutes a settlement area boundary expansion.

6.3.2 Phasing and Timing of Infrastructure Components

It is anticipated that wastewater infrastructure will be required to service an initial phase of development of PGEA P1B lands that proceeds under the following conditions:

- Secondary Plan for Lot 1 Lands is approved;
- Secondary Plan for Lot 2 Lands is delayed by ongoing appeal of ROPA; and,
- Region Projects IPFS 7550, 7552 and 7553 – Eighth Line/Trafalgar Trunk Sewers have not yet been commissioned by 2021.

The preferred wastewater servicing strategy for the HH PGEA P1B can be easily adapted to this phasing. There is opportunity to convey flows from Lot 1 lands located east of Trafalgar Road to HH #3 WWPS, and as outlined in Section 5.4.1, there is sufficient capacity in downstream sewers and at downstream pumping stations to accept all flows from the HH PGEA P1B.

Phasing of the preferred wastewater servicing strategy for development of Lot 1 lands only is shown in Figure 6-2.

The appeal of the proposed expansion of the Urban Area and development of Lot 2 lands may delay development of Lot 2 lands. This may result in an initial phase of development where Lot 1 lands are developed ahead of Lot 2 lands.

Potential development of Lot 1 lands by 2021 may precede the availability of the Eighth Line Trunk Sewer.

Sixth Line
Hornby Road
Eighth Line
Trafalgar Road

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1
Option 2

Proposed Collector 3

300mm
375mm
675mm
600mm
525mm
200mm
250mm
350mm FM

HH #2 WWPS
HH #3 WWPS

Steeles Avenue
Hornby Park
Hornby Presbyterian Cemetery
Highway 401
Halton Hills
Milton

0
520
Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Wastewater Infrastructure

- Wastewater Pumping Station
- Proposed Manhole (approximate location)
- Proposed Local Gravity Sewer
- Existing Gravity Sewer
- Existing ForceMain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)
- Direction of Potential Development Wastewater Flows

Sewer alignments are shown schematically.

Prior to Commissioning of Eighth Line Trunk Sewer

Figure 6-2
Initial Phasing of Preferred Wastewater Servicing

BluePlan ENGINEERING

May, 2019
717029-WW-004
NAD 1983 UTM Zone 17N

6.3.3 Additional Design Considerations

For Lot 2 lands located east of Trafalgar Road, there may be opportunity to drain south through future internal roads and eventually outlet to the existing 300mm diameter sewers running east along Steeles Avenue to HH#3 WWPS (or a future Eighth Line/Trafalgar Trunk Sewer Connection). The general topography of this Lot 1 and Lot 2 lands located east of Trafalgar Road will allow for construction of north-to-south sewers at sufficient depths should a future development internal road pattern allow for a general north-to-south alignment. This can be further considered as part of the development application process.

6.3.4 Cost Estimate

Preliminary cost estimates were prepared based on current unit costs and methodologies used in the 2017 DCs for water and wastewater infrastructure (provided in **Appendix F**), indexed to 2018 dollars based on the Statistics Canada Quarterly Non-Residential Construction Price Statistics (most recent update Q4 2017). Unit costs were applied based on size or required capacity of the proposed infrastructure and potential constraints (watercourse crossings, construction within an existing ROW (Steeles Avenue), etc.) It is expected that all sanitary sewers will follow future road right of ways. Estimated costs are summarized in Table 6-2.

Table 6-2. Cost Estimate for Proposed Wastewater Infrastructure

Component	Cost Estimate (2018$)	
	Lot 2 Developed Ahead of Commissioning of Eighth Line/Trafalgar Trunk Sewer	Lot 2 Developed After Commissioning of Eighth Line/Trafalgar Trunk Sewer
Local Sanitary Sewer (Direct Developer Cost)	$9.17 M	$9.89 M
Sub-Total Construction	**$9.17 M**	**$9.89 M**
Construction Contingency (10% of Construction Sub-Total)	$0.92 M	$0.99 M
Total Construction	**$10.09 M**	**$10.88 M**
Easement Requirements [1]	$0.07 M	$0.00 M
Study (Geotech, Hydrogeologic, Etc.) Requirements (7% of Total Construction)	$0.71 M	$0.76 M
Engineering Contingency (15% of Total Construction)	$1.51 M	$1.63 M
Total Cost	**$12.38 M**	**$13.28 M**

[1] Easement along north limit of Lot 1 lands required between Sixth Line and Proposed Collector Road 1 Option 2

Based on the above cost breakdown, the total estimated cost for the proposed wastewater infrastructure upgrades is approximately $12.38 Million to $13.28 Million. Cost efficiencies may be achieved if development phasing from Lot 1 Lands near Sixth Line North proceeds in a manner that allows for conveyance of all development flows through one proposed sewer (either along Sixth Line North or along Proposed Collector 2). The impact of development phasing on sewer construction in this area is discussed in Section 5.4.3.

The proposed wastewater improvements are sanitary sewers internal to the development or external to the development requiring a local connection, sized below 450mm diameter and do not meet the requirements under the current Local Service Policy to constitute a DC project.

7 Conclusion

7.1 General

The Town of Halton Hills has noted that they continue to plan for employment land use within the PGEA P1B lands in 2021. The Secondary Plan and associated OPAs for the study area reference 2021 as the planning horizon year for both Lot 1 and Lot 2 lands.

There are landowners / proponents within Lot 1 that have had discussions with the Town, and it is anticipated that development of areas of Lot 1 will occur concurrently with the required planning processes (zoning by-law amendments, functional servicing plans, etc.).

If the Town's objective to make the entirety of the PGEA Phase 1B lands (both Lot 1 and Lot 2) available for development for the 2021 planning horizon, then accommodation should be made to ensure availability of full municipal servicing to any developable area within the PGEA Phase 1B. The recommended water and wastewater servicing strategies provide for a comprehensive and flexible servicing scheme that can accommodate development in any part of Lot 1 or Lot 2.

The servicing scheme can be constructed and commissioned to suit development including the servicing of Lot 1 development without impacting Lot 2 lands that may not be incorporated into the Urban Area prior to development proceeding.

7.2 Water

Supply to the development from the existing 600mm diameter watermains running along Steeles Avenue is immediately available under the current pressure zone alignment (the entire PGEA P1B study area is currently within Zone 5). After commissioning of the Region's proposed Ultimate Pressure Zone Realignment, PGEA P1B lands will be serviced as part of Zone 250.

Initially 300mm diameter watermains fed from Steeles Avenue can be constructed along the proposed collector roads within the development to service proposed development throughout Lot 1 (and Lot 2) lands.

After commissioning of the Ultimate Pressure Zone Boundary Realignment, the proposed Zone 250 400mm diameter watermain to run along Hornby Road (from the 600mm diameter watermain along Steeles Avenue to the 900mm diameter watermain running along Trafalgar Road) can be constructed and commissioned to provide servicing to Employment lands fronting Hornby Road and security of supply to watermains constructed along collector roads within PGEA P1B.

The proposed 400mm diameter Hornby Road watermain is planned for construction in 2025. The Region has a policy in place that will allow for a developer to construct the project ahead of schedule, and prior to commissioning of the Ultimate Pressure Zone Boundary Realignment. Alternatively, servicing of the properties fronting Hornby Road can be through local watermains that connect to the proposed watermains to be constructed along the proposed collector roads. The refined servicing scheme for these properties can be determined through the development approval process.

The potential connection between proposed 300mm diameter watermains servicing the PGEA Phase 1B lands and the new 100mm / 50mm diameter watermain servicing residents in Hornby (Region IPFS 7774) could be considered further at the development application / detail design phase. Connection of the proposed 300mm diameter watermains to the proposed 100mm / 50mm diameter watermain servicing the specified residential properties in Hornby can provide security of supply as well as some water quality benefits from potential looping.

7.3 Wastewater

Ultimate wastewater servicing of the PGEA P1B lands will generally convey flows from Lot 1 and most of Lot 2 lands located east of Trafalgar Road to the proposed Eighth Line/Trafalgar Trunk Sewer and flows from Lot 1 and Lot 2 lands located west of Trafalgar Road (including all lands fronting along Trafalgar Road) to the existing sewers located along Steeles Avenue (and eventually to HH#2 and HH#1 WWPS).

If development progresses ahead of the construction and commissioning of the Eighth Line/Trafalgar Trunk Sewer, flows from the entire portion of Lot 2 lands can be conveyed to the west along Proposed Collector Road 3 to the existing sewers running west along Steeles Avenue. Flows from Lot 1 lands located east of Trafalgar will be conveyed to the east to HH #3 WWPS and outletted via forcemain to the existing sewers running west along Steeles Avenue (eventually outletting to HH #2 WWPS).

If sewers servicing Lot 2 lands located east of Trafalgar Road must be constructed prior to commissioning of the Eighth Line Sewer, then flows from Lot 2 lands located east of Trafalgar Road are to be conveyed west permanently.

A review of downstream impacts of a servicing scenario where all flows from PGEA P1B lands are conveyed through the HH #3, #2 and #1 WWPS to the Miller Way Trunk Sewer and Mid-Block WWPS showed that peak flows will not exceed Ultimate capacity at any WWPS.

References

Sustainable Halton Water and Wastewater Master Plan, 2011

Halton Region Official Plan, 2016

Town of Halton Hills Official Plan

Halton Region 2017 Development Charges Update Background Study - Water and Wastewater Technical Report, September 2016

Town of Halton Hills Premier Gateway Scoped Subwatershed Study – Phase 2: Impact Assessment and Management Strategy, 2017

Premier Gateway Secondary Plan – Water and Wastewater Servicing Functional Servicing Plan, June 2017

Halton South Georgetown Wastewater Servicing, Wastewater Main Project – Design Alternatives Technical Memorandum (TM-B3): Issued for 100% Draft Review, October 31, 2017

Technical Memorandum, Interim Transition of Pressure Zones in Oakville & Milton, For Zone 4 Reservoir (TWL = 250 m) Commissioning, Region of Halton, Version 4, Revised Final, November 22, 2017

Halton Region Report No.: FN-34-17/LPS84-17/PW-44-17 - Allocation Program Update, December 7, 2017

Halton Region Report No.: LPS60-18 - Extension of Municipal Services Outside of the Urban Area Boundary in Hornby, May 23, 2018

Town of Halton Hills By-Law No. 2018-0034, By-law to adopt Amendment No. 30 to the Official Plan of the Town of Halton Hills – Premier Gateway Employment Area Replacement Employment Lands

Town of Halton Hills By-Law No. 2018-0035, By-law to adopt Amendment No. 31A to the Official Plan of the Town of Halton Hills – Premier Gateway Employment Area Phase 1B Lot 1 Secondary Plan

Town of Halton Hills Premier Gateway Employment Area Phase 1B – Lot 1 Secondary Plan, June 2018

Town of Halton Hills By-Law No. 2018-0035, By-law to adopt Amendment No. 31B to the Official Plan of the Town of Halton Hills – Premier Gateway Employment Area Phase 1B Lot 2 Secondary Plan

Town of Halton Hills Premier Gateway Employment Area Phase 1B – Lot 2 Secondary Plan, June 2018

Halton South Georgetown Wastewater Servicing, Wastewater Main Project – Preliminary Drawings, June 22, 2018

Appendix A - Planning Data

Date:	10/31/2018	File:	717029
Project:	PGEA Phase 1B Area Servicing Plan		
Subject:	Planning Estimates and Growth Assumptions TM		

TECHNICAL MEMO

1. Introduction

The Region of Halton (the Region) initiated the Water and Wastewater Area Servicing Plan (ASP) for the Premier Gateway Phase 1B Employment Area (PGEA) in Halton Hills to identify and evaluate water and wastewater servicing alternatives and recommend a servicing solution. The ASP will support the PGEA which will serve as a key employment growth area including industrial, office, commercial and institutional services. This technical memorandum summarizes the planning estimates and growth assumptions for the PGEA Phase 1B ASP.

1.1. Proposed Development

The PGEA is an important employment area in the Town of Halton Hills located in the Milton/401 corridor. The PGEA is located along Steeles Avenue north of Highway 401, west of Winston Churchill Blvd, and east of Esquesing Line. The PGEA consists of four distinct Phases: 1A, 1B, 2A and 2B. The Area Servicing Plan will focus on Phase 1B of the PGEA.

The ASP study area encompasses the “Existing” Phase 1B area, as well as approximately 75 ha of “Replacement” employment lands currently outside the Urban Area in “Lot 2”. These lands, former Esquesing Township, are directly north of the existing Phase 1B area along Hornby Road and between Sixth Line and Eighth Line.

The ‘Replacement’ lands are subject to a separate Regional Official Plan Amendment and a Local Official Plan Amendment to bring the lands into the urban area. As these lands were not within the Urban Area in ROPA 38, the BPEs in 2011 did not allocate any growth to this area. A key objective of the ASP is to ensure this change is appropriately considered and planned for.

Figure 1 shows the general study area for the PGEA Phase 1B Water and Wastewater Area Servicing Plan.

2. Planning Estimates and Growth Assumptions

2.1. Best Planning Estimates (BPEs)

Halton Region Best Planning Estimates (BPEs) Data from June 2011 are generally used to determine the current and future water and wastewater servicing needs in the Region. This data is geographically distributed by Traffic Survey Zone (TSZ) and Small Geographic Units (SGUs) and contains approved population and employment projections for the Region up to the year 2031 consistent with the Region’s Official Plan.

Figure 2 shows the SGUs associated with the PGEA Phase 1B Water and Wastewater Area Servicing Plan.

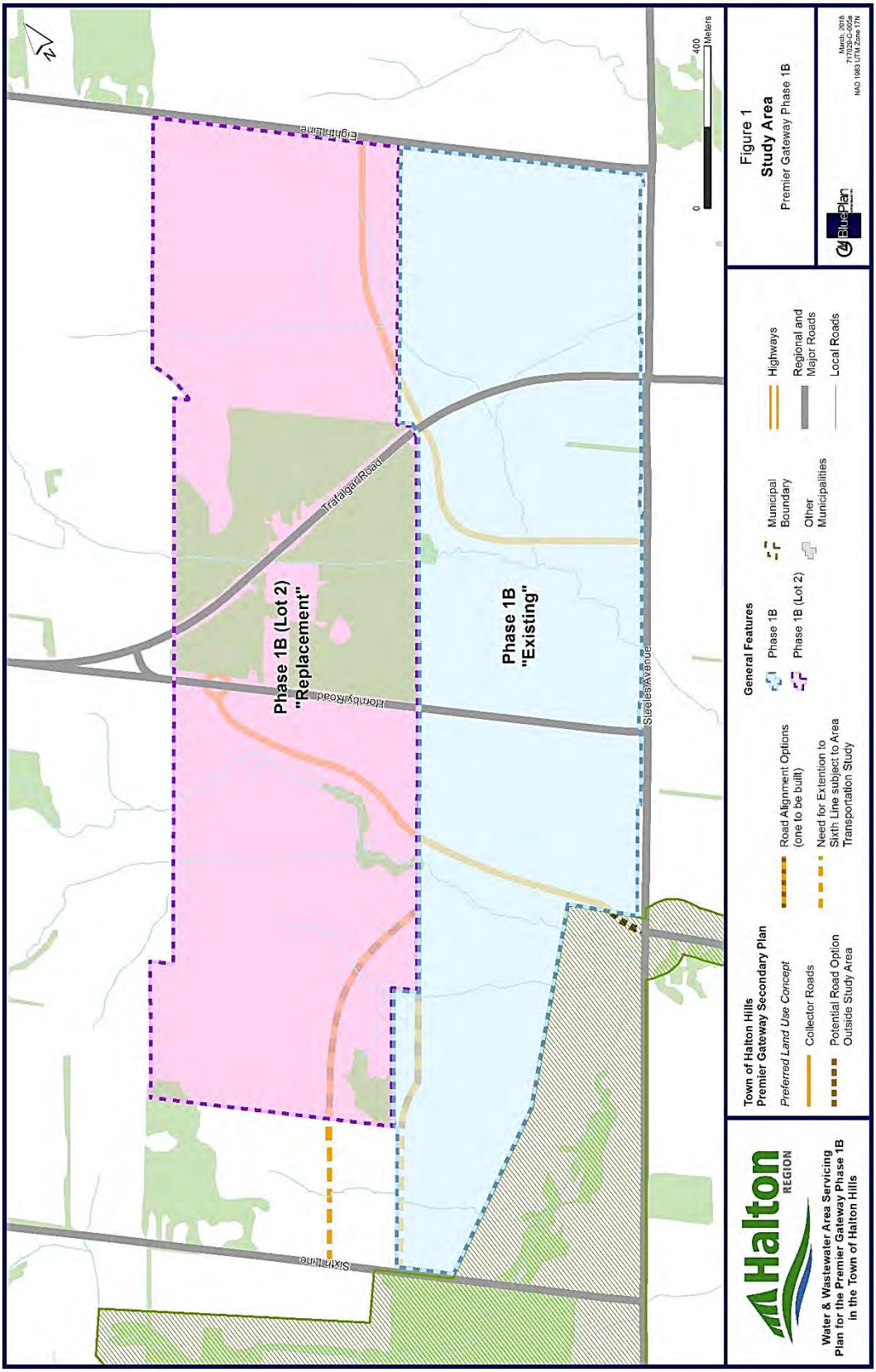


Figure 1 – Study Area

2.2. Premier Gateway Employment Area (PGEA)

According to the Town of Halton Hills Official Plan, the PGEA is organized into four phases: 1A, 1B, 2A and 2B. (See Figure 2). The Premier Gateway Employment Area Phase 1 (1A & 1B) is generally located on both the north and south sides of Steeles Avenue between the Town of Milton boundary and Eighth Line. The Premier Gateway Employment Area Phase 2 (2A & 2B) is generally located on both the north and south sides of Steeles Avenue between Eighth Line and the City of Brampton boundary.

The PGEA phases generally align with the SGUs boundaries with the exception of two areas:

- SGU 555.03 (overlaps with both Phase 1B and 2B)
- SGU 552.01 (overlaps with both Phase 1A and 2A)

Figure 2 shows the PGEA Phases and associated SGUs boundaries.

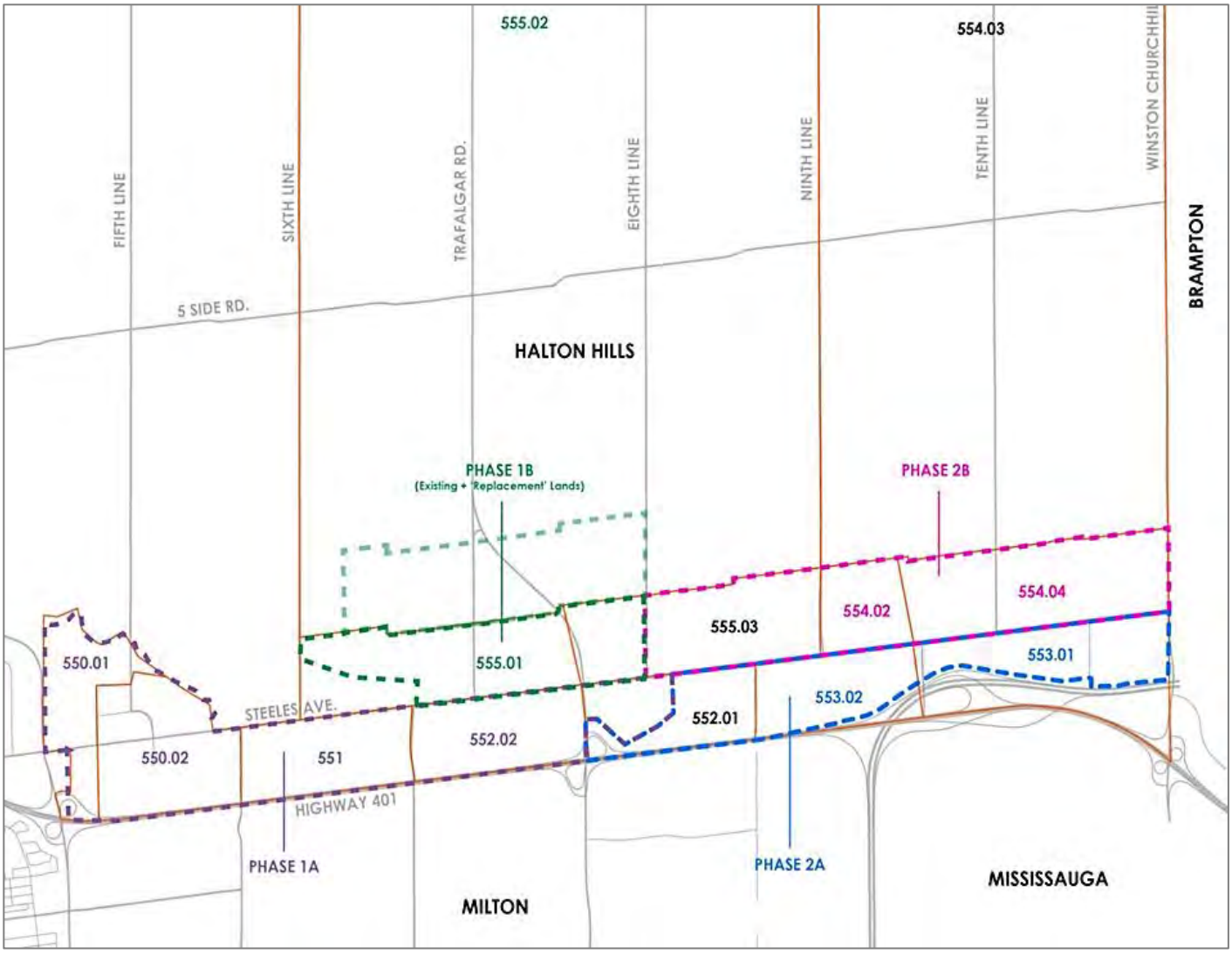


Figure 2 – PGEA Phases & SGUs Boundaries

2.3. Premier Gateway Phase 1B Secondary Plan Area - Growth Assumptions

This section outlines the PGEA Phase 1B Secondary Plan Area growth assumptions that are relevant to the ASP.

BPEs Growth Allocation
100% of SGU 555.01 allocated to Phase 1B (Existing Phase 1B)
100% of SGU 555.02 allocated to Phase 1B (Replacement Lands)
~33% of SGU 555.03 allocated to Phase 1B (Existing Phase 1B)

Since SGU 555.02 was not within the Urban Area in ROPA 38, the BPEs in 2011 did not allocate any growth to this area. The PGEA Phase 1B Secondary Plan Area assumed that SGU 555.02 will develop with the same density as the combined Phases 1B and 2B.

"Replacement" Lands Growth Assumptions (SGU 555.02)

Growth = Area x Density

Area: 80.5 ha (provided by the Town of Halton Hills)
Density: 24.6 (provide by Halton Region based on density for Phase 1B+2B)

Table 1 – PGEA Phase 1B Secondary Plan Employment Growth Assumptions (By SGU)

Phase 1B	Year				Area (ha)	Density (jobs/ha)
	2016	2021	2026	2031		
555.01 (Existing)	36	36	921	1,860[a]	111	24.3
555.03 (Existing)	9	9	463	833[b]		
555.02 (Replacement)		495[d]	989[d]	1,979[c]	80.5	24.6
Total Jobs				**4,672**	**191.5**	**24.4**

Notes
a. 1860 jobs are set out in the BPEs for SGU 555.01
b. 833 jobs result from allocating 33% of the jobs in SGU 555.03 to Phase 1B
c. 1979 jobs result from applying P1B + P2B density (24.6) to the Replacement Lands figure (80.5 ha) provided by the Town
d. The '2021' and '2026' assumptions for 555.02-1B are based on 25% and 50% of total growth during those periods.

Using historic shares assumptions, the ICI split for the "Replacement" lands was determined. The replacements lands were then added to the existing lands. The total planning estimates for the PGEA Phase 1B considering all assumptions are shown in Table 2.

Table 2 – PGEA Phase 1B Secondary Plan Assumptions (Total)

	Year					
	2006	**2011**	**2016**	**2021**	**2026**	**2031**
Population	153	151	149	145	166	163
Industrial	6	7	7	388	1,836	3,633
Commercial	37	38	38	132	475	911
Institutional	-	-	-	20	62	128
Employment	42	45	45	540	2,373	4,672
Total	**196**	**196**	**194**	**685**	**2,540**	**4,834**

2.1. Premier Gateway Phase 1B Secondary Plan Area – Phasing Assumptions

Due to uncertainty in the timing for development and growth in the PGEA, the Region provided various potential phasing scenarios to the 2031 for discussion purposes.

	2006	2007-2011	2012-2016	2017-2021	2022-2026	2027-2031	Notes
Lot 1 Phasing (555.01 & 555.03-1B)							
Option 1-A - Existing BPEs	42	45	45	45	1,384	**2,693**	- Based on existing phasing of BPEs for SGUs 555.01 and 555.03-1B
% of 2031 Growth Achieved	1.6%	1.7%	1.7%	1.7%	51.4%		
Option 1-B - PGEA Phase 1 Assumption	42	45	45	889	1,777	**2693**	- Applies the phasing of the BPEs for Phases 1A and 2A [ROPA 38 pre-2021 lands] (33% of growth by 2021 and 66% of growth by 2026) to the Phase 1B Lot 1 area.
% of 2031 Growth Achieved				33%	66%		- Results in 844 more jobs in the 2017-2021 and 393 more jobs in the 2022-2026 period than Option 1-A (Existing BPEs)
Option 1-C - PGEA Phase 1 Modified	42	45	45	1347	2,020	**2693**	- Applies a more aggressive phasing of the BPEs for Lot 1 (50% of growth by 2021 and 75% of growth by 2026)
% of 2031 Growth Achieved				50%	75%		- Results in 1301 more jobs in the 2017-2021 period and 636 more jobs in 2022-2026 than Option 1-A (Existing BPEs)
Lot 2 Phasing (555.02-1B)							
Option 2-A - .25, .50 Split				**495**	**990**	**1,979**	- Based on the assumption of 24.6 jobs / ha over 80.5 hectares, resulting in 1979 jobs
% of 2031 Growth Achieved				25%	50%		- Originally circulated assumption based on one quarter of the growth by 2021 and half the growth by 2026.
Option 2-B - PGEA Phase 1 Assumption				**653**	**1306**	**1,979**	
% of 2031 Growth Achieved				33%	66%		- Applies the phasing of the BPEs for Phases 1A and 2A (33% of growth by 2021 and 66% of growth by 2026) to the Phase 1B Lot 1 area.
Option 2-C - PGEA Post 2026				**0**	**1306**	**1,979**	

	2006	2007-2011	2012-2016	2017-2021	2022-2026	2027-2031	Notes
% of 2031 Growth Achieved				0%	66%		- Delays the growth in Lot 2. Growth phased to begin in the 2022-2026 period (66%), with the remaining 33% in the 2027-2031 period
Phase 1B (Lot 1 & Lot 2) Blended Phasing							
Option 1-B & 2-B	42	45	45	1,542	3,084	**4,672**	
% of 2031 Growth Achieved	0.9%	1.0%	1.0%	33.0%	66.0%	100.0 %	
% of Growth Increment in Phasing Period		0.1%	0.0%	32.3%	33.3%	34.3%	
Total Growth 2006-2031						**4,630**	
Option 1-B & 2-C	42	45	45	889	3,084	**4,672**	
% of 2031 Growth Achieved	0.9%	1.0%	1.0%	19.0%	66.0%	100.0 %	
% of Growth Increment in Phasing Period		0.1%	0.0%	18.2%	47.4%	34.3%	
Total Growth 2006-2031						**4,630**	
Option 1-C & 2-C	42	45	45	1,347	3,326	**4,672**	
% of 2031 Growth Achieved	0.9%	1.0%	1.0%	28.8%	71.2%	100.0 %	
% of Growth Increment in Phasing Period		0.1%	0.0%	28.1%	42.8%	29.1%	
Total Growth 2006-2031						**4,630**	

3. Closing

The PGEA Phase 1B Area Servicing Plan will move forward with these planning estimates and assumptions to identify and evaluate water and wastewater servicing alternatives and ensure the required infrastructure is provided to support growth in this area.

Appendix B - Halton Region Future Water Pressure Zones, Wastewater Drainage Areas and Water and Wastewater Capital Implementation Plans (2017-2031)

Legend

Water Pressure Zone

- A9G
- B1
- B1A
- B1B
- B2
- B2A
- B3
- B3A
- B3B
- B4
- B4A
- B5A
- B5
- C7G
- G6G
- G7G
- G5G
- G6L
- O1
- O2
- O2A
- O2B
- O3
- M5G
- TWL = 211m
- TWL = 223.5m
- TWL = 250m
- TWL = 267m

Other

- Booster/Pumping Station (PS)
- Reservoir (RES)
- Water Purification Plant (WPP)
- Pressure Reducing Valve (PRV)
- Well Field (WELL)
- Elevated Water Storage Tank (TANK)
- Roads
- Municipal Boundary

THIRD LINE RES
PROSPECT PARK WPP
A9G
HIGHWAY 7
SIXTH LINE
22ND SIDEROAD RES (GW)
LAKE BASED RES
G7G
MOORE PARK PS
G6G
NO 22 SIDE ROAD
NO 17 SIDE ROAD
GEORGETOWN WPP
TODD ROAD TANK
G6L
NORVAL TANK
G5G
ZONE 5 RES
ZONE 4 RES
ZONE 6 PS
NO 15 SIDE ROAD
FIRST LINE
GUELPH LINE
FOURTH LINE
FIFTH LINE
SIXTH LINE
EIGHTH LINE
TENTH LINE
WINSTON CHURCHILL BOULEVARD
HIGHWAY 401
C7G
KELSO WPP AND WELL
JAMES SNOW PARKWAY
TWL = 267m
MILTON TANK
HIGHWAY 407
TREMAINE ROAD
STEELES AVENUE
MAIN STREET RES
M5G
DERRY ROAD
THOMPSON ROAD
JAMES SNOW PARKWAY
TWL = 250m
FOURTH LINE PS
BRITTANIA ROAD
TWL= 223.5m
REGIONAL ROAD 25
FOURTH LINE
FIFTH LINE
SIXTH LINE
TRAFALGAR ROAD
EIGHTH LINE
HIGHWAY 407
MOORE RES
TWL = 223.5m
O3
NEYAGAWA PS
NEYAGAWA BOULEVARD
WILLIAM HALTON PARKWAY
TWL = 211m
EIGHTH LINE 223.5m PS
EIGHTH LINE RES
ZONE 3 PS
NINTH LINE
KITCHEN RES AND PS
UPPER MIDDLE ROAD
TRAFALGAR ROAD
O2B
O2A
O2
McCRANEY RES
THIRD LINE
NOTTINGHILL GATE
DAVIS ROAD PS
O1
EIGHTH LINE
HEADON RES
APPLEBY LINE RES AND PS
BEAUFORT RES AND PS
B5
B4
B3
B3A
B2A
BAILIE RES AND PS
WALKERS LINE
APPLEBY LINE
TYANDAGA RES AND PS
BRANT STREET RES AND PS
WASHBURN RES AND PS
GUELPH LINE
NORTH ALDERSHOT RES
B5A
B4A
B3B
B1B
B2
QUEEN ELIZABETH WAY
BURLOAK PS
WATERDOWN ROAD RES AND PS
MOUNT FOREST RES AND PS
HARVESTER ROAD
B1A
PLAINS ROAD
FAIRVIEW STREET
BURLOAK DRIVE
KINGSWAY PS
QUEEN ELIZABETH WAY
BRANT STREET
B1
NEW STREET
REBECCA STREET
LAKESHORE ROAD
OAKVILLE WPP
BURLOAK WPP
BURLINGTON WPP
Lake Ontario

GIS & Information Management
Public Works Department

Figure 2: Halton Region
Future Water Pressure Zones

0 0.75 1.5 3 4.5 6 Km

August 2016

R:\Infrastructure Management\Infrastructure Data\Projects\Development Capital Update\Midga Bielawski Request

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

Legend

- Skyway WWTP
- Mid-Halton WWTP
- Oakville SE WWTP
- Oakville SW WWTP
- Milton WWTP Decommission and Transfer to Mid-Halton WWTP
- Acton WWTP
- Georgetown WWTP
- Glen Williams - Hamlet with capacity reserved at Georgetown WWTP
- Norval - Hamlet with capacity reserved at Georgetown WWTP
- Georgetown Transfer Area to Mid-Halton WWTP
- Regional Boundary

N

Acton WWTP

Georgetown WWTP

Milton WWTP

Mid-Halton WWTP

Oakville SE WWTP

Oakville SW WWTP

Skyway WWTP

2017 Development Charges
Water and Wastewater
Technical Report

Halton Region
Future Wastewater Drainage Areas
Figure 5

715027-41-WW
December 2016
Data Source: Halton Region
Scale: 1:55,000 | NAD 1983 UTM Zone 17N

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

N

Acton WWTP

Georgetown WWTP

Milton WWTP

Mid-Halton WWTP

Oakville SE WWTP

Oakville SW WWTP

Skyway WWTP

Halton REGION

2017 Development Charges Water and Wastewater Technical Report

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

BluePlan ENGINEERING

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

Appendix C - Water Modelling Results

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

- Proposed Junction
- Existing Watermain / Planned Watermain Projects
- Proposed Watermain
- Region Watermain Projects

General Features

- Municipal Boundary
- Property Parcel
- Highways
- Regional and Major Roads
- Proposed Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Area PPIA-01 27.66 Ha — Proposed Wastewater Catchment Area

Catchment Area Direction of Flow Outlet

Area PPIA-06 0.20 Ha
Area PPIA-05 2.85 Ha
Area PPIA-03 4.47 Ha
Area PPIA-02 2.97 Ha
Area PPIA-04 1.12 Ha
Area PPIA-01 27.66 Ha
Area PIA-01 0.60 Ha
Area PPIA-09 0.60 Ha
Area PPIA-10 35.10 Ha
Area PPIA-07 7.01 Ha
Area PPIA-08 0.58 Ha
Area E-01 1.08 Ha
Area PIA-16 1.62 Ha
Area PIA-15 15.79 Ha
Area PIA-17 4.78 Ha
Area PIA-04 10.09 Ha
Area PIA-03 3.82 Ha
Area PIA-02 1.67 Ha
Area PIA-05 2.38 Ha
Area PIA-07 15.07 Ha
Area PIA-06 4.07 Ha
Area PIA-08 5.10 Ha
Area BCA-01 1.15 Ha
Area PIA-11 1.39 Ha
Area PIA-10 11.2 Ha
Area PIA-09 1.21 Ha
Area PIA-12 4.75 Ha
Area PIA-13 4.07 Ha
Area BCA-02 3.41 Ha
Area PIA-14 1.44 Ha
Area BCA-03 2.44 Ha

J-GMBP-0, J-GMBP-1, J-GMBP-2, J-GMBP-3, J-GMBP-5, J-GMBP-8
P-GMBP-1, P-GMBP-2, P-GMBP-4, P-GMBP-5, P-GMBP-6, P-GMBP-7, P-GMBP-8, P-GMBP-12, P-GMBP-13, P-GMBP-14
SH-J-107, SH-J-111, SH-J-181
MP-6641-1, MP-6641-2, MP-6642
WCV83896, WFT220855, WFT148659, WFT148680, WFT349697, WFT349713

Proposed Collector 1 Option 1 (Assumed Not Preferred Option)
Proposed Collector 1 Option 2
Proposed Collector 2
Proposed Collector 3
Proposed WM Easement
Halton Hills
Milton
Sixth Line
Hornby Road
Halton IPFS 4985 2 x 900mm
Halton IPFS 4985
Halton IPFS 7550 – 900mm
Halton IPFS 7553 – 1050mm

0 500 Meters

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Drawing C-1
Junction and Pipe IDs with Demand Allocation

BluePlan Engineering

February, 2019
717029-W-008
NAD 1983 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

- Proposed Junction
- Existing Watermain / Planned Watermain Projects
- Proposed Watermain
- Region Watermain Projects

General Features

- Municipal Boundary
- Property Parcel
- Highways
- Regional and Major Roads
- Proposed Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing C-2

Junction and Pipe IDs with Existing Contours

BluePlan ENGINEERING

February, 2019
717029-W-008
NAD 1983 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

MDD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing C-3
Model Results - 2021 MDD
Current Pressure Zone Boundary Alignment

BluePlan

February, 2019
717029-W-009
NAD 1983 UTM Zone 17N

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Hornby Road

Steeles Avenue

Ex. 600mm

Ex. 100mm

300mm

600mm

Halton Hills

Milton

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

PHD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing C-4
Model Results - 2021 PHD
Current Pressure Zone Boundary Alignment

BluePlan

February, 2019
717029-W-010
NAD 1983 UTM Zone 17N

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)
Proposed WM Easement
Proposed Collector 1 Option 2
Proposed Collector 2
Proposed Collector 3
Hornby Road
Steeles Avenue
Halton Hills
Milton
Halton IPFS 4985 2 x 900mm
Halton IPFS 4985 2 x 900mm
Ex. 600mm
Ex. 100mm
300mm
600mm
0
420
Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

Available Fire Flow (L/s)

- < 75 L/s
- 75 - 150 L/s
- 150 - 300 L/s
- ≥ 300 L/s
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing C-5
Model Results - 2021 MDD+FF
Current Pressure Zone Boundary Alignment

February, 2019
717029-W-011
NAD 1983 UTM Zone 17N

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton Hills

Milton

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Ex. 600mm

Ex. 100mm

300mm

600mm

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

MDD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

300mm

Ex. 600mm

600mm

Ex. 100mm

Halton Hills

Milton

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-6
Model Results - 2031 MDD
Ultimate Pressure Zone Boundary Realignment

BluePlan

February, 2019
717029-W-012
NAD 1983 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

PHD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

300mm

600mm

Ex. 600mm

Ex. 100mm

Halton Hills

Milton

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-7
Model Results - 2031 PHD
Ultimate Pressure Zone Boundary Realignment

BluePlan

February, 2019
717029-W-013
NAD 1983 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

Available Fire Flow (L/s)

- < 75 L/s
- 75 - 150 L/s
- 150 - 300 L/s
- ≥ 300 L/s
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton Hills

Milton

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

300mm

600mm

Ex. 600mm

Ex. 100mm

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-8
Model Results - 2031 MDD+FF
Ultimate Pressure Zone Boundary Realignment

BluePlan

February, 2019
717029-W-014
NAD 1983 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

MDD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

300mm

Ex. 600mm

600mm

Ex. 100mm

Halton Hills

Milton

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-9
Model Results - 2021 MDD
Ultimate Pressure Zone Boundary Realignment

BluePlan

February, 2019
717029-W-015
NAD 1983 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

PHD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

300mm

600mm

Ex. 600mm

Ex. 100mm

Halton Hills

Milton

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-10
Model Results - 2021 PHD
Ultimate Pressure Zone Boundary Realignment

BluePlan

February, 2019
717029-W-016
NAD 1983 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

Available Fire Flow (L/s)

- < 75 L/s
- 75 - 150 L/s
- 150 - 300 L/s
- ≥ 300 L/s
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed WM Easement

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Steeles Avenue

Halton Hills

Milton

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

300mm

600mm

Ex. 600mm

Ex. 100mm

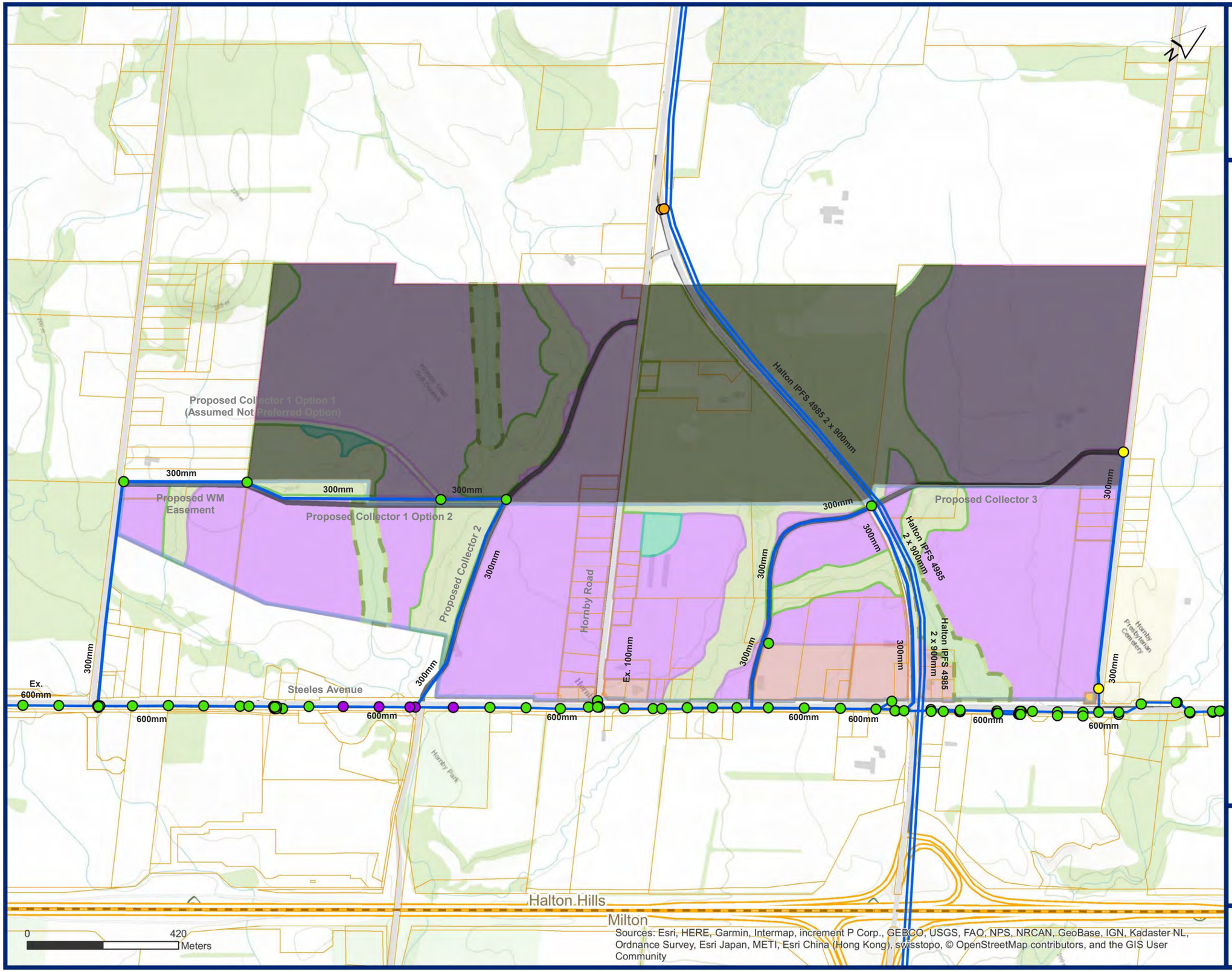
0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-11
Model Results - 2021 MDD+FF
Ultimate Pressure Zone Boundary Realignment

BluePlan

February, 2019
717029-W-017
NAD 1983 UTM Zone 17N



Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

MDD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

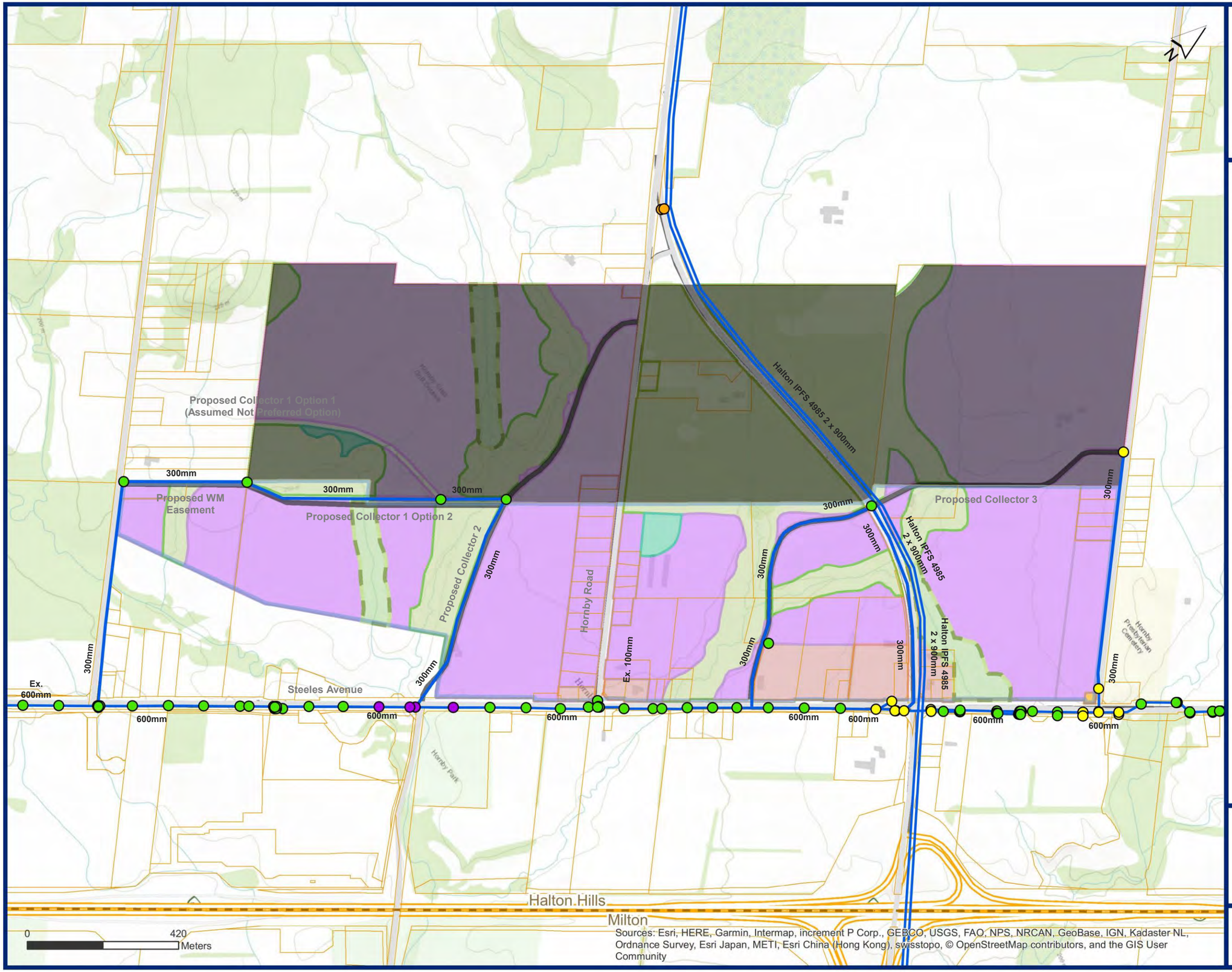
Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Current Pressure Zone Boundary Alignment

Drawing C-12
Model Results - 2021 MDD
Initial Phasing of Preferred Water Servicing

February, 2019
717029-W-015
NAD 1983 UTM Zone 17N



Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

PHD Pressure (psi)

- < 40 psi
- 40 - 60 psi
- 60 - 80 psi
- 80 - 100 psi
- ≥ 100 psi
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Current Pressure Zone Boundary Alignment

Drawing C-13
Model Results - 2021 PHD
Initial Phasing of Preferred Water Servicing

BluePlan ENGINEERING

February, 2019
717029-W-016
NAD 1983 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Town of Halton Hills
Premier Gateway Secondary Plan

Water Infrastructure

Available Fire Flow (L/s)

- < 75 L/s
- 75 - 150 L/s
- 150 - 300 L/s
- ≥ 300 L/s
- Existing Watermain / Planned Watermain Projects

General Features

- Proposed Roads
- Highways
- Regional and Major Roads
- Municipal Boundary
- Property Parcel

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Current Pressure Zone Boundary Alignment

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed WM Easement

Proposed Collector 2

Proposed Collector 3

Halton IPFS 4985 2 x 900mm

Halton IPFS 4985 2 x 900mm

Hornby Road

Steeles Avenue

Ex. 100mm

Ex. 600mm

300mm

600mm

Halton Hills

Milton

0 420 Meters

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing C-14
Model Results - 2021 MDD+FF
Initial Phasing of Preferred Water Servicing

BluePlan Engineering

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NAD 1983 UTM Zone 17N

Appendix D - Drainage Area Plans and Wastewater Modelling Results

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Area PPIA-06
0.20 Ha

Area PPIA-05
2.85 Ha

Area PPIA-03
4.47 Ha

Area PPIA-02
2.97 Ha

Area PPIA-01
27.66 Ha

Area PPIA-04
1.12 Ha

Area PIA-01
0.60 Ha

Area PPIA-09
0.60 Ha

Area PPIA-10
35.10 Ha

Area PPIA-07
7.01 Ha

Area PPIA-08
0.58 Ha

Area E-01
1.08 Ha

Area PIA-04
10.09 Ha

Area PIA-03
3.82 Ha

Area PIA-02
1.67 Ha

Area PIA-05
2.38 Ha

Area PIA-07
15.07 Ha

Area PIA-06
4.07 Ha

Area PIA-08
5.10 Ha

Area BCA-01
1.15 Ha

Area PIA-11
1.39 Ha

Area PIA-10
11.2 Ha

Area PIA-09
1.21 Ha

Area PIA-12
4.75 Ha

Area PIA-13
4.07 Ha

Area BCA-02
3.41 Ha

Area PIA-16
1.62 Ha

Area PIA-15
15.79 Ha

Area PIA-17
4.78 Ha

Area PIA-14
1.44 Ha

Area BCA-03
2.44 Ha

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 3

Hornby Road

Sixth Line

Halton IPFS 7550 – 900mm

Halton IPFS 7552 – 1050mm

Halton IPFS 7553 – 1050mm

Sources: Esri, HERE, Garmin, Intermap, increment P Corp, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station
- Gravity Main
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Area PPIA-01
27.66 Ha — Proposed Wastewater Catchment Area

Catchment Area Direction of Flow Outlet

Drawing D-1

Drainage Area Plan

Prior to Commissioning of Eighth Line Trunk Sewer

BluePlan

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717029-WW-004
WGS 1984 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station
- Gravity Main
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing D-2

Manhole and Pipe IDs with Existing Contours

Prior to Commissioning of Eighth Line Trunk Sewer

BluePlan

May, 2019
717029-WW-004
WGS 1984 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station

Wastewater Sewer Q/q

- <0.85
- 0.85 - 1.00
- >1.00
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Glen Golf Course

Sixth Line

Hornby Road

Hornby Presbyterian Cemetery

300mm

375mm

675mm

600mm

525mm

200mm

250mm

350mm FM

HH #2 WWPS

HH #3 WWPS

Under this scenario, design flows shown in Sanitary Design Sheet – After Commissioning of Eighth Line Sewer were added to 2031 model flows. Q/q results along Steeles were found to be less than 0.85 under this (more conservative) scenario and further refinement of model loads was not required.

It was assumed that the model had approximately 20 L/s Design Flow loaded to this sewer from portion of SGU 555.03 located west of Eighth Line (as shown in Sanitary Design Sheet Reference: SGUs / WW Flow Distribution from 2017 Background Study / Model).

Drawing D-3

Model Results (2031 Scenario)

Prior to Commissioning of Eighth Line Trunk Sewer

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717029-WW-004
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Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Area PPIA-06
0.20 Ha

Area PPIA-05
2.85 Ha

Area PPIA-03
4.47 Ha

Area PPIA-02
2.97 Ha

Area PPIA-01
27.66 Ha

Area PPIA-04
1.12 Ha

Area PIA-01
0.60 Ha

Area PPIA-07
7.01 Ha

Area PPIA-08
0.58 Ha

Area E-01
1.08 Ha

Area PPIA-09
0.60 Ha

Area PPIA-10
35.10 Ha

Area PIA-16
1.62 Ha

Area PIA-15
15.79 Ha

Area PIA-17
4.78 Ha

Area PIA-04
10.09 Ha

Area PIA-03
3.82 Ha

Area PIA-02
1.67 Ha

Area PIA-05
2.38 Ha

Area PIA-07
15.07 Ha

Area PIA-06
4.07 Ha

Area PIA-08
5.10 Ha

Area BCA-01
1.15 Ha

Area PIA-11
1.39 Ha

Area PIA-10
11.2 Ha

Area PIA-09
1.21 Ha

Area PIA-12
4.75 Ha

Area PIA-13
4.07 Ha

Area BCA-02
3.41 Ha

Area PIA-14
1.44 Ha

Area BCA-03
2.44 Ha

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 3

Flows from Area PPIA-10 assumed to be Even Split between P-PC3-04 and P-PC3-06

Hornby Road

Sixth Line

MH-PC2-01
MH-PC2-02
MH-PC2-03
MH-PC2-04
MH-PC2-05
MH-PC2-06
MH-PC2-07
MH-PC2-08
MH-PC2-09
MH-H-01
MH-H-02
MH-H-03
MH-H-04
MH-PC3-01
MH-PC3-02
MH-PC3-03
MH-PC3-04
MH-PC3-05
MH-PC3-06
MH-PC3-07
MH-PC3-08
MH-PC3-09
MH-PC3-10
MH-PC3-11
MH-PC3-12
MH-PC3-13
MH-PC3-14
MH-T-01
MH-T-02
MH-T-03
MH-S-01
MH-EL-01
MH-EL-02
MH-EL-03
MH-EL-04
MH-SL-01
MH-SL-02
MH-SL-03
MH-SL-04
MH-SL-05
MH2031_13
MH2031_7

GM2031_39
GM2031_40
GM2031_27
SMN219064
Halton IPFS 7550 – 900mm
Halton IPFS 7552 – 1050mm
Halton IPFS 7553 – 1050mm

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station

Wastewater Sewer Q/q

- < 0.8500
- 0.85 - 1.00
- > 1.00
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Industrial (PIA)
- Prestige Industrial (PPIA)

Area PPIA-01
27.66 Ha
Proposed Wastewater Catchment Area

Catchment Area Direction of Flow Outlet

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Drawing D-4
Drainage Area Plan
After Commissioning of Eighth Line Trunk Sewer

BluePlan

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WGS 1984 UTM Zone 17N

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station

Wastewater Sewer Q/q

- < 0.8500
- 0.85 - 1.00
- > 1.00
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing D-5

Manhole and Pipe IDs with Existing Contours

After Commissioning of Eighth Line Trunk Sewer

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717029-WW-004
WGS 1984 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 3

Hornby Glen Golf Course

Sixth Line

Hornby Road

Hornby Presbyterian Cemetery

HH #2 WWPS

HH #2 WWPS (Decommissioned)

Halton IPFS 7550 – 900mm

Halton IPFS 7552 – 1050mm

300mm

375mm

675mm

600mm

525mm

200mm

250mm

Halton Hills

Milton

For this scenario, model flows from portion of SGU 555.03 located west of Eighth Line were replaced with flows shown in Sanitary Design Sheet – After Commissioning of Eighth Line Sewer.

It was assumed that the model had approximately 20 L/s Design Flow loaded to this sewer from portion of SGU 555.03 located west of Eighth Line (as shown in Sanitary Design Sheet Reference: SGUs / WW Flow Distribution from 2017 Background Study / Model).

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station

Wastewater Sewer Q/q

- <0.85
- 0.85 - 1.00
- >1.00
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing D-6

Model Results (2031 Scenario)

After Commissioning of Eighth Line Trunk Sewer

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WGS 1984 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Area PPIA-06
0.20 Ha

Area PPIA-05
2.85 Ha

Area PPIA-03
4.47 Ha

Area PPIA-02
2.97 Ha

Area PPIA-01
27.66 Ha

Area PPIA-04
1.12 Ha

Area PIA-01
0.60 Ha

Area PPIA-09
0.60 Ha

Area PPIA-10
35.10 Ha

Area PPIA-07
7.01 Ha

Area PPIA-08
0.58 Ha

Area E-01
1.08 Ha

Area PIA-16
1.62 Ha

Area PIA-15
15.79 Ha

Area PIA-17
4.78 Ha

Area PIA-04
10.09 Ha

Area PIA-03
3.82 Ha

Area PIA-02
1.67 Ha

Area PIA-05
2.38 Ha

Area PIA-07
15.07 Ha

Area PIA-06
4.07 Ha

Area PIA-08
5.10 Ha

Area BCA-01
1.15 Ha

Area PIA-11
1.39 Ha

Area PIA-10
11.2 Ha

Area PIA-09
1.21 Ha

Area PIA-12
4.75 Ha

Area PIA-13
4.07 Ha

Area BCA-02
3.41 Ha

Area PIA-14
1.44 Ha

Area BCA-03
2.44 Ha

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 3

Hornby Road

Sixth Line

If development phasing from Lot 1 Lands near Sixth Line North proceeds from east to west, flows are recommended to be conveyed east through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and south along Proposed Collector 2 to the existing 675mm sanitary sewers running west along Steeles Ave. outletting to HH #2 WWPS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong K

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station
- Gravity Main
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Area PPIA-01
27.66 Ha — Proposed Wastewater Catchment Area

Catchment Area Direction of Flow Outlet

Drawing D-7

Drainage Area Plan

West Development Lands Routed to Proposed Collector 2 (Provisional)

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Proposed Sanitary Sewer Alignment assumed to follow Proposed Collector 1 Option 2 (allows for sewer construction as part of Lot 1 Development

If development phasing from Lot 1 Lands near Sixth Line North proceeds from east to west, flows are recommended to be conveyed east through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and south along Proposed Collector 2 to the existing 675mm sanitary sewers running west along Steeles Ave. outletting to HH #2 WWPS

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Hornby Road

Sixth Line

Hornby Glen Golf Course

Hornby Park

Hornby Presbyterian Cemetery

300mm

375mm

675mm

600mm

525mm

200mm

250mm

350mm FM

HH #2 WWPS

HH #3 WWPS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station

Wastewater Sewer Q/q

- <0.85
- 0.85 - 1.00
- >1.00
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing D-8

Model Results (2031 Scenario)

West Development Lands Routed to Proposed Collector 2 (Provisional)

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WGS 1984 UTM Zone 17N

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Area PPIA-06
0.20 Ha

Area PPIA-05
2.85 Ha

Area PPIA-03
4.47 Ha

Area PPIA-02
2.97 Ha

Area PPIA-01
27.66 Ha

Area PPIA-04
1.12 Ha

Area PIA-01
0.60 Ha

Area PPIA-09
0.60 Ha

Area PPIA-10
35.10 Ha

Area PPIA-07
7.01 Ha

Area PPIA-08
0.58 Ha

Area E-01
1.08 Ha

Area PIA-16
1.62 Ha

Area PIA-15
15.79 Ha

Area PIA-17
4.78 Ha

Area PIA-04
10.09 Ha

Area PIA-03
3.82 Ha

Area PIA-02
1.67 Ha

Area PIA-05
2.38 Ha

Area PIA-07
15.07 Ha

Area PIA-06
4.07 Ha

Area PIA-08
5.10 Ha

Area BCA-01
1.15 Ha

Area PIA-11
1.39 Ha

Area PIA-10
11.2 Ha

Area PIA-09
1.21 Ha

Area PIA-12
4.75 Ha

Area PIA-13
4.07 Ha

Area BCA-02
3.41 Ha

Area PIA-14
1.44 Ha

Area BCA-03
2.44 Ha

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 3

Hornby Road

Sixth Line

If development phasing from Lot 1 Lands near Sixth Line North proceeds from west to east, flows are recommended to be conveyed west through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and south along Sixth Line North to the existing 375mm sanitary sewer running east along Steeles Ave. outletting to HH #2 WWPS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong K

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station
- Gravity Main
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Area PPIA-01
27.66 Ha
Proposed Wastewater Catchment Area

Catchment Area Direction of Flow Outlet

Drawing D-9
Drainage Area Plan
West Development Lands Routed to Sixth Line (Provisional)

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WGS 1984 UTM Zone 17N

If development phasing from Lot 1 Lands near Sixth Line North proceeds from west to east, flows are recommended to be conveyed west through proposed 300mm sanitary sewers along Proposed Collector 1 Option 2 and south along Sixth Line North to the existing 375mm sanitary sewer running east along Steeles Ave. outletting to HH #2 WWPS

Proposed Collector 1 Option 1
(Assumed Not Preferred Option)

Proposed Collector 1 Option 2

Proposed Collector 2

Proposed Collector 3

Sixth Line

Hornby Road

Hornby Park

Hornby Glen Golf Course

Hornby Presbyterian Cemetery

300mm

375mm

675mm

600mm

525mm

200mm

250mm

350mm FM

SPS 004

HH #2 WWPS

MO4004

HH #3 WWPS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Halton REGION

Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 1B in the Town of Halton Hills

Wastewater Infrastructure

- Manhole (with Model ID)
- Wastewater Pumping Station

Wastewater Sewer Q/q

- <0.85
- 0.85 - 1.00
- >1.00
- Forcemain

General Features

- Study Area
- Municipal Boundary
- Proposed Roads
- Highways
- Regional and Major Roads

Land Use

- Business Commercial (BCA)
- Cemetery
- Enhancement Area (E)
- Greenlands
- Greenlands - Potential Relocation
- Prestige Industrial (PIA)
- Proposed Prestige Industrial (PPIA)

Drawing D-10

Model Results (2031 Scenario)

West Development Lands Routed to Sixth Line (Provisional)

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WGS 1984 UTM Zone 17N

Appendix E - Sanitary Design Sheets and Pipe Profiles

Halton Hills Premier Gateway Employment Phase 1B
Sanitary Sewer Design Sheet - Prior to Commissioning of Eighth Line Trunk Sewer
Reference: Drawing D-1: Drainage Area Plan - Prior to Commissioning of Eighth Line Sewer

Design Criteria (Collection System)	Value
Dry Weather Flow - Residential	215
Dry Weather Flow - Industrial	240
Dry Weather Flow - Employment (Blended ICI)	185
Infiltration / Inflow Allowance	0.286

Area	SGUs	Total Jobs	Area	Density				Units	Units
PIA, BCA and E	3.01, 555.03	2693	97.1	27.73				L/cap/d	L/cap/d
PPIA	555.02-1B	1980.3	82.6	23.99				L/cap/d	L/cap/d
		4673.3						L/cap/d	L/cap/d
								L/s/ha	L/s/ha

Design Flow

$$Q_{design} = DWF * M + (I * A)$$

I = Infiltration & Inflow Component
A = Gross Contributing Area (ha)
M = Harmon Peaking Factor

Harmon Peaking Factor (M):

$$M = 1 + \frac{14}{4 + P^{0.5}}$$

where p = population/1000
Minimum: 2.0

Design Standards

Minimum Sewer Diameter	RES: 200mm ; ICI: 300mm
Manning's "n"	0.013
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Grade	Refer to RH 2000

LOCATION					ELEVATION				Sewer Cover From	Sewer Cover To	Potential Loading Manhole	Block ID	Land Use	% of Block (persons & jobs)	% of Block (Area)	TOTAL (Block)			Prestige Industrial Area				Proposed Prestige Industrial Area				CUMULATIVE			Total Equivalent Population	Harmon Peak Factor	DWF (L/s)	Peak DWF (L/s)	Infiltration + Inflow (L/s)	Total Design Flow (L/s)	PIPE DATA			Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	% Full q/Q
Pipe Segment (Street)	Project Id	Pipe Id	Sanitary Manhole From	Sanitary Manhole To	Sanitary Sewer Invert From	Sanitary Sewer Invert To	Ground Elevation From	Ground Elevation To								Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Pop (persons)	Emp (jobs)	Area (ha)							Length (m)	Diameter (mm)	Slope (%)			
Proposed Collector 1 Option 2		P-PC1O2-01D	MH-PC1O2-01C	MH-SL-01	194.35	194.08	199.50	200.16	4.8	5.8									PIA-01 PIA-02		62.94	2.27					0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	133.8	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-01	MH-SL-01	MH-SL-02	194.02	193.74	200.16	198.87	5.8	4.8																0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	140.3	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-02	MH-SL-02	MH-SL-03	193.71	193.43	198.87	198.17	4.9	4.4																0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	141.8	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-03	MH-SL-03	MH-SL-04	193.40	193.09	198.17	199.51	4.5	6.1																0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	153.1	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-04	MH-SL-04	MH-SL-05	193.06	192.76	199.51	200.00	6.1	6.9																0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	149.2	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-05	MH-SL-05	SMH36412	192.73	192.68	200.00	198.30	7.0	5.3																0	**62.9**	2.3	70	4.28	0.17	0.75	0.65	**1.40**	28.7	300	0.2	45.00	0.62	0.03
Proposed Collector 1 Option 2		P-PC1O2-01B	MH-PC1O2-01B	MH-PC1O2-01A	195.94	195.71	200.03	199.89	3.8	3.9									PIA-03		105.91	3.82					0	105.9	3.8	118	4.22	0.29	1.24	1.09	2.33	115.5	300	0.2	45.00	0.62	0.05
Proposed Collector 1 Option 2		P-PC1O2-01A	MH-PC1O2-01A	MH-PC1O2-01	195.68	195.47	199.89	199.26	3.9	3.5																0	105.9	3.8	118	4.22	0.29	1.24	1.09	2.33	105.0	300	0.2	45.00	0.62	0.05
Proposed Collector 1 Option 2		P-PC1O2-01	MH-PC1O2-01	MH-PC1O2-02	195.44	194.89	199.26	198.25	3.5	3.1									PIA-04		279.75	10.09					0	385.7	13.9	431	4.01	1.07	4.29	3.98	8.27	135.8	300	0.4	64.00	0.87	0.13
Proposed Collector 1 Option 2		P-PC1O2-02	MH-PC1O2-02	MH-PC1O2-03	194.86	194.57	198.25	198.24	3.1	3.4									PIA-05		65.99	2.38					0	451.7	16.3	504	3.97	1.25	4.98	4.66	9.64	149.5	300	0.2	45.00	0.62	0.21
Proposed Collector 1 Option 2		P-PC1O2-03	MH-PC1O2-03	MH-PC1O2-04	194.54	194.23	198.24	199.98	3.4	5.4									PIA-06		112.84	4.07		PPIA-01 PPIA-04	690.32	28.78	0	1,254.8	49.1	1,401	3.70	3.49	12.90	14.05	26.95	154.0	300	0.2	45.00	0.62	0.60
Proposed Collector 1 Option 2		P-PC1O2-04	MH-PC1O2-04	MH-PC1O2-05	194.20	194.12	199.98	199.19	5.5	4.8														PPIA-02 PPIA-03	178.46	7.44	0	1,433.3	56.6	1,600	3.66	3.98	14.57	16.18	30.75	39.9	300	0.2	45.00	0.62	0.68
Proposed Collector 1 Option 2		P-PC1O2-05	MH-PC1O2-05	MH-PC2-05	192.50	192.22	199.19	198.06	6.4	5.5																0	1,433.3	56.6	1,600	3.66	3.98	14.57	16.18	30.75	138.4	300	0.2	45.00	0.62	0.68
Proposed Collector 2		P-PC2-01	MH-PC2-01	MH-PC2-02	198.91	197.63	202.23	200.99	3.0	3.1														PPIA-05 PPIA-06 PPIA-07	241.30	10.06	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	116.7	300	1.1	106.00	1.45	0.05
Proposed Collector 2		P-PC2-02	MH-PC2-02	MH-PC2-03	197.60	196.76	200.99	200.11	3.1	3.0																	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	139.8	300	0.6	78.00	1.07	0.07
Proposed Collector 2		P-PC2-03	MH-PC2-03	MH-PC2-04	196.73	196.35	200.11	200.70	3.1	4.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	125.9	300	0.3	55.00	0.76	0.10
Proposed Collector 2		P-PC2-04	MH-PC2-04	MH-PC2-05	196.32	194.75	200.70	198.06	4.1	3.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	130.6	300	1.2	111.00	1.52	0.05
Proposed Collector 2		P-PC2-05	MH-PC2-05	MH-PC2-06	192.22	191.82	198.06	198.35	5.5	6.2									PIA-07		417.83	15.07					0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	100.8	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-06	MH-PC2-06	MH-PC2-07	191.79	191.45	198.35	197.64	6.3	5.9																0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	84.4	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-07	MH-PC2-07	MH-PC2-08	191.42	190.83	197.64	201.96	5.9	10.8																0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	149.2	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-08	MH-PC2-08	MH-PC2-09	190.80	190.21	201.96	197.16	10.9	6.6																0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	146.6	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-09	MH-PC2-09	**SMH36404**	190.18	**189.69**	197.16	196.09	6.7	6.1																0	**2,092.4**	81.7	2,336	3.53	5.81	20.53	23.37	**43.90**	123.4	300	0.4	61.00	0.86	0.72
Hornby Road		P-H-01	MH-H-01	MH-H-02	198.41	197.82	201.71	201.00	3.0	2.9									PIA-08 PIA-09 PIA-10 E-01		515.42	18.59		PPIA-08	13.91	0.58	0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	145.8	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-02	MH-H-02	MH-H-03	197.79	197.19	201.00	200.65	2.9	3.1																0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	150.2	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-03	MH-H-03	MH-H-04	197.16	196.57	200.65	200.01	3.2	3.1																0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	148.3	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-04	MH-H-04	**SMH36400**	196.54	**195.94**	200.01	199.46	3.2	3.2									BCA-01		31.88	1.15					0	**561.2**	20.3	626	3.92	1.56	6.11	5.81	**11.93**	149.4	300	0.4	64.00	0.87	0.19
Proposed Collector 3		P-PC3-01	MH-PC3-01	MH-PC3-02	207.28	207.19	210.59	210.64	3.0	3.1														PPIA-10	841.92	35.10	0.0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	27.9	300	0.3	55.00	0.76	0.34
Proposed Collector 3		P-PC3-02	MH-PC3-02	MH-PC3-03	207.16	206.36	210.64	209.85	3.2	3.2																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	100.6	300	0.8	90.00	1.24	0.21
Proposed Collector 3		P-PC3-03	MH-PC3-03	MH-PC3-04	206.33	206.05	209.85	209.33	3.2	3.0																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	34.7	300	0.8	90.00	1.24	0.21
Proposed Collector 3		P-PC3-04	MH-PC3-04	MH-PC3-05	206.02	204.01	209.33	207.45	3.0	3.1																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	111.9	300	1.8	136.00	1.86	0.14
Proposed Collector 3		P-PC3-05	MH-PC3-05	MH-PC3-06	203.98	202.22	207.45	205.64	3.2	3.1																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	109.9	300	1.6	128.00	1.75	0.15
Proposed Collector 3		P-PC3-06	MH-PC3-06	MH-PC3-07	202.19	201.78	205.64	206.13	3.1	4.0																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	137.1	300	0.3	55.00	0.76	0.34
Proposed Collector 3		P-PC3-07	MH-PC3-07	MH-PC3-08	201.75	201.36	206.13	206.24	4.1	4.6														PPIA-09	14.39	0.60	0	856.3	35.7	956	3.81	2.38	9.07	10.21	19.28	129.5	300	0.3	55.00	0.76	0.35
Trafalgar Road		P-T-01	MH-T-01	MH-PC3-08	202.18	201.48	205.50	206.24	3.0	4.4									PIA-12		131.70	4.75					0	131.7	4.8	147	4.19	0.37	1.53	1.36	2.89	116.9	300	0.6	78.00	1.07	0.04
Proposed Collector 3		P-PC3-08	MH-PC3-08	MH-PC3-09	201.33	200.55	206.24	203.90	4.6	3.0																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	96.6	300	0.8	90.00	1.24	0.24
Proposed Collector 3		P-PC3-09	MH-PC3-09	MH-PC3-10	200.52	198.37	203.90	201.76	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	134.5	300	1.6	128.00	1.75	0.17
Proposed Collector 3		P-PC3-10	MH-PC3-10	MH-PC3-11	198.34	197.24	201.76	200.62	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	69.2	300	1.6	128.00	1.75	0.17
Proposed Collector 3		P-PC3-11	MH-PC3-11	MH-PC3-12	197.21	196.75	200.62	200.13	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	114.4	300	0.4	64.00	0.87	0.34
Proposed Collector 3		P-PC3-12	MH-PC3-12	MH-PC3-13	196.72	196.39	200.13	200.21	3.1	3.5																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	107.8	300	0.3	55.00	0.76	0.40
Proposed Collector 3		P-PC3-13	MH-PC3-13	MH-PC3-14	196.36	195.93	200.21	200.52	3.5	4.3									PIA-11 PIA-13 BCA-02		245.93	8.87					0	1,233.9	49.3	1,377	3.71	3.43	12.70	14.11	26.81	144.9	300	0.3	55.00	0.76	0.49
Proposed Collector 3		P-PC3-14	MH-PC3-14	**MH-S-01**	195.90	195.68	200.52	200.10	4.3	4.1																0	**1,233.9**	49.3	1,377	3.71	3.43	12.70	14.11	**26.81**	74.5	300	0.3	55.00	0.76	0.49
Trafalgar Road		P-T-02	MH-T-02	MH-T-03	204.30	204.02	207.08	207.55	2.5	3.2									BCA-03		67.65	2.44					0	67.7	2.4	76	4.28	0.19	0.80	0.70	1.50	139.5	300	0.2	45.00	0.62	0.03
Steeles Avenue		P-S-01	MH-T-03	SMH36392	203.99	203.90	207.55	207.95	3.2	3.7																0	**67.7**	2.4	76	4.28	0.19	0.80	0.70	**1.50**	42.1	300	0.2	45.00	0.62	0.03
Steeles Avenue		SMN98108	SMH99861	SMH99862	204.48	203.71	207.40	206.40	2.7	2.5																0	0.0	0.0	0	4.50	0.00	0.00	0.00	0.00	109.9	200	0.7	29.00	0.88	0.00
Steeles Avenue		SMN98109	SMH99862	SMH99863	203.65	203.16	206.40	207.50	2.5	4.1									PIA-14		39.93	1.44					0	39.9	1.4	45	4.32	0.11	0.48	0.41	0.89	125.3	250	0.4	39.00	0.77	0.02
Steeles Avenue		SMN98110	SMH99863	SMH99864	203.14	202.70	207.50	208.70	4.1	5.7									PIA-15		437.79	15.79					0	477.7	17.2	533	3.96	1.33	5.25	4.93	10.18	120.5	250	0.4	39.00	0.77	0.26
Steeles Avenue		SMN98111	SMH99864	SMH99865	202.67	202.06	208.70	208.40	5.8	6.1																0	477.7	17.2	533	3.96	1.33	5.25	4.93	**10.18**	146.2	250	0.4	39.00	0.77	0.26
Eighth Line		P-EL-01	MH-EL-01	MH-EL-02	207.70	206.99	211.00	211.50	3.0	4.2									PIA-16 PIA-17		177.44	6.40					0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	142.5	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-02	MH-EL-02	MH-EL-03	206.96	206.21	211.50	211.25	4.2	4.7																0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	149.6	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-03	MH-EL-03	MH-EL-04	206.18	205.43	211.25	209.00	4.8	3.3																0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	149.7	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-04	MH-EL-04	**SMH99865**	205.40	**205.28**	209.00	208.73	3.3	3.1																0	**177.4**	6.4	198	4.15	0.49	2.05	1.83	**3.88**	23.8	300	0.5	71.00	0.98	0.05
																				2693	97.1			1980.3	82.56														

Input by the User
Data from the InfoSewer Model
Assumed Data
Input by the User - Modified original model data

Manhole Branch Downstream Manhole
Manhole Upstream Manhole with Input Data from the model

Halton Hills Premier Gateway Employment Phase 1B
Sanitary Sewer Design Sheet - After Commissioning of Eighth Line Trunk Sewer
Reference: Drawing D-4 - Drainage Area Plan – After Commissioning of Eighth Line Sewer

Design Criteria (Collection System)	Value
Dry Weather Flow - Residential	215
Dry Weather Flow - Industrial	240
Dry Weather Flow - Employment (Blended ICI)	185
Infiltration / Inflow Allowance	0.286

Area	SGUs	Total Jobs	Area	Density				Units	Units
PIA, BCA and E	101, 555.03	2693	97.1	27.73				L/cap/d	L/cap/d
PPIA	555.02-1B	1980.3	82.6	23.99				L/cap/d	L/cap/d
		4673.3						L/cap/d	L/cap/d
								L/s/ha	L/s/ha

Design Flow

$$Q_{design} = DWF * M + (I * A)$$

I = Infiltration & Inflow Component
A = Gross Contributing Area (ha)
M = Harmon Peaking Factor

Harmon Peaking Factor (M):

$$M = 1 + \frac{14}{4 + P^{0.5}}$$

where p = population/1000
Minimum: 2.0

Design Standards

Minimum Sewer Diameter	RES: 200mm ; ICI: 300mm
Manning's "n"	0.013
Minimun Velocity	0.6 m/s
Maxmun Velocity	3.0 m/s
Minimun Pipe Grade	Refer to RH 2000

LOCATION					ELEVATION										TOTAL (Block)			Prestige Industrial Area				Proposed Prestige Industrial Area				CUMULATIVE							PIPE DATA					
Pipe Segment (Street)	Project Id	Pipe Id	Sanitary Manhole		Sanitary Sewer Invert		Ground Elevation		Sewer Cover From	Sewer Cover To	Potential Loading Manhole	Block ID	Land Use	% of Block (persons & jobs)	% of Block (Area)	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Pop (persons)	Emp (jobs)	Area (ha)	Total Equivalent Population	Harmon Peak Factor	DWF (L/s)	Peak DWF (L/s)	Infiltration + Inflow (L/s)	Total Design Flow (L/s)	Length (m)	Diameter (mm)	Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	% Full q/Q
			From	To	From	To	From	To																															
Proposed Collector 1 Option 2		P-PC1O2-01D	MH-PC1O2-01C	MH-SL-01	194.35	194.08	199.50	200.16	4.8	5.8									PIA-01 PIA-02		62.94	2.27					0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	133.8	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-01	MH-SL-01	MH-SL-02	194.02	193.74	200.16	198.87	5.8	4.8																	0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	140.3	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-02	MH-SL-02	MH-SL-03	193.71	193.43	198.87	198.17	4.9	4.4																	0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	141.8	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-03	MH-SL-03	MH-SL-04	193.40	193.09	198.17	199.51	4.5	6.1																	0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	153.1	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-04	MH-SL-04	MH-SL-05	193.06	192.76	199.51	200.00	6.1	6.9																	0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	149.2	300	0.2	45.00	0.62	0.03
Sixth Line		P-SL-05	MH-SL-05	SMH36412	192.73	192.68	200.00	198.30	7.0	5.3																	0	**62.9**	2.3	70	4.28	0.17	0.75	0.65	**1.40**	28.7	300	0.2	45.00	0.62	0.03
Proposed Collector 1 Option 2		P-PC1O2-01B	MH-PC1O2-01B	MH-PC1O2-01A	195.94	195.71	200.03	199.89	3.8	3.9									PIA-03		105.91	3.82					0	105.9	3.8	118	4.22	0.29	1.24	1.09	2.33	115.5	300	0.2	45.00	0.62	0.05
Proposed Collector 1 Option 2		P-PC1O2-01A	MH-PC1O2-01A	MH-PC1O2-01	195.68	195.47	199.89	199.26	3.9	3.5																	0	105.9	3.8	118	4.22	0.29	1.24	1.09	2.33	105.0	300	0.2	45.00	0.62	0.05
Proposed Collector 1 Option 2		P-PC1O2-01	MH-PC1O2-01	MH-PC1O2-02	195.44	194.89	199.26	198.25	3.5	3.1									PIA-04		279.75	10.09					0	385.7	13.9	431	4.01	1.07	4.29	3.98	8.27	135.8	300	0.4	64.00	0.87	0.13
Proposed Collector 1 Option 2		P-PC1O2-02	MH-PC1O2-02	MH-PC1O2-03	194.86	194.57	198.25	198.24	3.1	3.4									PIA-05		65.99	2.38					0	451.7	16.3	504	3.97	1.25	4.98	4.66	9.64	149.5	300	0.2	45.00	0.62	0.21
Proposed Collector 1 Option 2		P-PC1O2-03	MH-PC1O2-03	MH-PC1O2-04	194.54	194.23	198.24	199.98	3.4	5.4									PIA-06		112.84	4.07				PPIA-01 PPIA-04	690.32	28.78	0	1,254.8	49.1	1,401	3.70	3.49	12.90	14.05	26.95	154.0	300	0.2	45.00	0.62	0.60
Proposed Collector 1 Option 2		P-PC1O2-04	MH-PC1O2-04	MH-PC1O2-05	194.20	194.12	199.98	199.19	5.5	4.8														PPIA-02 PPIA-03	178.46	7.44	0	1,433.3	56.6	1,600	3.66	3.98	14.57	16.18	30.75	39.9	300	0.2	45.00	0.62	0.68
Proposed Collector 1 Option 2		P-PC1O2-05	MH-PC1O2-05	MH-PC2-05	192.50	192.22	199.19	198.06	6.4	5.5																	0	1,433.3	56.6	1,600	3.66	3.98	14.57	16.18	30.75	138.4	300	0.2	45.00	0.62	0.68
Proposed Collector 2		P-PC2-01	MH-PC2-01	MH-PC2-02	198.91	197.63	202.23	200.99	3.0	3.1														PPIA-05 PPIA-06 PPIA-07	241.30	10.06	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	116.7	300	1.1	106.00	1.45	0.05
Proposed Collector 2		P-PC2-02	MH-PC2-02	MH-PC2-03	197.60	196.76	200.99	200.11	3.1	3.0																	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	139.8	300	0.6	78.00	1.07	0.07
Proposed Collector 2		P-PC2-03	MH-PC2-03	MH-PC2-04	196.73	196.35	200.11	200.70	3.1	4.0																	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	125.9	300	0.3	55.00	0.76	0.10
Proposed Collector 2		P-PC2-04	MH-PC2-04	MH-PC2-05	196.32	194.75	200.70	198.06	4.1	3.0																	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	130.5	300	1.2	111.00	1.52	0.05
Proposed Collector 2		P-PC2-05	MH-PC2-05	MH-PC2-06	192.22	191.82	198.06	198.35	5.5	6.2									PIA-07		417.83	15.07					0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	100.8	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-06	MH-PC2-06	MH-PC2-07	191.79	191.45	198.35	197.64	6.3	5.9																	0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	84.4	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-07	MH-PC2-07	MH-PC2-08	191.42	190.83	197.64	201.96	5.9	10.8																	0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	149.2	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-08	MH-PC2-08	MH-PC2-09	190.80	190.21	201.96	197.16	10.9	6.6																	0	2,092.4	81.7	2,336	3.53	5.81	20.53	23.37	43.90	146.6	300	0.4	64.00	0.87	0.69
Proposed Collector 2		P-PC2-09	MH-PC2-09	**SMH36404**	190.18	**189.69**	197.16	196.09	6.7	6.1																	0	**2,092.4**	81.7	2,336	3.53	5.81	20.53	23.37	**43.90**	123.4	300	0.4	61.00	0.86	0.72
Hornby Road		P-H-01	MH-H-01	MH-H-02	198.41	197.82	201.71	201.00	3.0	2.9									PIA-08 PIA-09 PIA-10 E-01		515.42	18.59	0.58	PPIA-08	13.91		0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	145.8	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-02	MH-H-02	MH-H-03	197.79	197.19	201.00	200.65	2.9	3.1																	0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	150.2	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-03	MH-H-03	MH-H-04	197.16	196.57	200.65	200.01	3.2	3.1																	0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	148.3	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-04	MH-H-04	**SMH36400**	196.54	**195.94**	200.01	199.46	3.2	3.2									BCA-01		31.88	1.15					0	**561.2**	20.3	626	3.92	1.56	6.11	5.81	**11.93**	149.4	300	0.4	64.00	0.87	0.19
Proposed Collector 3		P-PC3-04	MH-PC3-05	MH-PC3-04	204.13	203.91	207.45	209.33	3.0	5.1														PPIA-10A	420.96	17.55	0	421.0	17.6	470	3.99	1.17	4.66	5.02	9.68	111.9	300	0.2	45.00	0.62	0.22
Proposed Collector 3		P-PC3-03	MH-PC3-04	MH-PC3-03	203.88	203.81	209.33	209.85	5.1	5.7																	0	421.0	17.6	470	3.99	1.17	4.66	5.02	9.68	34.7	300	0.2	45.00	0.62	0.22
Proposed Collector 3		P-PC3-02	MH-PC3-03	MH-PC3-02	203.78	203.58	209.85	210.64	5.8	6.8																	0	421.0	17.6	470	3.99	1.17	4.66	5.02	9.68	100.6	300	0.2	45.00	0.62	0.22
Proposed Collector 3		P-PC3-01	MH-PC3-02	MH-PC3-01	203.55	203.49	210.64	210.59	6.8	6.8																	0	421.0	17.6	470	3.99	1.17	4.66	5.02	9.68	27.9	300	0.2	45.00	0.62	0.22
Proposed Collector 3		P-PC3-01A	MH-PC3-01	MH-ELT-01	203.46	203.26	210.59	209.75	6.8	6.2																	0	**421.0**	17.6	470	3.99	1.17	4.66	5.02	**9.68**	104.4	300	0.2	45.00	0.62	0.22
Proposed Collector 3		P-PC3-06	MH-PC3-06	MH-PC3-07	202.19	201.78	205.64	206.13	3.1	4.0														PPIA-10B	420.96	17.55	0	421.0	17.6	470	3.99	1.17	4.66	5.02	9.68	137.1	300	0.3	55.00	0.76	0.18
Proposed Collector 3		P-PC3-07	MH-PC3-07	MH-PC3-08	201.75	201.36	206.13	206.24	4.1	4.6														PPIA-09	14.39	0.60	0	435.3	18.2	486	3.98	1.21	4.81	5.19	10.00	129.5	300	0.3	55.00	0.76	0.18
Trafalgar Road		P-T-01	MH-T-01	MH-PC3-08	202.18	201.48	205.50	206.24	3.0	4.4									PIA-12		131.70	4.75					0	131.7	4.8	147	4.19	0.37	1.53	1.36	2.89	116.9	300	0.6	78.00	1.07	0.04
Proposed Collector 3		P-PC3-08	MH-PC3-08	MH-PC3-09	201.33	200.55	206.24	203.90	4.6	3.0																	0	567.0	22.9	633	3.92	1.58	6.17	6.55	12.72	96.6	300	0.8	90.00	1.24	0.14
Proposed Collector 3		P-PC3-09	MH-PC3-09	MH-PC3-10	200.52	198.37	203.90	201.76	3.1	3.1																	0	567.0	22.9	633	3.92	1.58	6.17	6.55	12.72	134.5	300	1.6	128.00	1.75	0.10
Proposed Collector 3		P-PC3-10	MH-PC3-10	MH-PC3-11	198.34	197.24	201.76	200.62	3.1	3.1																	0	567.0	22.9	633	3.92	1.58	6.17	6.55	12.72	69.2	300	1.6	128.00	1.75	0.10
Proposed Collector 3		P-PC3-11	MH-PC3-11	MH-PC3-12	197.21	196.75	200.62	200.13	3.1	3.1																	0	567.0	22.9	633	3.92	1.58	6.17	6.55	12.72	114.4	300	0.4	64.00	0.87	0.20
Proposed Collector 3		P-PC3-12	MH-PC3-12	MH-PC3-13	196.72	196.39	200.13	200.21	3.1	3.5																	0	567.0	22.9	633	3.92	1.58	6.17	6.55	12.72	107.8	300	0.3	55.00	0.76	0.23
Proposed Collector 3		P-PC3-13	MH-PC3-13	MH-PC3-14	196.36	195.93	200.21	200.52	3.5	4.3									PIA-11 PIA-13 BCA-02		245.93	8.87					0	813.0	31.8	908	3.83	2.26	8.64	9.09	17.73	144.9	300	0.3	55.00	0.76	0.32
Proposed Collector 3		P-PC3-14	MH-PC3-14	**MH-S-01**	195.90	195.68	200.52	200.10	4.3	4.1																	0	**813.0**	31.8	908	3.83	2.26	8.64	9.09	**17.73**	74.5	300	0.3	55.00	0.76	0.32
Trafalgar Road		P-T-02	MH-T-02	MH-T-03	204.30	204.02	207.08	207.55	2.5	3.2									BCA-03		67.65	2.44					0	67.7	2.4	76	4.28	0.19	0.80	0.70	1.50	139.5	300	0.2	45.00	0.62	0.03
Steeles Avenue		P-S-01	MH-T-03	SMH36392	203.99	203.90	207.55	207.95	3.2	3.7																	0	**67.7**	2.4	76	4.28	0.19	0.80	0.70	**1.50**	42.1	300	0.2	45.00	0.62	0.03
Steeles Avenue		SMN98108	SMH99861	SMH99862	204.48	203.71	207.40	206.40	2.7	2.5																	0	0.0	0.0	0	4.50	0.00	0.00	0.00	0.00	109.9	200	0.7	29.00	0.88	0.00
Steeles Avenue		SMN98109	SMH99862	SMH99863	203.65	203.16	206.40	207.50	2.5	4.1									PIA-14		39.93	1.44					0	39.9	1.4	45	4.32	0.11	0.48	0.41	0.89	125.3	250	0.4	39.00	0.77	0.02
Steeles Avenue		SMN98110	SMH99863	SMH99864	203.14	202.70	207.50	208.70	4.1	5.7									PIA-15		437.79	15.79					0	477.7	17.2	533	3.96	1.33	5.25	4.93	10.18	120.5	250	0.4	39.00	0.77	0.26
Steeles Avenue		SMN98111	SMH99864	SMH99865	202.67	202.06	208.70	208.40	5.8	6.1																	0	477.7	17.2	533	3.96	1.33	5.25	4.93	**10.18**	146.2	250	0.4	39.00	0.77	0.26
Eighth Line		P-EL-01	MH-EL-01	MH-EL-02	207.70	207.01	211.00	211.50	3.0	4.2									PIA-16 PIA-17		177.44	6.40					0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	138.0	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-02	MH-EL-02	MH-EL-03	206.98	206.24	211.50	211.25	4.2	4.7																	0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	148.5	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-03	MH-EL-03	MH-EL-04	206.21	205.45	211.25	209.00	4.7	3.2																	0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	152.5	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-04	MH-EL-04	**SMH99865**	205.42	**205.26**	209.00	208.73	3.3	3.2																	0	**177.4**	6.4	198	4.15	0.49	2.05	1.83	**3.88**	30.5	300	0.5	71.00	0.98	0.05
															1647.74004	97.1					870.219041	82.6																

Input by the User
Data from the InfoSewer Model
Assumed Data
Input by the User - Modified original model data

Manhole — Branch Downstream Manhole
Manhole — Upstream Manhole with Input Data from the model

Halton Hills Premier Gateway Employment Phase 1B
Sanitary Sewer Design Sheet - West Development Lands Routed to Proposed Collector 2
Reference: Drawing D-8: Drainage Area Plan - West Development Lands Routed to Proposed Collector 2

Design Criteria (Collection System)	Value
Dry Weather Flow - Residential	215
Dry Weather Flow - Industrial	240
Dry Weather Flow - Employment (Blended ICI)	185
Infiltration / Inflow Allowance	0.286

Area	SGUs	Total Jobs	Area	Density				Units	Units
PIA, BCA and E	3.01, 555.03	2693	97.1	27.73				L/cap/d	L/cap/d
PPIA	555.02-1B	1980.3	82.6	23.99				L/cap/d	L/cap/d
		4673.3						L/cap/d	L/cap/d
								L/s/ha	L/s/ha

Design Flow

$$Q_{design} = DWF * M + (I * A)$$

I = Infiltration & Inflow Component
A = Gross Contributing Area (ha)
M = Harmon Peaking Factor

Harmon Peaking Factor (M):

$$M = 1 + \frac{14}{4 + P^{0.5}}$$

where p = population/1000
Minimum: 2.0

Design Standards

Minimum Sewer Diameter	RES: 200mm ; ICI: 300mm
Manning's "n"	0.013
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Grade	Refer to RH 2000

LOCATION					ELEVATION									TOTAL (Block)			Prestige Industrial Area				Proposed Prestige Industrial Area				CUMULATIVE								PIPE DATA					
Pipe Segment (Street)	Project Id	Pipe Id	Sanitary Manhole		Sanitary Sewer Invert		Ground Elevation		Sewer Cover From	Sewer Cover To	Potential Loading Manhole	Block ID	Land Use	% of Block (persons & jobs)	% of Block (Area)	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Pop (persons)	Emp (jobs)	Area (ha)	Total Equivalent Population	Harmon Peak Factor	DWF (L/s)	Peak DWF (L/s)	Infiltration + Inflow (L/s)	Total Design Flow (L/s)	Length (m)	Diameter (mm)	Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	% Full q/Q
			From	To	From	To	From	To																															
Proposed Collector 1 Option 2		P-PC1O2-01C	MH-PC1O2-01C	MH-PC1O2-01B	196.18	195.97	199.50	200.03	3.0	3.8									PIA-01 PIA-02		62.94	2.27					0	62.9	2.3	70	4.28	0.17	0.75	0.65	1.40	106.9	300	0.2	45.00	0.62	0.03
Proposed Collector 1 Option 2		P-PC1O2-01B	MH-PC1O2-01B	MH-PC1O2-01A	195.94	195.71	200.03	199.89	3.8	3.9									PIA-03		105.91	3.82					0	168.8	6.1	188	4.16	0.47	1.95	1.74	3.69	115.5	300	0.2	45.00	0.62	0.08
Proposed Collector 1 Option 2		P-PC1O2-01A	MH-PC1O2-01A	MH-PC1O2-01	195.68	195.47	199.89	199.26	3.9	3.5																	0	168.8	6.1	188	4.16	0.47	1.95	1.74	3.69	105.0	300	0.2	45.00	0.62	0.08
Proposed Collector 1 Option 2		P-PC1O2-01	MH-PC1O2-01	MH-PC1O2-02	195.44	194.89	199.26	198.25	3.5	3.1									PIA-04		279.75	10.09					0	448.6	16.2	501	3.97	1.25	4.95	4.63	9.58	135.8	300	0.4	64.00	0.87	0.15
Proposed Collector 1 Option 2		P-PC1O2-02	MH-PC1O2-02	MH-PC1O2-03	194.86	194.57	198.25	198.24	3.1	3.4									PIA-05		65.99	2.38					0	514.6	18.6	574	3.94	1.43	5.64	5.31	10.94	149.5	300	0.2	45.00	0.62	0.24
Proposed Collector 1 Option 2		P-PC1O2-03	MH-PC1O2-03	MH-PC1O2-04	194.54	194.23	198.24	199.98	3.4	5.4									PIA-06		112.84	4.07					0	1,317.8	51.4	1,471	3.69	3.66	13.49	14.70	28.19	154.0	300	0.2	45.00	0.62	0.63
Proposed Collector 1 Option 2		P-PC1O2-04	MH-PC1O2-04	MH-PC1O2-05	194.20	194.12	199.98	199.19	5.5	4.8													PPIA-01 PPIA-04	690.32	28.78	0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	39.9	300	0.2	45.00	0.62	0.71
Proposed Collector 1 Option 2		P-PC1O2-05	MH-PC1O2-05	MH-PC2-05	192.50	192.22	199.19	198.06	6.4	5.5													PPIA-02 PPIA-03	178.46	7.44	0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	138.4	300	0.2	45.00	0.62	0.71
Proposed Collector 2		P-PC2-01	MH-PC2-01	MH-PC2-02	198.91	197.63	202.23	200.99	3.0	3.1													PPIA-05 PPIA-06 PPIA-07	241.30	10.06	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	116.7	300	1.1	106.00	1.45	0.05
Proposed Collector 2		P-PC2-02	MH-PC2-02	MH-PC2-03	197.60	196.76	200.99	200.11	3.1	3.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	139.8	300	0.6	78.00	1.07	0.07
Proposed Collector 2		P-PC2-03	MH-PC2-03	MH-PC2-04	196.73	196.23	200.11	200.70	3.1	4.2																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	125.9	300	0.4	64.00	0.87	0.09
Proposed Collector 2		P-PC2-04	MH-PC2-04	MH-PC2-05	196.20	194.76	200.70	198.06	4.2	3.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	130.6	300	1.1	106.00	1.45	0.05
Proposed Collector 2		P-PC2-05	MH-PC2-05	MH-PC2-06	192.19	191.79	198.06	198.35	5.6	6.3									PIA-07		417.83	15.07					0	2,155.3	84.0	2,406	3.52	5.99	21.09	24.02	45.10	100.8	300	0.4	64.00	0.87	0.70
Proposed Collector 2		P-PC2-06	MH-PC2-06	MH-PC2-07	191.76	191.42	198.35	197.64	6.3	5.9																0	2,155.3	84.0	2,406	3.52	5.99	21.09	24.02	45.10	84.4	300	0.4	64.00	0.87	0.70
Proposed Collector 2		P-PC2-07	MH-PC2-07	MH-PC2-08	191.39	190.80	197.64	201.96	5.9	10.9																0	2,155.3	84.0	2,406	3.52	5.99	21.09	24.02	45.10	149.2	300	0.4	64.00	0.87	0.70
Proposed Collector 2		P-PC2-08	MH-PC2-08	MH-PC2-09	190.77	190.18	201.96	197.16	10.9	6.7																0	2,155.3	84.0	2,406	3.52	5.99	21.09	24.02	45.10	146.6	300	0.4	64.00	0.87	0.70
Proposed Collector 2		P-PC2-09	MH-PC2-09	**SMH36404**	190.15	**189.66**	197.16	196.09	6.7	6.1																0	**2,155.3**	84.0	2,406	3.52	5.99	21.09	24.02	**45.10**	123.4	300	0.4	61.00	0.86	0.74
Hornby Road		P-H-01	MH-H-01	MH-H-02	198.41	197.82	201.71	201.00	3.0	2.9									PIA-08 PIA-09 PIA-10 E-01		515.42	18.59					0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	145.8	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-02	MH-H-02	MH-H-03	197.79	197.19	201.00	200.65	2.9	3.1																0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	150.2	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-03	MH-H-03	MH-H-04	197.16	196.57	200.65	200.01	3.2	3.1																0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	148.3	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-04	MH-H-04	**SMH36400**	196.54	**195.94**	200.01	199.46	3.2	3.2									BCA-01		31.88	1.15					0	**561.2**	20.3	626	3.92	1.56	6.11	5.81	**11.93**	149.4	300	0.4	64.00	0.87	0.19
Proposed Collector 3		P-PC3-01	MH-PC3-01	MH-PC3-02	207.28	207.19	210.59	210.64	3.0	3.1													PPIA-10	841.92	35.10	0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	27.9	300	0.3	55.00	0.76	0.34
Proposed Collector 3		P-PC3-02	MH-PC3-02	MH-PC3-03	207.16	206.36	210.64	209.85	3.2	3.2																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	100.6	300	0.8	90.00	1.24	0.21
Proposed Collector 3		P-PC3-03	MH-PC3-03	MH-PC3-04	206.33	206.05	209.85	209.33	3.2	3.0																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	34.7	300	0.8	90.00	1.24	0.21
Proposed Collector 3		P-PC3-04	MH-PC3-04	MH-PC3-05	206.02	204.01	209.33	207.45	3.0	3.1																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	111.9	300	1.8	136.00	1.86	0.14
Proposed Collector 3		P-PC3-05	MH-PC3-05	MH-PC3-06	203.98	202.22	207.45	205.64	3.2	3.1																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	109.9	300	1.6	128.00	1.75	0.15
Proposed Collector 3		P-PC3-06	MH-PC3-06	MH-PC3-07	202.19	201.78	205.64	206.13	3.1	4.0																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	137.1	300	0.3	55.00	0.76	0.34
Proposed Collector 3		P-PC3-07	MH-PC3-07	MH-PC3-08	201.75	201.36	206.13	206.24	4.1	4.6													PPIA-09	14.39	0.60	0	856.3	35.7	956	3.81	2.38	9.07	10.21	19.28	129.5	300	0.3	55.00	0.76	0.35
Trafalgar Road		P-T-01	MH-T-01	MH-PC3-08	202.18	201.48	205.50	206.24	3.0	4.4									PIA-12		131.70	4.75					0	131.7	4.8	147	4.19	0.37	1.53	1.36	2.89	116.9	300	0.6	78.00	1.07	0.04
Proposed Collector 3		P-PC3-08	MH-PC3-08	MH-PC3-09	201.33	200.55	206.24	203.90	4.6	3.0																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	96.6	300	0.8	90.00	1.24	0.24
Proposed Collector 3		P-PC3-09	MH-PC3-09	MH-PC3-10	200.52	198.37	203.90	201.76	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	134.5	300	1.6	128.00	1.75	0.17
Proposed Collector 3		P-PC3-10	MH-PC3-10	MH-PC3-11	198.34	197.24	201.76	200.62	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	69.2	300	1.6	128.00	1.75	0.17
Proposed Collector 3		P-PC3-11	MH-PC3-11	MH-PC3-12	197.21	196.75	200.62	200.13	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	114.4	300	0.4	64.00	0.87	0.34
Proposed Collector 3		P-PC3-12	MH-PC3-12	MH-PC3-13	196.72	196.39	200.13	200.21	3.1	3.5																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	107.8	300	0.3	55.00	0.76	0.40
Proposed Collector 3		P-PC3-13	MH-PC3-13	MH-PC3-14	196.36	195.93	200.21	200.52	3.5	4.3									PIA-11 PIA-13 BCA-02		245.93	8.87					0	1,233.9	49.3	1,377	3.71	3.43	12.70	14.11	26.81	144.9	300	0.3	55.00	0.76	0.49
Proposed Collector 3		P-PC3-14	MH-PC3-14	**MH-S-01**	195.90	195.68	200.52	200.10	4.3	4.1																0	**1,233.9**	49.3	1,377	3.71	3.43	12.70	14.11	**26.81**	74.5	300	0.3	55.00	0.76	0.49
Trafalgar Road		P-T-02	MH-T-02	MH-T-03	204.30	204.02	207.08	207.55	2.5	3.2									BCA-03		67.65	2.44					0	67.7	2.4	76	4.28	0.19	0.80	0.70	1.50	139.5	300	0.2	45.00	0.62	0.03
Steeles Avenue		P-S-01	MH-T-03	SMH36392	203.99	203.90	207.55	207.95	3.2	3.7																0	**67.7**	2.4	76	4.28	0.19	0.80	0.70	**1.50**	42.1	300	0.2	45.00	0.62	0.03
Steeles Avenue		SMN98108	SMH99861	SMH99862	204.48	203.71	207.40	206.40	2.7	2.5																0	0.0	0.0	0	4.50	0.00	0.00	0.00	0.00	109.9	200	0.7	29.00	0.88	0.00
Steeles Avenue		SMN98109	SMH99862	SMH99863	203.65	203.16	206.40	207.50	2.5	4.1									PIA-14		39.93	1.44					0	39.9	1.4	45	4.32	0.11	0.48	0.41	0.89	125.3	250	0.4	39.00	0.77	0.02
Steeles Avenue		SMN98110	SMH99863	SMH99864	203.14	202.70	207.50	208.70	4.1	5.7									PIA-15		437.79	15.79					0	477.7	17.2	533	3.96	1.33	5.25	4.93	10.18	120.5	250	0.4	39.00	0.77	0.26
Steeles Avenue		SMN98111	SMH99864	SMH99865	202.67	202.06	208.70	208.40	5.8	6.1																0	477.7	17.2	533	3.96	1.33	5.25	4.93	**10.18**	146.2	250	0.4	39.00	0.77	0.26
Eighth Line		P-EL-01	MH-EL-01	MH-EL-02	207.70	206.99	211.00	211.50	3.0	4.2									PIA-16 PIA-17		177.44	6.40					0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	142.5	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-02	MH-EL-02	MH-EL-03	206.96	206.21	211.50	211.25	4.2	4.7																0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	149.6	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-03	MH-EL-03	MH-EL-04	206.18	205.43	211.25	209.00	4.8	3.3																0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	149.7	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-04	MH-EL-04	**SMH99865**	205.40	**205.28**	209.00	208.73	3.3	3.1																0	**177.4**	6.4	198	4.15	0.49	2.05	1.83	**3.88**	23.8	300	0.5	71.00	0.98	0.05
																	2693	97.1			1980.3	82.56															

Input by the User
Data from the InfoSewer Model
Assumed Data
Input by the User - Modified original model data

Manhole Branch Downstream Manhole
Manhole Upstream Manhole with Input Data from the model

Halton Hills Premier Gateway Employment Phase 1B
Sanitary Sewer Design Sheet - West Development Lands Routed to Sixth Line
Reference: Drawing D-10: Drainage Area Plan - West Development Lands Routed to Sixth Line

Design Criteria (Collection System)	Value
Dry Weather Flow - Residential	215
Dry Weather Flow - Industrial	240
Dry Weather Flow - Employment (Blended ICI)	185
Infiltration / Inflow Allowance	0.286

Area	SGUs	Total Jobs	Area	Density				Units	Units
PIA, BCA and E	3.01, 555.03	2693	97.1	27.73				L/cap/d	L/cap/d
PPIA	555.02-1B	1980.3	82.6	23.99				L/cap/d	L/cap/d
		4673.3						L/cap/d	L/cap/d
								L/s/ha	L/s/ha

Design Flow

$$Q_{design} = DWF * M + (I * A)$$

I = Infiltration & Inflow Component
A = Gross Contributing Area (ha)
M = Harmon Peaking Factor

Harmon Peaking Factor (M):

$$M = 1 + \frac{14}{4 + P^{0.5}}$$

where p = population/1000
Minimum: 2.0

Design Standards

Minimum Sewer Diameter	RES: 200mm ; ICI: 300mm
Manning's "n"	0.013
Minimun Velocity	0.6 m/s
Maximun Velocity	3.0 m/s
Minimun Pipe Grade	Refer to RH 2000

LOCATION					ELEVATION									TOTAL (Block)			Prestige Industrial Area				Proposed Prestige Industrial Area				CUMULATIVE							PIPE DATA					
Pipe Segment (Street)	Project Id	Pipe Id	Sanitary Manhole		Sanitary Sewer Invert		Ground Elevation		Sewer Cover From	Sewer Cover To	Potential Loading Manhole	Block ID	Land Use	% of Block (persons & jobs)	% of Block (Area)	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Area ID	Pop (persons)	Emp (jobs)	Area (ha)	Pop (persons)	Emp (jobs)	Area (ha)	Total Equivalent Population	Harmon Peak Factor	DWF (L/s)	Peak DWF (L/s)	Infiltration + Inflow (L/s)	Total Design Flow (L/s)	Length (m)	Diameter (mm)	Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	% Full q/Q
			From	To	From	To	From	To																														
Proposed Collector 1 Option 2		P-PC1O2-04	MH-PC1O2-05	MH-PC1O2-04	196.17	196.09	199.19	199.98	2.7	3.6													PPIA-01 PPIA-02 PPIA-03	841.92	35.10	0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	39.9	300	0.2	45.00	0.62	0.42
Proposed Collector 1 Option 2		P-PC1O2-03	MH-PC1O2-04	MH-PC1O2-03	196.06	195.75	199.98	198.24	3.6	2.2									PIA-06		112.84	4.07	PPIA-04	26.86	1.12	0	981.6	40.3	1,096	3.77	2.73	10.29	11.52	21.81	154.0	300	0.2	45.00	0.62	0.48
Proposed Collector 1 Option 2		P-PC1O2-02	MH-PC1O2-03	MH-PC1O2-02	195.72	195.43	198.24	198.25	2.2	2.5									PIA-05		65.99	2.38				0	1,047.6	42.7	1,169	3.76	2.91	10.93	12.20	23.13	149.5	300	0.2	45.00	0.62	0.51
Proposed Collector 1 Option 2		P-PC1O2-01	MH-PC1O2-02	MH-PC1O2-01	195.40	195.12	198.25	199.26	2.6	3.8									PIA-04		279.75	10.09				0	1,327.4	52.8	1,482	3.68	3.69	13.58	15.09	28.67	135.8	300	0.2	45.00	0.62	0.64
Proposed Collector 1 Option 2		P-PC1O2-01A	MH-PC1O2-01	MH-PC1O2-01A	195.09	194.88	199.26	199.89	3.9	4.7																0	1,327.4	52.8	1,482	3.68	3.69	13.58	15.09	28.67	105.0	300	0.2	45.00	0.62	0.64
Proposed Collector 1 Option 2		P-PC1O2-01B	MH-PC1O2-01A	MH-PC1O2-01B	194.85	194.62	199.89	200.03	4.7	5.1									PIA-03		105.91	3.82				0	1,433.3	56.6	1,600	3.66	3.98	14.57	16.18	30.75	115.5	300	0.2	45.00	0.62	0.68
Proposed Collector 1 Option 2		P-PC1O2-01C	MH-PC1O2-01B	MH-PC1O2-01C	194.59	194.38	200.03	199.50	5.1	4.8																0	1,433.3	56.6	1,600	3.66	3.98	14.57	16.18	30.75	106.9	300	0.2	45.00	0.62	0.68
Proposed Collector 1 Option 2		P-PC1O2-01D	MH-PC1O2-01C	MH-SL-01	194.35	194.08	199.50	200.16	4.8	5.8									PIA-01 PIA-02		62.94	2.27				0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	133.8	300	0.2	45.00	0.62	0.71
Sixth Line		P-SL-01	MH-SL-01	MH-SL-02	194.02	193.74	200.16	198.87	5.8	4.8																0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	140.3	300	0.2	45.00	0.62	0.71
Sixth Line		P-SL-02	MH-SL-02	MH-SL-03	193.71	193.43	198.87	198.17	4.9	4.4																0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	141.8	300	0.2	45.00	0.62	0.71
Sixth Line		P-SL-03	MH-SL-03	MH-SL-04	193.40	193.09	198.17	199.51	4.5	6.1																0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	153.1	300	0.2	45.00	0.62	0.71
Sixth Line		P-SL-04	MH-SL-04	MH-SL-05	193.06	192.76	199.51	200.00	6.1	6.9																0	1,496.2	58.9	1,670	3.65	4.16	15.15	16.83	31.98	149.2	300	0.2	45.00	0.62	0.71
Sixth Line		P-SL-05	MH-SL-05	SMH36412	192.73	192.68	200.00	198.30	7.0	5.3																0	**1,496.2**	58.9	1,670	3.65	4.16	15.15	16.83	**31.98**	28.7	300	0.2	45.00	0.62	0.71
Proposed Collector 2		P-PC2-01	MH-PC2-01	MH-PC2-02	198.91	197.63	202.23	200.99	3.0	3.1													PPIA-05 PPIA-06 PPIA-07	241.30	10.06	0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	116.7	300	1.1	106.00	1.45	0.05
Proposed Collector 2		P-PC2-02	MH-PC2-02	MH-PC2-03	197.60	196.76	200.99	200.11	3.1	3.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	139.8	300	0.6	78.00	1.07	0.07
Proposed Collector 2		P-PC2-03	MH-PC2-03	MH-PC2-04	196.73	196.35	200.11	200.70	3.1	4.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	125.9	300	0.3	55.00	0.76	0.10
Proposed Collector 2		P-PC2-04	MH-PC2-04	MH-PC2-05	196.32	194.75	200.70	198.06	4.1	3.0																0	241.3	10.1	269	4.10	0.67	2.75	2.88	5.62	130.6	300	1.2	111.00	1.52	0.05
Proposed Collector 2		P-PC2-05	MH-PC2-05	MH-PC2-06	194.72	194.32	198.06	198.35	3.0	3.7									PIA-07		417.83	15.07				0	659.1	25.1	736	3.88	1.83	7.11	7.19	14.29	100.8	300	0.4	64.00	0.87	0.22
Proposed Collector 2		P-PC2-06	MH-PC2-06	MH-PC2-07	194.29	193.95	198.35	197.64	3.8	3.4																0	659.1	25.1	736	3.88	1.83	7.11	7.19	14.29	84.4	300	0.4	64.00	0.87	0.22
Proposed Collector 2		P-PC2-07	MH-PC2-07	MH-PC2-08	193.92	193.33	197.64	201.96	3.4	8.3																0	659.1	25.1	736	3.88	1.83	7.11	7.19	14.29	149.2	300	0.4	64.00	0.87	0.22
Proposed Collector 2		P-PC2-08	MH-PC2-08	MH-PC2-09	193.30	192.71	201.96	197.16	8.4	4.1																0	659.1	25.1	736	3.88	1.83	7.11	7.19	14.29	146.6	300	0.4	64.00	0.87	0.22
Proposed Collector 2		P-PC2-09	MH-PC2-09	**SMH36404**	192.68	**192.19**	197.16	196.09	4.2	3.6																0	**659.1**	25.1	736	3.88	1.83	7.11	7.19	**14.29**	123.4	300	0.4	61.00	0.86	0.23
Hornby Road		P-H-01	MH-H-01	MH-H-02	198.41	197.82	201.71	201.00	3.0	2.9									PIA-08 PIA-09 PIA-10 E-01		515.42	18.59				PPIA-08	13.91	0.58	0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	145.8	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-02	MH-H-02	MH-H-03	197.79	197.19	201.00	200.65	2.9	3.1																0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	150.2	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-03	MH-H-03	MH-H-04	197.16	196.57	200.65	200.01	3.2	3.1																0	529.3	19.2	591	3.94	1.47	5.79	5.48	11.27	148.3	300	0.4	64.00	0.87	0.18
Hornby Road		P-H-04	MH-H-04	**SMH36400**	196.54	**195.94**	200.01	199.46	3.2	3.2									BCA-01		31.88	1.15				0	**561.2**	20.3	626	3.92	1.56	6.11	5.81	**11.93**	149.4	300	0.4	64.00	0.87	0.19
Proposed Collector 3		P-PC3-01	MH-PC3-01	MH-PC3-02	207.28	207.19	210.59	210.64	3.0	3.1													PPIA-10	841.92	35.10	0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	27.9	300	0.3	55.00	0.76	0.34
Proposed Collector 3		P-PC3-02	MH-PC3-02	MH-PC3-03	207.16	206.36	210.64	209.85	3.2	3.2																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	100.6	300	0.8	90.00	1.24	0.21
Proposed Collector 3		P-PC3-03	MH-PC3-03	MH-PC3-04	206.33	206.05	209.85	209.33	3.2	3.0																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	34.7	300	0.8	90.00	1.24	0.21
Proposed Collector 3		P-PC3-04	MH-PC3-04	MH-PC3-05	206.02	204.01	209.33	207.45	3.0	3.1																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	111.9	300	1.8	136.00	1.86	0.14
Proposed Collector 3		P-PC3-05	MH-PC3-05	MH-PC3-06	203.98	202.22	207.45	205.64	3.2	3.1																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	109.9	300	1.6	128.00	1.75	0.15
Proposed Collector 3		P-PC3-06	MH-PC3-06	MH-PC3-07	202.19	201.78	205.64	206.13	3.1	4.0																0	841.9	35.1	940	3.82	2.34	8.93	10.04	18.97	137.1	300	0.3	55.00	0.76	0.34
Proposed Collector 3		P-PC3-07	MH-PC3-07	MH-PC3-08	201.75	201.36	206.13	206.24	4.1	4.6													PPIA-09	14.39	0.60	0	856.3	35.7	956	3.81	2.38	9.07	10.21	19.28	129.5	300	0.3	55.00	0.76	0.35
Trafalgar Road		P-T-01	MH-T-01	MH-PC3-08	202.18	201.48	205.50	206.24	3.0	4.4									PIA-12		131.70	4.75				0	131.7	4.8	147	4.19	0.37	1.53	1.36	2.89	116.9	300	0.6	78.00	1.07	0.04
Proposed Collector 3		P-PC3-08	MH-PC3-08	MH-PC3-09	201.33	200.55	206.24	203.90	4.6	3.0																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	96.6	300	0.8	90.00	1.24	0.24
Proposed Collector 3		P-PC3-09	MH-PC3-09	MH-PC3-10	200.52	198.37	203.90	201.76	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	134.5	300	1.6	128.00	1.75	0.17
Proposed Collector 3		P-PC3-10	MH-PC3-10	MH-PC3-11	198.34	197.24	201.76	200.62	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	69.2	300	1.6	128.00	1.75	0.17
Proposed Collector 3		P-PC3-11	MH-PC3-11	MH-PC3-12	197.21	196.75	200.62	200.13	3.1	3.1																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	114.4	300	0.4	64.00	0.87	0.34
Proposed Collector 3		P-PC3-12	MH-PC3-12	MH-PC3-13	196.72	196.39	200.13	200.21	3.1	3.5																0	988.0	40.5	1,103	3.77	2.74	10.35	11.57	21.92	107.8	300	0.3	55.00	0.76	0.40
Proposed Collector 3		P-PC3-13	MH-PC3-13	MH-PC3-14	196.36	195.93	200.21	200.52	3.5	4.3									PIA-11 PIA-13 BCA-02		245.93	8.87				0	1,233.9	49.3	1,377	3.71	3.43	12.70	14.11	26.81	144.9	300	0.3	55.00	0.76	0.49
Proposed Collector 3		P-PC3-14	MH-PC3-14	**MH-S-01**	195.90	195.68	200.52	200.10	4.3	4.1																0	**1,233.9**	49.3	1,377	3.71	3.43	12.70	14.11	**26.81**	74.5	300	0.3	55.00	0.76	0.49
Trafalgar Road		P-T-02	MH-T-02	MH-T-03	204.30	204.02	207.08	207.55	2.5	3.2									BCA-03		67.65	2.44				0	67.7	2.4	76	4.28	0.19	0.80	0.70	1.50	139.5	300	0.2	45.00	0.62	0.03
Steeles Avenue		P-S-01	MH-T-03	SMH36392	203.99	203.90	207.55	207.95	3.2	3.7																0	**67.7**	2.4	76	4.28	0.19	0.80	0.70	**1.50**	42.1	300	0.2	45.00	0.62	0.03
Steeles Avenue		SMN98108	SMH99861	SMH99862	204.48	203.71	207.40	206.40	2.7	2.5																0	0.0	0.0	0	4.50	0.00	0.00	0.00	0.00	109.9	200	0.7	29.00	0.88	0.00
Steeles Avenue		SMN98109	SMH99862	SMH99863	203.65	203.16	206.40	207.50	2.5	4.1									PIA-14		39.93	1.44				0	39.9	1.4	45	4.32	0.11	0.48	0.41	0.89	125.3	250	0.4	39.00	0.77	0.02
Steeles Avenue		SMN98110	SMH99863	SMH99864	203.14	202.70	207.50	208.70	4.1	5.7									PIA-15		437.79	15.79				0	477.7	17.2	533	3.96	1.33	5.25	4.93	10.18	120.5	250	0.4	39.00	0.77	0.26
Steeles Avenue		SMN98111	SMH99864	SMH99865	202.67	202.06	208.70	208.40	5.8	6.1																0	477.7	17.2	533	3.96	1.33	5.25	4.93	**10.18**	146.2	250	0.4	39.00	0.77	0.26
Eighth Line		P-EL-01	MH-EL-01	MH-EL-02	207.70	206.99	211.00	211.50	3.0	4.2									PIA-16 PIA-17		177.44	6.40				0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	142.5	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-02	MH-EL-02	MH-EL-03	206.96	206.21	211.50	211.25	4.2	4.7																0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	149.6	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-03	MH-EL-03	MH-EL-04	206.18	205.43	211.25	209.00	4.8	3.3																0	177.4	6.4	198	4.15	0.49	2.05	1.83	3.88	149.7	300	0.5	71.00	0.98	0.05
Eighth Line		P-EL-04	MH-EL-04	**SMH99865**	205.40	**205.28**	209.00	208.73	3.3	3.1																0	**177.4**	6.4	198	4.15	0.49	2.05	1.83	**3.88**	23.8	300	0.5	71.00	0.98	0.05
																				2693	97.1			1980.3	82.56														

Input by the User
Data from the InfoSewer Model
Assumed Data
Input by the User - Modified original model data

Manhole Branch Downstream Manhole
Manhole Upstream Manhole with Input Data from the model

Halton Hills Premier Gateway Employment Phase 1B
Sanitary Sewer Design Sheet
Reference: SGUs / WW Flow Distribution from 2017 DC Background Study / Model

Design Criteria (Collection System)	Value
Dry Weather Flow - Residential	215
Dry Weather Flow - Commercial	145
Dry Weather Flow - Industrial	240
Dry Weather Flow - Institutional	180
Infiltration / Inflow Allowance	0.286

Units	Units
L/cap/d	L/cap/d
L/cap/d	L/cap/d
L/cap/d	L/cap/d
L/cap/d	L/cap/d
L/s/ha	L/s/ha

Units
L/cap/d
L/cap/d
L/cap/d
L/cap/d
L/s/ha

Units
L/cap/d
L/cap/d
L/cap/d
L/cap/d
L/s/ha

Units
L/cap/d
L/cap/d
L/cap/d
L/cap/d
L/s/ha

Units
L/cap/d
L/cap/d
L/cap/d
L/cap/d
L/s/ha

Units
L/cap/d
L/cap/d
L/cap/d
L/cap/d
L/s/ha

$$Q_{design} = DWF * M + (I * A)$$

Harmon Peaking Factor (M):

$$M = 1 + \frac{14}{4 + P^{0.5}}$$

where p = population/1000
where p = population/1000
Minimum: 2.0

Design Standards	
Minimum Sewer Diameter	RES: 200mm ; ICI: 300mm
Manning's "n"	0.013
Minimum Velocity	0.6 m/s
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Grade	Refer to RH 2000

Pipe Segment (Street)	LOCATION: Project Id	LOCATION: Pipe Id	Sanitary Manhole: From	Sanitary Manhole: To	ELEVATION: Sanitary Sewer Invert: From	ELEVATION: Sanitary Sewer Invert: To	ELEVATION: Ground Elevation: From	ELEVATION: Ground Elevation: To	Sewer Cover From	Sewer Cover To	Residential: Area ID	Residential: Pop (persons)	Residential: Area (ha)	Commercial: Area ID	Commercial: Emp (jobs)	Commercial: Pop (persons)	Commercial: Area (ha)	Industrial: Area ID	Industrial: Emp (jobs)	Industrial: Pop (persons)	Industrial: Area (ha)	Institutional: Area ID	Institutional: Emp (jobs)	Institutional: Pop (persons)	Institutional: Area (ha)	Area (ha)	Total Equivalent Population	Harmon Peak Factor	DWF (L/s)	Peak DWF (L/s)	Infiltration + Inflow (L/s)	Total Design Flow (L/s)	Growth Flows	PIPE DATA: Length (m)	PIPE DATA: Diameter (mm)	PIPE DATA: Slope (%)	Full Flow Capacity (L/s)	Full Flow Velocity (m/s)	% Full q/Q
Eighth Line / Trafalgar Trunk											554.02	0		554.02	189	127		554.02	857	957		554.02	29	24		44.5	1,108	3.77	2.76	10.40	12.72	23.12							
Eighth Line / Trafalgar Trunk											553.02	0		553.02	237	160		553.02	869	970		553.02	59	49		74.4	1,179	3.75	2.93	11.01	21.28	32.30							
Eighth Line / Trafalgar Trunk											555.03-2B	42		555.03-2B	332	224		555.03-2B	1289	1438		555.03-2B	45	37		82.9	1,741	3.63	4.33	15.74	23.72	39.46							
Eighth Line / Trafalgar Trunk											555.03-1B	21		555.03-1B	166	112		555.03-1B	644	719		555.03-1B	22	19		41.5	871	3.84	2.17	8.32	11.86	20.18							
Eighth Line / Trafalgar Trunk											552.01	0		552.01	919	620		552.01	581	649		552.01	12	10		77.9	1,278	3.73	3.18	11.86	22.27	34.13							
Eighth Line / Trafalgar Trunk											*555.02*	0		*555.02*	0	0		*555.02*	432	482		*555.02*	0	0		17.6	482	3.98	1.20	4.78	5.02	9.80							
To Eighth Line / Trafalgar Trunk																										**338.7**	**6,660**	**3.13**	**16.57**	**51.83**	**96.88**	**148.71**	**135.11**						
To HH#2 WWPS											555.01	142		555.01	371	250		555.01	1471	1642		555.01	18	15		126.8	2,049	3.58	5.10	18.24	36.26	54.51							
To HH#2 WWPS											552.02	0		552.02	941	635		552.02	740	826		552.02	23	19		79.8	1,480	3.68	3.68	13.57	22.82	36.38							
To HH#2 WWPS											551.00	0		551.00	432	291		551	604	674		551	17	14		78.7	980	3.81	2.44	9.28	22.52	31.80							
To HH#2 WWPS											*555.02*	0		*555.02*	0	0		*555.02*	1549	1729		*555.02*	0	0		63.0	1,729	3.63	4.30	15.63	18.00	33.64							
Gravity Flows to HH#2 WWPS																										**348.3**	**6,237**	**3.15**	**15.52**	**48.97**	**99.60**	**148.57**	**133.33**						
To HH#2 WWPS (After Commissining of Eighth Line / Trafalagar Trunk Sewer)																																**148.57**	**133.33**						
To HH#1 WWPS											550.01	0		550.01	634	428		550.01	524	585		550.01	17	14		26.9	1,027	3.79	2.55	9.69	7.70	17.39							
To HH#1 WWPS											550.02	0		550.02	650	438		550.02	1506	1681		550.02	25	21		102.7	2,140	3.56	5.33	18.98	29.37	48.35							
Gravity Flows to HH#1 WWPS																										**129.6**	**3,167**	**3.42**	**7.88**	**26.97**	**37.08**	**64.05**	**29.10**						
To HH#1 WWPS (After Commissining of Eighth Line / Trafalagar Trunk Sewer)																																**212.62**	**162.43**						

Input by the User
Data from the InfoSewer Model
Assumed Data
Input by the User - Modified original model data

Manhole Branch Downstream Manhole
Manhole Upstream Manhole with Input Data from the model

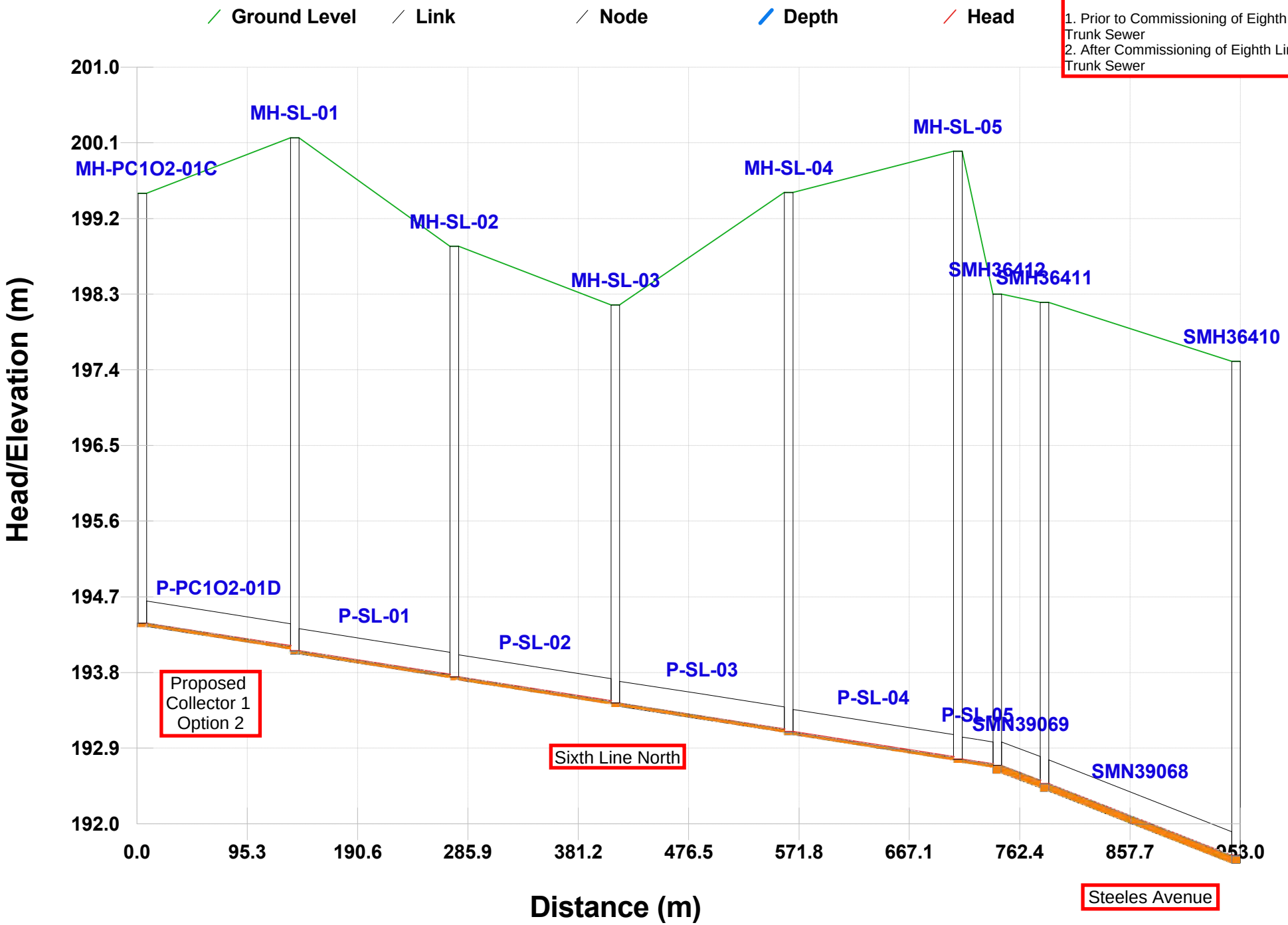
4871

Steady-State HGL Profile of Links P-PC1O2-01D,P-SL-01,...,SMN39068

InfoSewer Pipe Profile Graph
Proposed Collector Road 1 and Sixth Line North

Results shown for Scenarios:

1. Prior to Commissioning of Eighth Line Trunk Sewer
2. After Commissioning of Eighth Line Trunk Sewer

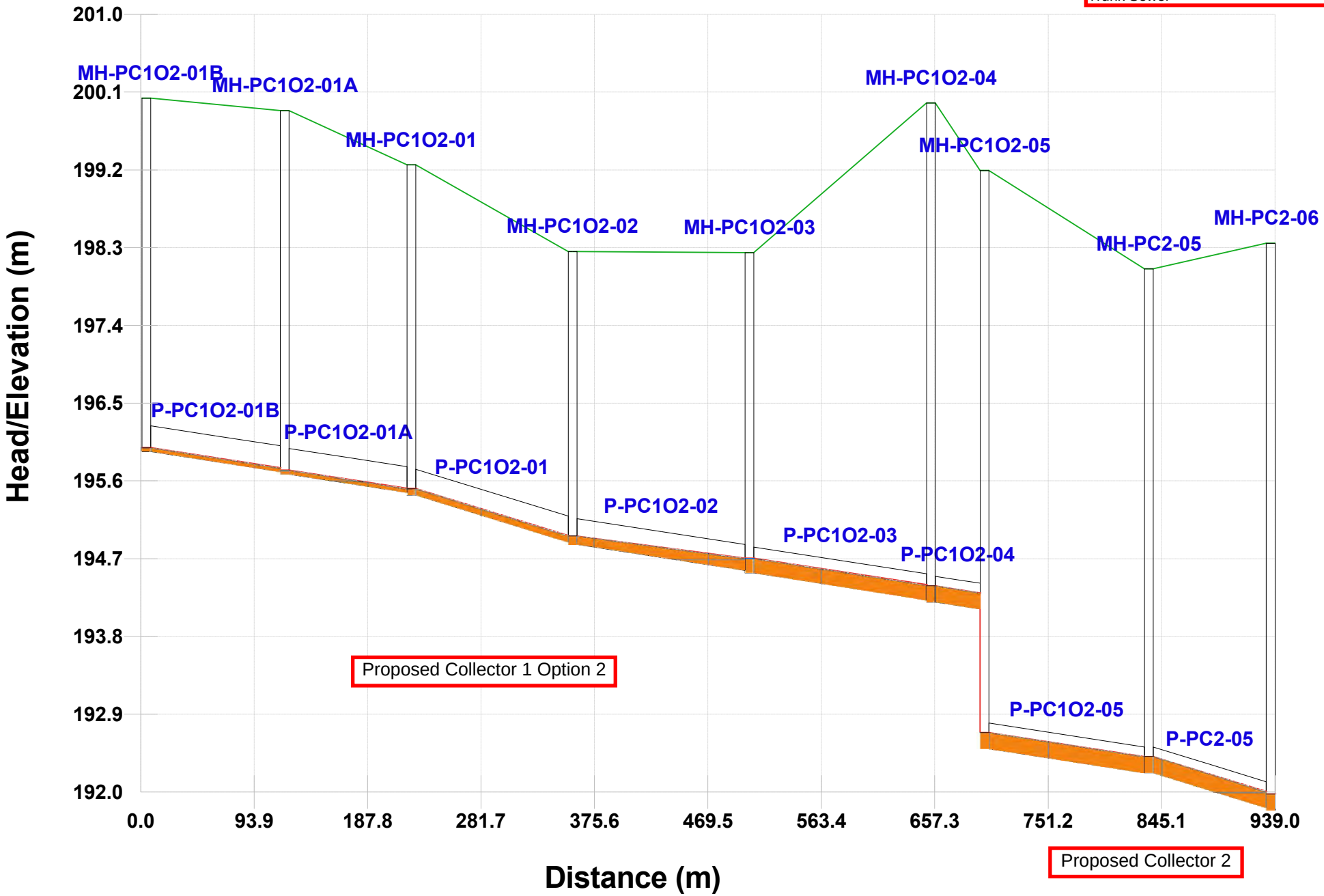


Steady-State HGL Profile of Links P-PC1O2-01B,P-PC1O2-01A,...,P-PC2-05

InfoSewer Pipe Profile Graph
Proposed Collector 1 Option 2

Results shown for Scenarios:

1. Prior to Commissioning of Eighth Line Trunk Sewer
2. After Commissioning of Eighth Line Trunk Sewer

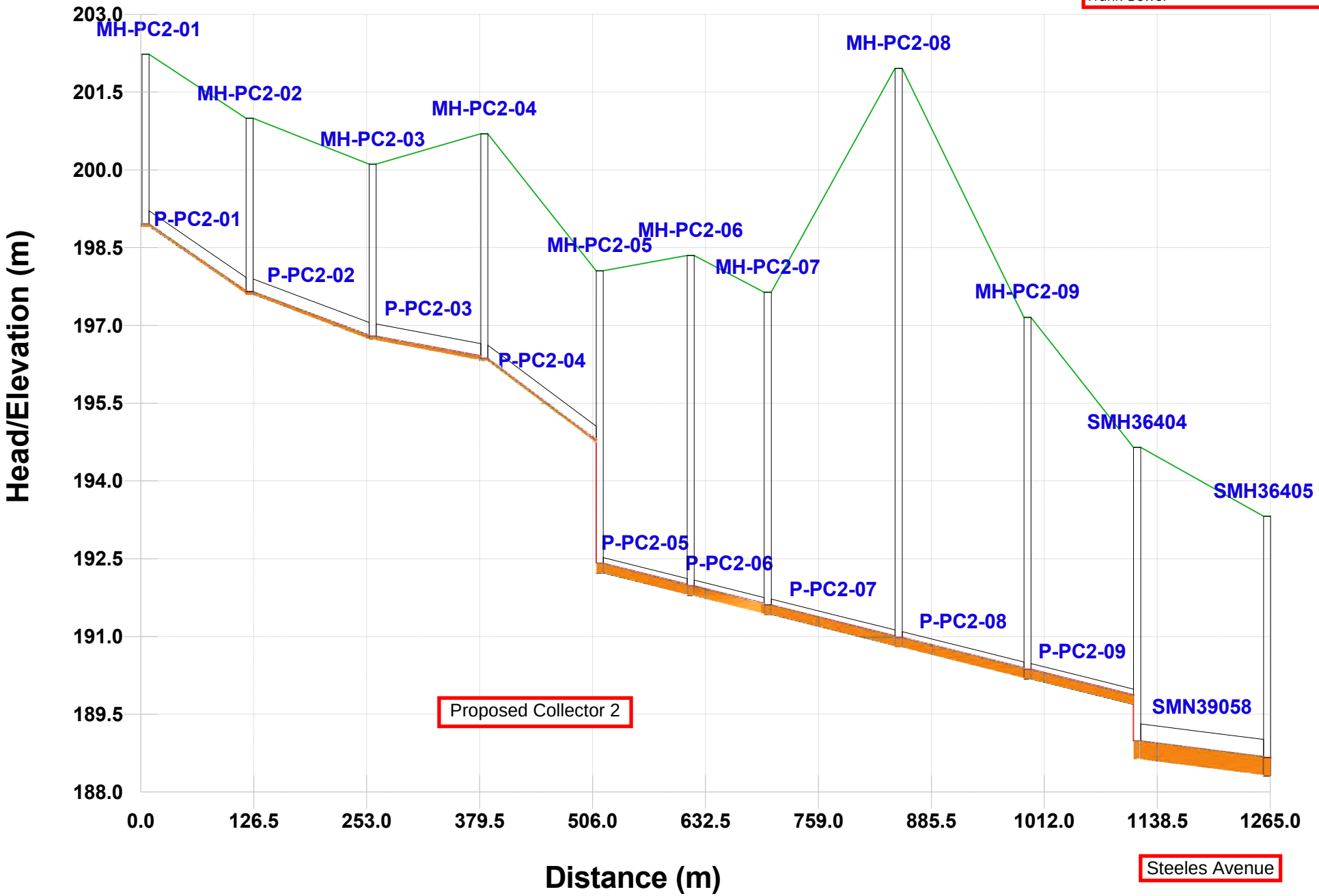


Steady-State HGL Profile of Links P-PC2-01,P-PC2-02,...,SMN39058

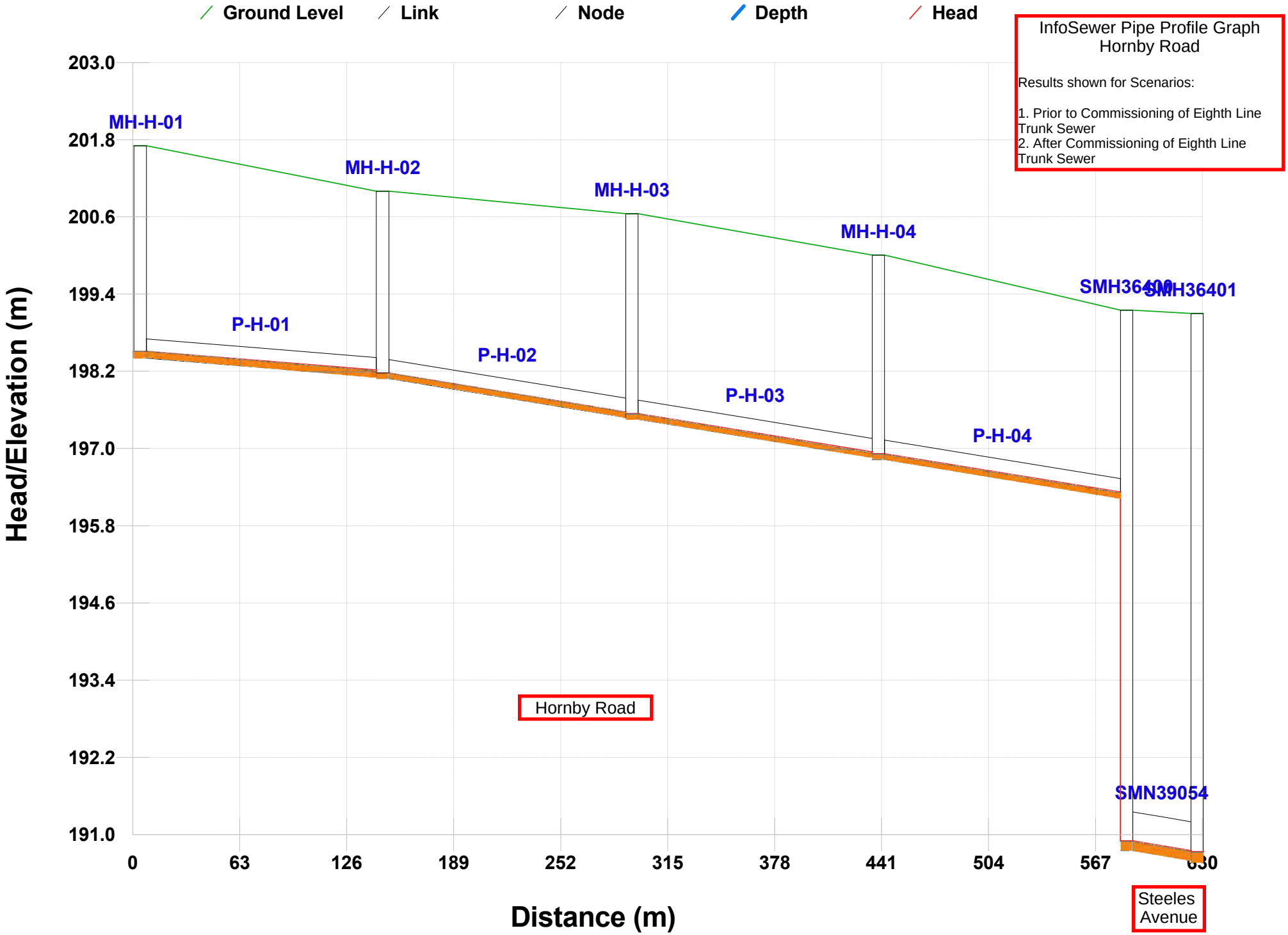
InfoSewer Pipe Profile Graph
Proposed Collector 2

Results shown for Scenarios:

1. Prior to Commissioning of Eighth Line Trunk Sewer
2. After Commissioning of Eighth Line Trunk Sewer



Steady-State HGL Profile of Links P-H-01,P-H-02,...,SMN39054



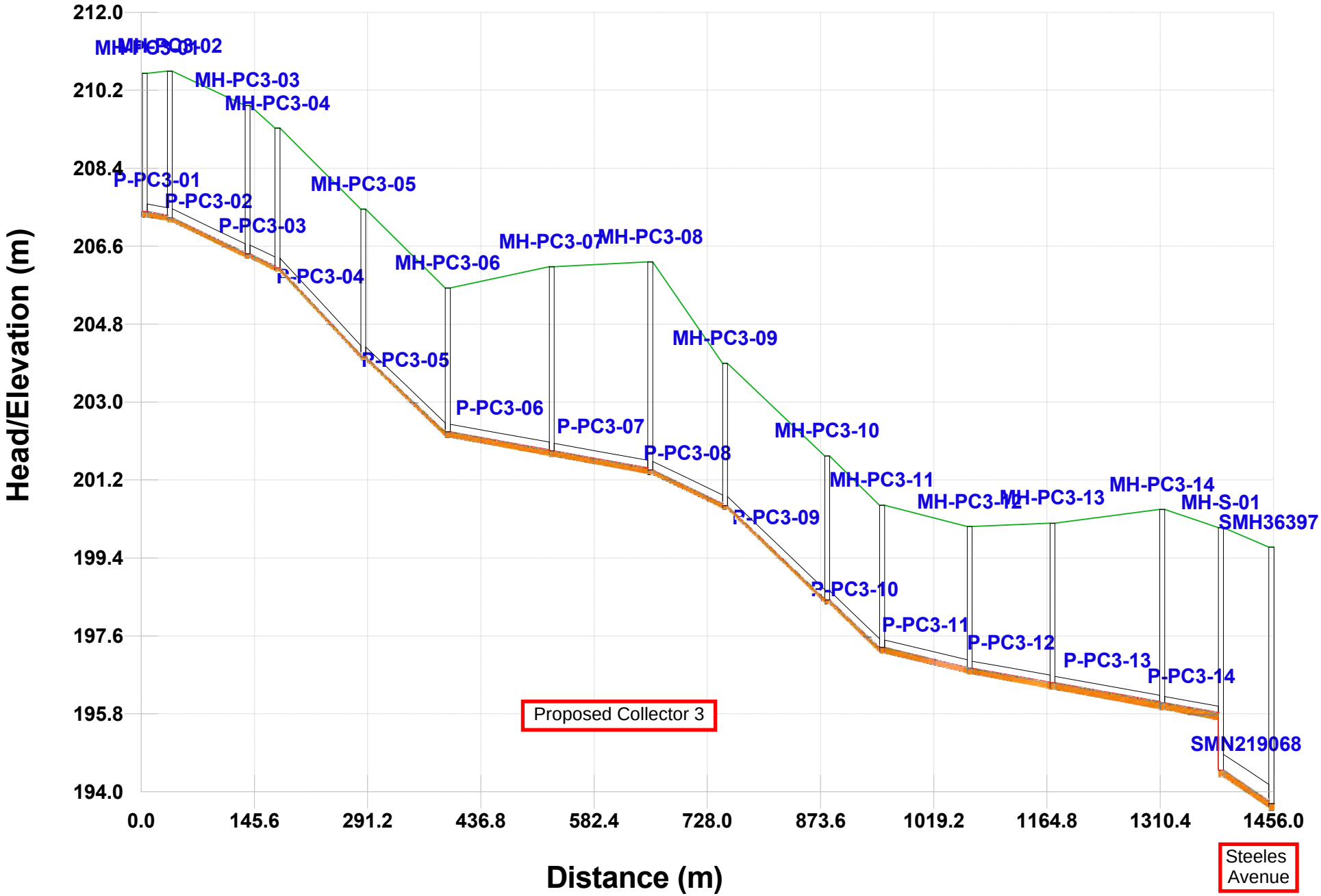
Steady-State HGL Profile of Links P-PC3-01,P-PC3-02,...,SMN219068

Ground Level Link Node Depth Head

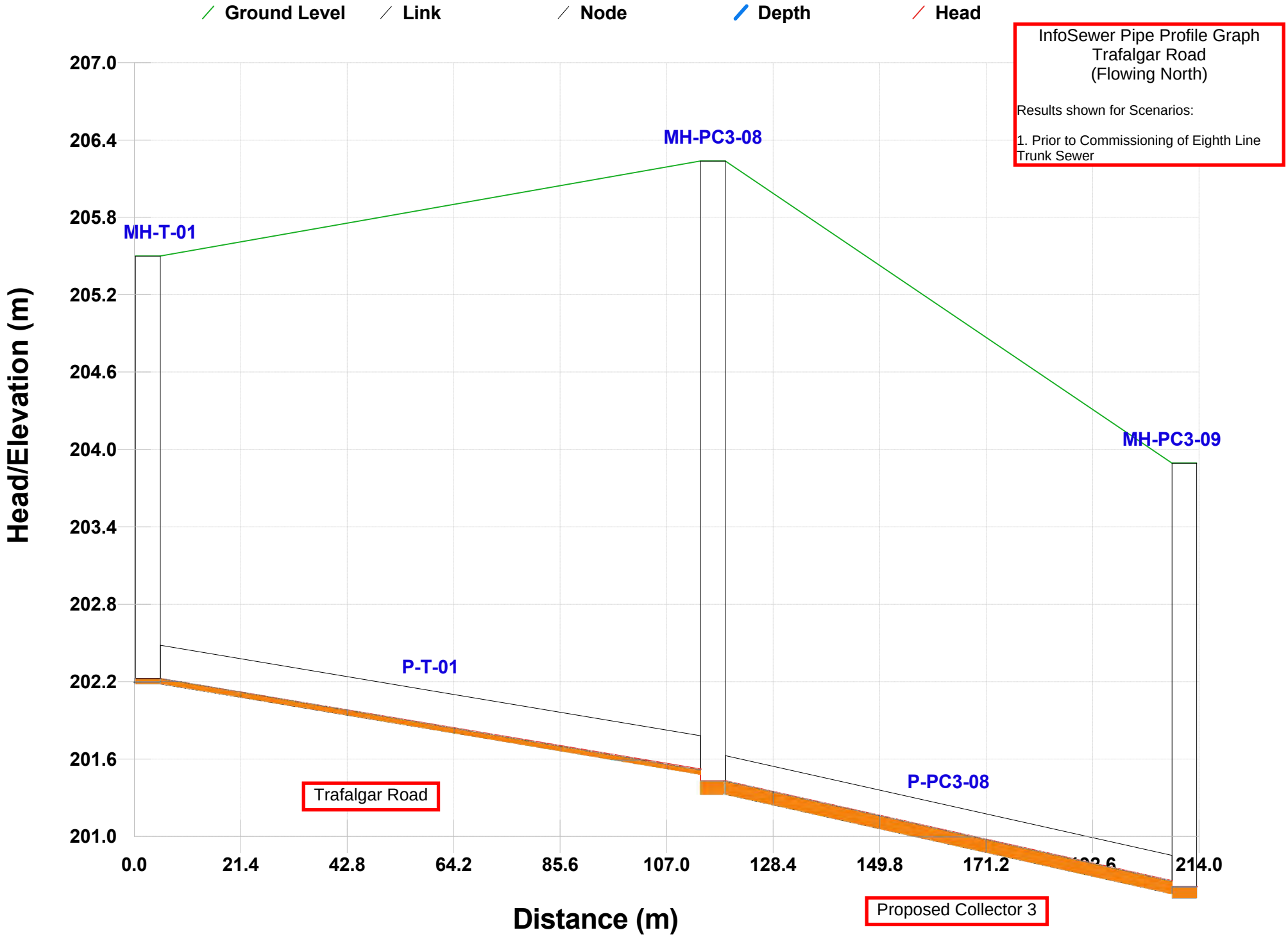
InfoSewer Pipe Profile Graph
Proposed Collector 3

Results shown for Scenarios:

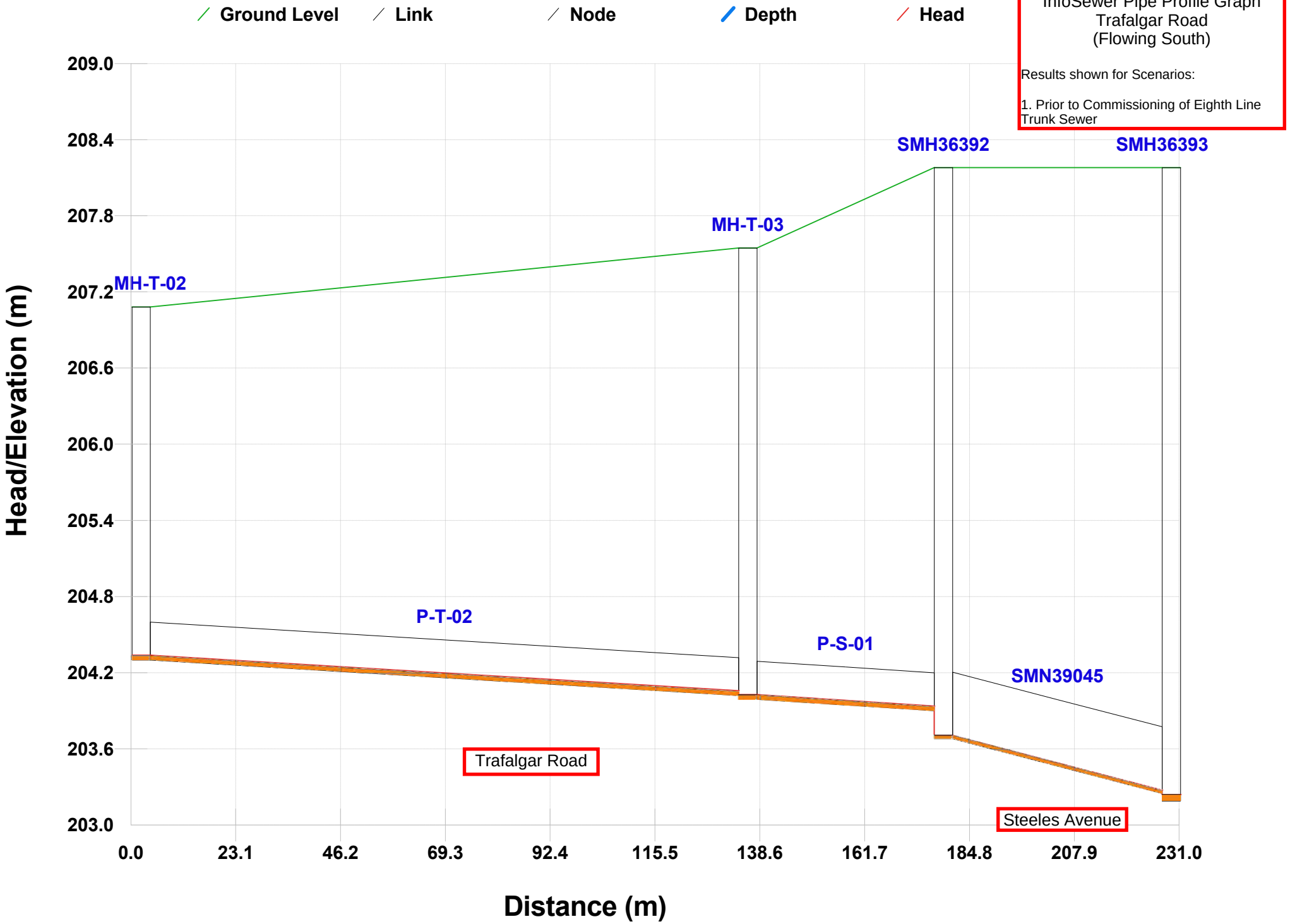
1. Prior to Commissioning of Eighth Line Trunk Sewer



Steady-State HGL Profile of Link(s) P-T-01,P-PC3-08



Steady-State HGL Profile of Link(s) P-T-02,P-S-01,SMN39045

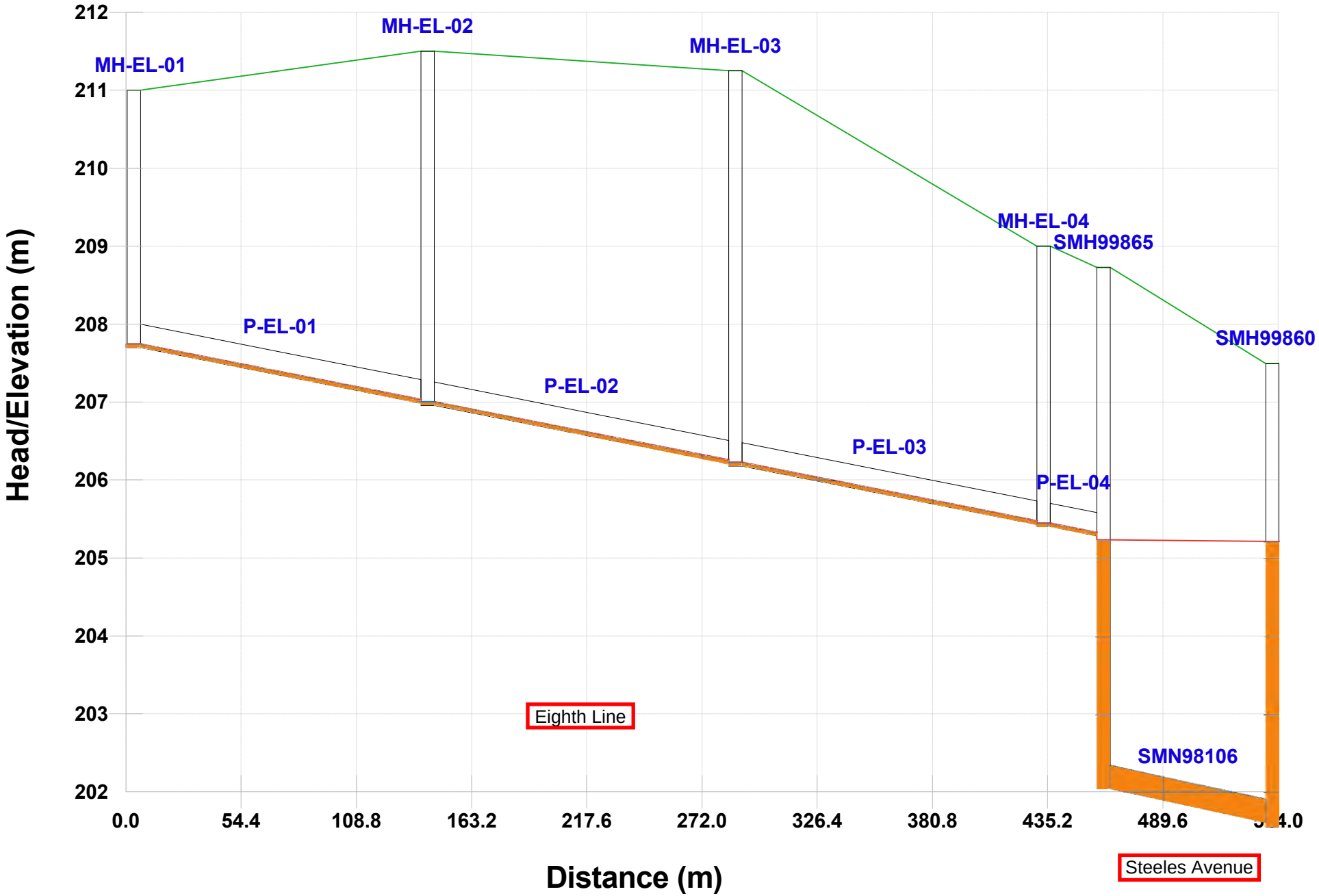


Steady-State HGL Profile of Links P-EL-01,P-EL-02,...,SMN98106

InfoSewer Pipe Profile Graph
Eighth Line

Results shown for Scenarios:

1. Prior to Commissioning of Eighth Line Trunk Sewer

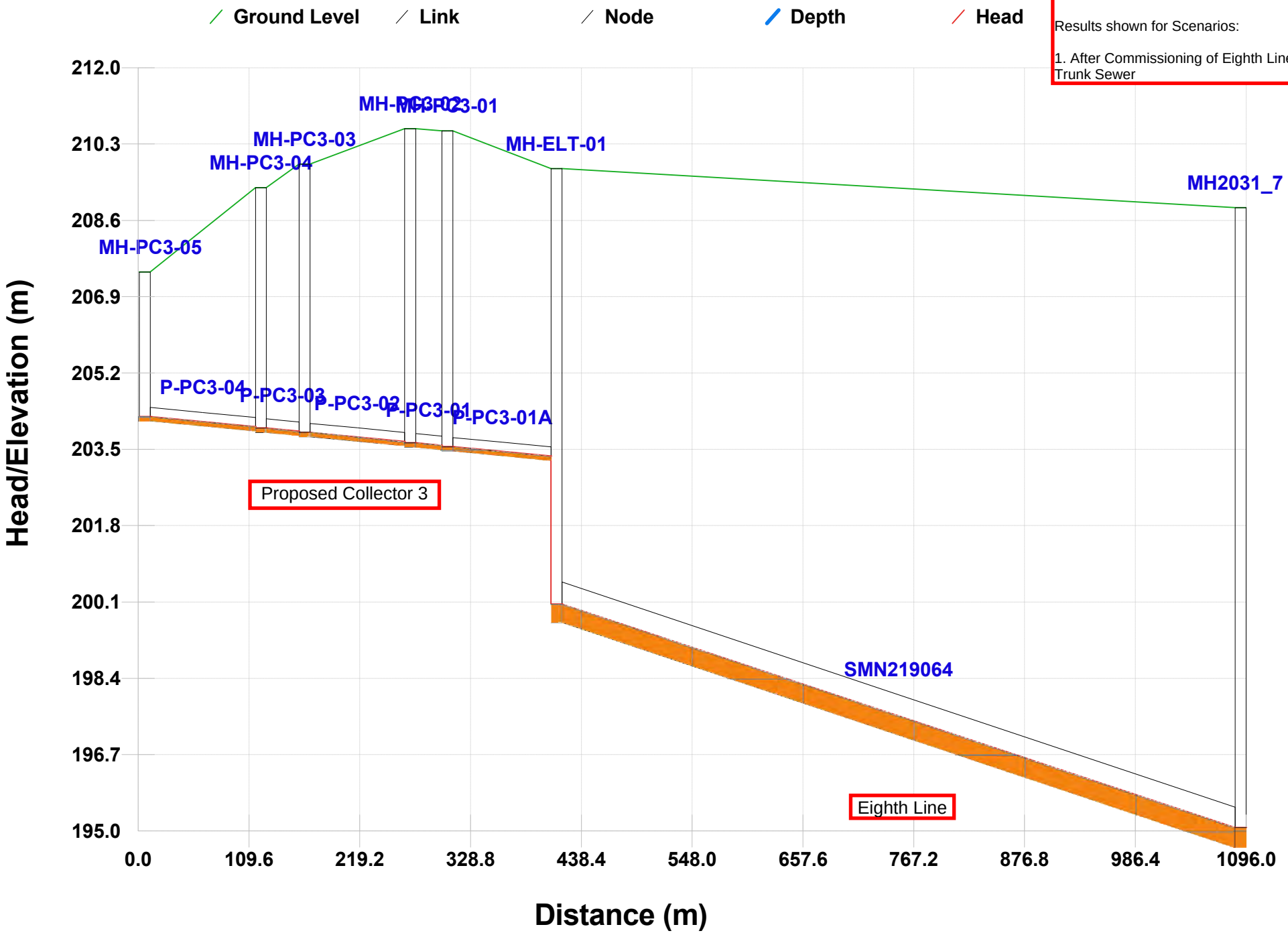


Steady-State HGL Profile of Links P-PC3-04,P-PC3-03,...,SMN219064

InfoSewer Pipe Profile Graph
Proposed Collector Road 3
(Flowing Towards Eighth Line Trunk Sewer)

Results shown for Scenarios:

1. After Commissioning of Eighth Line Trunk Sewer

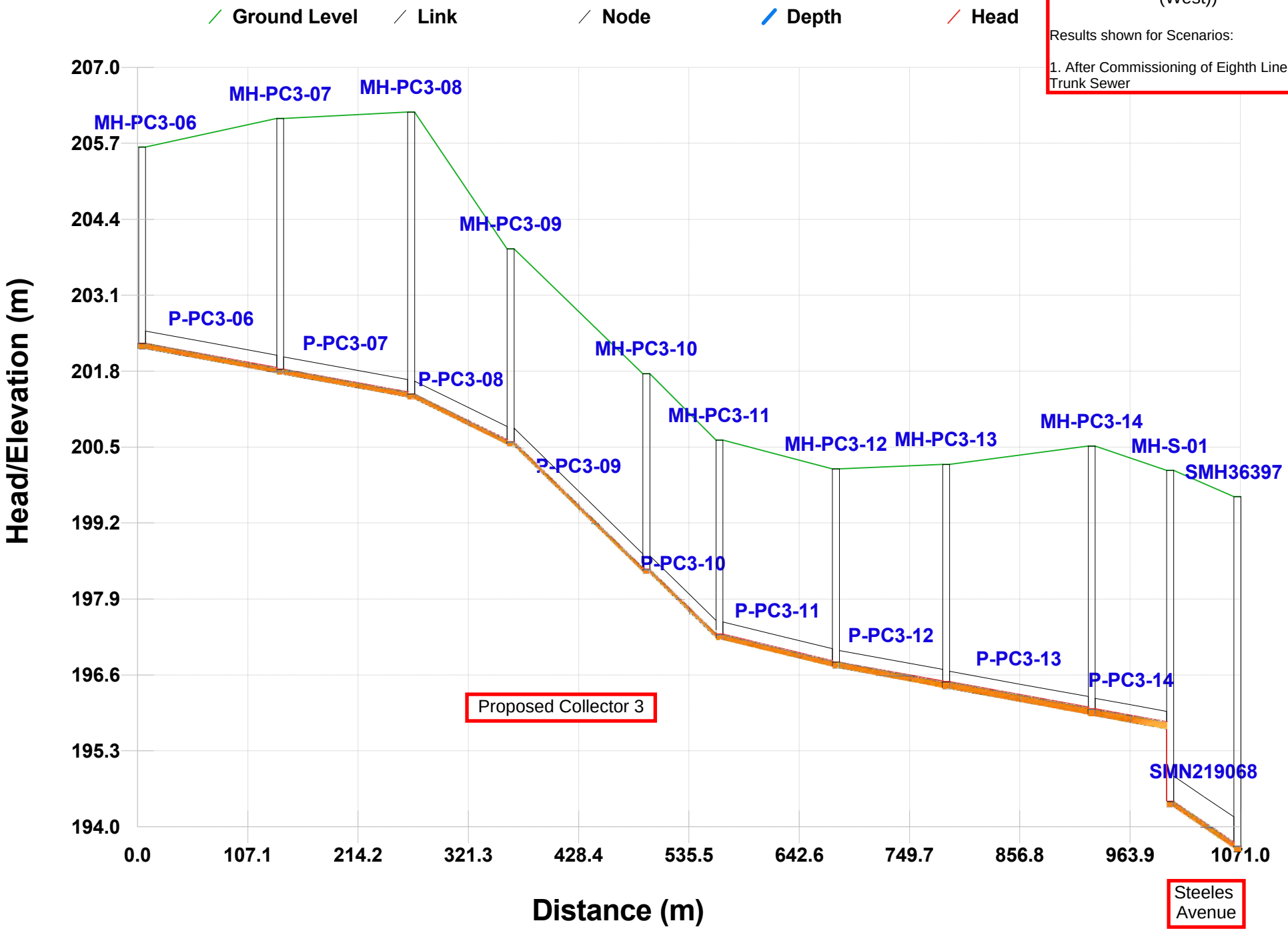


Steady-State HGL Profile of Links P-PC3-06,P-PC3-07,...,SMN219068

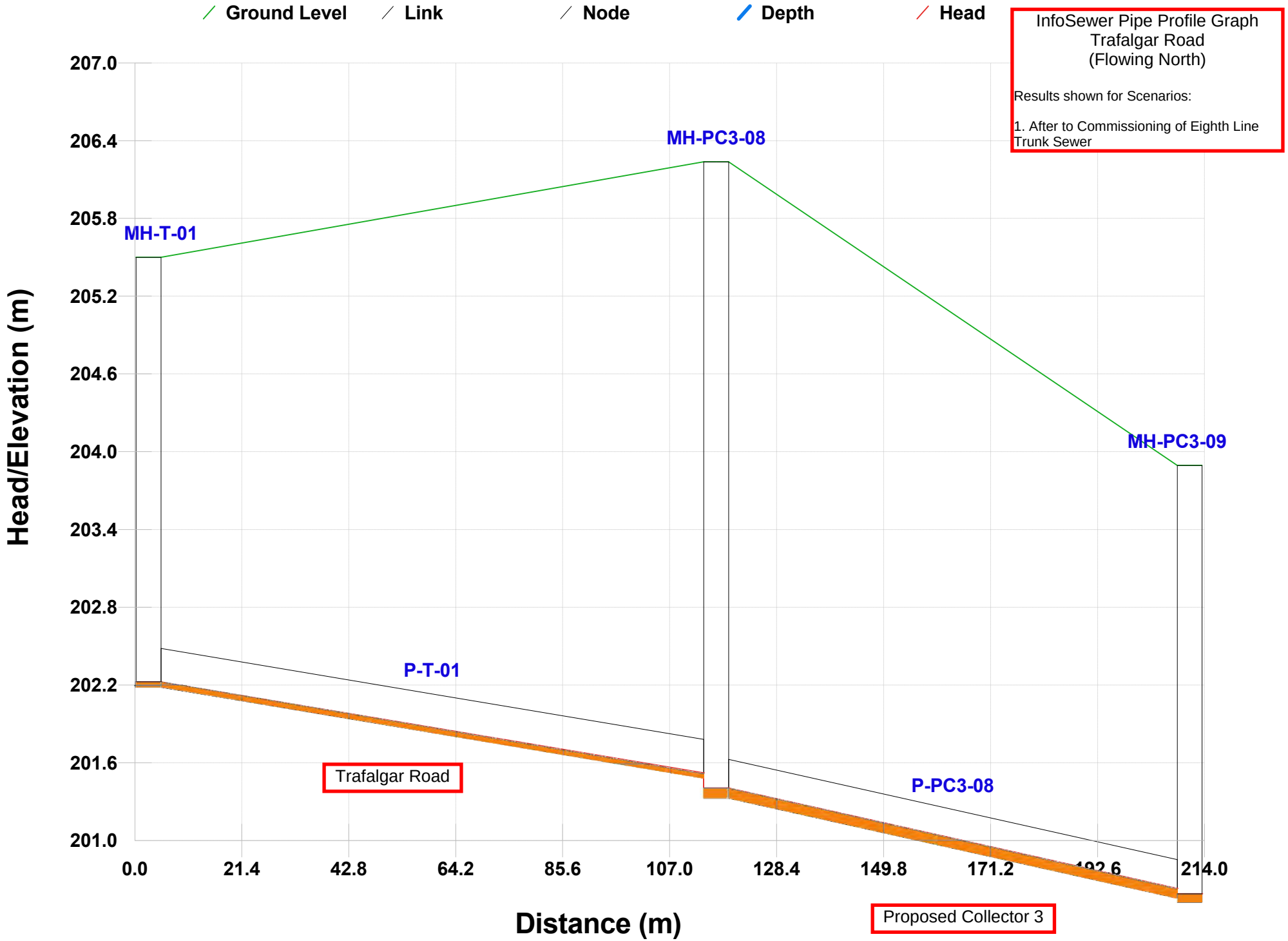
InfoSewer Pipe Profile Graph
Proposed Collector Road 3
(Flowing Towards Steeles Avenue (West))

Results shown for Scenarios:

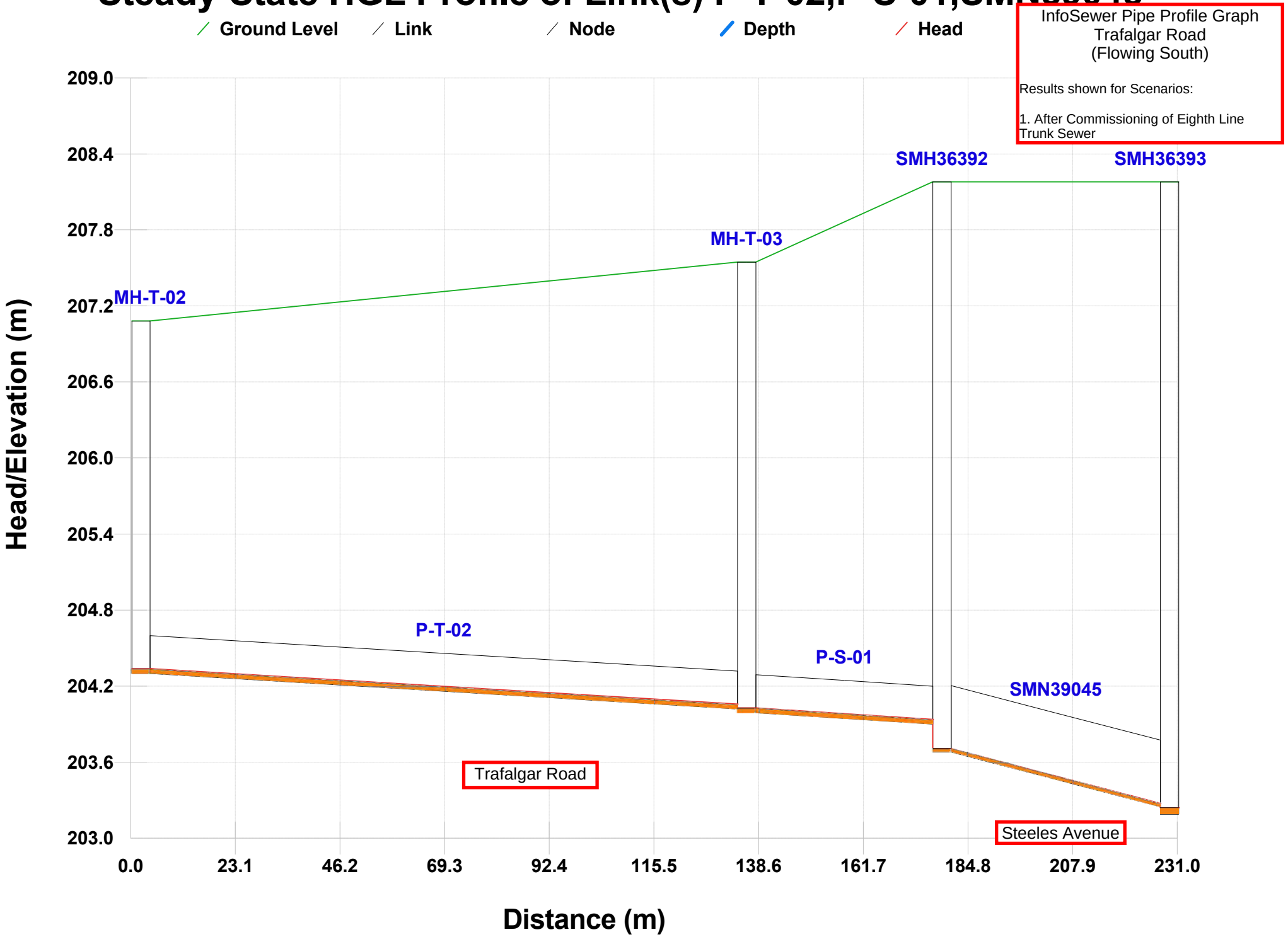
1. After Commissioning of Eighth Line Trunk Sewer



Steady-State HGL Profile of Link(s) P-T-01,P-PC3-08



Steady-State HGL Profile of Link(s) P-T-02,P-S-01,SMN39045

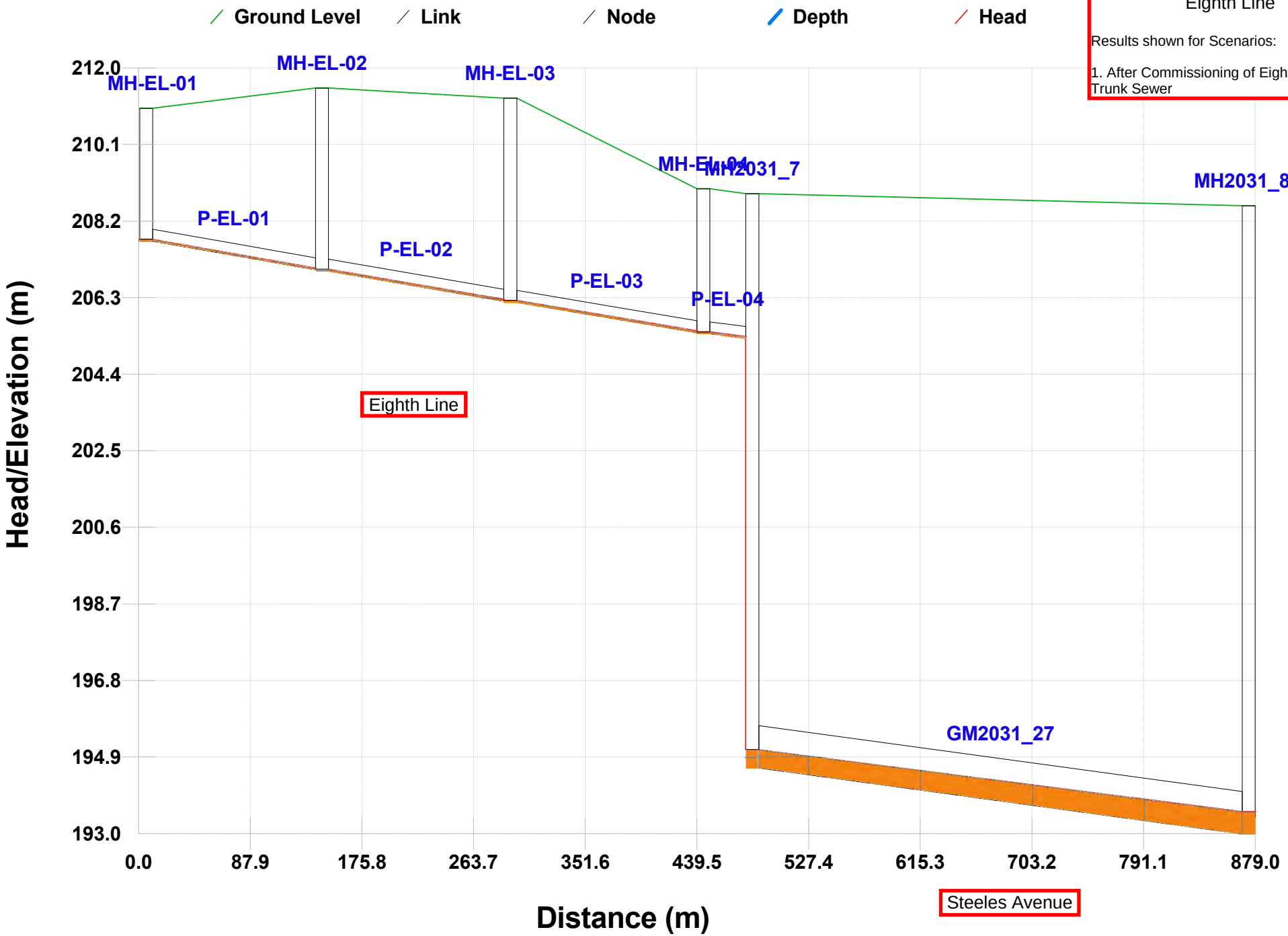


Steady-State HGL Profile of Links P-EL-01,P-EL-02,...,GM2031 27

InfoSewer Pipe Profile Graph
Eighth Line

Results shown for Scenarios:

1. After Commissioning of Eighth Line Trunk Sewer



Appendix F - Cost Estimates

Costing for Premier Gateway Employment Area - Phase 1B - Area Servicing Plan - Preliminary Cost Estimate
Water and Wastewater Unit Rates (based on 2017 DC Water and Wastewater Background Study)

2018 Unit Costs

101.76% x 2016 DC Study Costs

Sewer Unit Costs

5 m depth

Diameter (mm)	Total Unit Cost (Inflated to Q4 2017) (2018 $/m)	Total Unit Cost (2017 DC Study) (2016 $/m)
300	$ 629.00	$ 618
375	$ 670.00	$ 659
450	$ 728.00	$ 715
525	$ 783.00	$ 769
600	$ 1,007.00	$ 990
675	$ 1,229.00	$ 1,208
750	$ 1,355.00	$ 1,331
825	$ 1,453.00	$ 1,428
900	$ 1,710.00	$ 1,680
975	$ 1,835.00	$ 1,804
1050	$ 2,030.00	$ 1,995
1200	$ 2,279.00	$ 2,239
1350	$ 2,497.00	$ 2,454
1500	$ 2,800.00	$ 2,752
1800	$ 3,557.00	$ 3,496
2100	$ 4,398.00	$ 4,322
2400	$ 5,416.00	$ 5,323
3000	$ 7,554.00	$ 7,424

Sewer Unit Costs

10 m depth

Diameter (mm)	Total Unit Cost (2016 $/m)	Total Unit Cost (2017 DC Study) (2016 $/m)
300	$ 2,655.00	$ 2,609
375	$ 2,733.00	$ 2,686
450	$ 2,831.00	$ 2,782
525	$ 2,921.00	$ 2,871
600	$ 3,194.00	$ 3,139
675	$ 3,512.00	$ 3,452
750	$ 3,677.00	$ 3,613
825	$ 3,818.00	$ 3,752
900	$ 4,177.00	$ 4,105
975	$ 4,328.00	$ 4,253
1050	$ 4,634.00	$ 4,554
1200	$ 4,955.00	$ 4,870
1350	$ 5,277.00	$ 5,186
1500	$ 5,603.00	$ 5,506
1800	$ 6,508.00	$ 6,396
2100	$ 7,569.00	$ 7,438
2400	$ 8,736.00	$ 8,585
3000	$ 11,140.00	$ 10,947

Contingencies

Geotech / Hydrog / Studies	7%
Engineering / Halton Review	15%
Construction Contingency	10%

Land Value (Permanent Easement)

	per square foot
$74.15	per square metres

Land Value (Permanent Easement) based on 50% of land value for low-density use established for recent GMBP projects:
Low-Density: $600,000/acre
Apartment: $2,000,000/acre
Industrial: $850,000/acre
Commercial: $1,500,000/acre

Assume easement width of: 6.00 m

Sewer Trenchless Crossings

For Creeks & Trans Canada

Length = 20

Diameter	2018 $ Cost	2016 $ Cost
200	$ 67,160.00	$66,000
250	$ 67,160.00	$66,000
300	$ 67,160.00	$66,000
375	$ 168,918.00	$166,000
450	$ 199,445.00	$196,000
525	$ 199,445.00	$196,000
600	$ 199,445.00	$196,000
675	$ 250,324.00	$246,000
750	$ 250,324.00	$246,000
825	$ 321,554.00	$316,000
900	$ 372,433.00	$366,000
975	$ 372,433.00	$366,000
1050	$ 423,312.00	$416,000
1200	$ 423,312.00	$416,000
1350	$ 488,436.00	$480,000
1500	$ 488,436.00	$480,000
1650	$ 488,436.00	$480,000
1800	#N/A	#N/A
2100	#N/A	#N/A
2400	#N/A	#N/A
3000	#N/A	#N/A

For Regional Roads, Rail and Hydro Corridors

Length = 60

Diameter	2018 $ Cost	2016 $ Cost
200	$ 120,074.00	$118,000
250	$ 120,074.00	$118,000
300	$ 120,074.00	$118,000
375	$ 425,347.00	$418,000
450	$ 455,874.00	$448,000
525	$ 455,874.00	$448,000
600	$ 455,874.00	$448,000
675	$ 506,753.00	$498,000
750	$ 506,753.00	$498,000
825	$ 720,444.00	$708,000
900	$ 771,322.00	$758,000
975	$ 771,322.00	$758,000
1050	$ 822,201.00	$808,000
1200	$ 822,201.00	$808,000
1350	$ 1,017,576.00	$1,000,000
1500	$ 1,017,576.00	$1,000,000
1650	$ 1,017,576.00	$1,000,000
1800	#N/A	#N/A
2100	#N/A	#N/A
2400	#N/A	#N/A
3000	#N/A	#N/A

For Freeways, Major Creek Crossings

Length = 150

Diameter	2018 $ Cost	2016 $ Cost
200	$ 239,130.00	$235,000
250	$ 239,130.00	$235,000
300	$ 239,130.00	$235,000
375	$ 1,002,312.00	$985,000
450	$ 1,032,839.00	$1,015,000
525	$ 1,032,839.00	$1,015,000
600	$ 1,032,839.00	$1,015,000
675	$ 1,083,718.00	$1,065,000
750	$ 1,083,718.00	$1,065,000
825	$ 1,617,945.00	$1,590,000
900	$ 1,668,824.00	$1,640,000
975	$ 1,668,824.00	$1,640,000
1050	$ 1,719,703.00	$1,690,000
1200	$ 1,719,703.00	$1,690,000
1350	$ 2,208,139.00	$2,170,000
1500	$ 2,208,139.00	$2,170,000
1650	$ 2,208,139.00	$2,170,000
1800	#N/A	#N/A
2100	#N/A	#N/A
2400	#N/A	#N/A
3000	#N/A	#N/A

Manhole unit rates

Pipe Diam	MH Diam	Spacing	Cost 5m	Cost 10m	Cost 5m	Cost 10m
375-600	1500	100	$12,501	$20,752	$12,501	$20,752
675-825	1800	100	$19,869	$32,983	$19,869	$32,983

Manhole Costs

Diameter	Manhole	Cost	2018 $ Cost 10m deep Cost	2018 $ Cost 5m deep	2016 $ Cost 10m deep Cost	2016 $ Cost 5m deep
200	1200	$20,752	$20,352.00	$11,193.00	$20,000	$11,000
250	1200	$20,752	$20,352.00	$11,193.00	$20,000	$11,000
300	1200	$20,752	$20,352.00	$11,193.00	$20,000	$11,000
325	1200	$20,752	$20,352.00	$11,193.00	$20,000	$11,000
350	1200	$20,752	$20,352.00	$11,193.00	$20,000	$11,000
375	1200	$20,752	$20,352.00	$11,193.00	$20,000	$11,000
450	1500	$20,752	$35,615.00	$25,439.00	$35,000	$25,000
525	1500	$20,752	$35,615.00	$25,439.00	$35,000	$25,000
600	1500	$20,752	$35,615.00	$25,439.00	$35,000	$25,000
675	1800	$32,983	$61,055.00	$40,703.00	$60,000	$40,000
750	1800	$32,983	$61,055.00	$40,703.00	$60,000	$40,000
825	1800	$32,983	$61,055.00	$40,703.00	$60,000	$40,000
900	2400	$57,446	$86,494.00	$50,879.00	$85,000	$50,000
975	2400	$57,446	$86,494.00	$50,879.00	$85,000	$50,000
1050	3000	$64,702	$111,933.00	$61,055.00	$110,000	$60,000
1200	3000	$64,702	$111,933.00	$61,055.00	$110,000	$60,000
1350	3000	$64,702	$111,933.00	$61,055.00	$110,000	$60,000
1500	3000	$64,702	$111,933.00	$61,055.00	$110,000	$60,000
1650	3000	$64,702	$111,933.00	$61,055.00	$110,000	$60,000
1800	Special Construction	$83,153	#N/A	#N/A	#N/A	#N/A
2100	Special Construction	$83,153	#N/A	#N/A	#N/A	#N/A
2400	Special Construction	$83,153	#N/A	#N/A	#N/A	#N/A
3000	Special Construction	$83,153	#N/A	#N/A	#N/A	#N/A

Assuming for Crossings all Manholes are 5-10m deep

Costing for Premier Gateway Employment Area - Phase 1B - Area Servicing Plan - Preliminary Cost Estimate
Water and Wastewater Unit Rates (based on 2017 DC Water and Wastewater Background Study)

Forcemain/Watermain Trenchless Crossings

Creeks & Trans Canada		
Length =	20	
Diameter	2018 $ Cost	2016 $ Cost
150	$ 29,510.00	$29,000
200	$ 30,527.00	$30,000
250	$ 30,527.00	$30,000
300	$ 37,650.00	$37,000
350	$ 45,791.00	$45,000
400	$ 206,568.00	$203,000
450	$ 211,656.00	$208,000
500	$ 223,867.00	$220,000
600	$ 252,359.00	$248,000
750	$ 301,202.00	$296,000
900	$ 384,644.00	$378,000
1050	$ 446,716.00	$439,000
1200	$ 515,911.00	$507,000

Regional Roads, Rail and Hydro Corridors		
Length=	60	
Diameter	2018 $ Cost	2016 $ Cost
150	$ 82,424.00	$81,000
200	$ 83,441.00	$82,000
250	$ 83,441.00	$82,000
300	$ 90,564.00	$89,000
350	$ 98,705.00	$97,000
400	$ 462,997.00	$455,000
450	$ 468,085.00	$460,000
500	$ 480,296.00	$472,000
600	$ 508,788.00	$500,000
750	$ 557,632.00	$548,000
900	$ 783,533.00	$770,000
1050	$ 845,605.00	$831,000
1200	$ 914,801.00	$899,000

Freeways, Major Creek Crossings		
Length=	150	150
Diameter	2018 $ Cost	2016 $ Cost
150	$ 201,480.00	$198,000
200	$ 202,498.00	$199,000
250	$ 202,498.00	$199,000
300	$ 209,621.00	$206,000
350	$ 217,761.00	$214,000
400	$ 1,039,962.00	$1,022,000
450	$ 1,045,050.00	$1,027,000
500	$ 1,057,261.00	$1,039,000
600	$ 1,085,753.00	$1,067,000
750	$ 1,134,597.00	$1,115,000
900	$ 1,681,035.00	$1,652,000
1050	$ 1,743,107.00	$1,713,000
1200	$ 1,812,302.00	$1,781,000

Forcemain / Watermain Valve Costs

Diameter (mm)	Cost 2012$	Cost 2016$ Inflated from 2012	2018 $ Cost	2016 $ Cost
150	$1,445	$1,595	$ 1,628.00	$ 1,600
200	$1,779	$1,965	$ 2,035.00	$ 2,000
250	$1,996	$2,203	$ 2,239.00	$ 2,200
300	$5,199	$5,741	$ 5,597.00	$ 5,500
350	$8,403	$9,278	$ 10,176.00	$ 10,000
400	$34,907	$38,540	$ 35,615.00	$ 35,000
450	$37,319	$41,204	$ 40,703.00	$ 40,000
500	$42,607	$47,041	$ 45,791.00	$ 45,000
600	$55,440	$61,210	$ 55,967.00	$ 55,000
750	$77,154	$85,184	$ 86,494.00	$ 85,000
900	$82,339	$90,909	$ 91,582.00	$ 90,000
1050	$110,161	$121,627	$ 111,933.00	$ 110,000
1200	$140,859	$155,519	$ 142,461.00	$ 140,000
1350			$ 152,636.00	$ 150,000
1500			$ 178,076.00	$ 175,000
1650			$ 203,515.00	$ 200,000
1800			$ 228,955.00	$ 225,000
2100			$ 254,394.00	$ 250,000

Watermain & Forcemain Unit Costs

5 m depth

Diameter (mm)	Total Unit Cost (2018 $/m)	Total Unit Cost (2016 $/m)
400	$ 883.00	$ 868
450	$ 985.00	$ 968
500	$ 1,123.00	$ 1,104
600	$ 1,332.00	$ 1,309
750	$ 1,593.00	$ 1,565
900	$ 1,979.00	$ 1,944
1050	$ 2,287.00	$ 2,248
1200	$ 2,702.00	$ 2,655
1350	$ 3,273.00	$ 3,216
1500	$ 3,625.00	$ 3,562
1650	$ 4,203.00	$ 4,131
1800	$ 4,686.00	$ 4,605
2100	$ 5,345.00	$ 5,253

Facilities

	2018 $ Cost	2018 $ Cost	
Reservoirs - New	$915,818.00	$900,000	($/ML)
Reservoirs - Expansion			($/ML)
Water PS ≤ 150L/s	$23,404.00	$23,000	($/L/s)
Water PS > 150 L/s ≤ 600 L/s	$13,228.00	$13,000	($/L/s)
Wastewater PS > 150 L/s ≤ 600 L/s	$13,228.00	$13,000	($/L/s)
Wastewater PS >600 L/s	$11,193.00	$11,000	($/L/s)
WWTP			

Tunneling Unit Costs

Nom. Pipe Size (mm)	Total Unit Cost (2015 $/m)
1050	0
1200	0
1350	0
1500	0
1650	0
1800	0
1950	0
2100	0
2250	0
2400	0
2550	0
2700	0
3000	0

Tunelling Construction Costs

Diameter	Cost 2012$-PEEL	Cost 2016$ - Inflated from 2012 - PEEL	Cost 2012$ - HALTON	Cost 2016$ Inflated from 2012 - HALTON	2018 $ Cost	2016 $ Cost
150	$ 1,100	$ 1,214	$ 1,000	$ 1,104	$ 1,323.00	$ 1,300
200	$ 1,100	$ 1,214	$ 1,000	$ 1,104	$ 1,323.00	$ 1,300
250	$ 1,100	$ 1,214	$ 1,000	$ 1,104	$ 1,323.00	$ 1,300
300	$ 1,100	$ 1,214	$ 1,000	$ 1,104	$ 1,323.00	$ 1,300
325	$ 1,100	$ 1,214	$ 1,000	$ 1,104	$ 1,323.00	$ 1,300
350	$ 1,100	$ 1,214	$ 1,000	$ 1,104	$ 1,323.00	$ 1,300
375	$ 5,020	$ 5,543	$ 4,564	$ 5,039	$ 6,411.00	$ 6,300
400	$ 5,210	$ 5,752	$ 4,736	$ 5,229	$ 6,411.00	$ 6,300
450	$ 5,588	$ 6,170	$ 5,080	$ 5,609	$ 6,411.00	$ 6,300
500	$ 5,967	$ 6,588		$ -	$ 6,411.00	$ 6,300
525	$ 6,156	$ 6,797	$ 5,597	$ 6,180	$ 6,411.00	$ 6,300
600	$ 6,725	$ 7,425	$ 6,113	$ 6,749	$ 6,411.00	$ 6,300
675	$ 7,293	$ 8,052	$ 6,630	$ 7,320	$ 6,411.00	$ 6,300
750	$ 7,861	$ 8,679	$ 7,146	$ 7,890	$ 6,411.00	$ 6,300
825	$ 8,429	$ 9,306	$ 7,663	$ 8,461	$ 9,972.00	$ 9,800
900	$ 8,997	$ 9,934	$ 8,179	$ 9,030	$ 9,972.00	$ 9,800
975	$ 9,565	$ 10,561	$ 8,696	$ 9,601	$ 9,972.00	$ 9,800
1050	$ 10,134	$ 11,188	$ 9,212	$ 10,171	$ 9,972.00	$ 9,800
1200	$ 11,270	$ 12,443	$ 10,245	$ 11,311	$ 9,972.00	$ 9,800
1350	$ 12,406	$ 13,697	$ 11,278	$ 12,452	$ 13,228.00	$ 13,000
1500	$ 13,543	$ 14,952	$ 12,311	$ 13,592	$ 13,228.00	$ 13,000
1650	$ 14,679	$ 16,207	$ 13,344	$ 14,733	$ 13,228.00	$ 13,000
1800	$ 15,815	$ 17,461	$ 14,377	$ 15,873	$ 13,228.00	$ 13,000
2100	$ 18,088	$ 19,970	$ 16,443	$ 18,154	$ 13,228.00	$ 13,000
2400	$ 20,360	$ 22,480	$ 18,510	$ 20,437	$ 13,228.00	$ 13,000
3000	$ 24,906	$ 27,498	$ 22,642	$ 24,999	$ 13,228.00	$ 13,000

Premier Gateway Employment Area - Phase 1B - Area Servicing Plan - Cost Estimate
Proposed Water Infrastructure

								A		B		C		D	E	F=A+B+C+D+E	G	H=F+G	I	J	K	L=H+I+J+K	
Road	PROJECT #	FROM_	TO	NOTES	LENGTH (m)	DIAMETER (mm)	Unit Cost	Base Cost ($)	Construction Uplift (%)	Construction Uplift ($)	Urban Uplift (%)	Urban Uplift ($)	# Valves	Valves ($)	Crossings ($)	Construction Sub-Total ($)	10% Construction Contingency ($)	Construction Total ($)	Geotech/ Hydrog Requirements	Property / Easement	15% Engineering Contingency	Total Estimated Cost	Comments
DC ELIGIBLE - Region Project 6641 - 4	**DC ELIGIBLE - Region Project 6641 - 400 mm WM on Hornby Rd from Steeles Ave to Trafalgar Rd (Zone 250)**																						
Hornby Road	MP-6641-1	SH-J-107	WFT148659	Constrained	555	400	$ 883	$ 490,286	50%	$245,143	50%	$ 245,143	1	$ 35,615		$ 1,016,187	$ 101,619	$ 1,117,806	$ 78,246		$ 167,671	$ 1,363,724	
Hornby Road	MP-6641-2	SH-J-107	SH-J-181	Constrained	506	400	$ 883	$ 446,956	50%	$223,478	50%	$ 223,478	1	$ 35,615		$ 929,526	$ 92,953	$ 1,022,479	$ 71,574		$ 153,372	$ 1,247,424	
TOTAL DC ELIGIBLE	**TOTAL DC ELIGIBLE**				**1,061**			**$ 937,242**		**$ 468,621**		**$ 468,621**		**$ 71,230**		**$ 1,945,714**	**$ 194,571**	**$ 2,140,285**	**$ 149,820**	**$ -**	**$ 321,043**	**$ 2,611,148**	
LOCAL DISTRIBUTION WATERMAIN	**LOCAL DISTRIBUTION WATERMAIN**																						
Proposed Collector 3	MP-6642	SH-J-111	J-GMBP-8	Somewhat Constrained	577	300	$ 700	$ 404,075	15%	$60,611	0%	$ -	1	$ 5,597	$37,650	$ 507,933	$ 50,793	$ 558,726	$ 39,111		$ 83,809	$ 681,646	
MP-6643	MP-6643	SH-J-113	J-GMBP-0	Somewhat Constrained	546	400	$ 883	$ 481,687	15%	$72,253	0%	$ -	1	$ 35,615		$ 589,556	$ 58,956	$ 648,511	$ 45,396		$ 97,277	$ 791,184	
Proposed Collector 3	P-GMBP-0	J-GMBP-8	WFT148680	Unconstrained	175	300	$ 700	$ 122,433	0%	$0	0%	$ -	1	$ 5,597		$ 128,030	$ 12,803	$ 140,833	$ 9,858		$ 21,125	$ 171,817	
Eighth Line	P-GMBP-1	WFT349713	J-GMBP-0	Constrained	656	300	$ 700	$ 459,159	50%	$229,580	25%	$ 114,790	1	$ 5,597		$ 809,126	$ 80,913	$ 890,039	$ 62,303		$ 133,506	$ 1,085,847	
Sixth Line	P-GMBP-12	J-GMBP-5	WCV83896	Constrained	627	300	$ 700	$ 438,893	50%	$219,447	25%	$ 109,723	1	$ 5,597		$ 773,660	$ 77,366	$ 851,026	$ 59,572		$ 127,654	$ 1,038,252	
Trafalgar Road	P-GMBP-13	SH-J-111	WFT349697	Constrained	600	300	$ 700	$ 420,239	50%	$210,120	50%	$ 210,120	1	$ 5,597	$75,300	$ 921,376	$ 92,138	$ 1,013,513	$ 70,946		$ 152,027	$ 1,236,486	
Hornby Road	P-GMBP-14	WFT-F-1060	SH-J-181	Constrained	319	400	$ 883	$ 281,840	50%	$140,920	25%	$ 70,460	1	$ 35,615		$ 528,836	$ 52,884	$ 581,719	$ 40,720		$ 87,258	$ 709,697	
Proposed Collector 3	P-GMBP-2	J-GMBP-0	SH-J-111	Somewhat Constrained	731	300	$ 700	$ 511,372	15%	$76,706	0%	$ -	1	$ 5,597	$37,650	$ 631,325	$ 63,133	$ 694,458	$ 48,612		$ 104,169	$ 847,238	
Proposed Collector 2	P-GMBP-4	SH-J-181	J-GMBP-1	Somewhat Constrained	647	300	$ 700	$ 452,653	15%	$67,898	0%	$ -	1	$ 5,597		$ 526,148	$ 52,615	$ 578,763	$ 40,513		$ 86,814	$ 706,090	
Proposed Collector 1 Option 2	P-GMBP-5	J-GMBP-1	J-GMBP-2	Unconstrained	185	300	$ 700	$ 129,593	0%	$0	0%	$ -	1	$ 5,597	$37,650	$ 172,840	$ 17,284	$ 190,124	$ 13,309		$ 28,519	$ 231,952	
Proposed Collector 2	P-GMBP-6	J-GMBP-1	WFT220855	Somewhat Constrained	636	300	$ 700	$ 445,530	15%	$66,829	0%	$ -	1	$ 5,597		$ 517,956	$ 51,796	$ 569,752	$ 39,883		$ 85,463	$ 695,097	
Proposed Collector 1 Option 2	P-GMBP-7	J-GMBP-2	J-GMBP-3	Unconstrained	551	300	$ 700	$ 385,701	0%	$0	0%	$ -	1	$ 5,597	$37,650	$ 428,948	$ 42,895	$ 471,842	$ 33,029		$ 70,776	$ 575,648	
Proposed Collector 1 Option 2	P-GMBP-8	J-GMBP-3	J-GMBP-5	Somewhat Constrained	336	300	$ 700	$ 235,156	15%	$35,273	0%	$ -	1	$ 5,597	$37,650	$ 313,677	$ 31,368	$ 345,045	$ 24,153	$74,711	$ 51,757	$ 495,665	
TOTAL LOCAL DISTRIBUTION WATER	**TOTAL LOCAL DISTRIBUTION WATERMAIN**				**6,586**			**$4,768,333**		**$ 1,179,637**		**$ 505,093**		**$ 132,797**		**$ 6,849,410**	**$ 684,941**	**$ 7,534,351**	**$ 527,405**	**$ 74,711**	**$ 1,130,153**	**$ 9,266,619**	
TOTAL WATERMAIN (Including Provi	**TOTAL WATERMAIN (Including Provisional)**				**7,647**			**$5,705,575**		**$ 1,648,258**		**$ 973,714**		**$ 204,027**		**$ 8,795,124**	**$ 879,512**	**$ 9,674,636**	**$ 677,225**	**$ 74,711**	**$ 1,451,195**	**$ 11,877,767**	

Premier Gateway Employment Area - Phase 1B - Area Servicing Plan - Preliminary Cost Estimate
Proposed Wastewater Infrastructure
Prior to Commissioning fo Eighth Line Trunk Sewer

												A		B		C			E	F=A+B+C+E		G	H=F+G	I	J	K	L=H+I+J+K	
Road	PROJECT #	FROM_G.E.	TO_G.E.	FROM_INV	TO_INV	NOTES	TYPE	LENGTH (m)	DIAMETER (mm)	AVG DEPTH (m)	Unit Cost (by depth)	Base Cost ($)	Construction Uplift (%)	Construction Uplift ($)	Urban Uplift (%)	Urban Uplift ($)	# MHs	MH Cost ($)	Crossings ($)	Construction Sub-Total ($)	Construction Contingency (%)	Construction Contingency ($)	Construction Total ($)	Geotech/ Hydrog Requirements	Property / Easement	Engineering Contingency	Total Estimated Cost	Comments
LOCAL SANITARY SEWER																												
Proposed Collector 1 Option 2	P-PC1O2-01D	199.5	200.16	194.348782	194.08123	Somewhat Constrained		133.78	300	5.61	$ 2,655	$ 355,175	15%	$ 53,276	0%	$ -	1	$ 20,352		$ 428,804	10%	$ 42,880	$ 471,684	$ 33,018	$ 37,355	$ 70,753	$ 612,810	
Sixth Line	P-SL-01	200.16	198.87	194.02123	193.740668	Constrained		140.28	300	5.63	$ 2,655	$ 372,446	50%	$ 186,223	25%	$ 93,112	1	$ 20,352		$ 672,133	10%	$ 67,213	$ 739,346	$ 51,754		$ 110,902	$ 902,002	
Sixth Line	P-SL-02	198.87	198.17	193.710668	193.426992	Constrained		141.84	300	4.95	$ 629	$ 89,216	50%	$ 44,608	25%	$ 22,304	1	$ 11,193		$ 167,321	10%	$ 16,732	$ 184,053	$ 12,884		$ 27,608	$ 224,545	
Sixth Line	P-SL-03	198.17	199.51	193.396992	193.090802	Constrained		153.10	300	5.60	$ 2,655	$ 406,467	50%	$ 203,234	25%	$ 101,617	1	$ 20,352		$ 731,670	10%	$ 73,167	$ 804,837	$ 56,339		$ 120,725	$ 981,901	
Sixth Line	P-SL-04	199.51	200	193.060802	192.762352	Constrained		149.23	300	6.84	$ 2,655	$ 396,192	50%	$ 198,096	25%	$ 99,048	1	$ 20,352		$ 713,689	10%	$ 71,369	$ 785,058	$ 54,954		$ 117,759	$ 957,770	
Sixth Line	P-SL-05	200	198.3	192.732352	192.675	Constrained		28.68	300	6.45	$ 2,655	$ 76,135	50%	$ 38,067	25%	$ 19,034	1	$ 20,352		$ 153,588	10%	$ 15,359	$ 168,947	$ 11,826		$ 25,342	$ 206,115	
Proposed Collector 1 Option 2	P-PC1O2-01B	200.031	199.887	195.938714	195.707706	Unconstrained		115.50	300	4.14	$ 629	$ 72,652	0%	$ -	0%	$ -	1	$ 11,193		$ 83,845	10%	$ 8,385	$ 92,230	$ 6,456	$ 37,355	$ 13,834	$ 149,875	
Proposed Collector 1 Option 2	P-PC1O2-01A	199.887	199.258	195.677706	195.467618	Unconstrained		105.04	300	4.00	$ 629	$ 66,073	0%	$ -	0%	$ -	1	$ 11,193		$ 77,266	10%	$ 7,727	$ 84,992	$ 5,949		$ 12,749	$ 103,691	
Proposed Collector 1 Option 2	P-PC1O2-01	199.258	198.254	195.437618	194.894338	Unconstrained		135.82	300	3.59	$ 629	$ 85,431	0%	$ -	0%	$ -	1	$ 11,193		$ 96,624	10%	$ 9,662	$ 106,286	$ 7,440		$ 15,943	$ 129,669	
Proposed Collector 1 Option 2	P-PC1O2-02	198.254	198.244	194.864338	194.565258	Unconstrained		149.54	300	3.53	$ 629	$ 94,061	0%	$ -	0%	$ -	1	$ 11,193		$ 105,254	10%	$ 10,525	$ 115,779	$ 8,105		$ 17,367	$ 141,250	
Proposed Collector 1 Option 2	P-PC1O2-03	198.244	199.975	194.535258	194.227218	Unconstrained		154.02	300	4.73	$ 629	$ 96,879	0%	$ -	0%	$ -	1	$ 11,193		$ 108,072	10%	$ 10,807	$ 118,879	$ 8,322		$ 17,832	$ 145,032	
Proposed Collector 1 Option 2	P-PC1O2-04	199.975	199.194	194.197218	194.117518	Unconstrained		39.85	300	5.43	$ 2,655	$ 105,802	0%	$ -	0%	$ -	1	$ 20,352	$ 67,160	$ 193,314	10%	$ 19,331	$ 212,645	$ 14,885		$ 31,897	$ 259,427	
Proposed Collector 1 Option 2	P-PC1O2-05	199.194	198.056	192.5	192.22314	Unconstrained		138.43	300	6.26	$ 2,655	$ 367,532	0%	$ -	0%	$ -	1	$ 20,352		$ 387,884	10%	$ 38,788	$ 426,672	$ 29,867		$ 64,001	$ 520,540	
Proposed Collector 2	P-PC2-01	202.229	200.993	198.9115	197.62736	Unconstrained		116.74	300	3.34	$ 629	$ 73,429	0%	$ -	0%	$ -	1	$ 11,193		$ 84,622	10%	$ 8,462	$ 93,085	$ 6,516		$ 13,963	$ 113,563	
Proposed Collector 2	P-PC2-02	200.993	200.109	197.59736	196.75856	Unconstrained		139.80	300	3.37	$ 629	$ 87,934	0%	$ -	0%	$ -	1	$ 11,193		$ 99,127	10%	$ 9,913	$ 109,040	$ 7,633		$ 16,356	$ 133,029	
Proposed Collector 2	P-PC2-03	200.109	200.698	196.72856	196.35095	Unconstrained		125.87	300	3.86	$ 629	$ 79,172	0%	$ -	0%	$ -	1	$ 11,193		$ 90,365	10%	$ 9,037	$ 99,402	$ 6,958		$ 14,910	$ 121,270	
Proposed Collector 2	P-PC2-04	200.698	198.056	196.32095	194.75435	Unconstrained		130.55	300	3.84	$ 629	$ 82,116	0%	$ -	0%	$ -	1	$ 11,193		$ 93,309	10%	$ 9,331	$ 102,640	$ 7,185		$ 15,396	$ 125,221	
Proposed Collector 2	P-PC2-05	198.056	198.35	192.22308	191.81988	Unconstrained		100.80	300	6.18	$ 2,655	$ 267,624	0%	$ -	0%	$ -	1	$ 20,352		$ 287,976	10%	$ 28,798	$ 316,774	$ 22,174		$ 47,516	$ 386,464	
Proposed Collector 2	P-PC2-06	198.35	197.643	191.78988	191.45236	Unconstrained		84.38	300	6.38	$ 2,655	$ 224,029	0%	$ -	0%	$ -	1	$ 20,352		$ 244,381	10%	$ 24,438	$ 268,819	$ 18,817		$ 40,323	$ 327,959	
Proposed Collector 2	P-PC2-07	197.643	201.96	191.42236	190.82576	Unconstrained		149.15	300	8.68	$ 2,655	$ 395,993	0%	$ -	0%	$ -	1	$ 20,352		$ 416,345	10%	$ 41,635	$ 457,980	$ 32,059		$ 68,697	$ 558,735	
Proposed Collector 2	P-PC2-08	201.96	197.158	190.79576	190.20932	Unconstrained		146.61	300	9.06	$ 2,655	$ 389,250	0%	$ -	0%	$ -	1	$ 20,352		$ 409,602	10%	$ 40,960	$ 450,562	$ 31,539		$ 67,584	$ 549,685	
Proposed Collector 2	P-PC2-09	197.158	196.085068	190.17932	189.68556	Somewhat Constrained		123.44	300	6.69	$ 2,655	$ 327,733	15%	$ 49,160	25%	$ 81,933	2	$ 40,704		$ 499,530	10%	$ 49,953	$ 549,484	$ 38,464		$ 82,423	$ 670,370	
Hornby Road	P-H-01	201.706	201	198.406	197.8228	Constrained		145.80	300	3.24	$ 629	$ 91,708	50%	$ 45,854	50%	$ 45,854	1	$ 11,193		$ 194,609	10%	$ 19,461	$ 214,070	$ 14,985		$ 32,111	$ 261,166	
Hornby Road	P-H-02	201	200.649	197.7928	197.19216	Constrained		150.16	300	3.33	$ 629	$ 94,451	50%	$ 47,225	50%	$ 47,225	1	$ 11,193		$ 200,094	10%	$ 20,009	$ 220,104	$ 15,407		$ 33,016	$ 268,527	
Hornby Road	P-H-03	200.649	200.008	197.16216	196.56908	Constrained		148.27	300	3.46	$ 629	$ 93,262	50%	$ 46,631	50%	$ 46,631	1	$ 11,193		$ 197,717	10%	$ 19,772	$ 217,488	$ 15,224		$ 32,623	$ 265,336	
Hornby Road	P-H-04	200.008	199.457382	196.53908	195.94148	Constrained		149.40	300	3.49	$ 629	$ 93,973	50%	$ 46,986	50%	$ 46,986	1	$ 11,193		$ 199,138	10%	$ 19,914	$ 219,052	$ 15,334		$ 32,858	$ 267,243	
Proposed Collector 3	P-PC3-01	210.594	210.641	207.2765	207.192698	Unconstrained		27.93	300	3.38	$ 629	$ 17,570	0%	$ -	0%	$ -	1	$ 11,193		$ 28,763	10%	$ 2,876	$ 31,640	$ 2,215		$ 4,746	$ 38,601	
Proposed Collector 3	P-PC3-02	210.641	209.852	207.162698	206.35761	Unconstrained		100.64	300	3.49	$ 629	$ 63,300	0%	$ -	0%	$ -	1	$ 11,193		$ 74,493	10%	$ 7,449	$ 81,942	$ 5,736		$ 12,291	$ 99,970	
Proposed Collector 3	P-PC3-03	209.852	209.327	206.32761	206.050362	Unconstrained		34.66	300	3.40	$ 629	$ 21,799	0%	$ -	0%	$ -	1	$ 11,193		$ 32,992	10%	$ 3,299	$ 36,291	$ 2,540		$ 5,444	$ 44,275	
Proposed Collector 3	P-PC3-04	209.327	207.452	206.020362	204.005424	Unconstrained		111.94	300	3.38	$ 629	$ 70,411	0%	$ -	0%	$ -	1	$ 11,193		$ 81,604	10%	$ 8,160	$ 89,764	$ 6,283		$ 13,465	$ 109,512	
Proposed Collector 3	P-PC3-05	207.452	205.635	203.975424	202.216624	Unconstrained		109.93	300	3.45	$ 629	$ 69,143	0%	$ -	0%	$ -	1	$ 11,193		$ 80,336	10%	$ 8,034	$ 88,369	$ 6,186		$ 13,255	$ 107,811	
Proposed Collector 3	P-PC3-06	205.635	206.125	202.186624	201.775447	Unconstrained		137.06	300	3.90	$ 629	$ 86,210	0%	$ -	0%	$ -	1	$ 11,193	$ 67,160	$ 164,563	10%	$ 16,456	$ 181,019	$ 12,671		$ 27,153	$ 220,844	
Proposed Collector 3	P-PC3-07	206.125	206.236	201.745447	201.356935	Somewhat Constrained		129.50	300	4.63	$ 629	$ 81,458	15%	$ 12,219	25%	$ 20,365	1	$ 11,193		$ 125,234	10%	$ 12,523	$ 137,758	$ 9,643		$ 20,664	$ 168,064	
Trafalgar Road	P-T-01	205.5	206.236	202.1825	201.481184	Constrained		116.89	300	4.04	$ 629	$ 73,521	50%	$ 36,761	50%	$ 36,761	2	$ 22,386		$ 169,429	10%	$ 16,943	$ 186,371	$ 13,046		$ 27,956	$ 227,373	
Proposed Collector 3	P-PC3-08	206.236	203.895	201.326935	200.553775	Somewhat Constrained		96.65	300	4.13	$ 629	$ 60,790	15%	$ 9,118	25%	$ 15,197	1	$ 11,193		$ 96,299	10%	$ 9,630	$ 105,928	$ 7,415		$ 15,889	$ 129,233	
Proposed Collector 3	P-PC3-09	203.895	201.757	200.523775	198.372575	Unconstrained		134.45	300	3.38	$ 629	$ 84,569	0%	$ -	0%	$ -	1	$ 11,193		$ 95,762	10%	$ 9,576	$ 105,338	$ 7,374		$ 15,801	$ 128,513	
Proposed Collector 3	P-PC3-10	201.757	200.62	198.342575	197.235855	Unconstrained		69.17	300	3.40	$ 629	$ 43,508	0%	$ -	0%	$ -	1	$ 11,193		$ 54,701	10%	$ 5,470	$ 60,171	$ 4,212		$ 9,026	$ 73,409	
Proposed Collector 3	P-PC3-11	200.62	200.125	197.205855	196.748255	Unconstrained		114.40	300	3.40	$ 629	$ 71,958	0%	$ -	0%	$ -	1	$ 11,193		$ 83,151	10%	$ 8,315	$ 91,466	$ 6,403		$ 13,720	$ 111,588	
Proposed Collector 3	P-PC3-12	200.125	200.206	196.718255	196.394945	Unconstrained		107.77	300	3.61	$ 629	$ 67,787	0%	$ -	0%	$ -	1	$ 11,193	$ 67,160	$ 146,140	10%	$ 14,614	$ 160,754	$ 11,253		$ 24,113	$ 196,120	
Proposed Collector 3	P-PC3-13	200.206	200.518	196.364945	195.930302	Unconstrained		144.88	300	4.21	$ 629	$ 91,130	0%	$ -	0%	$ -	1	$ 11,193		$ 102,323	10%	$ 10,232	$ 112,555	$ 7,879		$ 16,883	$ 137,318	
Proposed Collector 3	P-PC3-14	200.518	200.1	195.900302	195.676781	Somewhat Constrained		74.51	300	4.52	$ 629	$ 46,865	15%	$ 7,030	25%	$ 11,716	1	$ 11,193		$ 76,804	10%	$ 7,680	$ 84,484	$ 5,914		$ 12,673	$ 103,071	
Trafalgar Road	P-T-02	207.081	207.546	204.297196	204.018116	Constrained		139.54	300	3.16	$ 629	$ 87,771	50%	$ 43,885	50%	$ 43,885	1	$ 11,193		$ 186,734	10%	$ 18,673	$ 205,408	$ 14,379		$ 30,811	$ 250,597	
Steeles Avenue	P-S-01	207.546	207.95	203.988116	203.904	Constrained		42.06	300	3.80	$ 629	$ 26,454	50%	$ 13,227	100%	$ 26,454	1	$ 11,193		$ 77,329	10%	$ 7,733	$ 85,062	$ 5,954		$ 12,759	$ 103,776	
Eighth Line	P-EL-01	211	211.5	207.7	206.9877	Constrained		142.46	300	3.91	$ 629	$ 89,607	50%	$ 44,804	25%	$ 22,402	1	$ 11,193		$ 168,006	10%	$ 16,801	$ 184,806	$ 12,936		$ 27,721	$ 225,464	
Eighth Line	P-EL-02	211.5	211.25	206.9577	206.20975	Constrained		149.59	300	4.79	$ 629	$ 94,092	50%	$ 47,046	25%	$ 23,523	1	$ 11,193		$ 175,854	10%	$ 17,585	$ 193,440	$ 13,541		$ 29,016	$ 235,996	
Eighth Line	P-EL-03	211.25	209	206.17975	205.4313	Constrained		149.69	300	4.32	$ 629	$ 94,155	50%	$ 47,078	25%	$ 23,539	1	$ 11,193		$ 175,964	10%	$ 17,596	$ 193,561	$ 13,549		$ 29,034	$ 236,144	
Eighth Line	P-EL-04	209	208.729	205.4013	205.28253	Constrained		23.75	300	3.52	$ 629	$ 14,941	50%	$ 7,471	25%	$ 3,735	1	$ 11,193		$ 37,340	10%	$ 3,734	$ 41,074	$ 2,875		$ 6,161	$ 50,111	
TOTAL LOCAL SANITARY SEWER												**$ 6,241,774**		**$ 1,227,999**		**$ 831,322**	**49**	**$ 667,524**	**$ 201,480**	**$ 9,170,099**		**$ 917,010**	**$ 10,087,108**	**$ 706,098**	**$ 74,711**	**$ 1,513,066**	**$ 12,380,983**	

Premier Gateway Employment Area - Phase 1B - Area Servicing Plan - Preliminary Cost Estimate
Proposed Wastewater Infrastructure
After Commissioning of Eighth Line Trunk Sewer

													A		B		C			E	F=A+B+C+E		G	H=F+G	I	J	K	L=H+I+J+K	
Road	PROJECT #	FROM_G.E.	TO_G.E.	FROM_INV	TO_INV	NOTES	TYPE	LENGTH (m)	DIAMETER (mm)	AVG DEPTH (m)	Unit Cost (by depth)	Base Cost ($)	Construction Uplift (%)	Construction Uplift ($)	Urban Uplift (%)	Urban Uplift ($)	# MHs	MH Cost ($)	Crossings ($)	Construction Sub-Total ($)	Construction Contingency (%)	Construction Contingency ($)	Construction Total ($)	Geotech/ Hydrog Requirements	Property / Easement	Engineering Contingency	Total Estimated Cost	Comments
LOCAL SANITARY SEWER																													
Proposed Collector 1 Option 2	P-PC1O2-01D	199.5	200.16	194.348782	194.08123	Somewhat constrained		133.78	300	5.61	$ 2,655	$ 355,175	15%	$ 53,276	0%	$ -	1	$ 20,352		$ 428,804	10%	$ 42,880	$ 471,684	$ 33,018	$ 37,355	$ 70,753	$ 612,810	
Sixth Line	P-SL-01	200.16	198.87	194.02123	193.740668	Constrained		140.28	300	5.63	$ 2,655	$ 372,446	50%	$ 186,223	25%	$ 93,112	1	$ 20,352		$ 672,133	10%	$ 67,213	$ 739,346	$ 51,754		$ 110,902	$ 902,002	
Sixth Line	P-SL-02	198.87	198.17	193.710668	193.426992	Constrained		141.84	300	4.95	$ 629	$ 89,216	50%	$ 44,608	25%	$ 22,304	1	$ 11,193		$ 167,321	10%	$ 16,732	$ 184,053	$ 12,884		$ 27,608	$ 224,545	
Sixth Line	P-SL-03	198.17	199.51	193.396992	193.090802	Constrained		153.10	300	5.60	$ 2,655	$ 406,467	50%	$ 203,234	25%	$ 101,617	1	$ 20,352		$ 731,670	10%	$ 73,167	$ 804,837	$ 56,339		$ 120,725	$ 981,901	
Sixth Line	P-SL-04	199.51	200	193.060802	192.762352	Constrained		149.23	300	6.84	$ 2,655	$ 396,192	50%	$ 198,096	25%	$ 99,048	1	$ 20,352		$ 713,689	10%	$ 71,369	$ 785,058	$ 54,954		$ 117,759	$ 957,770	
Sixth Line	P-SL-05	200	198.3	192.732352	192.675	Constrained		28.68	300	6.45	$ 2,655	$ 76,135	50%	$ 38,067	25%	$ 19,034	1	$ 20,352		$ 153,588	10%	$ 15,359	$ 168,947	$ 11,826		$ 25,342	$ 206,115	
Proposed Collector 1 Option 2	P-PC1O2-01B	200.031	199.887	195.938714	195.707706	Unconstrained		115.50	300	4.14	$ 629	$ 72,652	0%	$ -	0%	$ -	1	$ 11,193		$ 83,845	10%	$ 8,385	$ 92,230	$ 6,456	$ 37,355	$ 13,834	$ 149,875	
Proposed Collector 1 Option 2	P-PC1O2-01A	199.887	199.258	195.677706	195.467618	Unconstrained		105.04	300	4.00	$ 629	$ 66,073	0%	$ -	0%	$ -	1	$ 11,193		$ 77,266	10%	$ 7,727	$ 84,992	$ 5,949		$ 12,749	$ 103,691	
Proposed Collector 1 Option 2	P-PC1O2-01	199.258	198.254	195.437618	194.894338	Unconstrained		135.82	300	3.59	$ 629	$ 85,431	0%	$ -	0%	$ -	1	$ 11,193		$ 96,624	10%	$ 9,662	$ 106,286	$ 7,440		$ 15,943	$ 129,669	
Proposed Collector 1 Option 2	P-PC1O2-02	198.254	198.244	194.864338	194.565258	Unconstrained		149.54	300	3.53	$ 629	$ 94,061	0%	$ -	0%	$ -	1	$ 11,193		$ 105,254	10%	$ 10,525	$ 115,779	$ 8,105		$ 17,367	$ 141,250	
Proposed Collector 1 Option 2	P-PC1O2-03	198.244	199.975	194.535258	194.227214	Unconstrained		154.02	300	4.73	$ 629	$ 96,880	0%	$ -	0%	$ -	1	$ 11,193		$ 108,073	10%	$ 10,807	$ 118,880	$ 8,322		$ 17,832	$ 145,034	
Proposed Collector 1 Option 2	P-PC1O2-04	199.975	199.194	194.197214	194.11751	Unconstrained		39.85	300	5.43	$ 2,655	$ 105,807	0%	$ -	0%	$ -	1	$ 20,352	$ 67,160	$ 193,319	10%	$ 19,332	$ 212,651	$ 14,886		$ 31,898	$ 259,434	
Proposed Collector 1 Option 2	P-PC1O2-05	199.194	198.056	192.5	192.223138	Unconstrained		138.43	300	6.26	$ 2,655	$ 367,534	0%	$ -	0%	$ -	2	$ 40,704		$ 408,238	10%	$ 40,824	$ 449,062	$ 31,434		$ 67,359	$ 547,856	
Proposed Collector 2	P-PC2-01	202.229	200.993	198.9115	197.62736	Somewhat constrained		116.74	300	3.34	$ 629	$ 73,429	15%	$ 11,014	0%	$ -	1	$ 11,193		$ 95,637	10%	$ 9,564	$ 105,201	$ 7,364		$ 15,780	$ 128,345	
Proposed Collector 2	P-PC2-02	200.993	200.109	197.59736	196.75856	Unconstrained		139.80	300	3.37	$ 629	$ 87,934	0%	$ -	0%	$ -	1	$ 11,193		$ 99,127	10%	$ 9,913	$ 109,040	$ 7,633		$ 16,356	$ 133,029	
Proposed Collector 2	P-PC2-03	200.109	200.698	196.72856	196.35095	Unconstrained		125.87	300	3.86	$ 629	$ 79,172	0%	$ -	0%	$ -	1	$ 11,193		$ 90,365	10%	$ 9,037	$ 99,402	$ 6,958		$ 14,910	$ 121,270	
Proposed Collector 2	P-PC2-04	200.698	198.056	196.32095	194.754362	Unconstrained		130.55	300	3.84	$ 629	$ 82,115	0%	$ -	0%	$ -	1	$ 11,193		$ 93,308	10%	$ 9,331	$ 102,639	$ 7,185		$ 15,396	$ 125,220	
Proposed Collector 2	P-PC2-05	198.056	198.35	192.223078	191.81989	Unconstrained		100.80	300	6.18	$ 2,655	$ 267,616	0%	$ -	0%	$ -	1	$ 20,352		$ 287,968	10%	$ 28,797	$ 316,765	$ 22,174		$ 47,515	$ 386,453	
Proposed Collector 2	P-PC2-06	198.35	197.643	191.78989	191.45237	Unconstrained		84.38	300	6.38	$ 2,655	$ 224,029	0%	$ -	0%	$ -	1	$ 20,352		$ 244,381	10%	$ 24,438	$ 268,819	$ 18,817		$ 40,323	$ 327,959	
Proposed Collector 2	P-PC2-07	197.643	201.96	191.42237	190.82577	Unconstrained		149.15	300	8.68	$ 2,655	$ 395,993	0%	$ -	0%	$ -	1	$ 20,352		$ 416,345	10%	$ 41,635	$ 457,980	$ 32,059		$ 68,697	$ 558,735	
Proposed Collector 2	P-PC2-08	201.96	197.158	190.79577	190.20933	Unconstrained		146.61	300	9.06	$ 2,655	$ 389,250	0%	$ -	0%	$ -	1	$ 20,352		$ 409,602	10%	$ 40,960	$ 450,562	$ 31,539		$ 67,584	$ 549,685	
Proposed Collector 2	P-PC2-09	197.158	196.085068	190.17933	189.68557	Somewhat constrained		123.44	300	6.69	$ 2,655	$ 327,733	15%	$ 49,160	25%	$ 81,933	2	$ 40,704		$ 499,530	10%	$ 49,953	$ 549,484	$ 38,464		$ 82,423	$ 670,370	
Hornby Road	P-H-01	201.706	201	198.406	197.8228	Constrained		145.80	300	3.24	$ 629	$ 91,708	50%	$ 45,854	50%	$ 45,854	1	$ 11,193		$ 194,609	10%	$ 19,461	$ 214,070	$ 14,985		$ 32,111	$ 261,166	
Hornby Road	P-H-02	201	200.649	197.7928	197.19216	Constrained		150.16	300	3.33	$ 629	$ 94,451	50%	$ 47,225	50%	$ 47,225	1	$ 11,193		$ 200,094	10%	$ 20,009	$ 220,104	$ 15,407		$ 33,016	$ 268,527	
Hornby Road	P-H-03	200.649	200.008	197.16216	196.56908	Constrained		148.27	300	3.46	$ 629	$ 93,262	50%	$ 46,631	50%	$ 46,631	1	$ 11,193		$ 197,717	10%	$ 19,772	$ 217,488	$ 15,224		$ 32,623	$ 265,336	
Hornby Road	P-H-04	200.008	199.457382	196.53908	195.94148	Constrained		149.40	300	3.49	$ 629	$ 93,973	50%	$ 46,986	50%	$ 46,986	1	$ 11,193		$ 199,138	10%	$ 19,914	$ 219,052	$ 15,334		$ 32,858	$ 267,243	
Proposed Collector 3	P-PC3-04	207.452	209.327	204.1345	203.910618	Unconstrained		111.94	300	4.37	$ 629	$ 70,411	0%	$ -	0%	$ -	1	$ 11,193		$ 81,604	10%	$ 8,160	$ 89,764	$ 6,283		$ 13,465	$ 109,512	
Proposed Collector 3	P-PC3-03	209.327	209.852	203.880618	203.811306	Unconstrained		34.66	300	5.74	$ 2,655	$ 92,012	0%	$ -	0%	$ -	1	$ 20,352		$ 112,364	10%	$ 11,236	$ 123,600	$ 8,652		$ 18,540	$ 150,792	
Proposed Collector 3	P-PC3-02	209.852	210.641	203.781306	203.580034	Unconstrained		100.64	300	6.57	$ 2,655	$ 267,189	0%	$ -	0%	$ -	1	$ 20,352		$ 287,541	10%	$ 28,754	$ 316,295	$ 22,141		$ 47,444	$ 385,879	
Proposed Collector 3	P-PC3-01	210.641	210.594	203.550034	203.494166	Unconstrained		27.93	300	7.10	$ 2,655	$ 74,165	0%	$ -	0%	$ -	1	$ 20,352		$ 94,517	10%	$ 9,452	$ 103,968	$ 7,278		$ 15,595	$ 126,842	
Proposed Collector 3	P-PC3-01A	210.594	209.75	203.464166	203.255288	Somewhat constrained		104.44	300	6.81	$ 2,655	$ 277,286	15%	$ 41,593	25%	$ 69,321	1	$ 20,352		$ 408,552	10%	$ 40,855	$ 449,407	$ 31,458		$ 67,411	$ 548,276	
Proposed Collector 3	P-PC3-06	205.635	206.125	202.186624	201.775447	Unconstrained		137.06	300	3.90	$ 629	$ 86,210	0%	$ -	0%	$ -	1	$ 11,193	$ 67,160	$ 164,563	10%	$ 16,456	$ 181,019	$ 12,671		$ 27,153	$ 220,844	
Proposed Collector 3	P-PC3-07	206.125	206.236	201.745447	201.356935	Somewhat constrained		129.50	300	4.63	$ 629	$ 81,458	15%	$ 12,219	25%	$ 20,365	2	$ 22,386		$ 136,427	10%	$ 13,643	$ 150,070	$ 10,505		$ 22,510	$ 183,085	
Trafalgar Road	P-T-01	205.5	206.236	202.1825	201.481184	Constrained		116.89	300	4.04	$ 629	$ 73,521	50%	$ 36,761	50%	$ 36,761	1	$ 11,193		$ 158,236	10%	$ 15,824	$ 174,059	$ 12,184		$ 26,109	$ 212,352	
Proposed Collector 3	P-PC3-08	206.236	203.895	201.326935	200.553775	Somewhat constrained		96.65	300	4.13	$ 629	$ 60,790	15%	$ 9,118	25%	$ 15,197	1	$ 11,193		$ 96,299	10%	$ 9,630	$ 105,928	$ 7,415		$ 15,889	$ 129,233	
Proposed Collector 3	P-PC3-09	203.895	201.757	200.523775	198.372575	Unconstrained		134.45	300	3.38	$ 629	$ 84,569	0%	$ -	0%	$ -	1	$ 11,193		$ 95,762	10%	$ 9,576	$ 105,338	$ 7,374		$ 15,801	$ 128,513	
Proposed Collector 3	P-PC3-10	201.757	200.62	198.342575	197.235855	Unconstrained		69.17	300	3.40	$ 629	$ 43,508	0%	$ -	0%	$ -	1	$ 11,193		$ 54,701	10%	$ 5,470	$ 60,171	$ 4,212		$ 9,026	$ 73,409	
Proposed Collector 3	P-PC3-11	200.62	200.125	197.205855	196.748255	Unconstrained		114.40	300	3.40	$ 629	$ 71,958	0%	$ -	0%	$ -	1	$ 11,193		$ 83,151	10%	$ 8,315	$ 91,466	$ 6,403		$ 13,720	$ 111,588	
Proposed Collector 3	P-PC3-12	200.125	200.206	196.718255	196.394945	Unconstrained		107.77	300	3.61	$ 629	$ 67,787	0%	$ -	0%	$ -	1	$ 11,193	$ 67,160	$ 146,140	10%	$ 14,614	$ 160,754	$ 11,253		$ 24,113	$ 196,120	
Proposed Collector 3	P-PC3-13	200.206	200.518	196.364945	195.930302	Unconstrained		144.88	300	4.21	$ 629	$ 91,130	0%	$ -	0%	$ -	1	$ 11,193		$ 102,323	10%	$ 10,232	$ 112,555	$ 7,879		$ 16,883	$ 137,318	
Proposed Collector 3	P-PC3-14	200.518	200.1	195.900302	195.676781	Somewhat constrained		74.51	300	4.52	$ 629	$ 46,865	15%	$ 7,030	25%	$ 11,716	1	$ 11,193		$ 76,804	10%	$ 7,680	$ 84,484	$ 5,914		$ 12,673	$ 103,071	
Trafalgar Road	P-T-02	207.081	207.546	204.297196	204.018116	Constrained		139.54	300	3.16	$ 629	$ 87,771	50%	$ 43,885	50%	$ 43,885	1	$ 11,193		$ 186,734	10%	$ 18,673	$ 205,408	$ 14,379		$ 30,811	$ 250,597	
Steeles Avenue	P-S-01	207.546	207.95	203.988116	203.904	Constrained		42.06	300	3.80	$ 629	$ 26,454	50%	$ 13,227	100%	$ 26,454	1	$ 11,193		$ 77,329	10%	$ 7,733	$ 85,062	$ 5,954		$ 12,759	$ 103,776	
Eighth Line	P-EL-01	211	211.5	207.7	207.010105	Constrained		137.98	300	3.89	$ 629	$ 86,789	50%	$ 43,394	25%	$ 21,697	1	$ 11,193		$ 163,073	10%	$ 16,307	$ 179,381	$ 12,557		$ 26,907	$ 218,844	
Eighth Line	P-EL-02	211.5	211.25	206.980105	206.237595	Constrained		148.50	300	4.77	$ 629	$ 93,408	50%	$ 46,704	25%	$ 23,352	1	$ 11,193		$ 174,657	10%	$ 17,466	$ 192,122	$ 13,449		$ 28,818	$ 234,389	
Eighth Line	P-EL-03	211.25	209	206.207595	205.445205	Constrained		152.48	300	4.30	$ 629	$ 95,909	50%	$ 47,954	25%	$ 23,977	1	$ 11,193		$ 179,033	10%	$ 17,903	$ 196,936	$ 13,786		$ 29,540	$ 240,262	
Eighth Line	P-EL-04	209	208.729	205.415205	205.26285	Constrained		30.47	300	3.53	$ 629	$ 19,166	50%	$ 9,583	25%	$ 4,792	1	$ 11,193		$ 44,734	10%	$ 4,473	$ 49,207	$ 3,445		$ 7,381	$ 60,033	
TOTAL LOCAL SANITARY SEWER												**$ 6,783,089**		**$ 1,281,844**		**$ 901,262**	**50**	**$ 724,512**	**$ 201,480**	**$ 9,892,187**		**$ 989,219**	**$ 10,881,406**	**$ 761,698**	**$ 74,711**	**$ 1,632,211**	**$ 13,350,026**	