

# MEMO

To: Cam Elsby, P.Eng. (City of Ottawa) From: Stantec Consulting Ltd.

Stantec Project: 163402031 – City of Ottawa Urban Expansion Area Date: March 21, 2025  
Hydraulic Assessments

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## South March Urban Expansion Area Assessment

### 1. Introduction

The City of Ottawa (City)'s New Official Plan (OP) was adopted by City Council in 2021. To identify infrastructure needs required to support growth to the 2046 horizon of the OP, the City updated its Infrastructure Master Plan (IMP) in 2024.

The Province of Ontario issued a Provincial Planning Statement<sup>1</sup> (PPS) in October 2024, enabling private landowners to request an expansion of the urban boundary at any time, including outside of a comprehensive review or OP update. If a proponent wishes to include land within the Urban Boundary, they may make an application for an Urban and Village Boundary Expansion Official Plan Amendment (OPA), which are generally site-specific, and consist of the following five (5) steps:

- Step 1 - Assess existing servicing capacity
- Step 2 - Identify new servicing capacity
- Application submission
- Step 3 - Assess land need
- Step 4 - Settlement area parcel analysis
- Step 5 - Council decision

Steps 1 and 2 are to be performed before the planning process. Steps 3 through 5 are part of the planning process. Before applicants begin the planning process, applicants must consult with the City to obtain Servicing Capacity information as part of steps 1 and 2. To provide the Servicing

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<sup>1</sup> <https://www.ontario.ca/page/provincial-planning-statement-2024>

Capacity information, the following assessments were completed for the proposed areas to be included within the urban boundary area:

1. an assessment of existing and planned servicing (water and sanitary) capacity, and
2. where system capacities will not be available to support the OPA application based on planned system upgrades, an assessment identifying off-site works and the associated costs required to accommodate the expansion.

The following technical memorandum (TM) presents the findings of the Step 1 and Step 2 assessments for the proposed South March urban boundary expansion OPA application, as they pertain to potable water distribution infrastructure needs.

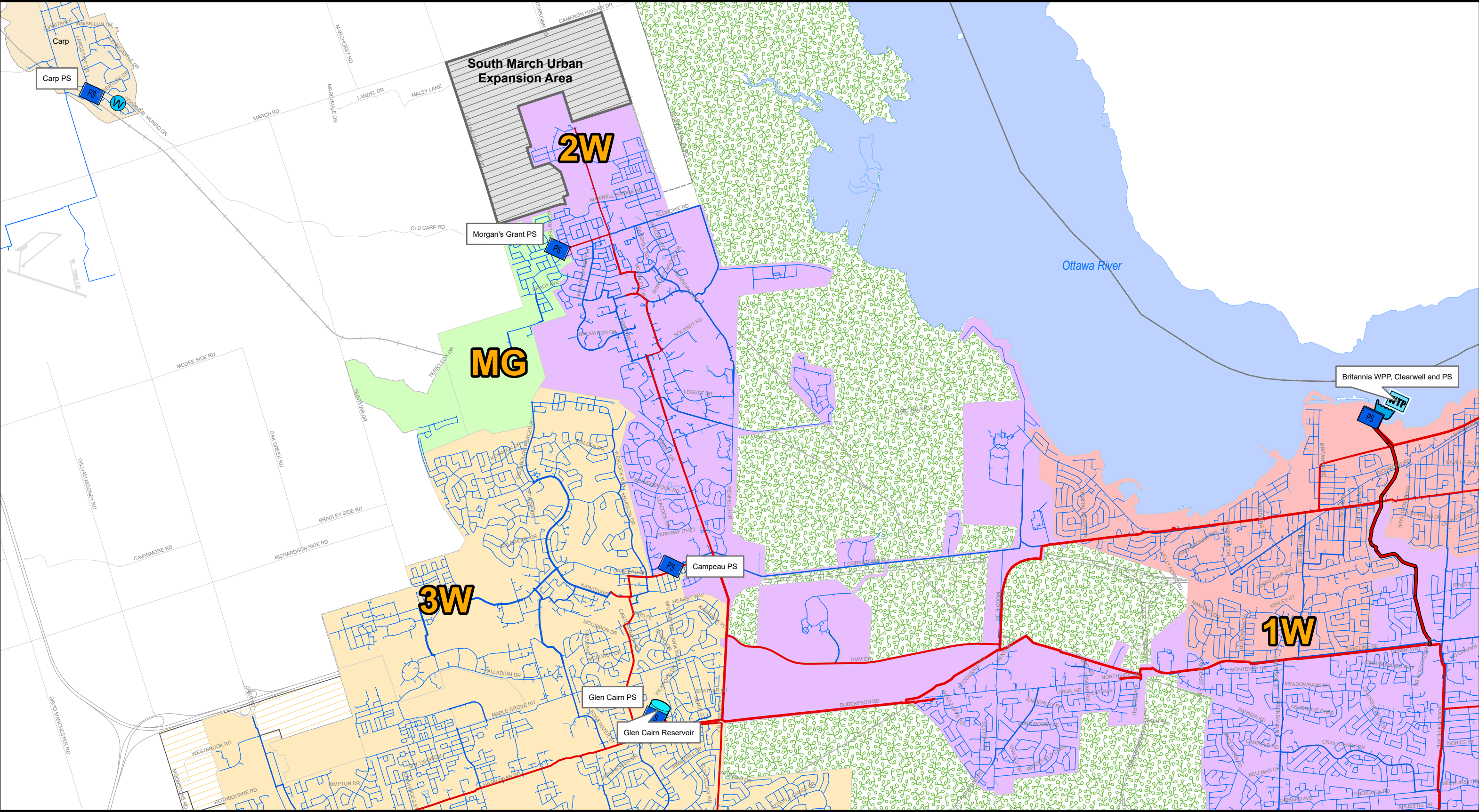
## 2. Background

### 2.1 Study Area

The South March Urban Expansion Area (SMUEA) is located north of Kanata, adjacent to the Morgan's Grant area and the Kanata North Urban Expansion Area (KNUEA). The area is generally bound by the following roads:

- To the north by March Rd and Cameron Harvey Dr;
- To the east by the former Beachburg Rail Corridor;
- To the south by the KNUEA and Old Carp Rd; and,
- To the west by Old Second Line Rd.

**Figure 1** shows the location of the SMUEA within the overall water distribution system. **Figure 2** provides a closer view of the SMUEA and adjacent infrastructure. The SMUEA is directly adjacent to the existing pressure zones MG and 2W. The potential to service the SMUEA from these pressure zones is assessed in **Section 3.1**.



**South March Urban Expansion Area Assessment**

Figure 1: Existing Water Distribution System & Proposed South March Expansion Area

**Legend**

- WTP** Water Purification Plant  
**PS** Pump Station (Active)  
**W** Well

- Storage**  
**Clearwell**  
**Reservoir**

- Backbone Watermain**  
152 mm - 305 mm  
406 mm - 508 mm  
610 mm - 914 mm  
1067 mm - 1372 mm  
1524 mm - 1981 mm  
2550 mm

- Distribution Watermain**  
≤ 102 mm  
152 mm - 305 mm  
356 mm - 508 mm  
610 mm - 914 mm  
1372 mm

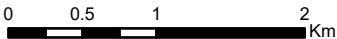
- Existing Pressure Zones**  
1E  
1W  
2C  
2E  
2W

- 3SW  
3W  
EMR  
LEIT  
ME  
MG

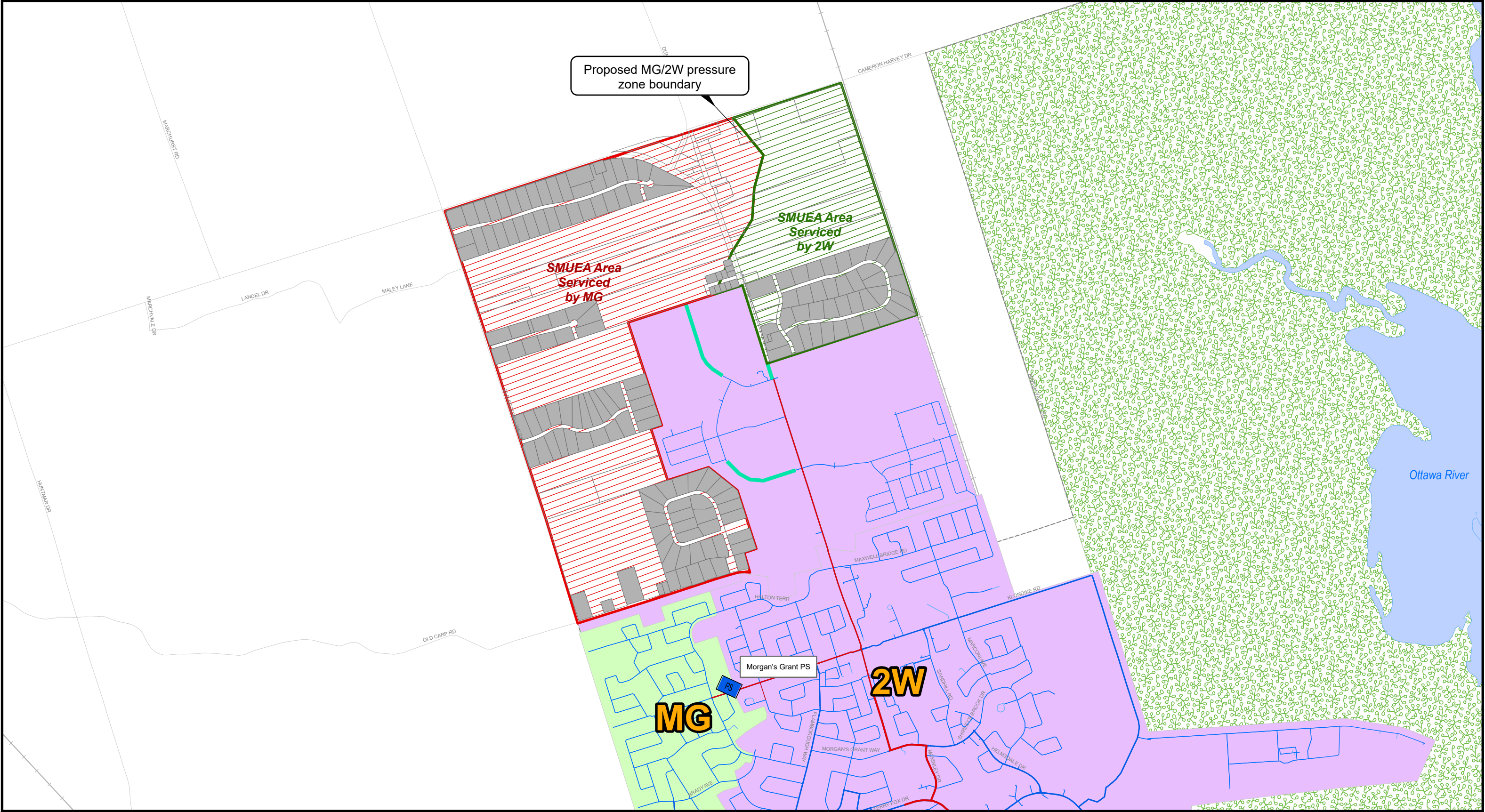
- MONT  
SHADOW RIDGE  
SUC  
YOW

- Official Plan Urban Expansion Area  
Villages  
Greenbelt  
Major Rivers

- South March Urban Expansion Area







South March Urban Expansion  
Area Assessment

Figure 2: Proposed South March  
Expansion Area & Adjacent  
Infrastructure

Legend



Pump Station (Active)

Backbone Watermain

- 152 mm - 305 mm
- 406 mm - 508 mm
- 610 mm - 914 mm
- 1067 mm - 1372 mm
- 1524 mm - 1981 mm
- 2550 mm

Distribution Watermain

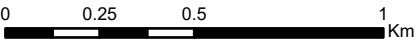
- ≤ 102 mm
- 152 mm - 305 mm
- 356 mm - 508 mm
- 610 mm - 914 mm
- 1372 mm

South March Urban  
Expansion Area (SMUEA)

- SMUEA Area  
Serviced by 2W
- SMUEA Area  
Serviced by MG

- Parcels within  
SMUEA
- Existing Lots within  
SMUEA

- Kanata North CDP  
Planned Watermains  
(Benefitting SMUEA)





The land use within the SMUEA will be residential. **Table 1** presents the projected growth unit counts within the SMUEA. The unit types assumed for water demand calculations (based on the unit types defined in the 2024 Water Master Plan (WMP)) are also presented in the table.

**Table 1: Projected SMUEA Growth Unit Counts**

Unit Type	Unit Type for Water Demand Calculations	Count
Single Detached	Single Family House (SFH)	1,325
Semi-Detached	Multi-Level Townhouse (MLT)	-
Row House	MLT	1,325
Apartments	Apartment (APT)	1,430
Total	N/A	4,080

While an estimate build-out population of 8,568 was also provided, the potable water demand calculations are based on the dwelling counts and 2024 WMP level of service criteria, which include revised population calculations based on population density by unit type. The results are presented in **Section 2.5**.

No detailed concept plan or phasing plan was available at the time of this assessment, therefore a uniform distribution (density) of demand across the area was assumed, and potential phasing of recommended infrastructure is assessed based on assumed phasing of demands as a percentage of calculated build-out demand.

As shown in **Figure 2**, the urban expansion area also includes existing developments currently not serviced by the central water distribution system. If the urban boundary is expanded to include these existing developments, they may seek to connect to municipal services. Therefore, this assessment also considers the impact of their demands on the infrastructure needs. Based on a review of geographical information system (GIS) parcel data, watermain data and satellite imaging, these lots are predominantly residential, with a few commercial and light industrial properties. The parcel count and land use of existing developments is summarized in **Table 2**. The residential properties were assumed to consist of single family houses.

**Table 2: Land Use and Parcel Counts of Existing Developments within the SMUEA**

Land Use	Unit Type for Water Demand Calculations	Parcel Count
Residential	SFH	130
Commercial/Light Industrial	Commercial	2
Vacant	N/A	4
Total	N/A	136

Projected potable water demands for the SMUEA are presented in **Section 2.5**.

## 2.2 Background Information

The following background studies were reviewed for this analysis:

- Infrastructure Master Plan (City of Ottawa, 2024) [2024 IMP], including supporting studies such as:
  - City of Ottawa 2024 Water Master Plan (Stantec Consulting Ltd., 2024) [2024 WMP]
  - Appendix H – Benefit to Existing Calculations [2024 IMP Appendix H]
- Preliminary Potable Water Servicing Analysis of School Sites along Terry Fox Drive at Goulbourn Forced Road (KNL Lands) (Stantec Consulting Ltd., 2015) [KNL Lands Goulbourn Forced Road Watermain Assessment]
- Kanata North Potable Water Servicing Analysis (Stantec Consulting Ltd., 2016) [KNL Potable Water Assessment]
- Kanata North Community Design Plan (Novatech, 2016) [Kanata North CDP]
- Kanata North Urban Expansion Potable Water Assessment (Stantec Consulting Ltd., 2016) [2016 KNUE Potable Water Assessment]
- Operating Zone MG at Zone 3W Pressure (Stantec Consulting Ltd., 2016) [2016 MG/3W Pressure Zone Reconfiguration Study]
- South March Urban Expansion Area Servicing Capacity Assessment (Novatech, 2024) [South March Servicing Report]
- Morgan's Grant Booster Pumping Station As-Built Drawings (J.L. Richards & Associates, 2003) [MGPS As-Built Drawings]

A draft version of the IMP was initially prepared in 2023 (Draft 2023 IMP), which included recommendations for servicing urban expansion areas added to the Official Plan (OP) by the provincial Ministry of Municipal Affairs and Housing (MMAH). These additional urban expansion areas included the SMUEA, then denoted as W-1. However, this provincial decision was reversed in October 2023, and these additional urban expansion areas were removed from the OP. Hence, the recommendations for servicing urban expansion areas were not finalized, and can be subject to revisions based on the more recent available information and the final 2024 IMP recommendations and supporting analyses.

## 2.3 Discussions with Stakeholders

Technical advisory committee (TAC) meetings were held with City staff to gather input on infrastructure planning, asset management and operations considerations for this assessment. The following considerations were discussed:

- Existing properties within the boundaries of the urban expansion area should be considered in the servicing assessment.
- There may be limited space within the existing Morgan's Grant Pumping Station (MGPS) building for an additional pump. There may be limited space within the existing parcel boundaries for a building expansion to accommodate an additional pump.



- Reliance on infrastructure development within the adjacent Kanata North Urban Expansion area should be limited.
- The existing City water distribution network has a limited number of pressure reducing valve (PRV) chambers.
- Water quality (water age) should be considered when recommending new watermains.

## 2.4 Level of Service and Design Criteria

The potable water servicing analysis is based on the level of service (LOS) and design criteria established in the 2024 WMP *Table 3-1* and supporting technical memoranda (TMs). The proposed servicing alternatives and recommended alternative were developed based on an assessment of peak domestic demand conditions, fire flow (FF) conditions, reliability scenarios, and water quality.

**Table 3** summarizes the main LOS targets used to develop proposed servicing alternatives, and identify a recommended alternative. The required fire flow (RFF) target is 13,000 L/min (217 L/s; 18.7 MLD) for 3 hours.

**Table 3: Summary of Pressure LOS Targets**

Condition	Pressure	
	(kPa)	(psi)
<b>Maximum Pressures</b>		
<b>Basic Day (BSDY) Demands (Occupied Areas)</b>	552	80
<b>BSDY (Unoccupied Areas)</b>	689	100
<b>Minimum Pressures</b>		
<b>Maximum Day (MXDY) Demands</b>	345	50
<b>Peak Hour (PKHR) Demands</b>	276	40
<b>BSDY+FF (Reliability)</b>		
<i>Maximum duration below target pressure should not exceed 24 hrs</i>		
<b>MXDY+FF &amp; BSDY+FF (Reliability)</b>	140	20

## 2.5 Potable Water Demands

Potable water demands were calculated for the SMUEA projected developments and existing lots, using the unit counts presented in **Section 2.1** and the 2024 WMP design criteria. The demands are summarized in **Table 4**. The demands were allocated to the pressure zones MG and 2W, based on a theoretical pressure zone boundary delineated in **Section 3.1**. However, this allocation should be reviewed once more detailed concept plan and phasing information is available for the proposed developments.

**Table 4: Water Demand Projections**

Area	Pressure Zone Servicing <sup>(1)</sup>	BSDY (MLD)	5-Year MXDY <sup>(2)</sup> (MLD)	1-Year MXDY <sup>(3)</sup> (MLD)
<b>South March Lands (Development Areas)</b>	Serviced by 2W	1.0	1.9	1.4
	Serviced by MG	2.3	4.4	3.3
	<b>Total (2W+MG)</b>	<b>3.3</b>	<b>6.2</b>	<b>4.7</b>
<b>South March Lands (Existing Estate Lots)</b>	Serviced by 2W	0.03	0.05	0.04
	Serviced by MG	0.11	0.24	0.17
	<b>Total (2W+MG)</b>	<b>0.1</b>	<b>0.3</b>	<b>0.2</b>

**Notes:**

- (1) Pressure zone servicing based on pressure zone boundary delineated in **Section 3.1**.
- (2) MXDY demand based on an outdoor water demand (OWD) with a design frequency of 5 years, used for assessing and planning the pressure zones' high-lift pumping and storage capacities.
- (3) MXDY demand based on an OWD with a design frequency of 1 year, used for assessing and planning the WPPs' treatment capacity.

### 3. OPA Step 1 – Assessment of Existing and Planned Infrastructure Capacity

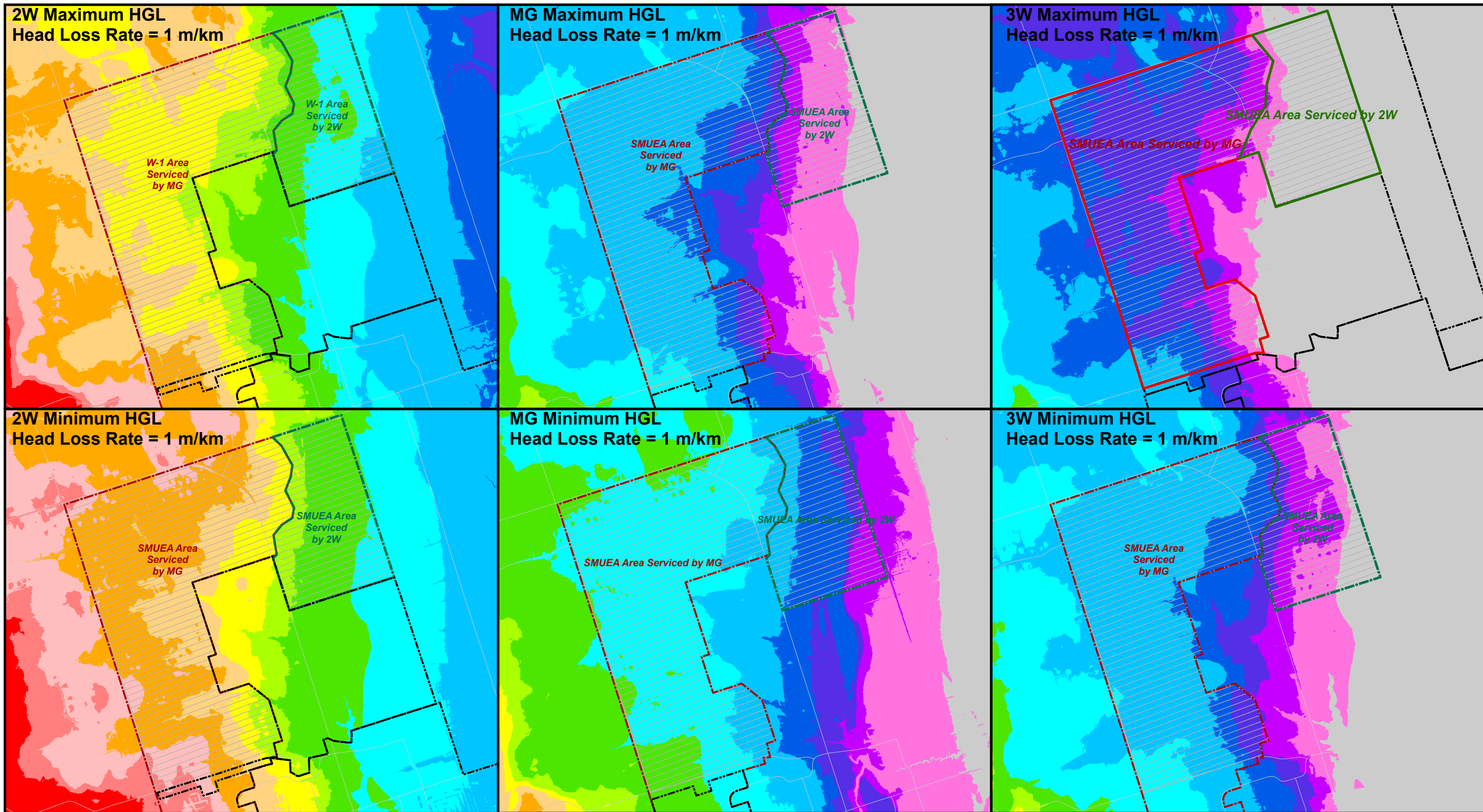
#### 3.1 Pressure Zone Boundary Analysis

The serviceability of the SMUEA is first assessed conceptually using an analysis of existing pressure zone boundaries. This analysis can help identify constraints within the existing pressure zones, which are confirmed using the hydraulic model. This analysis is also used as a preliminary evaluation of the serviceability of urban expansion areas, which are then further evaluated in the capacity analysis spreadsheet tool and hydraulic model. Feasible conceptual pressure zone servicing strategies can be identified from the onset of the analysis, and alternatives and permutations for the capacity and hydraulic assessments can be reduced.

The pressure zone boundary analysis incorporates head losses generated by flows through the system. A typical industry best practice target head loss rate of 1 m/km within the upstream water distribution network is used to derive the theoretical pressure zone boundaries. However, actual head loss rates within the network can vary due to distribution system characteristics including watermain looping, varying pipe roughness, and distribution of demands, and thus the pressure distributions are further assessed using the hydraulic model. Pressure distributions based on hydraulic model hydraulic gradelines (HGLs) and calculated SMUEA demands are presented in the assessment of servicing alternatives in **Section 4.3**.

**Figure 3** shows the pressure zone boundary analysis results for the pressure zones 2W, MG and 3W, as they pertain to servicing the SMUEA. The natural pressure zone boundary between MG and 2W is approximately east of March Rd, with approximately 70% of the SMUEA within the MG servicing area, and 30% within the 2W servicing area. This percentage split was applied to the potable water demands presented in **Section 2.5**. This boundary is applied in the hydraulic assessment (**Sections 3.3** and **4.2**), and in the assessment of servicing alternatives in **Section 4.3**.





## South March Urban Expansion Area Assessment

### Figure 3: Pressure Zone Boundary Analysis - SMUEA Servicing

SMUEA demands are not considered in this theoretical analysis. Instead, head losses due to additional demands and resulting flows are generated using a theoretical rate of 1 m/km.

#### Legend

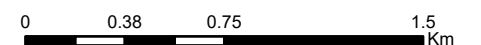
- Existing Pressure Zone Boundaries
- SMUEA Area Serviced by 2W
- SMUEA Area Serviced by MG

#### Pressures (psi)

- 0 psi < Pressure ≤ 20 psi
- 20 psi < Pressure ≤ 25 psi
- 25 psi < Pressure ≤ 30 psi
- 30 psi < Pressure ≤ 35 psi

- 35 psi < Pressure ≤ 40 psi
- 40 psi < Pressure ≤ 45 psi
- 45 psi < Pressure ≤ 50 psi
- 50 psi < Pressure ≤ 60 psi
- 60 psi < Pressure ≤ 70 psi
- 70 psi < Pressure ≤ 80 psi

- 80 psi < Pressure ≤ 85 psi
- 85 psi < Pressure ≤ 90 psi
- 90 psi < Pressure ≤ 95 psi
- 95 psi < Pressure ≤ 100 psi
- Pressure > 100 psi



### 3.2 Capacity Analysis

The capacity of the existing water distribution's pumping stations (PS), storage and treatment facilities was assessed using the City's capacity analysis spreadsheet tool. Capacity constraints requiring upgrades were assessed based on a trigger year of 2046, which is the 2024 IMP's growth horizon. Planned upgrades in the 2024 IMP were considered, however, while they impact the overall system's treatment and pumping capacity, they do not directly impact the servicing of the SMUEA.

From a capacity perspective, the additional SMUEA peak demands (governing scenario: MXDY+FF) cannot be directly supplied from the existing MG pressure zone. The MGPS has a firm operational capacity of 12.4 MLD, which is less than the zone's projected MXDY+FF of 24.8 MLD. While the MGPS can supply the projected PKHR demand of 12.4 MLD (existing MG + growth within MG + SMUEA), it cannot supply the target RFF of 13,000 L/min (217 L/s; 18.7 MLD) for 3 hours without supplement. In previous planning assessments, a target RFF of 6,500 L/min (108 L/s; 9.4 MLD) for the pressure zone MG was used, based on historical fire flow capabilities of pressure zone MG, the low density of existing developments and growth occurring within existing built-up areas. This target RFF could be supplied from the MGPS, supplemented by 2W check valves, hence no MGPS upgrades were required. However, for potential new developments outside existing built-up areas which will trigger an expansion of the existing pressure zone boundaries, the target RFF of 13,000 L/min (217 L/s; 18.7 MLD) for 3 hours is applied, similar to the rest of the City's expansion areas. Therefore, system upgrades to supplement the available fire flow will be needed to service the SMUEA's RFF requirements.

**Table 5: Impact of SMUEA Peak Demands on Existing Facility Upgrade Growth Triggers**

Servicing Scenario	Facility	Upgrade Needed by 2046?	
		w/o SMUEA <sup>(1)</sup>	w/ SMUEA <sup>(1)</sup>
All	Total Treatment from Lemieux WPP and Britannia WPP (with 2024 IMP's Proposed Storage Upgrades <sup>(2)</sup> )	2066	2065
	2W+ Pumping from Britannia HLP and Carlington Heights PS (with 2024 IMP's Proposed Storage Upgrades <sup>(3)</sup> )	2101+	2099
Servicing from 2W+	MG Pumping from Morgan's Grant PS (No Existing Storage)	2101+	2018 <i>OR Additional fire flow supplement (check valves)</i>
Servicing from 3W	3W Pumping from Glen Cairn Reservoir & Campeau Dr PS (with Existing Storage)	2101+	2079 <sup>(4)</sup>

Legend: Upgrades required by 2046

**Notes:**

- (1) SMUEA includes both growth areas and existing estate lots.
- (2) To offset system-wide peak treatment requirements from the WPPs, the 2024 IMP proposed the following storage upgrades: Ottawa South Reservoir, Orleans Reservoir, new Riverside South ET, new Tewin Reservoir.
- (3) The following 2024 IMP's proposed storage upgrades offset peak 2W+ pumping requirements from the Britannia HLP-2W pumps and the Carlington Heights PS-2W pumps: new Riverside South ET.
- (4) Servicing from 3W includes SMUEA and pressure zone MG reconfigured into 3W (existing areas & growth within MG).



### 3.3 Hydraulic Assessment

The need for potential off-site watermain upgrades (new watermain and/or existing watermain replacement) was assessed based on a review of existing watermain in the vicinity of the SMUEA, and using the City's hydraulic model, under future growth (2046 growth from the OP) and infrastructure conditions (i.e., with planned infrastructure). This assessment is based on the theoretical pressure zone boundary identified in **Section 3.1**.

**Table 6** presents a summary of direct servicing opportunities and infrastructure gaps. The infrastructure gaps were identified as needed, in addition to planned infrastructure recommended in the 2024 IMP and in the Kanata North CDP.

The area proposed to be serviced from 2W would be directly connected to a planned watermain extension along March Rd. For this assessment, this watermain was represented as an extension of the existing 400 mm diam. watermain on March Rd. However, different alignments and/or sizes providing an equivalent capacity may eventually be implemented as part of the Kanata North CDP. In addition to this proposed connection redundant capacity is needed to provide reliability in the event of watermain breaks on March Rd. Planned Kanata North CDP 300 mm diam. watermain provide looping (as shown in **Figure 2**), but there is not enough capacity to fulfil the LOS criteria under BSDY+FF demands in the event of a watermain break.

The existing water distribution infrastructure in Morgan's Grant cannot adequately service areas beyond the current pressure zone boundaries, and as such new transmission watermain are needed to extend the existing network to the boundary of the SMUEA. Additionally, to supply the target RFF of 13,000 L/min (217 L/s; 18.7 MLD) for 3 hours, additional WM upgrades would be needed to support a potential MGPS upgrade.

**Table 6** also presents the infrastructure gaps identified based on the impact of the SMUEA demands on existing service areas' pressures. Hydraulic modelling results (PKHR minimum pressure distribution in existing areas' model nodes) are presented in **Appendix A**. The addition of the SMUEA demands results in an increase in flows, which generates increased head losses through the existing feedermain from 2W areas inside the Greenbelt (IGB) to areas outside the Greenbelt (OGB). As a result, lower pressures are observed in existing 2W areas OGB, and further downstream in MG, compared to baseline 2046 (growth & planned infrastructure) conditions. To fully revert the LOS to baseline conditions, head loss reduction measures in the existing water distribution network within 2W would be needed, such as:

- Feedermain upgrades (to reduce head losses due to increased flows);
- An expansion of the Glen Cairn Reservoir (to reduce peak flows from 2W IGB to OGB with additional balancing storage);
  - This upgrade was presented in the Draft 2023 IMP, but upon additional storage optimization analyses following the removal of the lands added by the MMAH to the OP, was not included in the 2024 IMP recommendations.

- A pressure zone reconfiguration to redirect flows from 2W to MG through 3W (to reduce peak flows through 2W OGB).

Major feedermain upgrades or storage facility expansions would require wider considerations for overall growth within the distribution system, which are better addressed at a Master Plan level, and are therefore not further considered in this assessment. For the purposes of identifying a feasible servicing solution for the SMUEA, the most feasible head loss reduction measure would be a pressure zone reconfiguration to redirect flows from 2W to MG, through 3W.

**Table 6: Direct Servicing Opportunities and Infrastructure Gaps for SMUEA**

Servicing Area	Opportunities for Direct Servicing	Infrastructure Gaps
<b>SMUEA<sup>(1)</sup> 2W</b>	<ul style="list-style-type: none"> <li>• Direct connection to existing 400 mm diam. WM on March Rd</li> </ul>	<ul style="list-style-type: none"> <li>• Redundant feed needed in the event of a WM break on March Rd, between Maxwell Bridge Rd and Invention Blvd</li> <li>• Redundant feed needed in the event of a WM break on March Rd, between Invention Blvd and Buckbean Ave</li> </ul>
<b>SMUEA<sup>(1)</sup> MG</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• New watermain connections from MG</li> <li>• Fire flow capacity from MG (supplement from adjacent zones and/or upgrade existing MGPS, with supporting WM upgrades)</li> </ul>
<b>Existing Service Areas within 2W</b>	<ul style="list-style-type: none"> <li>• N/A – Already serviced</li> </ul>	<ul style="list-style-type: none"> <li>• Head loss reduction measures in existing water distribution network within 2W (feedermain upgrades or peak flow reduction/balancing)</li> </ul>
<b>Existing Service Areas within MG</b>		

Notes:

(1) SMUEA includes both growth and existing estate lots.

### 3.4 Step 1 Conclusions & Recommendations

The capacity of the existing water distribution system to directly service the SMUEA was assessed. **The existing water distribution system cannot directly supply the SMUEA to fulfil the 2024 IMP's target LOS criteria. Therefore, the OPA Step 2 assessment is needed to identify off-site infrastructure needs** and address the following infrastructure gaps:

- Redundant feed needed in the event of a WM break on March Rd, between Maxwell Bridge Rd and Invention Blvd, to service the SMUEA from 2W;
- Redundant feed needed in the event of a WM break on March Rd between Invention Blvd and Buckbean Ave, to service the SMUEA from 2W;
- New watermain connections from MG;

- Fire flow capacity from MG (supplement from adjacent zones and/or upgrade existing MGPS, with supporting WM upgrades); and,
- Head loss reduction measures in existing water distribution network within 2W (feedermain upgrades or peak flow reduction/balancing).

Off-site infrastructure needs to address these constraints, along with Class D opinions of probable costs (OPCs) and cost allocation are addressed in Step 2 of the OPA, presented in **Section 4**.

## 4. OPA Step 2 – Identification & Assessment of Off-Site Infrastructure Needs

### 4.1 Capacity Analysis

As identified in the Step 1 capacity analysis (**Section 3.1**), the MGPS alone cannot supply the target RFF of 13,000 L/min (217 L/s; 18.7 MLD) for 3 hours. Therefore, off-site PS capacity upgrades will be needed to service the SMUEA. These are further assessed as part of the servicing alternative Option B in **Section 4.3**.

### 4.2 Hydraulic Assessment

As identified in the Step 1 hydraulic analysis (**Section 3.3**), infrastructure gaps need to be addressed off-site. Potential off-site infrastructure solutions for each infrastructure gap are presented in **Table 7**. Additional infrastructure solutions to be implemented on-site (i.e., within the boundaries of the SMUEA) to support the proposed off-site infrastructure are also identified. These potential solutions are further assessed as part of the servicing alternatives assessment in **Section 4.3**.

As discussed in the Step 1 hydraulic analysis, these off-site infrastructure solutions would be needed in addition to already planned infrastructure from the 2024 IMP and from the Kanata North CDP.



**Table 7: Infrastructure Gaps and Potential Off-Site Solutions and Additional Internal Needs to Support Off-Site Solutions**

Servicing Area	Infrastructure Gaps	Potential Off-Site Solutions	Additional Internal Needs to Support Off-Site Solutions
<b>SMUEA<sup>(1)</sup> 2W</b>	<ul style="list-style-type: none"> <li>Redundant feed needed in the event of a WM break on March Rd, between Maxwell Bridge Rd and Invention Blvd</li> </ul>	-	<ul style="list-style-type: none"> <li>New PRV chamber from MG servicing area</li> </ul>
	<ul style="list-style-type: none"> <li>Redundant feed needed in the event of a WM break on March Rd, between Invention Blvd and Buckbean Ave</li> </ul>		
<b>SMUEA<sup>(1)</sup> MG</b>	<ul style="list-style-type: none"> <li>New watermain connections from MG</li> </ul>	<ul style="list-style-type: none"> <li>New watermains and watermain upgrades in MG</li> </ul>	-
	<ul style="list-style-type: none"> <li>Fire flow capacity (supplement from adjacent zones and/or upgrade existing MGPS, with supporting WM upgrades)</li> </ul>	<ul style="list-style-type: none"> <li>Check valves (CVs) from 2W servicing area</li> <li>New watermains and watermain upgrades in MG</li> </ul>	-
<b>Existing Service Areas within 2W</b>	<ul style="list-style-type: none"> <li>Head loss reduction measures in existing water distribution network within 2W (feedermain upgrades or peak flow reduction/balancing)</li> </ul>	<ul style="list-style-type: none"> <li>Pressure zone reconfiguration to redirect flows from 2W to MG through 3W (to reduce peak flows through 2W OGB)</li> </ul>	-
<b>Existing Service Areas within MG</b>			

Notes:

(1) SMUEA includes both growth and existing estate lots.

### 4.3 Servicing Alternatives

To address the infrastructure gaps identified in Step 1, three (3) servicing alternatives were identified and assessed. **Table 8** summarizes each servicing option and the associated off-site infrastructure needs. Each option is further described and illustrated in the following sub-sections, including discussions of LOS achieved and potential phasing opportunities. For feasible options, OPCs are presented, which were developed using the Class D costing templates from the 2024 IMP. Details on the OPCs are provided in **Section 4.4**.

**Table 8: SMUEA Servicing Alternatives and Off-Site Infrastructure Needs**

Option ID	Option A	Option B	Option C
<b>Planned Infrastructure Benefitting SMUEA</b>	<ul style="list-style-type: none"> <li>Planned Kanata North CDP watermain for 2W area servicing</li> </ul>	<ul style="list-style-type: none"> <li>Planned Kanata North CDP watermain for 2W area servicing</li> </ul>	<ul style="list-style-type: none"> <li>Planned Kanata North CDP watermain for 2W area servicing</li> </ul>
<b>FF Supplement</b>	No MGPS upgrades; Supplement MG FF from 2W	Upgraded MGPS for FF	3W Servicing
<b>Off-Site Pumping Upgrade Needs</b>	None	Add 13,000 L/min of pumping capacity to MGPS	None
<b>Off-Site WM Upgrade Needs &amp; Additional Internal Infrastructure Needs</b>	<ul style="list-style-type: none"> <li>New 400 mm diam. PRV chamber within the SMUEA (at MG/2W boundary)</li> <li>New 620 m long 400 mm diam. WM along Old Second Line Rd, from Klondike Rd to SMUEA Boundary</li> <li>New 180 m long 400 mm diam. WM along Oakside Cres, from Goward Dr to Old Carp Rd</li> <li>New 140 m long 400 mm diam. WM along Old Carp Rd, from Oakside Cres to SMUEA Boundary</li> <li>Upsize 590 m of WM to 400 mm diam. along Klondike Rd, from Halton Terr to Old Second Line Rd</li> <li>Upsize 450 m of WM to 400 mm diam. along Halton Terr, from Klondike Rd to Goward Dr</li> <li>Upsize 320 m of WM to 400 mm diam. along Goward Dr, from Halton Terr to Oakside Cres</li> </ul>	<ul style="list-style-type: none"> <li>New 400 mm diam. PRV chamber within the SMUEA (at MG/2W boundary)</li> <li>New 620 m long 600 mm diam. WM along Old Second Line Rd, from Klondike Rd to SMUEA Boundary</li> <li>New 180 m long 600 mm diam. WM along Oakside Cres, from Goward Dr to Old Carp Rd</li> <li>New 140 m long 600 mm diam. WM along Old Carp Rd, from Oakside Cres to SMUEA Boundary</li> <li>Upsize 590 m of WM to 600 mm diam. along Klondike Rd, from Halton Terr to Old Second Line Rd</li> <li>Upsize 120 m of WM to 600 mm diam. along Klondike Rd, from MGPS to Halton Terr</li> <li>Upsize 450 m of WM to 600 mm diam. along Halton Terr, from Klondike Rd to Goward Dr</li> <li>Upsize 320 m of WM to 400 mm diam. along Goward Dr, from Halton Terr to Oakside Cres</li> </ul>	<ul style="list-style-type: none"> <li>New 400 mm diam. PRV chamber within the SMUEA (at MG/2W boundary)</li> <li>New 620 m long 400 mm diam. WM along Old Second Line Rd, from Klondike Rd to SMUEA Boundary</li> <li>New 180 m long 400 mm diam. WM along Oakside Cres, from Goward Dr to Old Carp Rd</li> <li>New 140 m long 400 mm diam. WM along Old Carp Rd, from Oakside Cres to SMUEA Boundary</li> <li>New 910 m long 400 mm diam. WM along Old Second Line Rd, from Terry Fox Dr to Klondike Rd</li> <li>New 1,460 m long 400 mm diam. WM (with PRV chamber) along Goulbourn Forced Rd, from Keyrock Dr to St. Isabel Catholic Elementary School</li> </ul>
<b>Target LOS (PKHR Minimum Pressures) Achieved within SMUEA?</b>	No – see <b>Figure 4</b>	Yes (if addressed in PS upgrade) – see <b>Figure 6</b>	Yes – see <b>Figure 8</b>
<b>Impact on Existing Servicing Areas Compared to Baseline<sup>(1)</sup></b>	Reduced PKHR minimum pressures below 40 psi and below 35 psi in 2W and MG	Reduced PKHR minimum pressures below 40 psi and below 35 psi in 2W and MG	Reduced PKHR minimum pressures below 40 psi in 2W Similar PKHR minimum pressures below 35 psi in 2W Increased PKHR minimum pressures in MG
<b>Advantages</b>	Minimal infrastructure requirements (watermain only)	PKHR minimum pressure LOS target achieved under SMUEA buildout conditions (if addressed in PS upgrade) PS upgrade and larger WMs provide flexibility to accommodate more growth beyond SMUEA	PKHR minimum pressure LOS target achieved under SMUEA buildout conditions Potential to decommission PS (reduce number of PSs to operate) Capacity for growth beyond SMUEA
<b>Disadvantages</b>	Does not fulfil target PKHR minimum pressure LOS under SMUEA buildout conditions Limited capacity for growth beyond SMUEA	PS upgrade needed Larger WMs needed (increased water quality (water age) concerns)	Operation of PRV chambers needed
<b>Potential Phasing Opportunities</b>	<ul style="list-style-type: none"> <li><b>Phase A1:</b> Servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase A2:</b> Servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase A3:</b> Servicing from MG (supplement FF from 2W CVs)</li> </ul>	<ul style="list-style-type: none"> <li><b>Phase B1:</b> Servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase B2:</b> Servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase B3:</b> Servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase B4:</b> Servicing from MG (w/ FF from MG) <ul style="list-style-type: none"> <li>Upgrade MGPS to supply target fire flow (13,000 L/min)</li> <li>CVs from 2W maintained for reliability</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>Phase C1:</b> Interim servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase C2:</b> Interim servicing from MG (supplement FF from 2W CVs)</li> <li><b>Phase C3:</b> Ultimate servicing from 3W (MG reconfigured into 3W) <ul style="list-style-type: none"> <li>MGPS decommissioned (or maintained as standby)</li> <li>CVs from 2W maintained for reliability</li> </ul> </li> </ul>
<b>Feasible Option?</b>	Not feasible	Feasible	Feasible
<b>Opinion of Probable Cost (2025\$)<sup>(2)</sup></b>	<b>N/A – No OPC for unfeasible option</b>	<b>\$39.1 M</b>	<b>\$23.8 M</b>

**Notes:**

(1) Baseline 2046 (growth & infrastructure) conditions; refer to **Appendix A** for results.

(2) Class D OPCs based on 2024 IMP templates.

#### 4.1.1 Option A

Option A consists of directly servicing the SMUEA with off-site watermain, without any additional facility (MGPS) upgrades to supply the target RFF. The infrastructure needs under Option A are listed in **Table 9** and illustrated in **Figure 4**.

**Table 9: Option A – Off-Site & Additional Internal Infrastructure Needs**

Servicing Area	Phase (ID)	Description	Diameter (mm)	Length (m)	Along	From	To
2W	A-2W	New PRV Chamber	400	N/A	Within SMUEA (at MG/2W boundary)		
MG	A-MG-1a	New Watermain	400	620	Old Second Line Rd	Klondike Rd	SMUEA Boundary
	A-MG-1b	New Watermain	400	180	Oakside Cres	Goward Dr	Old Carp Rd
		New Watermain	400	140	Old Carp Rd	Oakside Cres	SMUEA Boundary
	A-MG-2	Existing Watermain Upgrade	400	590	Klondike Rd	Halton Terr	Old Second Line Rd
	A-MG-3	Existing Watermain Upgrade	400	450	Halton Terr	Klondike Rd	Goward Dr
		Existing Watermain Upgrade	400	320	Goward Dr	Halton Terr	Oakside Cres

Fire flows would be provided by the MGPS, supplemented by 2W via check valves.

Due to upstream constraints in the existing distribution system with the addition of the SMUEA's peak demands, higher flows and hence higher head losses are observed upstream of the MGPS in 2W. This results in lower suction HGLs, which cannot be overcome by the existing PS's head gain, resulting in lower discharge HGLs (and pressures) within MG. Up to ~50% of the SMUEA is projected to experience minimum pressure deficiencies under PKHR demand conditions. The extent of these deficiencies is illustrated in **Figure 4**. Furthermore, there is a reduction in LOS in existing servicing areas in 2W and in MG due to the impact of the additional SMUEA's peak demands, as illustrated in **Appendix A**. Under Option A, addressing these impacts would require additional upstream upgrades not identified as off-site infrastructure requirements for the SMUEA, since they would need to be assessed at a Master Plan level, incorporating other system-wide growth and infrastructure considerations.

Option A most closely aligns with the recommendations of the *Draft 2023 IMP*. However, previous recommendations were based on a superseded set of recommendations, which notably included the Glen Cairn Reservoir Expansion, hence the hydraulic results within the system have since been updated.



**Figure 5** illustrates potential phases for the proposed Option A infrastructure. Each phase is assessed in terms of LOS achieved (percentage of areas experiencing PKHR minimum pressures below 40 psi) as a function of demand supplied. While under Option A, there is capacity to supply up to ~3.0 MLD in MXDY demands, mitigation measures would be needed to supply build-out conditions. These mitigation measures could include one or a combination of the following on-site solutions:

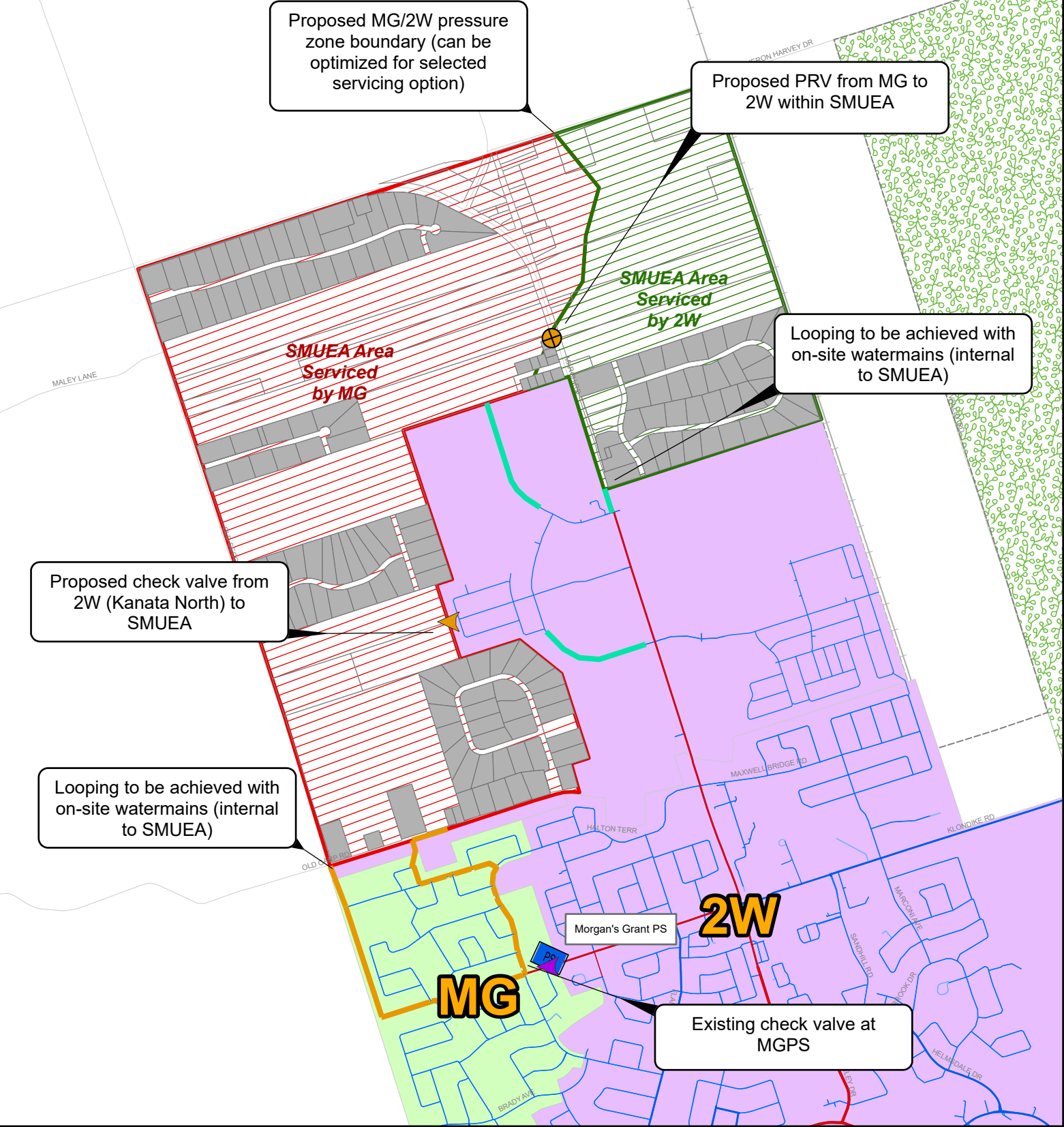
- Adjusting grading;
- Land use limitations (non-residential land uses);
- Building height restrictions;
- Servicing of higher flows using jet pumps; and,
- Oversizing services.

There is the potential to develop sub-phases for the proposed infrastructure, e.g., for A-MG-1a, by only building ~165 m of watermain along Old Second Line Rd, from Goward Dr to the SMUEA Boundary. This would align with the recommendations of the *South March Servicing Report*. However, this will result in a lower LOS due to the reduced number of interconnections to the existing distribution system.

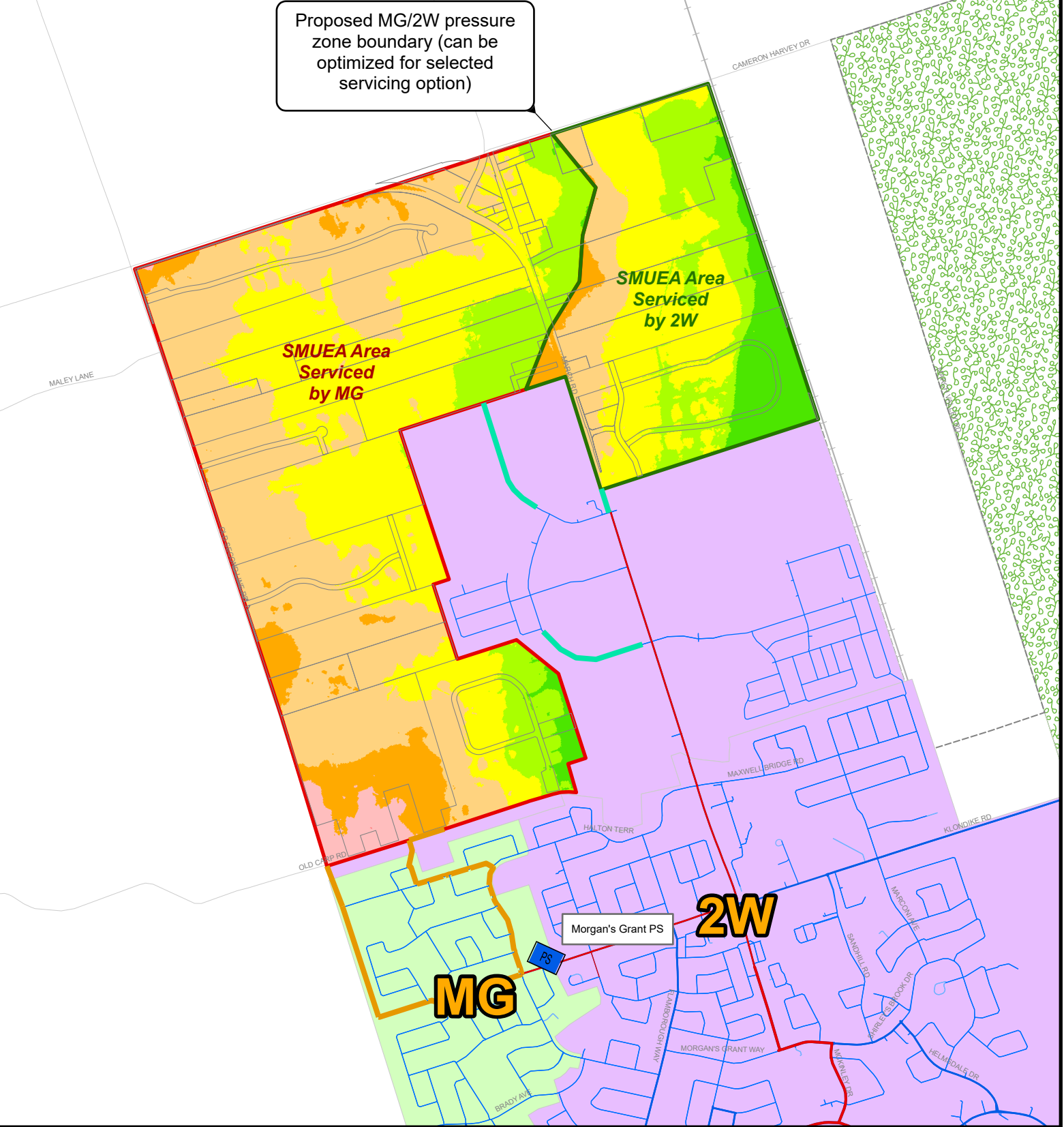
Overall, Option A does not fulfil the target LOS requirements. Furthermore, Option A limits the City's capacity to supply any potential long-term growth beyond the SMUEA's boundaries.

**Therefore, Option A is not considered feasible as it does not meet LOS requirements and is not further assessed, and OPCs for this option are not presented.**

Conceptual Servicing Plan



PKHR Minimum Pressure Distribution (Scenario: 2046 with SMUEA Demands)



South March Urban Expansion Area Assessment

Figure 4: Option A - Conceptual Servicing Plan and PKHR Minimum Pressure Distribution

Legend

- PS Pump Station (Active)
- Existing Check Valve
- Kanata North CDP Planned Watermains (Benefitting SMUEA)

- South March Urban Expansion Area (SMUEA)
- SMUEA Area Serviced by 2W
  - SMUEA Area Serviced by MG
  - Parcels within SMUEA

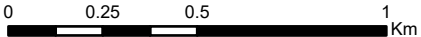
- Existing Lots within SMUEA
- Proposed Off-Site Watermains
- Proposed Valves
  - Check Valve
  - PRV

Pressures (psi)

- Not Serviceable
- 0 psi < Pressure ≤ 20 psi
- 20 psi < Pressure ≤ 25 psi
- 25 psi < Pressure ≤ 30 psi
- 30 psi < Pressure ≤ 35 psi
- 35 psi < Pressure ≤ 40 psi

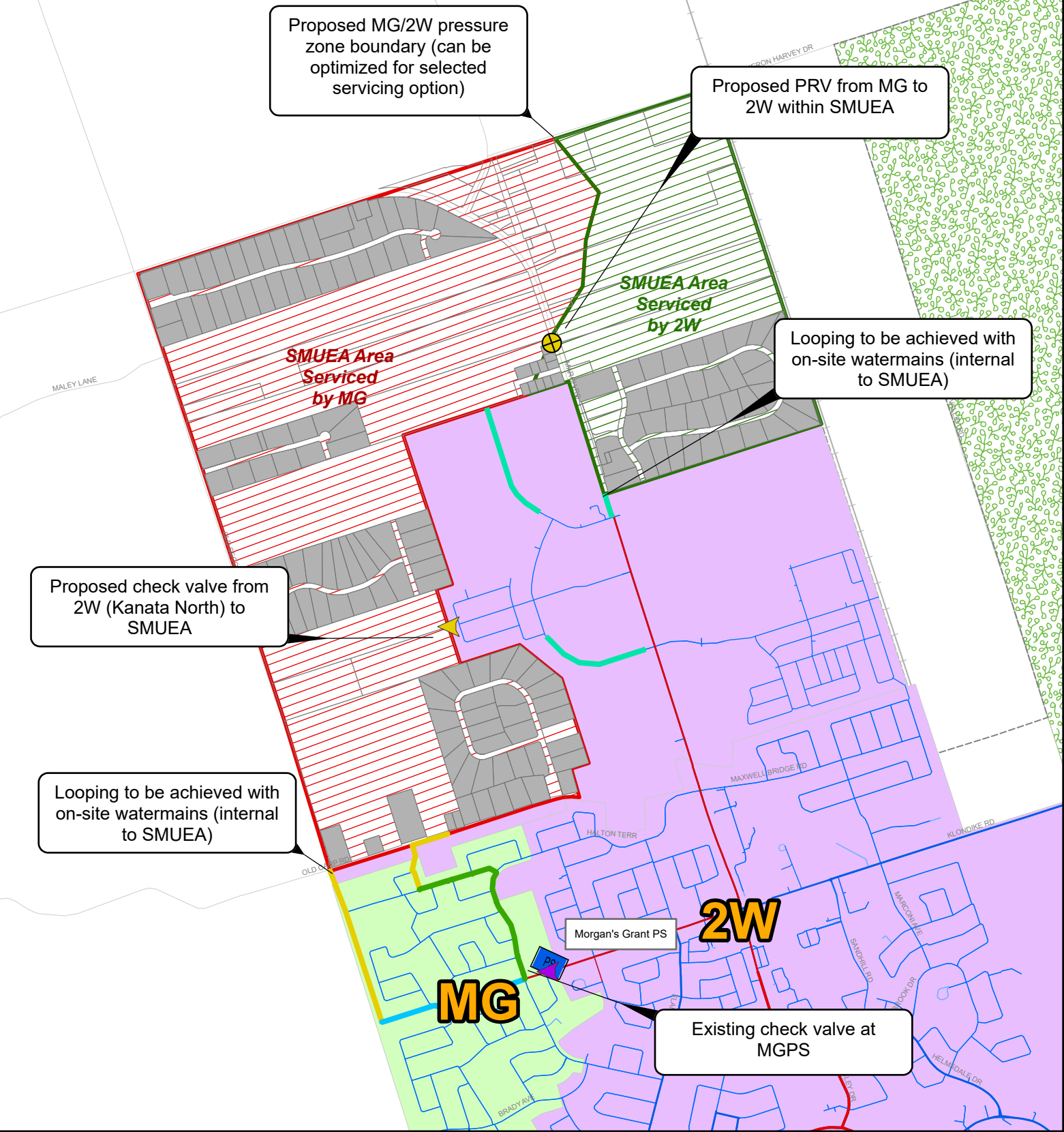
- 40 psi < Pressure ≤ 45 psi
- 45 psi < Pressure ≤ 50 psi
- 50 psi < Pressure ≤ 60 psi
- 60 psi < Pressure ≤ 70 psi
- 70 psi < Pressure ≤ 80 psi
- 80 psi < Pressure ≤ 85 psi
- 85 psi < Pressure ≤ 90 psi

- 90 psi < Pressure ≤ 95 psi
- 95 psi < Pressure ≤ 100 psi
- Pressure > 100 psi

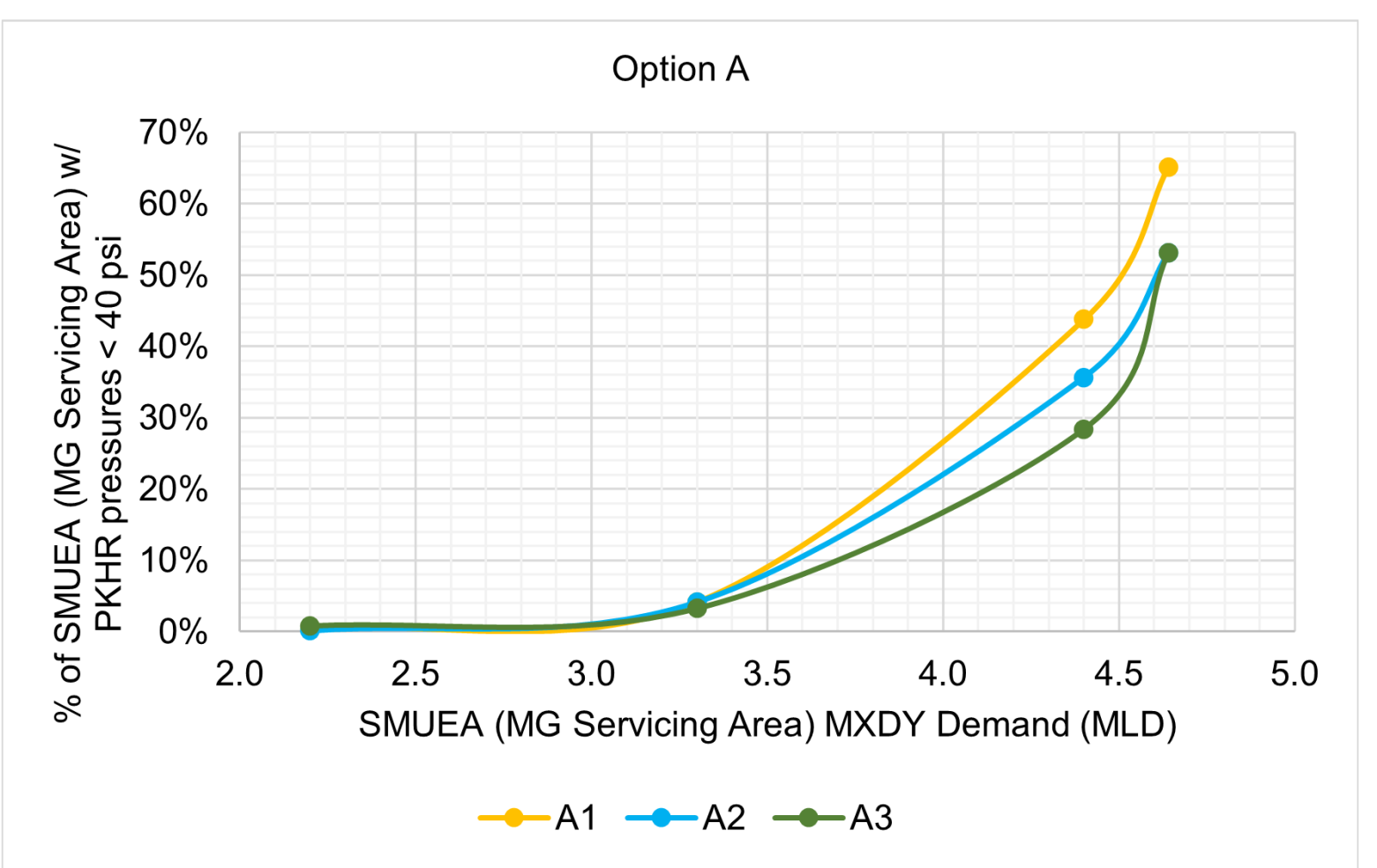




Conceptual Phasing Plan



Level of Service by Phase, Based on SMUEA (MG Servicing Area) MXDY Demand (MLD)



South March Urban Expansion Area Assessment

Figure 5: Option A - Potential Phasing of Infrastructure & Level of Service

Legend

**PS** Pump Station (Active)

Existing Check Valve

Kanata North CDP Planned Watermain (Benefitting SMUEA)

**South March Urban Expansion Area (SMUEA)**

SMUEA Area Serviced by 2W

SMUEA Area Serviced by MG

Parcels within SMUEA

Existing Lots within SMUEA

**Proposed Off-Site Watermain**

Phase 1

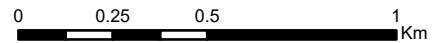
Phase 2

Phase 3

**Proposed Valves (Phase 1)**

Check Valve

PRV





#### 4.1.2 Option B

Option B consists of directly servicing the SMUEA with off-site watermain, along with an upgrade to the MGPS to supply the target RFF. The infrastructure needs under Option B are listed in **Table 10** and illustrated in **Figure 6**.

A preliminary review of the MGPS As-Built Drawings suggests that there is no space within the existing MGPS building to add two (2) 13,000 L/min pumps to supply the target RFF (assuming the largest pump is out of service). Additional land would be needed to accommodate an expansion of the existing MGPS. Alternatively, the existing pumps could be upsized to provide the required capacity, along with the accompanying piping, electrical power and backup power upgrades. These options would need to be assessed in a separate functional design study. For the purpose of providing conceptual OPCs to inform off-site infrastructure needs, the latter option (upsizing existing pumps) is assumed.

**Table 10: Option B – Off-Site & Additional Internal Infrastructure Needs**

Servicing Area	Phase (ID)	Description	Diameter (mm)	Length (m)	Along	From	To
2W	B-2W	New PRV Chamber	400	N/A	Within SMUEA (at MG/2W boundary)		
MG	B-MG-1a	New Watermain	600	620	Old Second Line Rd	Klondike Rd	SMUEA Boundary
	B-MG-1b	New Watermain	600	180	Oakside Cres	Goward Dr	Old Carp Rd
		New Watermain	600	140	Old Carp Rd	Oakside Cres	SMUEA Boundary
	B-MG-2	Existing Watermain Upgrade	600	590	Klondike Rd	Halton Terr	Old Second Line Rd
		Existing Watermain Upgrade	600	120	Klondike Rd	MGPS	Halton Terr
	B-MG-3	Existing Watermain Upgrade	600	450	Halton Terr	Klondike Rd	Goward Dr
		Existing Watermain Upgrade	600	320	Goward Dr	Halton Terr	Oakside Cres
	B-MG-4	Add 13,000 L/min of pumping capacity to MGPS	N/A				

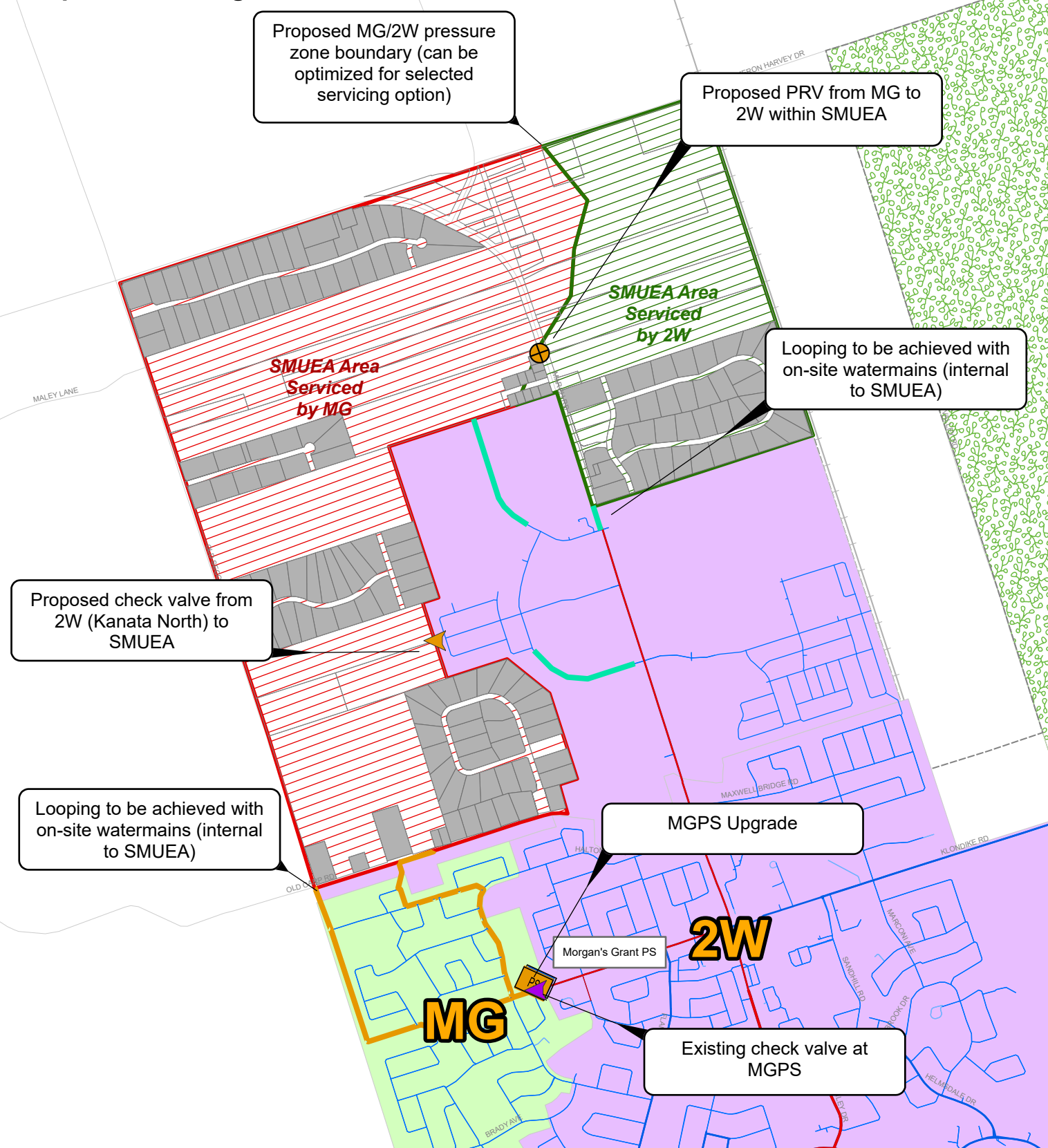
While the MGPS would be the primary fire flow supply under a normal scenario, check valves from 2W would still be needed to provide reliability in the event of an MGPS failure, and supply BSDY+FF demands.

Due to upstream constraints in the existing distribution system with the addition of the SMUEA's peak demands, higher flows and hence higher head losses are observed upstream of the MGPS in 2W. This results in lower suction HGLs, which cannot be overcome by the existing PS's head gain, resulting in lower discharge HGLs (and pressures) within MG. Up to ~15-20% of the SMUEA is projected to experience minimum pressure deficiencies under PKHR demand conditions. The extent of these deficiencies is illustrated in **Figure 6**. It is nonetheless recognized that pressure deficiencies could be addressed as part of the MGPS upgrade, by increasing the MGPS's head gain. Adjustments to the MGPS's operational head gain to address suction HGL reduction should be assessed in functional design, should an MGPS upgrade be selected as the preferred servicing option. Increasing the MGPS head gain also offers the City capacity to supply potential long-term growth beyond the SMUEA's boundaries. However, there is a reduction in LOS in existing servicing areas in 2W and in MG due to the impact of the additional SMUEA's peak demands, as illustrated in **Appendix A**. Under Option B, addressing these impacts would require additional upstream upgrades not identified as off-site infrastructure requirements for the SMUEA, since they would need to be assessed at a Master Plan level, incorporating other system-wide growth and infrastructure considerations.

Therefore, in terms of servicing the SMUEA, Option B is a feasible option and is further assessed in terms of OPC. The OPC for Option B is \$39.1 M (see details in **Section 4.4**). **Option B is a viable option which could be re-assessed in subsequent servicing studies. Additional Master Plan-level considerations are needed to address the impacts of the additional SMUEA's peak demands on the existing service areas' LOS.**

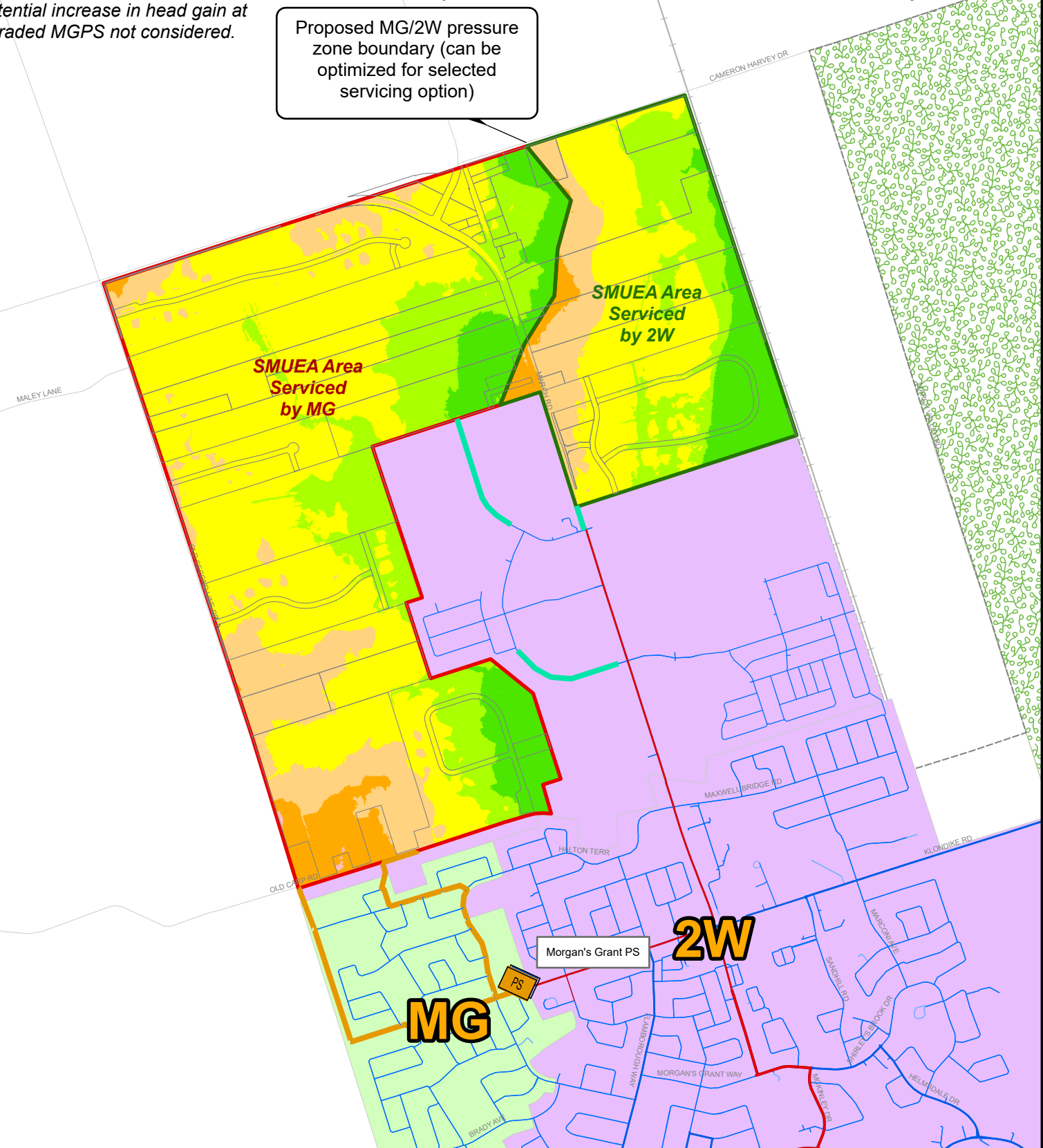
**Figure 7** illustrates potential phases for the proposed Option B infrastructure. Each phase is assessed in terms of LOS achieved (percentage of areas experiencing PKHR minimum pressures below 40 psi) as a function of demand supplied. The proposed phases consist of implementing the required watermain upgrades which can accommodate the MGPS upgrade (last phase). There may be potential water quality (water age) concerns in large watermains. As part of future functional design studies, water age should be assessed. Mitigation measures, including on-site looping within the SMUEA, should be included as part of the functional design.

## Conceptual Servicing Plan



### PKHR Minimum Pressure Distribution (Scenario: 2046 with SMUEA Demands)











\*Potential increase in head gain at upgraded MGPS not considered.



# South March Urban Expansion Area Assessment

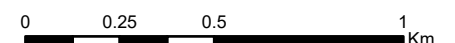
Figure 6: Option B - Conceptual Servicing Plan and PKHR Minimum Pressure Distribution

### Legend

-  Existing Check Valve  
 Kanata North CDP Planned Watermain (Benefitting SMUEA)
- South March Urban Expansion Area (SMUEA)**  
 SMUEA Area Served by 2W  
 SMUEA Area Served by MG  
 Parcels within SMUEA
-  Existing Lots within SMUEA  
 Proposed Off-Site Watermain  
 PS Upgrades
- Proposed Valves**  
 Check Valve
-  Private Property

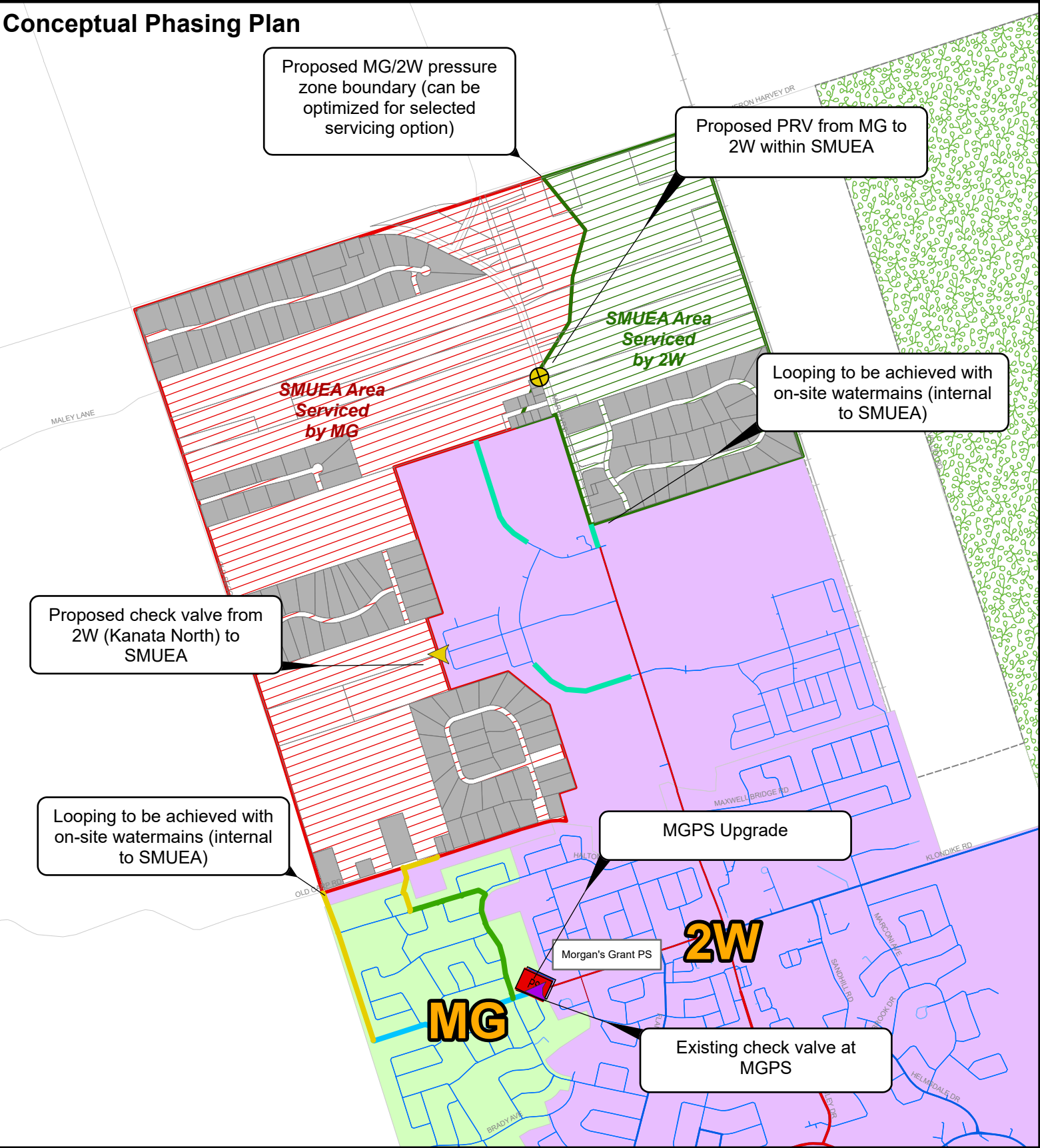
## Pressures (psi)

- | Pressure (psi)             |  | Pressure (psi)             |  | Pressure (psi)              |  |
|----------------------------|--|----------------------------|--|-----------------------------|--|
| Not Serviceable            |  | 45 psi < Pressure ≤ 50 psi |  | 95 psi < Pressure ≤ 100 psi |  |
| 0 psi < Pressure ≤ 20 psi  |  | 50 psi < Pressure ≤ 60 psi |  | Pressure > 100 psi          |  |
| 20 psi < Pressure ≤ 25 psi |  | 60 psi < Pressure ≤ 70 psi |  |                             |  |
| 25 psi < Pressure ≤ 30 psi |  | 70 psi < Pressure ≤ 80 psi |  |                             |  |
| 30 psi < Pressure ≤ 35 psi |  | 80 psi < Pressure ≤ 85 psi |  |                             |  |
| 35 psi < Pressure ≤ 40 psi |  | 85 psi < Pressure ≤ 90 psi |  |                             |  |

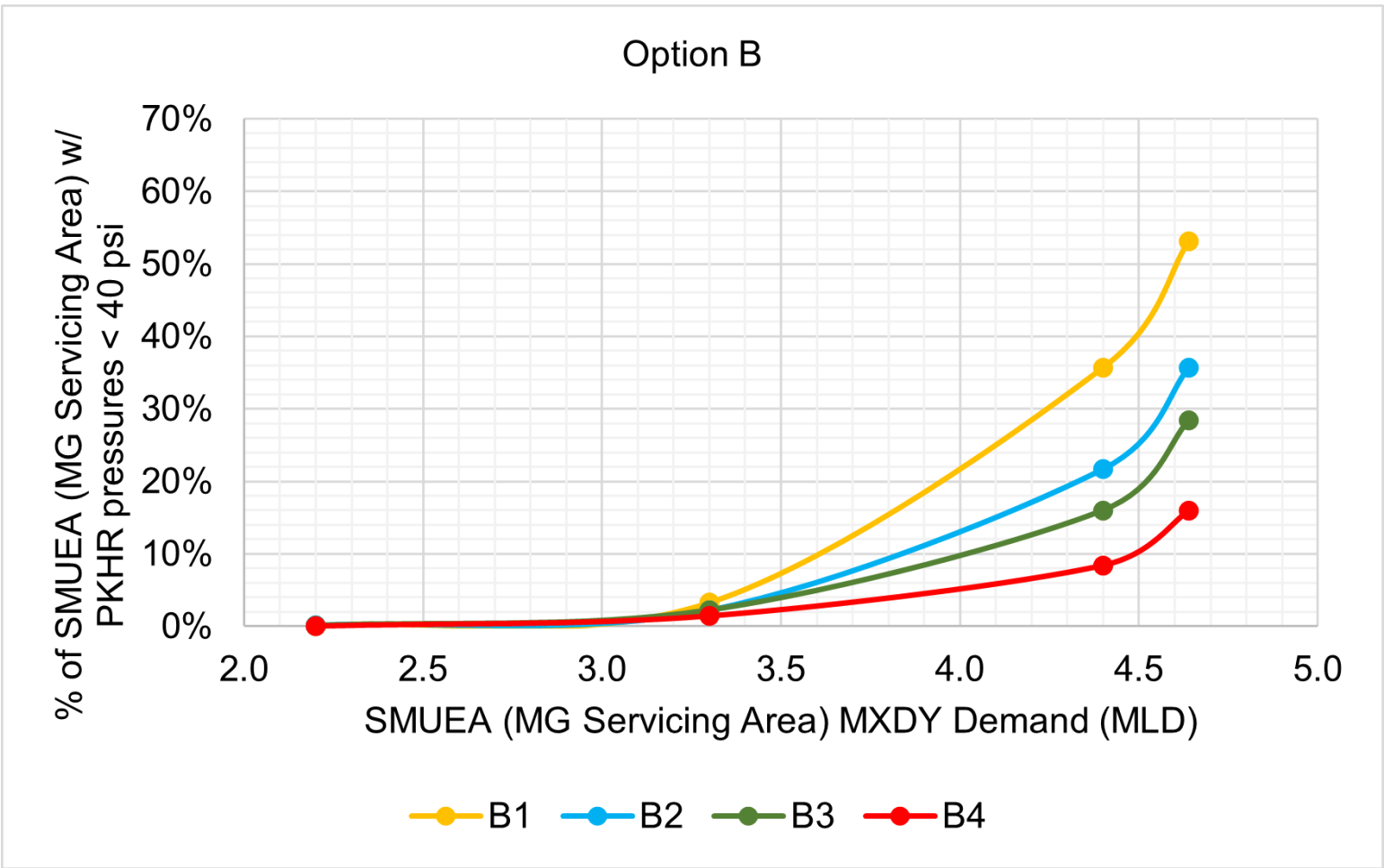




Conceptual Phasing Plan



Level of Service by Phase, Based on SMUEA (MG Servicing Area) MXDY Demand (MLD)



South March Urban Expansion Area Assessment

Figure 7: Option B - Potential Phasing of Infrastructure & Level of Service

Legend

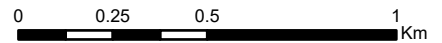
- Existing Check Valve
- Kanata North CDP Planned Watermain (Benefitting SMUEA)

- South March Urban Expansion Area (SMUEA)**
- SMUEA Area Serviced by 2W
  - SMUEA Area Serviced by MG

- Parcels within SMUEA
- Existing Lots within SMUEA

- Proposed Off-Site Watermain**
- Phase 1
  - Phase 2
  - Phase 3

- Proposed Valves (Phase 1)**
- PS Upgrades (Phase 4)
  - Check Valve
  - PRV



### 4.1.3 Option C

Option C consists of directly servicing the SMUEA with off-site watermain, along with a pressure zone reconfiguration such that the Morgan's Grant area would be serviced from zone 3W to supply the target RFF. The existing Morgan's Grant PS would no longer be the primary PS supplying Morgan's Grant, and could be decommissioned or maintained as a standby PS in the event of a failure of supply from 3W. The infrastructure needs under Option C are listed in **Table 11** and illustrated in **Figure 8**.

**Table 11: Option C – Off-Site & Additional Internal Infrastructure Needs**

Servicing Area	Phase (ID)	Description	Diameter (mm)	Length (m)	Along	From	To
2W	C-2W	New PRV Chamber	400	N/A	Within SMUEA (at MG/2W boundary)		
MG (reconfigured into 3W)	C-3W-1a	New Watermain	400	620	Old Second Line Rd	Klondike Rd	SMUEA Boundary
	C-3W-1b	New Watermain	400	180	Oakside Cres	Goward Dr	Old Carp Rd
		New Watermain	400	140	Old Carp Rd	Oakside Cres	SMUEA Boundary
	C-3W-2	New Watermain	400	910	Old Second Line Rd	Terry Fox Dr	Klondike Rd
	C-3W-3	New Watermain (with PRV chamber)	400	1,460	Goulbourn Forced Rd	Keyrock Dr	St. Isabel Catholic Elementary School

While zone 3W will be the primary fire flow supply under a normal scenario, check valves from 2W would still be needed to provide reliability in the event of an interruption in zone 3W supply. Alternatively, the following reliability measures could also be considered:

- If the MGPS is not decommissioned, it could be used as a standby PS; or,
- Providing a redundant PRV chamber from 3W.

These options should be assessed as part of future studies, which would include an analysis of full life-cycle costs for each option.

The projected maximum pressure distribution within MG, when serviced from 3W (with a PRV chamber), is illustrated in **Appendix B**. An alternative to a PRV chamber from 3W to the MG area would be to retrofit individual service lines with PRVs, as was done as part of the SUC pressure zone reconfiguration in lower elevation areas adjacent to the Rideau River. This approach was

appropriate in these areas due to the existing watermain layout, which would have required several disconnects and the creation of dead-ends to service them from a single PRV chamber. In the case of reconfiguring MG into 3W, however, there is sufficient looping within the distribution network to allow fully servicing MG from 3W via a single PRV chamber. **Appendix B** also shows the maximum pressure zone distribution within MG if serviced directly at 3W HGLs, which illustrates the following scenarios:

- If individual service lines were retrofitted with PRVs (properties which would experience high pressures can be identified);
- If the proposed PRV chamber were to fail.

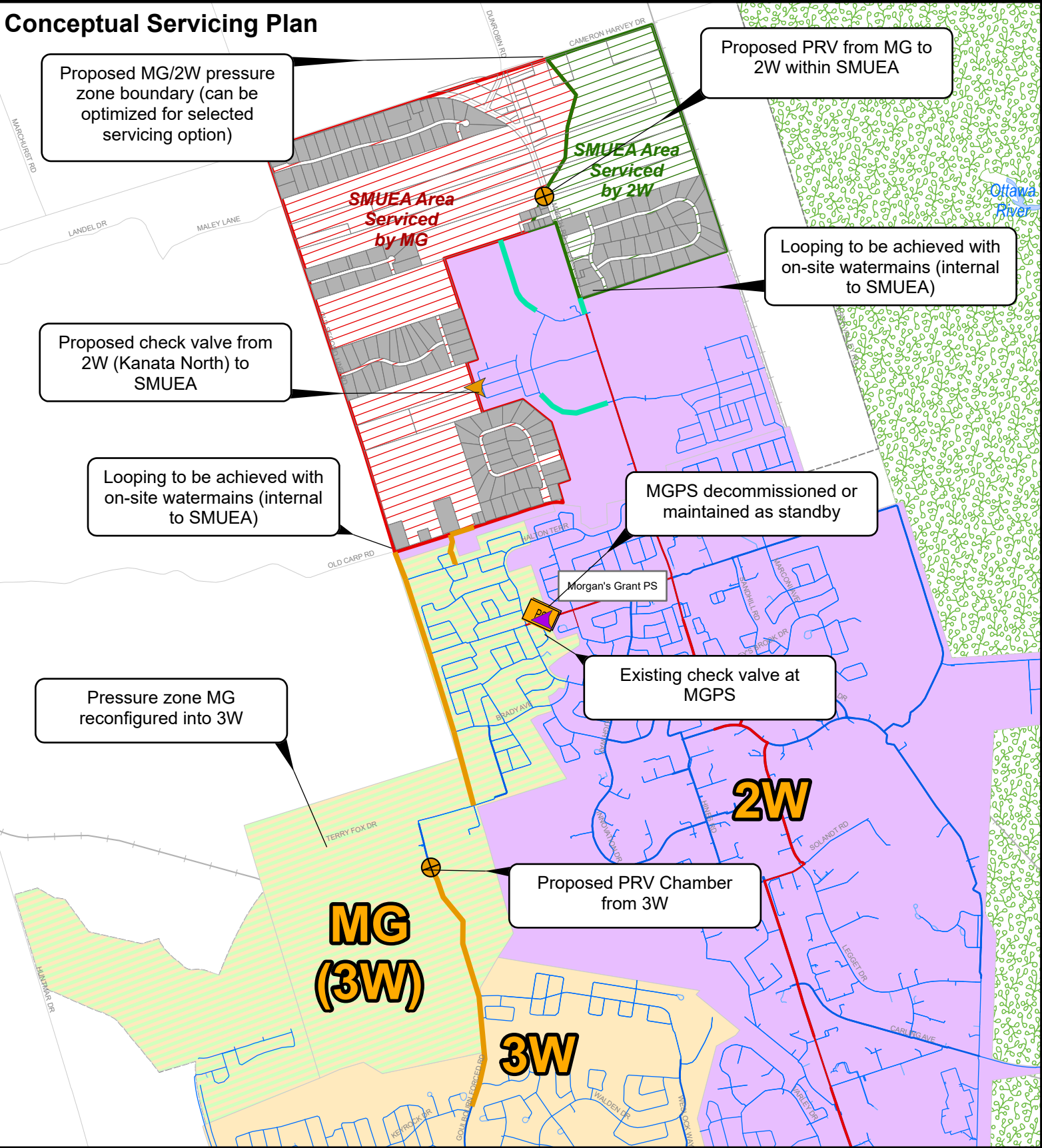
With a redirection of part of the SMUEA supply from 2W & MG to 3W, observed pressure deficiencies under Options A and B are addressed. **Figure 8** illustrates the minimum pressure distribution under Option C. Furthermore, as shown in **Appendix A**, the impact of the additional SMUEA peak demands on existing areas' LOS in 2W OGB are mitigated, and the LOS in MG can be improved.

Therefore, Option C is a feasible option, and is further assessed in terms of OPC. The OPC for Option C is \$23.8 M (see details in **Section 4.4**). In terms of capital costs, Option C is less expensive than Option B. Option C also offers the City capacity to supply long-term growth beyond the SMUEA's boundaries, without any further PS upgrades (see pressure zone boundary analysis in **Section 3.1**). **Therefore, based on the current assessment and for the purposes of developing a conceptual servicing plan for the SMUEA, Option C is the recommended option, and should be re-assessed in further studies.**

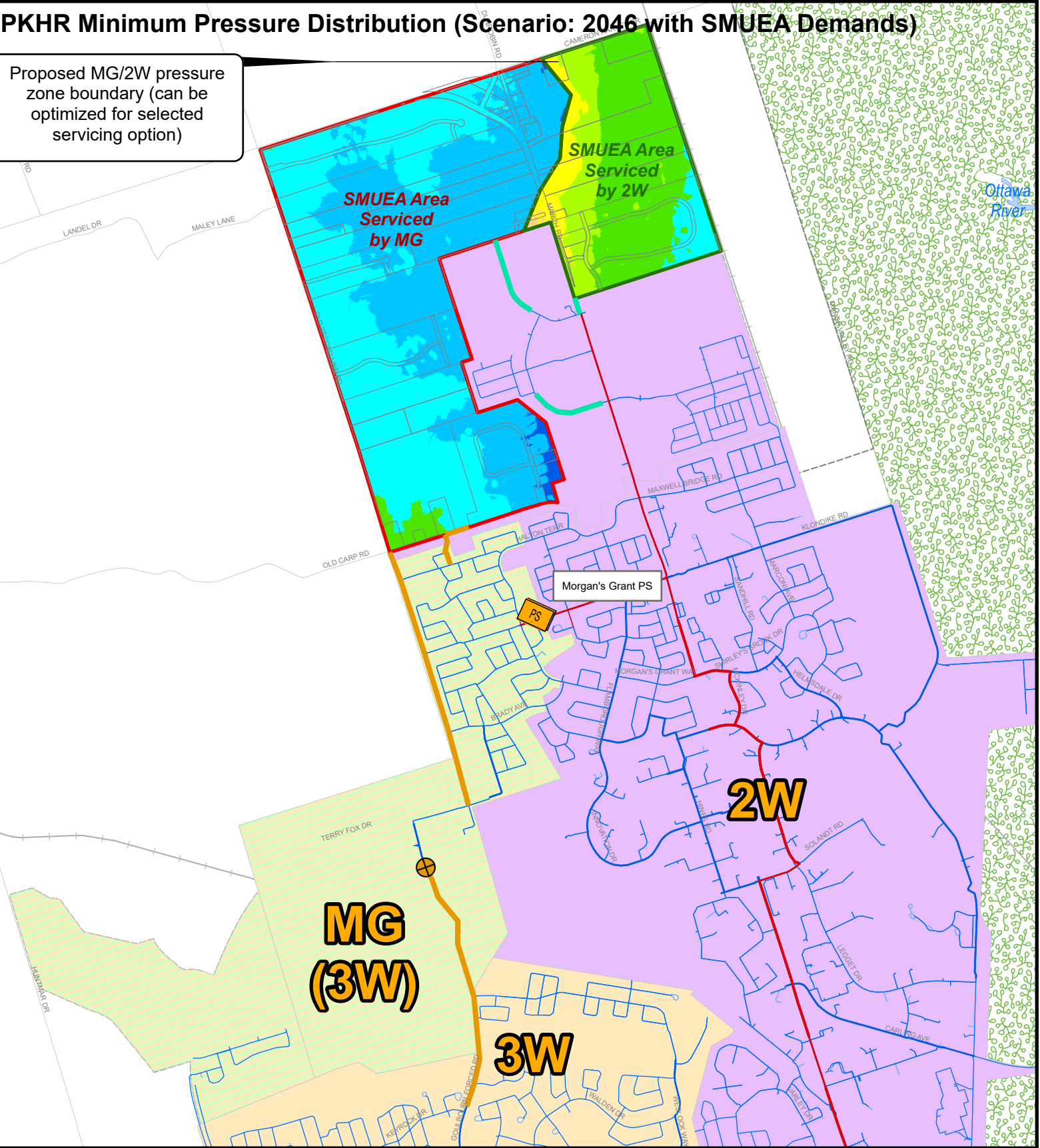
**Figure 9** illustrates the potential phases for the proposed Option C infrastructure. Each phase is assessed in terms of LOS achieved (percentage of areas experiencing PKHR minimum pressures below 40 psi) as a function of demand supplied. The initial phases (C-3W-1a, C-3W-1b) align with the initial phases of Option A, and can provide capacity up to an SMUEA MXDY demand of ~3.0 MLD. However, ultimately, the reconfiguration into 3W fulfils the target LOS upon buildout of the SMUEA.



Conceptual Servicing Plan



PKHR Minimum Pressure Distribution (Scenario: 2046 with SMUEA Demands)



South March Urban Expansion Area Assessment

Figure 8: Option C - Conceptual Servicing Plan and PKHR Minimum Pressure Distribution

Legend

- Check Valve
- Kanata North CDP Planned Watermains (Benefitting SMUEA)

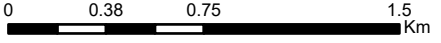
- South March Urban Expansion Area (SMUEA)
- SMUEA Area Serviced by 2W
  - SMUEA Area Serviced by MG
  - Parcels within SMUEA

- Existing Lots within SMUEA
- Proposed Off-Site Watermains
- PS Decommissioned/Standby

- Proposed Valves
- Check Valve
  - PRV

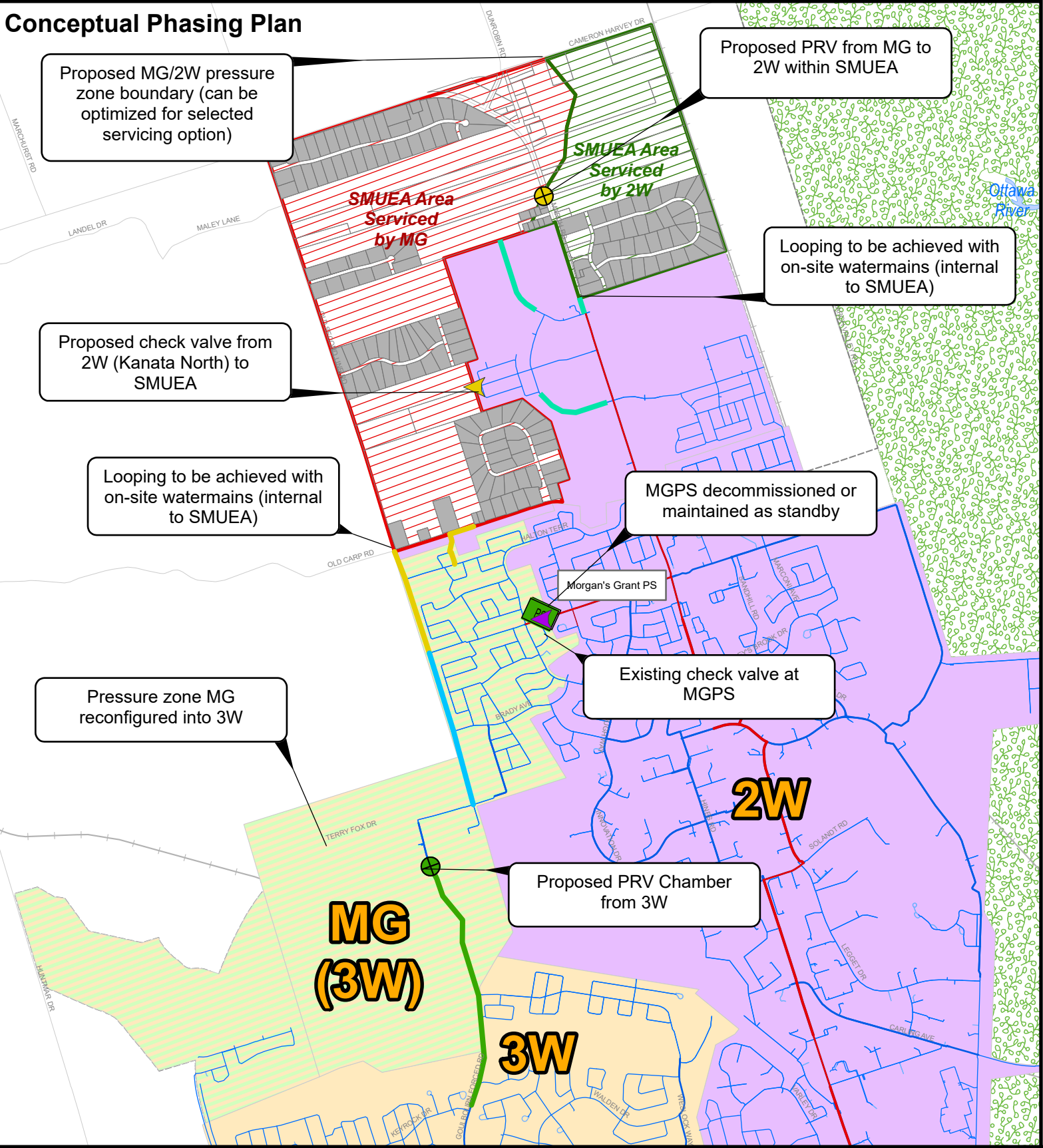
Pressures (psi)

- Not Serviceable
- 0 psi < Pressure ≤ 20 psi
- 20 psi < Pressure ≤ 25 psi
- 25 psi < Pressure ≤ 30 psi
- 30 psi < Pressure ≤ 35 psi
- 35 psi < Pressure ≤ 40 psi
- 40 psi < Pressure ≤ 45 psi
- 45 psi < Pressure ≤ 50 psi
- 50 psi < Pressure ≤ 60 psi
- 60 psi < Pressure ≤ 70 psi
- 70 psi < Pressure ≤ 80 psi
- 80 psi < Pressure ≤ 85 psi
- 85 psi < Pressure ≤ 90 psi
- 90 psi < Pressure ≤ 95 psi
- 95 psi < Pressure ≤ 100 psi
- Pressure > 100 psi

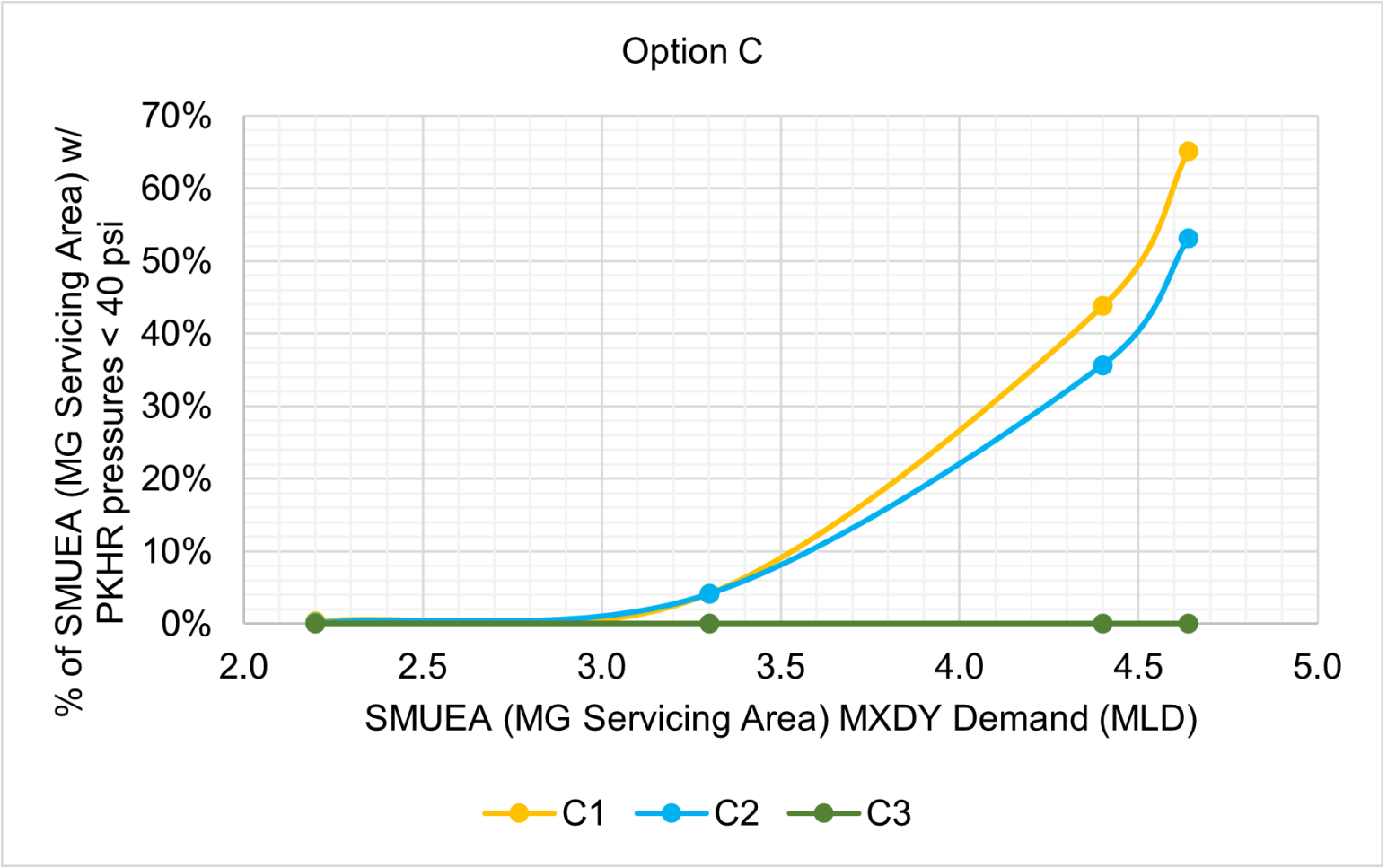




Conceptual Phasing Plan



Level of Service by Phase, Based on SMUEA (MG Servicing Area) MXDY Demand (MLD)



South March Urban Expansion Area Assessment

Figure 9: Option C - Potential Phasing of Infrastructure & Level of Service

Legend

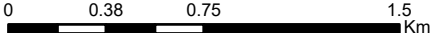
- Check Valve
- Kanata North CDP Planned Watermains (Benefitting SMUEA)

- South March Urban Expansion Area (SMUEA)
- SMUEA Area Serviced by 2W

- SMUEA Area Serviced by MG
- Parcels within SMUEA
- Existing Lots within SMUEA

- Proposed Off-Site Watermains
- Phase 1
  - Phase 2
  - Phase 3

- Proposed Valves (Phase 1)
- Check Valve
  - PRV
- Proposed Valves (Phase 3)
- PRV



#### 4.4 Opinion of Probable Cost & Cost Allocation

Using the Class D costing templates developed by Ainley Graham & Associates Limited – Ainley Group for use in the 2024 IMP, OPCs were developed for Options B and C, which were both deemed feasible based on the assessment presented in **Section 4.3**. The OPCs are presented in 2025\$, using the 2020-2024 inflation rates established in the 2024 IMP and an assumed rate of 3% from 2024 to 2025.

Option C is the recommended alternative based on the current assessment and for the purposes of developing a conceptual servicing plan for the SMUEA. Option B is also a viable option which could be re-assessed in subsequent servicing studies, however, Master Plan-level assessments are also needed to address the impact of the additional SMUEA's peak demands on existing areas' LOS.

Cost allocations between growth stakeholders and benefit-to-existing (BTE) were developed based on the framework outlined in the *2024 IMP Appendix H*. At the time of this assessment, the details of the mechanisms to recuperate fees for the costs allocated to growth were unknown, as this assessment does not directly support an update to the Development Charges By-Law. The BTE components were determined as follows:

- For new watermain proposed to directly connect the SMUEA (growth & existing areas) to the existing water distribution network, a BTE = 5% was applied;
- For existing watermain upgrades (replacement with upsizing) which are growth-driven and where there are no existing conditions or performance concerns, a BTE = 5% was applied;
- For new watermain which provide an improvement in LOS (e.g., by providing additional looping), which are growth-driven and where there are no existing conditions or performance concerns, a BTE = 5% was applied; and,
- For existing facility upgrades which provide an improvement in LOS, which are growth-driven and where there are no existing conditions or performance concerns, a BTE = 5% was applied.

**Table 12** presents the OPCs (in 2025\$) and allocation by phase and between growth and BTE for Option B. **Table 13** presents the OPCs (in 2025\$) and allocation for Option C. Detailed OPC calculation sheets are provided in **Appendix C**.

**Table 12: Option B – OPCs (2025\$), Potential Phasing and Preliminary Cost Allocation**

Servicing Area	Phase (ID)	Growth (M\$)	BTE (M\$)	Total (M\$)	Growth %	BTE %
<b>2W</b>	<b>B-2W</b>	\$0.199	\$0.01	<b>\$0.2</b>	95%	5%
<b>MG</b>	<b>B-MG-1a</b>	\$5.0	\$0.3	<b>\$5.3</b>	95%	5%
	<b>B-MG-1b</b>	\$2.8	\$0.2	<b>\$3.0</b>	95%	5%
	<b>B-MG-2</b>	\$6.0	\$0.4	<b>\$6.4</b>	95%	5%
	<b>B-MG-3</b>	\$6.7	\$0.4	<b>\$7.1</b>	95%	5%
	<b>B-MG-4</b>	\$16.2	\$0.9	<b>\$17.1</b>	95%	5%
<b>Total</b>		<b>\$36.9</b>	<b>\$2.2</b>	<b>\$39.1</b>	<b>95%</b>	<b>5%</b>

**Table 13: Option C – OPCs (2025\$), Potential Phasing and Preliminary Cost Allocation**

Servicing Area	Phase (ID)	Growth (M\$)	BTE (M\$)	Total (M\$)	Growth %	BTE %
<b>2W</b>	<b>C-2W</b>	\$0.199	\$0.01	<b>\$0.2</b>	95%	5%
<b>MG</b>	<b>C-3W-1a</b>	\$4.0	\$0.2	<b>\$4.2</b>	95%	5%
	<b>C-3W-1b</b>	\$2.2	\$0.2	<b>\$2.4</b>	95%	5%
	<b>C-3W-2</b>	\$5.8	\$0.3	<b>\$6.1</b>	95%	5%
	<b>C-3W-3</b>	\$10.4	\$0.5	<b>\$10.9</b>	95%	5%
<b>Total</b>		<b>\$22.4</b>	<b>\$1.2</b>	<b>\$23.8</b>	<b>95%</b>	<b>5%</b>

#### 4.5 Servicing Recommendations

Based on the comparison of servicing alternatives presented in **Section 4.3** and of the OPCs presented in **Section 4.4**, the recommended SMUEA servicing alternative is Option C, which consists of directly servicing the SMUEA with off-site watermain, along with a pressure zone reconfiguration such that the Morgan's Grant area would be serviced from zone 3W to supply the target RFF. The existing Morgan's Grant PS would no longer be the primary PS supplying Morgan's Grant, and could be decommissioned or maintained as a standby PS in the event of a failure of supply from 3W. The OPC for Option C is \$23.8 M (see details in **Section 4.4**). The OPC for Option C does not include the costs for decommissioning the MGPS. This should be assessed as part of future studies, which would include an analysis of full life-cycle costs, and a comparison against the option of maintaining the MGPS as a standby facility.

This option fulfils the target LOS requirements, and provides the long-term capacity to service the SMUEA and other potential growth areas beyond the SMUEA's boundaries. As the infrastructure under Option C is gradually phased in, there is capacity for development to proceed. Depending on the planned phasing of development compared to the infrastructure implementation phases, low pressure mitigation measures (e.g., adjusting grading, on-site pressure boosting, land use and/or building height limitations, oversizing services) may be required. The proposed infrastructure phasing plan also allows for the City to gain further operational experience in operating PRV chambers until Option C is fully implemented.



#### 4.6 Step 2 Conclusions & Recommendations

Off-site water distribution infrastructure will be needed to service the SMUEA. The recommended servicing strategy consists of partially servicing the SMUEA from pressure zones 2W and MG (reconfigured into pressure zone 3W). This servicing strategy is recommended tentatively, pending further analyses in Functional Design and master servicing studies. An Environmental Assessment (EA) study is required to clarify the preferred alternative.

The off-site infrastructure listed in **Table 14** is needed to support this proposed servicing strategy:

**Table 14: SMUEA Off-Site & Additional Internal Infrastructure Needs**

Servicing Area	Phase (ID)	Description	Diameter (mm)	Length (m)	Along	From	To
2W	C-2W	New PRV Chamber	400	N/A	Within SMUEA (at MG/2W boundary)		
MG (reconfigured into 3W)	C-3W-1a	New Watermain	400	620	Old Second Line Rd	Klondike Rd	SMUEA Boundary
	C-3W-1b	New Watermain	400	180	Oakside Cres	Goward Dr	Old Carp Rd
		New Watermain	400	140	Old Carp Rd	Oakside Cres	SMUEA Boundary
	C-3W-2	New Watermain	400	910	Old Second Line Rd	Terry Fox Dr	Klondike Rd
	C-3W-3	New Watermain (with PRV chamber)	400	1,460	Goulbourn Forced Rd	Keyrock Dr	St. Isabel Catholic Elementary School

This option fulfils the target LOS requirements, and provides the long-term capacity to service the SMUEA and other potential growth areas beyond the SMUEA's boundaries. The Class D OPC for this option is \$23.8 M, with 95% being allocated to growth and 5% to BTE. This OPC and the proposed allocation should be reviewed in future studies.

As the infrastructure under Option C is gradually phased in, there is capacity for development to proceed. Depending on the planned phasing of development compared to the infrastructure implementation phases, low pressure mitigation measures (e.g., adjusting grading, on-site pressure boosting, land use and/or building height limitations, oversizing services) may be required. The proposed infrastructure phasing plan also allows for the City to gain further operational experience in operating PRVs until Option C is fully implemented. A second option (Option B) involving the upgrade of the MGPS was also deemed viable, however, Master Plan-level assessments are also needed to address the impact of the additional SMUEA's peak demands on existing areas' LOS.

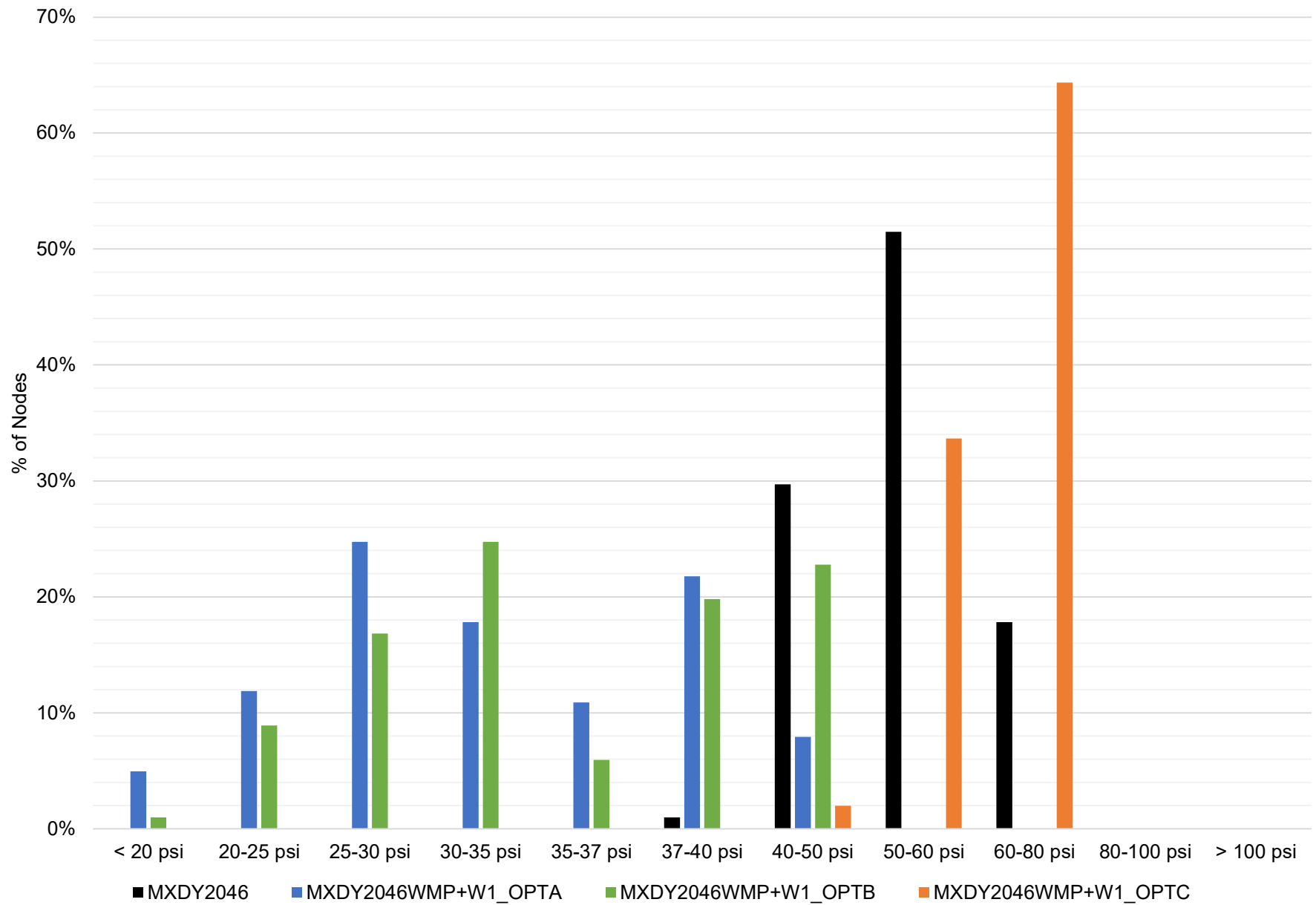
Future assessments (functional design studies, Master Plan studies) should include considerations for the following:

- Assessment of water age and mitigation measures, considering final on-site servicing design;
- Review of SMUEA detailed concept plans and phasing plans, once available;
- Review of cost allocation and mechanisms to recuperate costs associated with growth;
- Refined assessment of options including life-cycle costs;
- Assessment of storage facility expansions and/or feedermain upgrades to mitigate head losses from 2W IGB to OGB; and,
- Additional sizing and capacity considerations for other lands adjacent to the SMUEA where future urban boundary expansions could occur.



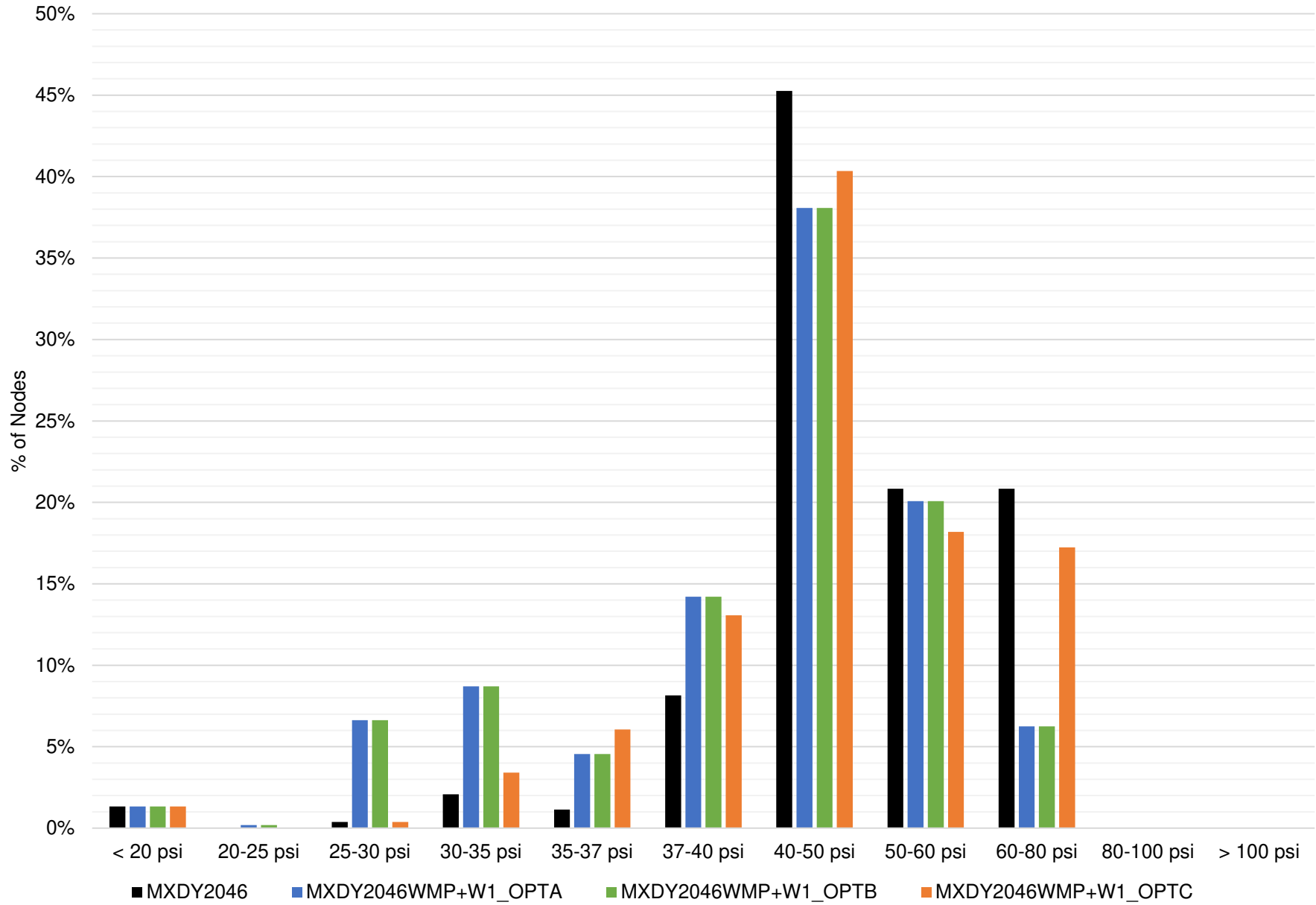
**Appendix A Hydraulic Modelling Results: PKHR Minimum Pressure Distribution  
(Existing Service Areas)**

MG Existing Areas' Node Results - PKHR Min. Pressure Distribution - OGB (101 Demand Nodes)





2W Existing Areas' Node Results - PKHR Min. Pressure Distribution - OGB (528 Demand Nodes)

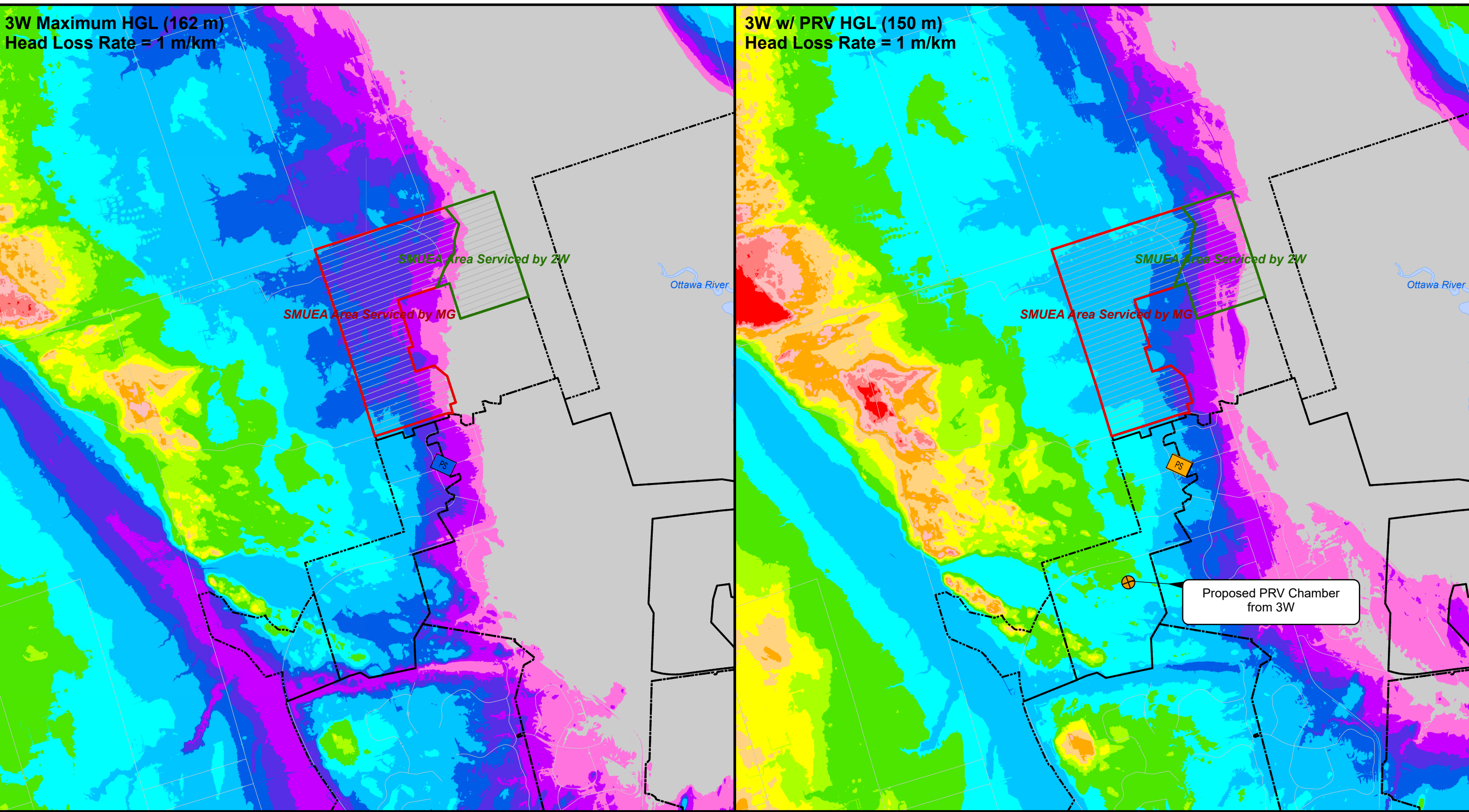




## Appendix B Pressure Distribution Mapping – Servicing MG from 3W

3W Maximum HGL (162 m)  
Head Loss Rate = 1 m/km

3W w/ PRV HGL (150 m)  
Head Loss Rate = 1 m/km



South March Urban Expansion  
Area Assessment  
Appendix B: 3W Maximum  
Pressure Distribution

Legend

- PS Pump Station (Active)
- Existing Pressure Zone Boundaries
- SMUEA Area Serviced by 2W

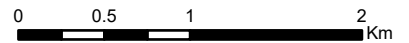
- SMUEA Area Serviced by MG
- PS Decommissioned/ Standby
- Proposed PRV

Pressures (psi)

- Not Serviceable
- 0 psi < Pressure ≤ 20 psi
- 20 psi < Pressure ≤ 25 psi
- 25 psi < Pressure ≤ 30 psi
- 30 psi < Pressure ≤ 35 psi

- 35 psi < Pressure ≤ 40 psi
- 40 psi < Pressure ≤ 45 psi
- 45 psi < Pressure ≤ 50 psi
- 50 psi < Pressure ≤ 60 psi
- 60 psi < Pressure ≤ 70 psi
- 70 psi < Pressure ≤ 80 psi

- 80 psi < Pressure ≤ 85 psi
- 85 psi < Pressure ≤ 90 psi
- 90 psi < Pressure ≤ 95 psi
- 95 psi < Pressure ≤ 100 psi
- Pressure > 100 psi






**Appendix C    Opinions of Probable Costs**



Date:

3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:

Project Type:

Project Title:

Project Phase:

SAP Project Number:

Project Location:

Watermain

Trunk Watermain and Appurtenances

PRV MG-2W (Internal to Development)

Conceptual Design

TBD

Refer to report figures for project location

Project Location Map:

Refer to report figures for project location

Project Description

New PRV Internal to SMUEA (MG-2W Boundary)

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$60,000

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$12,000
Utilities (5% - 20%)	15.0%	1	\$9,000
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$600
City Internal Costs (7% - 10%)	8.5%	1	\$5,100
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$3,000
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$6,000
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$3,000
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$3,000
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$600
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$89,700
RISK FACTORS SUBTOTAL:			\$12,600
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$35,880
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$138,180

\* Capital Cost Components Percentage Allowance Range as per City 2013 PDR

\*\* Risk Factors Percentage Allowance to be Applied Based on the Project Complexity

\*\*\* Overall Contingency is Applied to Estimated Construction and Capital Cost Components

Project Related Comments:

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$161,947
2022	9.9%	\$177,980
2023	7.8%	\$191,862
2024	5.79%	\$202,971
2025	3%	\$209,060
2026	3%	\$215,332
2027	3%	\$221,792
2028	3%	\$228,446
2029	3%	\$235,299
2030	3%	\$242,358
2031	3%	\$249,629
2032	3%	\$257,118
2033	3%	\$264,831
2034	3%	\$272,776
2035	3%	\$280,959
2036	3%	\$289,388
2037	3%	\$298,070
2038	3%	\$307,012
2039	3%	\$316,222
2040	3%	\$325,709
2041	3%	\$335,480
2042	3%	\$345,544
2043	3%	\$355,911
2044	3%	\$366,588
2045	3%	\$377,586
2046	3%	\$388,913


CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
PRV MG-2W (Internal to Development)						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	0	wk	\$1,000	\$0
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	0	wk	\$1,000	\$0
A020.02	F-1012	Police Assistance at Intersection	0	hr	\$280	\$0
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	0	LS	\$33,400	\$0
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	0	LS	\$4,400	\$0
A040.03	805, F-1004	Erosion and Sediment Control Measures	0	LS	\$11,100	\$0
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	0	LS	\$11,100	\$0
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	0	LS	\$33,400	\$0
Sub-Total Section A:					\$0	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	0			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$1,500	\$0
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	0			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$35,000	\$0
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	1	ea	\$60,000	\$60,000
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	0	m	\$500	\$0
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$60,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$60,000</b>



Date:3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain  
Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - Old Second Line Rd

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
610mm diam. WM along Old Second Line Rd from Klondike Rd to SMUEA

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$1,500,707

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$300,141
Utilities (5% - 20%)	15.0%	1	\$225,106
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$15,007
City Internal Costs (7% - 10%)	8.5%	1	\$127,560
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$75,035
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$150,071
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$75,035
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$75,035
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$15,007
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$2,243,556
RISK FACTORS SUBTOTAL:			\$315,148
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$897,423
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$3,456,127
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$4,050,581
2022	9.9%	\$4,451,589
2023	7.8%	\$4,798,813
2024	5.79%	\$5,076,664
2025	3%	\$5,228,964
2026	3%	\$5,385,833
2027	3%	\$5,547,408
2028	3%	\$5,713,830
2029	3%	\$5,885,245
2030	3%	\$6,061,802
2031	3%	\$6,243,657
2032	3%	\$6,430,966
2033	3%	\$6,623,895
2034	3%	\$6,822,612
2035	3%	\$7,027,290
2036	3%	\$7,238,109
2037	3%	\$7,455,252
2038	3%	\$7,678,910
2039	3%	\$7,909,277
2040	3%	\$8,146,556
2041	3%	\$8,390,952
2042	3%	\$8,642,681
2043	3%	\$8,901,961
2044	3%	\$9,169,020
2045	3%	\$9,444,091
2046	3%	\$9,727,413

CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - Old Second Line Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	45	wk	\$1,000	\$45,333
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	45	wk	\$1,000	\$45,333
A020.02	F-1012	Police Assistance at Intersection	48	hr	\$280	\$13,440
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$18,500	\$18,500
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$2,400	\$2,400
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$6,100	\$6,100
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$6,100	\$6,100
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$18,500	\$18,500
Sub-Total Section A:					\$155,707	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	620			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	620	m	\$1,500	\$930,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	3			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0


<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	3	ea	\$35,000	\$105,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	620	m	\$500	\$310,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$1,345,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$1,500,707</b>



Date:

3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain

Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - Oakside Cres

Conceptual Design

TBD

Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
610mm diam. WM along Oakside Cres from Goward Dr to Old Carp Rd

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$459,413

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$91,883
Utilities (5% - 20%)	15.0%	1	\$68,912
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$4,594
City Internal Costs (7% - 10%)	8.5%	1	\$39,050
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$22,971
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$45,941
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$22,971
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$22,971
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$4,594
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$686,823
RISK FACTORS SUBTOTAL:			\$96,477
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$274,729
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$1,058,029
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$1,240,010
2022	9.9%	\$1,362,771
2023	7.8%	\$1,469,067
2024	5.79%	\$1,554,126
2025	3%	\$1,600,750
2026	3%	\$1,648,772
2027	3%	\$1,698,235
2028	3%	\$1,749,182
2029	3%	\$1,801,658
2030	3%	\$1,855,708
2031	3%	\$1,911,379
2032	3%	\$1,968,720
2033	3%	\$2,027,782
2034	3%	\$2,088,615
2035	3%	\$2,151,274
2036	3%	\$2,215,812
2037	3%	\$2,282,286
2038	3%	\$2,350,755
2039	3%	\$2,421,278
2040	3%	\$2,493,916
2041	3%	\$2,568,733
2042	3%	\$2,645,795
2043	3%	\$2,725,169
2044	3%	\$2,806,924
2045	3%	\$2,891,132
2046	3%	\$2,977,866

CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - Oakside Cres						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	17	wk	\$1,000	\$16,667
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	17	wk	\$1,000	\$16,667
A020.02	F-1012	Police Assistance at Intersection	16	hr	\$280	\$4,480
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$5,600	\$5,600
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$800	\$800
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$1,800	\$1,800
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$1,800	\$1,800
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$5,600	\$5,600
Sub-Total Section A:					\$53,413	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	190			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	190	m	\$1,500	\$285,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	2			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0


<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	2	ea	\$35,000	\$70,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	80	m	\$500	\$40,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	110	m <sup>2</sup>	\$100	\$11,000

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$406,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$459,413</b>



Date:

3/5/2025



Asset Management

Infrastructure Planning Unit

Infrastructure Category:

Project Type:

Project Title:

Project Phase:

SAP Project Number:

Project Location:

Watermain

Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - Old Carp Rd

Conceptual Design

TBD

Refer to report figures for project location

Project Location Map:

Refer to report figures for project location

Project Description

610mm diam. WM along Old Carp Rd from Oakside Cres to SMUEA

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$398,827

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$79,765
Utilities (5% - 20%)	15.0%	1	\$59,824
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$3,988
City Internal Costs (7% - 10%)	8.5%	1	\$33,900
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$19,941
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$39,883
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$19,941
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$19,941
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$3,988
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$596,246
RISK FACTORS SUBTOTAL:			\$83,754
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$238,498
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$918,498
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$1,076,479
2022	9.9%	\$1,183,051
2023	7.8%	\$1,275,329
2024	5.79%	\$1,349,170
2025	3%	\$1,389,646
2026	3%	\$1,431,335
2027	3%	\$1,474,275
2028	3%	\$1,518,503
2029	3%	\$1,564,058
2030	3%	\$1,610,980
2031	3%	\$1,659,309
2032	3%	\$1,709,089
2033	3%	\$1,760,361
2034	3%	\$1,813,172
2035	3%	\$1,867,567
2036	3%	\$1,923,594
2037	3%	\$1,981,302
2038	3%	\$2,040,741
2039	3%	\$2,101,964
2040	3%	\$2,165,022
2041	3%	\$2,229,973
2042	3%	\$2,296,872
2043	3%	\$2,365,778
2044	3%	\$2,436,752
2045	3%	\$2,509,854
2046	3%	\$2,585,150


CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - Old Carp Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	13	wk	\$1,000	\$13,333
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	13	wk	\$1,000	\$13,333
A020.02	F-1012	Police Assistance at Intersection	32	hr	\$280	\$8,960
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$4,800	\$4,800
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$600	\$600
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$1,500	\$1,500
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$1,500	\$1,500
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$4,800	\$4,800
Sub-Total Section A:					\$48,827	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	140			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	140	m	\$1,500	\$210,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	2			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	2	ea	\$35,000	\$70,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	140	m	\$500	\$70,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$350,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$398,827</b>



Date:3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain  
Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - Klondike Rd

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
610mm diam. WM along Klondike Rd from Halton Terr to Old Second Line Rd

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$1,438,887

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$287,777
Utilities (5% - 20%)	15.0%	1	\$215,833
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$14,389
City Internal Costs (7% - 10%)	8.5%	1	\$122,305
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$71,944
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$143,889
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$71,944
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$71,944
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$14,389
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$2,151,136
RISK FACTORS SUBTOTAL:			\$302,166
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$860,454
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$3,313,756
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$3,883,722
2022	9.9%	\$4,268,211
2023	7.8%	\$4,601,131
2024	5.79%	\$4,867,536
2025	3%	\$5,013,562
2026	3%	\$5,163,969
2027	3%	\$5,318,888
2028	3%	\$5,478,455
2029	3%	\$5,642,809
2030	3%	\$5,812,093
2031	3%	\$5,986,456
2032	3%	\$6,166,049
2033	3%	\$6,351,031
2034	3%	\$6,541,562
2035	3%	\$6,737,809
2036	3%	\$6,939,943
2037	3%	\$7,148,141
2038	3%	\$7,362,586
2039	3%	\$7,583,463
2040	3%	\$7,810,967
2041	3%	\$8,045,296
2042	3%	\$8,286,655
2043	3%	\$8,535,255
2044	3%	\$8,791,312
2045	3%	\$9,055,052
2046	3%	\$9,326,703


CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - Klondike Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	43	wk	\$1,000	\$43,333
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	43	wk	\$1,000	\$43,333
A020.02	F-1012	Police Assistance at Intersection	64	hr	\$280	\$17,920
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$17,600	\$17,600
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$2,300	\$2,300
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$5,900	\$5,900
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$5,900	\$5,900
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$17,600	\$17,600
Sub-Total Section A:					\$153,887	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	590			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	590	m	\$1,500	\$885,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	3			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	3	ea	\$35,000	\$105,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	590	m	\$500	\$295,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$1,285,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$1,438,887</b>



Date:3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain  
Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - MGPS Discharge

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
610mm diam. WM along Klondike Rd from MGPS to Halton Terr

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):\$350,380

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$70,076
Utilities (5% - 20%)	15.0%	1	\$52,557
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$3,504
City Internal Costs (7% - 10%)	8.5%	1	\$29,782
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$17,519
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$35,038
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$17,519
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$17,519
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$3,504
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$523,818
RISK FACTORS SUBTOTAL:			\$73,580
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$209,527
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$806,925
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$945,716
2022	9.9%	\$1,039,342
2023	7.8%	\$1,120,411
2024	5.79%	\$1,185,283
2025	3%	\$1,220,841
2026	3%	\$1,257,466
2027	3%	\$1,295,190
2028	3%	\$1,334,046
2029	3%	\$1,374,067
2030	3%	\$1,415,289
2031	3%	\$1,457,748
2032	3%	\$1,501,481
2033	3%	\$1,546,525
2034	3%	\$1,592,921
2035	3%	\$1,640,708
2036	3%	\$1,689,930
2037	3%	\$1,740,628
2038	3%	\$1,792,846
2039	3%	\$1,846,632
2040	3%	\$1,902,031
2041	3%	\$1,959,092
2042	3%	\$2,017,864
2043	3%	\$2,078,400
2044	3%	\$2,140,752
2045	3%	\$2,204,975
2046	3%	\$2,271,124

CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm)				
		FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - MGPS Discharge						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	12	wk	\$1,000	\$12,000
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	12	wk	\$1,000	\$12,000
A020.02	F-1012	Police Assistance at Intersection	16	hr	\$280	\$4,480
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$4,300	\$4,300
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$500	\$500
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$1,400	\$1,400
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$1,400	\$1,400
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$4,300	\$4,300
Sub-Total Section A:					\$40,380	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	120			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	120	m	\$1,500	\$180,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	2			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	2	ea	\$35,000	\$70,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	120	m	\$500	\$60,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$310,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$350,380</b>



Date:

3/5/2025

Ottawa

CITY OF OTTAWA

Asset Management

Infrastructure Planning Unit

Infrastructure Category:

Project Type:

Project Title:

Project Phase:

SAP Project Number:

Project Location:

Watermain

Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - Halton Terr

Conceptual Design

TBD

Refer to report figures for project location

Project Location Map:

Refer to report figures for project location

Project Description

610mm diam. WM along Halton Terr from Klondike Rd to Goward Dr

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$1,160,513

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$232,103
Utilities (5% - 20%)	15.0%	1	\$174,077
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$11,605
City Internal Costs (7% - 10%)	8.5%	1	\$98,644
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$58,026
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$116,051
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$58,026
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$58,026
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$11,605
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$1,734,967
RISK FACTORS SUBTOTAL:			\$243,708
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$693,987
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$2,672,662
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$3,132,360
2022	9.9%	\$3,442,464
2023	7.8%	\$3,710,976
2024	5.79%	\$3,925,841
2025	3%	\$4,043,617
2026	3%	\$4,164,925
2027	3%	\$4,289,873
2028	3%	\$4,418,569
2029	3%	\$4,551,126
2030	3%	\$4,687,660
2031	3%	\$4,828,290
2032	3%	\$4,973,138
2033	3%	\$5,122,333
2034	3%	\$5,276,003
2035	3%	\$5,434,283
2036	3%	\$5,597,311
2037	3%	\$5,765,231
2038	3%	\$5,938,187
2039	3%	\$6,116,333
2040	3%	\$6,299,823
2041	3%	\$6,488,818
2042	3%	\$6,683,482
2043	3%	\$6,883,987
2044	3%	\$7,090,506
2045	3%	\$7,303,222
2046	3%	\$7,522,318


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CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - Halton Terr						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	35	wk	\$1,000	\$34,667
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	35	wk	\$1,000	\$34,667
A020.02	F-1012	Police Assistance at Intersection	96	hr	\$280	\$26,880
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$14,100	\$14,100
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$1,900	\$1,900
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$4,600	\$4,600
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$4,600	\$4,600
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$14,100	\$14,100
Sub-Total Section A:					\$135,513	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	460			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	460	m	\$1,500	\$690,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	3			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	3	ea	\$35,000	\$105,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	460	m	\$500	\$230,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$1,025,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$1,160,513</b>

Date:3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain  
Trunk Watermain and Appurtenances

MG Watermain Upgrades (to Support MGPS Upgrade) - Goward Dr

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
610mm diam. WM along Goward Dr from Halton Terr to Oakside Cres

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):\$864,420

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$172,884
Utilities (5% - 20%)	15.0%	1	\$129,663
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$8,644
City Internal Costs (7% - 10%)	8.5%	1	\$73,476
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$43,221
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$86,442
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$43,221
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$43,221
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$8,644
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$1,292,308
RISK FACTORS SUBTOTAL:			\$181,528
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$516,923
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$1,990,759
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$2,333,170
2022	9.9%	\$2,564,154
2023	7.8%	\$2,764,158
2024	5.79%	\$2,924,202
2025	3%	\$3,011,928
2026	3%	\$3,102,286
2027	3%	\$3,195,355
2028	3%	\$3,291,216
2029	3%	\$3,389,952
2030	3%	\$3,491,651
2031	3%	\$3,596,400
2032	3%	\$3,704,292
2033	3%	\$3,815,421
2034	3%	\$3,929,883
2035	3%	\$4,047,780
2036	3%	\$4,169,213
2037	3%	\$4,294,290
2038	3%	\$4,423,118
2039	3%	\$4,555,812
2040	3%	\$4,692,486
2041	3%	\$4,833,261
2042	3%	\$4,978,259
2043	3%	\$5,127,607
2044	3%	\$5,281,435
2045	3%	\$5,439,878
2046	3%	\$5,603,074




CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades (to Support MGPS Upgrade) - Goward Dr						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	26	wk	\$1,000	\$26,000
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	26	wk	\$1,000	\$26,000
A020.02	F-1012	Police Assistance at Intersection	64	hr	\$280	\$17,920
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$10,600	\$10,600
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$1,500	\$1,500
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$3,400	\$3,400
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$3,400	\$3,400
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$10,600	\$10,600
Sub-Total Section A:					\$99,420	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	330			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$1,000	\$0
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	330	m	\$1,500	\$495,000
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	3			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$20,000	\$0
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	3	ea	\$35,000	\$105,000
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	0	ea	\$7,000	\$0
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	0	m	\$500	\$0
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	330	m	\$500	\$165,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$765,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$864,420</b>

Date:

3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:

Pump Station

Project Type:

Pump Station

Project Title:

Morgan's Grant PS Upgrades for FF

Project Phase:

Conceptual Design

SAP Project Number:

TBD

Project Location:

Refer to report figures

Project Location Map:

Refer to report figures for project location

Project Description

Add 13,000 L/min of pumping capacity

FINAL - 2020 - CLASS D - ESTIMATED - CONSTRUCTION COSTS (No HST):			\$5,157,200
Class D Capital Cost Components and Risk Factors			
Item	Percentage	Yes/No = 1/0	Estimated Cost
Capital Cost Components*			
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$1,031,440
Utilities (5% - 20%)	5.0%	1	\$257,860
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$51,572
City Internal Costs (7% - 10%)	8.5%	1	\$438,362
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$257,860
Risk Factors**			
Geo-Tech Issues - Soil (1% - 5%)	10.0%	1	\$515,720
Geo-Tech issues - Bedrock (1% - 5%)	2.0%	1	\$103,144
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 5%)	2.0%	1	\$103,144
Change in Design Standards (1% - 5%)	1.0%	1	\$51,572
Construction Contract Duration (2% per year)	2.0%	1	\$103,144
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$51,572
Planning, Design and Land use Approvals (5% - 10%)	5.0%	1	\$257,860
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$7,194,294
RISK FACTORS SUBTOTAL:			\$1,186,156
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$2,877,718
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$11,258,168
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17%	\$13,194,572
2022	10%	\$14,500,835
2023	7.8%	\$15,631,900
2024	5.79%	\$16,536,987
2025	3%	\$17,033,097
2026	3%	\$17,544,090
2027	3%	\$18,070,412
2028	3%	\$18,612,525
2029	3%	\$19,170,901
2030	3%	\$19,746,028
2031	3%	\$20,338,408
2032	3%	\$20,948,561
2033	3%	\$21,577,018
2034	3%	\$22,224,328
2035	3%	\$22,891,058
2036	3%	\$23,577,790
2037	3%	\$24,285,123
2038	3%	\$25,013,677
2039	3%	\$25,764,087
2040	3%	\$26,537,010
2041	3%	\$27,333,120
2042	3%	\$28,153,114
2043	3%	\$28,997,707
2044	3%	\$29,867,638
2045	3%	\$30,763,668
2046	3%	\$31,686,578

City of Ottawa	Water Booster Station 500 L/s - Greenfield				
	FINAL - Class D - Construction Cost Estimating Template				
	Morgan's Grant PS Upgrades for FF				
A. Division Description					Costs
Division 1 - General Requirements					\$171,900
Division 2 - Site Work					\$1,069,800
Division 3 - Concrete					\$916,500
Division 4 - Masonry					\$85,000
Division 5 - Metals					\$280,000
Division 6 - Wood and Plastics					\$40,000
Division 7 - Thermal and Moisture Protection					\$110,000
Division 8 - Doors and Windows					\$25,000
Division 9 - Finishes					\$30,000
Division 10 - Specialties					\$50,000
Division 11 - Equipment					\$614,000
Division 12 - Furnishings					\$0
Division 14 - Conveying Systems					\$20,000
Division 15 - Mechanical					\$440,000
Division 16 - Electrical & Communication					\$1,305,000
2020 - Class D - Estimated Construction Costs (No HST):					\$5,157,200
Estimate Note:					
The Construction Cost Estimating Template for 500 L/s Water Booster Station has been prepared for guidance in project evaluation and implementation from the information available at the time of the 2020 unit prices.					
NOTE:		ADJUST QUANTITIES/UNIT COSTS AS REQUIRED			
Division 1, General Requirements					
Item No:	Description	Qty	Unit	Unit Cost	Costs
D1.1	Field office for Contract Administrator 35m2 to 70m2	43	wk	\$1,000	\$43,000
D1.2	Mobilization and Demobilization	1	LS	\$67,400	\$67,400
D1.3	Commissioning & Training and O & M Manuals & Record Drawings	1	LS	\$22,700	\$22,700
D1.4	Erosion and Sediment Control Measures	1	LS	\$11,200	\$11,200
D1.5	Traffic Control Plan	1	LS	\$5,400	\$5,400
D1.6	Pre-Construction Inspection	1	LS	\$2,600	\$2,600
D1.7	Construction Site Safety Management and Control	1	LS	\$5,400	\$5,400
D1.8	1.8m High Construction Interlock Safety Fencing	1	LS	\$14,200	\$14,200
Subtotal Construction Costs Division 1:					\$171,900
Division 2 - Site Work					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D2.1	Clearing and Grubbing	1	LS	\$25,000	\$25,000
D2.2	Removal & Disposal of Clearing and Grubbing Materials	1	LS	\$20,000	\$20,000
D2.3	Sheeting and Shoring of Excavations	1	LS	\$70,000	\$70,000
D2.4	Excavating, Backfilling, and Compacting	1	LS	\$50,000	\$50,000
D2.5	Earthworks & Site Grading, Including Imported Backfill Material	1	LS	\$40,000	\$40,000
D2.6	Unshrinkable Backfill	22	m³	\$400	\$8,800
D2.7	Hydro Underground Service	1	LS	\$10,000	\$10,000
D2.8	Telephone Underground Service	1	LS	\$5,000	\$5,000
D2.9	Sub-Drain	1	LS	\$5,000	\$5,000
D2.10	Underground Yard Piping for Washroom Potable Water Service and Sanitary Service	1	LS	\$8,000	\$8,000
D2.11	Supply and install 500 mm diameter Concrete Pressure Class C303 Watermain c/w all Appurtenances and Mechanical Restraints and Connections on the Site	100	m	\$4,500	\$450,000
D2.12	Connections to Existing Watermains	2	ea	\$25,000	\$50,000
D2.13	Access, Air Release and Drain-Out Valve Chamber	1	LS	\$80,000	\$80,000
D2.14	Water Pressure Reducing Valve Chamber	1	LS	\$80,000	\$80,000
D2.15	Underground Yard Piping - Storm Drainage	1	LS	\$30,000	\$30,000
D2.16	Supply and Install Watermain Insulation	1	LS	\$2,000	\$2,000
D2.17	Natural Gas Service and Coordination	1	LS	\$16,000	\$16,000
D2.18	Pump House & Reservoir Asphalt Access Driveway & Parking Area	1	LS	\$40,000	\$40,000
D2.19	1.82 Chain-link Security Fencing with Top Rail as per OPSD 972.102 and 3m wide Swing Gate OPSD 972.102 with locking hardware	1	LS	\$40,000	\$40,000
D2.20	Topsoil & Sod and Landscaping & Plantings	1	LS	\$40,000	\$40,000
Subtotal Construction Costs Division 2:					\$1,069,800




Division 3 - Concrete Work					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D3.1	Cast-in-place Concrete, including Forming & Reinforcing of Structural Concrete Foundation, including Slabs on Grade, Footings, Floor Slabs, Beams, Columns, Walls, Working Slabs, Pipe and Equipment Supports, Cutting and Coring for Water Booster Station Building	1	LS	\$900,000	\$900,000
D3.2	Miscellaneous 30MPa Concrete, Formed, where not otherwise Provided	0	m3	\$0	\$0
D3.3	Miscellaneous Reinforced 30MPa Concrete, Formed, where not otherwise Provided	0	m3	\$0	\$0
D3.4	Reinforced Concrete 100% Containment Curb for Standby Generator & Reinforced Concrete 100% Containment Crib Box for Fuel Tank at Water Booster Station Building	1	LS	\$10,000	\$10,000
D3.5	Concrete Foundations for Communications / Alarms Tower	1	LS	\$1,500	\$1,500
D3.6	Concrete Footings for Chain-link Fence Posts	1	LS	\$5,000	\$5,000
Subtotal Construction Costs Division 3:					\$916,500
Division 4 - Masonry					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D4.1	Masonry & Bricks, including supply and placing all Masonry & Bricks Units for Water Booster Station Building	1	LS	\$85,000	\$85,000
Subtotal Construction Costs Division 4:					\$85,000
Division 5 - Metals					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D5.1	Metal Roofing, Metal Flashings and Metal Fascia Water Booster Station Building	1	LS	\$30,000	\$30,000
D5.2	Structural Steel including Fabrication, Supply and Installation of Beams, Columns, Open Web Steel Joists, Crane Beams and Rails, Steel Stairs & Landings with Handrailing, Metal Grating, Ladders, Ladders with Fall Arrest System, Equipment Frames, Access Hatches, Vents, and all other Miscellaneous Metals, including but not limited to Bolts, Brackets, etc. and the supply of Window and Door Lintels. Water Booster Station Building	1	LS	\$250,000	\$250,000
Subtotal Construction Costs Division 5:					\$280,000
Division 6 - Wood & Plastics					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D6.1	Wood and Plastics, including Roof Trusses and all Carpentry	1	LS	\$40,000	\$40,000
Subtotal Construction Costs Division 6:					\$40,000
Division 7 - Thermal and Moisture Protection					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D7.1	Waterproofing Membrane for Exterior Below Grade Surfaces Thermal and Moisture Protection including Corrosion Protection, Rigid Board Insulation, Vapour Barriers, Trim Sealants, Construction Joint Watertight Sealer, etc. Water Booster Station Building	1	LS	\$70,000	\$70,000
D7.2	Waterproofing and Sealing of Concrete Containment Slab & Curb around the Diesel Generator and Waterproofing and Sealing of Concrete Containment Slab & Crib around Fuel Tank	1	LS	\$40,000	\$40,000
Subtotal Construction Costs Division 7:					\$110,000
Division 8 - Doors and Windows					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D8.1	Doors, and Windows including Framing, Hollow Metal Doors, Roll-Up Door, Metal Flashing and Hardware for Water Booster Station Building	1	LS	\$25,000	\$25,000
Subtotal Construction Costs Division 8:					\$25,000

Division 9 - Finishes					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D9.1	Finishes, including Wall Finishes, Floor Finishes, Ceiling, Painting	1	LS	\$30,000	\$30,000
Subtotal Construction Costs Division 9:					\$30,000
Division 10 - Specialities					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D10.1	Washroom Hot Water Tank, Sink, Toilet, Mirror, Fan and all Piping and Accessories	1	LS	\$20,000	\$20,000
D10.2	Seismic Restraints	1	LS	\$30,000	\$30,000
D10.3	Fire Proofing	0	LS	\$0	\$0
Subtotal Construction Costs Division 10:					\$50,000
Division 11 - Equipment					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D11.01	Equipment General Requirements	1	LS	\$2,000	\$2,000
D11.02	Five (5) Centrifugal Pumps - , Four Duty and One Standby Sized to meet the maximum flow of <b>300 L/s</b> . The Pumps will operate on an alternating duty basis.	5	ea	\$110,000	\$550,000
D11.03	Pressure under no-flow or minimum-flow conditions controlled by a Low Flow Protection Pressure Tank	1	LS	\$7,000	\$7,000
D11.04	Air Release and Drain Valves	0	ea	\$0	\$0
D11.05	Backflow Preventer Valve	0	ea	\$0	\$0
D11.06	Water Pressure Reducing Valve	0	ea	\$0	\$0
D11.07	Chemical Feed Equipment c/w Pumps, Chemical Storage Tank, Miscellaneous Pipe/Tube/Fittings	1	LS	\$40,000	\$40,000
D11.08	Chemical Analyzer	1	LS	\$15,000	\$15,000
Subtotal Construction Costs Division 11:					\$614,000
Division 12 - Furnishings					
D12.1	Storage Shelves for Drawings in Water Booster Station Building	0	LS	\$0	\$0
D12.2	Desk & Chair, Cabinet in Water Booster Station Building	0	LS	\$0	\$0
Subtotal Construction Costs Division 12:					\$0
Division 14 - Conveying Systems					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D14.1	Lifting Equipment including all Gantry and Davit Cranes, Lifting Davits and other Specified Lifting Equipment	1	LS	\$20,000	\$20,000
Subtotal Construction Costs Division 14:					\$20,000
Division 15 Mechanical					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D15.01	304L SS Process Piping and Valves including Supply an Installation of all Process Piping, Valves, Fittings, Couplings, Restraints, Adjusting, Testing, Disinfection	1	LS	\$350,000	\$350,000
D15.02	Flowmeters and Transmitters	0	LS	\$0	\$0
D15.03	Building Mechanical including Drainage, Heating, Ventilation, Air Conditioning, Equipment, and Controls.	1	LS	\$90,000	\$90,000
Subtotal Construction Costs Division 15:					\$440,000

Division 16 - Electrical & Communications					
Item No:	Description	Qty	Unit	Unit Cost	Cost
D16.01	Electrical General Requirements	1	LS	\$25,000	\$25,000
D16.02	Electrical Supply for Five (5) Centrifugal Pumps with VFD Drive with Electric Valve Actuators and Related Equipment	1	LS	\$300,000	\$300,000
D16.03	Electrical Power Supply Feeds and Conduit, MCCs, Soft Starters, Distribution for the Works, Interior Lighting, Receptacles, Security Systems, Base Board Heater, and Complete Wiring of all Instruments and Equipment	1	LS	\$400,000	\$400,000
D16.04	Supply and Install Communication Tower, Antenna/Dish, Supply, Install, Terminate & Test Coax w/ Cable & Conduit and Cisco AirNet 1200 System	1	LS	\$80,000	\$80,000
D16.05	Instrumentation and Control including PLCS, HMI, SCADA Programming and Control Panel, Radio Equipment, all level and Pressure Sensors and Transmitters, Chlorination System Alarms, Smoke and CO Detectors and Alarms, MCC Power Metering Instrumentation.	1	LS	\$185,000	\$185,000
D16.06	Supply and Install Stand-By Emergency Diesel Generator, including Transfer Switch, DG Exhaust Code Requirements and Fuel Tank (See Division 3 for Containment Crib and Curb)	1	LS	\$250,000	\$250,000
D16.07	Lighting Pole (3.3m ht), 2 x Brackets and 2 x 70 Watt HPS Specialty Flat Glass Luminaire with Photo - Controller for Security and Maintenance	2	ea	\$15,000	\$30,000
D16.08	Arc Flash Study, Coordination Study and Harmonic Analysis	1	LS	\$10,000	\$10,000
D16.09	Auto dialer with Panel, System Controller, Power Supply Module, Programming Keypad, Telephone Line Surge Protector, Supply, Install, Terminate & Test DI/O w/Cable & Conduit	1	LS	\$25,000	\$25,000
Subtotal Construction Costs Division 16:					\$1,305,000
<b>FINAL 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (No HST):</b>					<b>\$5,157,200</b>

Date:

3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:

Watermain

Trunk Watermain and Appurtenances

MG Watermain Upgrades - Old Second Line Rd

Project Phase:  
SAP Project Number:  
Project Location:

Conceptual Design

TBD

Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description

406mm diam. WM along Old Second Line Rd from Klondike Rd to SMUEA

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$1,215,507

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$243,101
Utilities (5% - 20%)	15.0%	1	\$182,326
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$12,155
City Internal Costs (7% - 10%)	8.5%	1	\$103,318
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$60,775
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$121,551
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$60,775
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$60,775
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$12,155
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$1,817,182
RISK FACTORS SUBTOTAL:			\$255,256
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$726,873
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$2,799,312

\* Capital Cost Components Percentage Allowance Range as per City 2013 PDR

\*\* Risk Factors Percentage Allowance to be Applied Based on the Project Complexity

\*\*\* Overall Contingency is Applied to Estimated Construction and Capital Cost Components

Project Related Comments:

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$3,280,793
2022	9.9%	\$3,605,592
2023	7.8%	\$3,886,828
2024	5.79%	\$4,111,876
2025	3%	\$4,235,232
2026	3%	\$4,362,289
2027	3%	\$4,493,157
2028	3%	\$4,627,952
2029	3%	\$4,766,791
2030	3%	\$4,909,794
2031	3%	\$5,057,088
2032	3%	\$5,208,801
2033	3%	\$5,365,065
2034	3%	\$5,526,017
2035	3%	\$5,691,797
2036	3%	\$5,862,551
2037	3%	\$6,038,428
2038	3%	\$6,219,581
2039	3%	\$6,406,168
2040	3%	\$6,598,353
2041	3%	\$6,796,304
2042	3%	\$7,000,193
2043	3%	\$7,210,199
2044	3%	\$7,426,505
2045	3%	\$7,649,300
2046	3%	\$7,878,779


CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades - Old Second Line Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	45	wk	\$1,000	\$45,333
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	45	wk	\$1,000	\$45,333
A020.02	F-1012	Police Assistance at Intersection	48	hr	\$280	\$13,440
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$14,800	\$14,800
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$2,000	\$2,000
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$4,900	\$4,900
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$4,900	\$4,900
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$14,800	\$14,800
Sub-Total Section A:					\$145,507	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	620			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	620	m	\$1,000	\$620,000
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$1,500	\$0
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	4			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0



<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	4	ea	\$20,000	\$80,000
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$35,000	\$0
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	5	ea	\$7,000	\$35,000
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	50	m	\$500	\$25,000
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	620	m	\$500	\$310,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$1,070,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$1,215,507</b>

Date:3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain  
Trunk Watermain and Appurtenances

MG Watermain Upgrades - Oakside Cres

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
406mm diam. WM along Oakside Cres from Goward Dr to Old Carp Rd

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):\$351,280

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$70,256
Utilities (5% - 20%)	15.0%	1	\$52,692
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$3,513
City Internal Costs (7% - 10%)	8.5%	1	\$29,859
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$17,564
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$35,128
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$17,564
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$17,564
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$3,513
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$525,164
RISK FACTORS SUBTOTAL:			\$73,769
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$210,065
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$808,998
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$948,145
2022	9.9%	\$1,042,012
2023	7.8%	\$1,123,289
2024	5.79%	\$1,188,327
2025	3%	\$1,223,977
2026	3%	\$1,260,696
2027	3%	\$1,298,517
2028	3%	\$1,337,473
2029	3%	\$1,377,597
2030	3%	\$1,418,925
2031	3%	\$1,461,493
2032	3%	\$1,505,337
2033	3%	\$1,550,497
2034	3%	\$1,597,012
2035	3%	\$1,644,923
2036	3%	\$1,694,270
2037	3%	\$1,745,099
2038	3%	\$1,797,452
2039	3%	\$1,851,375
2040	3%	\$1,906,916
2041	3%	\$1,964,124
2042	3%	\$2,023,048
2043	3%	\$2,083,739
2044	3%	\$2,146,251
2045	3%	\$2,210,639
2046	3%	\$2,276,958

CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades - Oakside Cres						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	16	wk	\$1,000	\$16,000
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	16	wk	\$1,000	\$16,000
A020.02	F-1012	Police Assistance at Intersection	16	hr	\$280	\$4,480
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$4,200	\$4,200
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$600	\$600
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$1,400	\$1,400
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$1,400	\$1,400
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$4,200	\$4,200
Sub-Total Section A:					\$48,280	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	180			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	180	m	\$1,000	\$180,000
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$1,500	\$0
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	3			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0


<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	3	ea	\$20,000	\$60,000
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$35,000	\$0
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	1	ea	\$7,000	\$7,000
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	10	m	\$500	\$5,000
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	80	m	\$500	\$40,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	110	m <sup>2</sup>	\$100	\$11,000



<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$303,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$351,280</b>

Date:

3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:  
  
Project Phase:  
SAP Project Number:  
Project Location:

Watermain  
Trunk Watermain and Appurtenances

MG Watermain Upgrades - Old Carp Rd

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
406mm diam. WM along Old Carp Rd from Oakside Cres to SMUEA

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$307,727

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$61,545
Utilities (5% - 20%)	15.0%	1	\$46,159
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$3,077
City Internal Costs (7% - 10%)	8.5%	1	\$26,157
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$15,386
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$30,773
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$15,386
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$15,386
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$3,077
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$460,051
RISK FACTORS SUBTOTAL:			\$64,623
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$184,021
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$708,695

\* Capital Cost Components Percentage Allowance Range as per City 2013 PDR

\*\* Risk Factors Percentage Allowance to be Applied Based on the Project Complexity

\*\*\* Overall Contingency is Applied to Estimated Construction and Capital Cost Components

Project Related Comments:

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$830,590
2022	9.9%	\$912,818
2023	7.8%	\$984,018
2024	5.79%	\$1,040,993
2025	3%	\$1,072,223
2026	3%	\$1,104,389
2027	3%	\$1,137,521
2028	3%	\$1,171,647
2029	3%	\$1,206,796
2030	3%	\$1,243,000
2031	3%	\$1,280,290
2032	3%	\$1,318,699
2033	3%	\$1,358,260
2034	3%	\$1,399,007
2035	3%	\$1,440,978
2036	3%	\$1,484,207
2037	3%	\$1,528,733
2038	3%	\$1,574,595
2039	3%	\$1,621,833
2040	3%	\$1,670,488
2041	3%	\$1,720,603
2042	3%	\$1,772,221
2043	3%	\$1,825,387
2044	3%	\$1,880,149
2045	3%	\$1,936,553
2046	3%	\$1,994,650


CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
MG Watermain Upgrades - Old Carp Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	13	wk	\$1,000	\$13,333
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	13	wk	\$1,000	\$13,333
A020.02	F-1012	Police Assistance at Intersection	32	hr	\$280	\$8,960
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$3,600	\$3,600
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$500	\$500
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$1,200	\$1,200
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$1,200	\$1,200
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$3,600	\$3,600
Sub-Total Section A:					\$45,727	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	140			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	140	m	\$1,000	\$140,000
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$1,500	\$0
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	2			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	2	ea	\$20,000	\$40,000
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$35,000	\$0
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	1	ea	\$7,000	\$7,000
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	10	m	\$500	\$5,000
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	140	m	\$500	\$70,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$262,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$307,727</b>



Date:3/5/2025



Asset Management  
Infrastructure Planning Unit

Infrastructure Category:  
Project Type:  
Project Title:

Watermain  
Trunk Watermain and Appurtenances

New 3W Watermain to MG (w/in MG) - Old Second Line Rd

Project Phase:  
SAP Project Number:  
Project Location:

Conceptual Design  
TBD  
Refer to report figures for project location

Project Location Map:  
Refer to report figures for project location

Project Description  
406mm diam. WM along Old Second Line Rd from Terry Fox Rd to Klondike Rd

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):\$1,755,553

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$351,111
Utilities (5% - 20%)	15.0%	1	\$263,333
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$17,556
City Internal Costs (7% - 10%)	8.5%	1	\$149,222
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$87,778
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$175,555
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$87,778
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$87,778
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$17,556
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$2,624,552
RISK FACTORS SUBTOTAL:			\$368,666
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$1,049,821
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$4,043,039

\* Capital Cost Components Percentage Allowance Range as per City 2013 PDR

\*\* Risk Factors Percentage Allowance to be Applied Based on the Project Complexity

\*\*\* Overall Contingency is Applied to Estimated Construction and Capital Cost Components

Project Related Comments:

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$4,738,442
2022	9.9%	\$5,207,548
2023	7.8%	\$5,613,737
2024	5.79%	\$5,938,772
2025	3%	\$6,116,935
2026	3%	\$6,300,443
2027	3%	\$6,489,456
2028	3%	\$6,684,140
2029	3%	\$6,884,664
2030	3%	\$7,091,204
2031	3%	\$7,303,940
2032	3%	\$7,523,059
2033	3%	\$7,748,750
2034	3%	\$7,981,213
2035	3%	\$8,220,649
2036	3%	\$8,467,269
2037	3%	\$8,721,287
2038	3%	\$8,982,925
2039	3%	\$9,252,413
2040	3%	\$9,529,986
2041	3%	\$9,815,885
2042	3%	\$10,110,362
2043	3%	\$10,413,673
2044	3%	\$10,726,083
2045	3%	\$11,047,865
2046	3%	\$11,379,301

CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
New 3W Watermain to MG (w/in MG) - Old Second Line Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	65	wk	\$1,000	\$64,667
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	65	wk	\$1,000	\$64,667
A020.02	F-1012	Police Assistance at Intersection	64	hr	\$280	\$17,920
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$21,200	\$21,200
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$2,900	\$2,900
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$7,000	\$7,000
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$7,000	\$7,000
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$21,200	\$21,200
Sub-Total Section A:					\$206,553	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	910			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	910	m	\$1,000	\$910,000
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$1,500	\$0
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	5			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	5	ea	\$20,000	\$100,000
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$35,000	\$0
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	0	ea	\$60,000	\$0
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	7	ea	\$7,000	\$49,000
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	70	m	\$500	\$35,000
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	910	m	\$500	\$455,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	0	m <sup>2</sup>	\$100	\$0

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	0	ea	\$15,000	\$0
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	0	m	\$8,000	\$0
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	0	m	\$2,000	\$0
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$1,549,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$1,755,553</b>

Date:

3/5/2025

Ottawa

CITY OF OTTAWA

Asset Management

Infrastructure Planning Unit

Infrastructure Category:

Project Type:

Project Title:

Project Phase:

SAP Project Number:

Project Location:

Watermain

Trunk Watermain and Appurtenances

New 3W Watermain to MG (w/ PRV) - Goulbourn Forced Rd

Conceptual Design

TBD

Refer to report figures for project location

Project Location Map:

Refer to report figures for project location

Project Description

406mm diam. WM along Goulbourn Forced Rd from Keyrock Dr to St. Isabel Catholic Elementary School

FINAL - 2020 - CLASS D - ESTIMATED CONSTRUCTION COSTS (NO HST):

\$3,139,847

CAPITAL COST COMPONENTS AND RISK FACTORS

Item	Percentage**	Yes/No = 1/0	Estimated Cost
Capital Cost Components*		Change as Required	
Engineering - Design, Contract Adm. (15% - 25%)	20.0%	1	\$627,969
Utilities (5% - 20%)	15.0%	1	\$470,977
Property - REPDO Estimate (1% - 10%)	1.0%	1	\$31,398
City Internal Costs (7% - 10%)	8.5%	1	\$266,887
Misc. Soft Costs - Permit, Public Art, etc. (5%)	5.0%	1	\$156,992
Risk Factors**			
Geo-Tech Issues - Soil (1% - 10%)	10.0%	1	\$313,985
Geo-Tech issues - Bedrock (1% - 5%)	5.0%	1	\$156,992
Geo-Tech Issues - Grey Silty Clay (1% - 10%)	0.0%	0	\$0
Special Hydro-Geo Conditions (1% - 10%)	5.0%	1	\$156,992
Change in Design Standards (1% - 5%)	0.0%	0	\$0
Construction Contract Duration (2% per year)	0.0%	0	\$0
Species at Risk and Project Mitigation (1% - 5%)	1.0%	1	\$31,398
Planning, Design and Land use Approvals (5% - 10%)	0.0%	0	\$0
Provincial and Federal Environmental Assessments (5% - 10%)	0.0%	0	\$0
CONSTRUCTION COST AND CAPITAL COST COMPONENTS SUBTOTAL:			\$4,694,071
RISK FACTORS SUBTOTAL:			\$659,368
OVERALL CLASS D CONTINGENCY (40%-50%) ***	40%	1	\$1,877,628
FINAL - 2020 - CLASS D - ESTIMATED TOTAL CAPITAL COST (No HST):			\$7,231,067
* Capital Cost Components Percentage Allowance Range as per City 2013 PDR			
** Risk Factors Percentage Allowance to be Applied Based on the Project Complexity			
*** Overall Contingency is Applied to Estimated Construction and Capital Cost Components			
Project Related Comments:			

COST INFLATION CHART		
Year	Inflation % per Year	Yearly Total Cost Projection
2021	17.2%	\$8,474,810
2022	9.9%	\$9,313,817
2023	7.8%	\$10,040,294
2024	5.79%	\$10,621,627
2025	3%	\$10,940,276
2026	3%	\$11,268,484
2027	3%	\$11,606,539
2028	3%	\$11,954,735
2029	3%	\$12,313,377
2030	3%	\$12,682,779
2031	3%	\$13,063,262
2032	3%	\$13,455,160
2033	3%	\$13,858,815
2034	3%	\$14,274,579
2035	3%	\$14,702,816
2036	3%	\$15,143,901
2037	3%	\$15,598,218
2038	3%	\$16,066,164
2039	3%	\$16,548,149
2040	3%	\$17,044,594
2041	3%	\$17,555,932
2042	3%	\$18,082,610
2043	3%	\$18,625,088
2044	3%	\$19,183,840
2045	3%	\$19,759,356
2046	3%	\$20,352,136



CITY OF OTTAWA		Trunk Watermains (300mm, 400mm, 600mm, 750mm & 900mm) FINAL - 2020 - Class D - Construction Cost Estimating Template				
New 3W Watermain to MG (w/ PRV) - Goulbourn Forced Rd						
<b>Estimate Note:</b> This Construction Cost Estimate Template for Trunk Watermains has been prepared for guidance in project evaluation and implementation from the information available at 2020 unit cost prices.						
NOTE		ADJUST QUANTITIES/UNIT PRICES AS REQUIRED				
Section A - General						
Code	Spec	Description	Qty	Unit	Unit Cost	Cost
A010		Field Office				
A010.01	F-1001	Field office for Contract Administrator 35-70m2	101	wk	\$1,000	\$101,333
A020		TRAFFIC CONTROL PLAN				
A020.01	F-1010	Traffic Control Plan	101	wk	\$1,000	\$101,333
A020.02	F-1012	Police Assistance at Intersection	16	hr	\$280	\$4,480
A030		PEDESTRIAN CONTROL				
A030.01	F-1013	Construction Site Pedestrian Control Implementation	1	LS	\$38,500	\$38,500
A040		EROSION & SEDIMENT CONTROL				
A040.01	805, F-1004	Erosion and Sediment Control Plan and Monitoring	1	LS	\$5,100	\$5,100
A040.03	805, F-1004	Erosion and Sediment Control Measures	1	LS	\$12,800	\$12,800
A060		PRE-CONSTRUCTION INSPECTION				
A060.01	F-1011	Pre-Construction Inspection	1	LS	\$12,800	\$12,800
A999		Non-Standard Items				
A999.01	GC 6.04	Construction Site Health and Safety Management and Control	1	LS	\$38,500	\$38,500
Sub-Total Section A:					\$314,847	
Section G - Watermains						
G010		EXCAVATION AND BACKFILL				
G010.02	401, 441,F-4411, F-7010	Additional excavation & backfill with 50mm clear stone	0	m³	\$75	\$0
G020		SELECT SUBGRADE MATERIAL				
G020.01	212, 314, F-2120, F-3147	Select subgrade material for Trench Backfill	0	m³	\$50	\$0
G030		WATERMAIN - PVC PIPE	1,410			
G030.05	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	300mm watermain, PVC, CL 150, DR-18 including all appurtenances	0	m	\$800	\$0
G030.06	441, F-4411, F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, PVC, CL 150, DR-18 including all appurtenances	1410	m	\$1,000	\$1,410,000
G050		WATERMAIN - CONCRETE PRESSURE PIPE				
G050.01	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	400mm watermain, concrete pressure pipe, CL C303 including all appurtenances	0	m	\$1,200	\$0
G050.02	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	600mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$1,500	\$0
G050.03	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	750mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,000	\$0
G050.04	F-4411 ,F-4412, F-4491, F-4492, F-4493, F-4494	900mm watermain, concrete pressure pipe, CL C301 including all appurtenances	0	m	\$2,500	\$0
G070		VALVE AND VALVE CHAMBER	7			
G070.04	F-4411 ,F-4413, F-4491, F-4492, F-4493, F-4494	300mm Gate valve, valve chamber, W3	0	ea	\$9,500	\$0

<b>G080</b>		<b>BUTTERFLY VALVE AND VALVE CHAMBER</b>				
G080.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	400mm Butterfly valve,W5 & valve chamber, W2	7	ea	\$20,000	\$140,000
G080.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$35,000	\$0
G080.03	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	750mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$50,000	\$0
G080.04	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Butterfly valve,W5 & valve chamber, W2	0	ea	\$65,000	\$0
<b>G090</b>		<b>VALVE CHAMBER ONLY FOR TVS</b>				
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	1500mm Valve Chamber (Only) FOR 300mm TVS per W4	0	ea	\$10,000	\$0
G090.05	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	R-1 valve chamber (only) for TVS(any size) off 400mm watermain, W10	0	ea	\$12,000	\$0
<b>G100</b>		<b>MISCELLANEOUS VALVE CHAMBER</b>				
G100.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	610mm access, air relief and drain out valve chamber type R-1 per W10	0	ea	\$20,000	\$0
G100.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Automatic Flushing Chamber per W3.2	0	ea	\$10,000	\$0
		PRV Chamber (2 isolation valves, PRV valve in b/w, bypass line)	1	ea	\$60,000	\$60,000
<b>G110</b>		<b>BRANCH VALVE CHAMBER</b>				
G110.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 600mm watermain per W11	0	ea	\$35,000	\$0
G110.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	Branch Valve chamber type R-3 off 900mm watermain per W11	0	ea	\$65,000	\$0
<b>G120</b>		<b>LINE VALVE CHAMBER</b>				
G120.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line valve chamber Type R-3 per W12	0	ea	\$80,000	\$0
G120.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line valve chamber Type R-3 per W12	0	ea	\$120,000	\$0
<b>G130</b>		<b>BRANCH AND LINE VALVE CHAMBER</b>				
G130.01	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	600mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$120,000	\$0
G130.02	F-4411, F-4413, F-4491, F-4492, F-4493, F-4494	900mm Line & (150mm - 400mm) Branch Valve Chamber Type R-4 per W13	0	ea	\$150,000	\$0
<b>G140</b>		<b>HYDRANTS</b>				
G140.01.	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W19	12	ea	\$7,000	\$84,000
G140.02	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	Hydrant W20 Complete with Ditch Culvert	0	ea	\$6,500	\$0
G140.03	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI CL52 or PVC CL150, DR-18	0	m	\$350	\$0
G140.04	F-4411, F4414, F-4419, F4491, F-4492, F-4493, F-4494	150 mm Hydrant lateral DI, CL52 or PVC CL 150 DR18, including reinstatement	120	m	\$500	\$60,000
<b>G170</b>		<b>TEMPORARY OVERLAND SERVICES</b>				
G170.999.01	F-4411, F4416, F-4491, F-4492 F-4493, F-4494	Temporary Service Connections - Supply, Installation & Protection	0	ea	\$700	\$0
<b>G180</b>		<b>TRENCH REINSTATEMENT (ALL INCLUSIVE PRICE METHOD)</b>				
G180.02	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Existing Road(All Inclusive Method)	1000	m	\$500	\$500,000
G180.03	F-4411, F-4419, F4491, F-4492, F-4493, F4494	Trench Reinstatement - Green Field (All Inclusive Method)	410	m <sup>2</sup>	\$100	\$41,000

<b>G999</b>		<b>TRENCHLESS CONSTRUCTION</b>				
G999.01	450, F-4491, F-4492, F-4493, F-4494	Entry and Exist Pits for Trenchless Construction (All Inclusive)	2	ea	\$15,000	\$30,000
G999.02	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 750mm Steel Casing Pipe by Boring & Jacking	50	m	\$8,000	\$400,000
G999.03	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 400mm Concrete Pressure Pipe Watermain Class C303 inside the 750mm Steel Casing, including Spacers and Flowable Grout	50	m	\$2,000	\$100,000
G999.04	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1000mm Steel Casing Pipe by Boring & Jacking	0	m	\$10,000	\$0
G999.05	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 600mm Concrete Pressure Pipe Watermain Class C301 inside the 1000mm Steel Casing, including Spacers and Flowable Grout	0	m	\$3,000	\$0
G999.06	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 1500mm Steel Casing Pipe by Boring & Jacking	0	m	\$14,000	\$0
G999.07	450, F-4491, F-4492, F-4493, F-4494	Supply and Install 900mm Concrete Pressure Pipe Watermain Class C301 inside the 1500 mm Steel Casing, including Spacers and Flowable Grout	0	m	\$5,000	\$0
<b>Sub-Total Section G:</b>						<b>\$2,825,000.00</b>
<b>Section U - Labour and Equipment</b>						
<b>U010</b>		<b>Labour</b>				
U010.01	127, F-8025	Unskilled labour (including supervision where not otherwise provided)	0	hr	\$70	\$0
U010.02	127, F-8025	Skilled labour (including supervision where not otherwise provided)	0	hr	\$75	\$0
<b>U020</b>		<b>Equipment</b>				
U020.01	127, F-8026	Bulldozer, 45 kW min (D3) (operated)	0	hr	\$135	\$0
U020.02	127, F-8026	Crawler mounted hydraulic backhoe, 24,500 kg minimum operating weight (Operated)	0	hr	\$175	\$0
U020.03	127, F-8026	Dump truck - rear axle, tandem drive, 22,000kg GVW min (operated)	0	hr	\$110	\$0
U020.04	F-8026	Front end loader backhoe, rubber tired 45 kW min (operated)	0	hr	\$110	\$0
U020.05	127, F-8026	Hydraulic rock breaker, boom mounted - 1400 Joules (operated)	0	hr	\$500	\$0
U020.06	127, F-8026	Portable air compressor 9m3/min including air hammer and all attachments (operated)	0	hr	\$100	\$0
U020.07	127, F-8028	Sweeper (Operated)	0	hr	\$150	\$0
U020.08	F-8026	Water truck - 7,500l min (operated)	0	hr	\$125	\$0
U020.09	F-4109	Flusher (Operated)	0	hr	\$150	\$0
U020.11	127, F-8028	CCTV Video Unit (with pan tilt camera)	0	hr	\$180	\$0
U020.12	F-4110	Combo Cleaning Unit	0	hr	\$200	\$0
U020.13	127, F-8026	Hydro Excavating/Vacuum Truck (Operated)	0	hr	\$325	\$0
<b>Sub-Total Section U:</b>						<b>\$0</b>
<b>FINAL - 2020 - Class D - Estimated Construction Costs (No HST):</b>						<b>\$3,139,847</b>