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Technical Memorandum

Date: June 1, 2020 **Project No.:** 300034976.0001

Project Name: Bolton Option 3 Lands Preliminary Water Modelling

Client Name: Bolton Option 3 Landowners Group

Submitted To: Ms. Miriam Polga, P.Eng., Region of Peel

Submitted By: Rachel Walton, MASc., E.I.T.

Reviewed By: Jennifer Georgas, P.Eng., Jeff Langlois, P.Eng., MBA

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Bolton Option 3 Landowners Group (BO3LG) to complete a preliminary hydraulic water modelling analysis of the proposed Option 3 lands being considered as part of the urban boundary expansion of the Bolton settlement area in the Town of Caledon (Town). The water distribution system in Bolton is part of the Region of Peel (Region) water distribution system.

As dictated by the Ontario Growth Plan, the Region must plan for its share of growth to 2041. The projected growth numbers are dictated by the Province of Ontario and allocated by the Region to the lower tier Municipalities through Regional Council direction and Regional Official Plan Amendment. The Town previously completed the Bolton Residential Expansion Study (BRES) to determine the best approach to meet their urban boundary expansion needs. The BRES examined six different options for expansion of the Bolton settlement area and examined how each area could be serviced. The location of the BRES Option 3 lands is shown in Figure 1.

As determined in the BRES, the Option 3 lands are generally outside of the range of elevations associated with Pressure Zone 6 of the existing water distribution infrastructure in Bolton. As such, development of the Option 3 lands will ultimately require the development of a new pressure Zone 7. Previous studies completed in support of BRES identified a new Zone 7 booster pumping station at King Street and Coleraine Drive. Ultimately, floating storage is proposed in the form of an elevated tank (ET) to provide storage for flow equalization, fire demands and emergencies. The ET is to be situated in the vicinity of the northwest corner of the Option 3 lands.

The purpose of this preliminary modelling exercise is to determine interim alternative water servicing arrangements, which leverage the existing Zone 6 water supply to allow some portion of the Option 3 lands to be developed prior to the design and construction of the ultimate Zone 7 servicing solution. Water supply to the zone in the interim scenario would be principally through a new Zone 7 booster pumping station. Options investigated included providing water supply to meet fire demands on an interim basis through pumped, as opposed to floating, storage.

This technical memorandum has been written to provide water distribution servicing recommendations in support of interim development of the Option 3 lands.

ELEVATED WATER TANK - ALTERNATE LOCATION

ELEVATED WATER TANK

OPTION 1 NORTH HILL WEST 151ha

OPTION 2 NORTH HILL EAST 160ha

OPTION 3 GO STATION FOCUS 165ha

OPTION 4 KING STREET WEST 171ha

OPTION 5 HEALY ROAD NORTH 213ha

OPTION 6 HUMBER STATION ROAD 182ha

FUTURE GO STATION

ROUNDING OUT AREA - 1

ROUNDING OUT AREA - 2

ROUNDING OUT AREA - 3

BOOSTER PUMPING STATION

NORTH BOLTON ELEVATED TANK

BOLTON ELEVATED WATER TANK

ROPA 28 EMPLOYMENT LANDS

CITY OF BRAMPTON SPA 47 EMPLOYMENT LANDS

ELEVATED WATER TANK

ZONE 7

ZONE 6

ZONE 5

ZONE 6

ZONE 6

ZONE 5

KING ST

HEALEY RD

THE GORE RD

HUMBER STATION RD

COLERAINE DR

CN RAIL

MAYFIELD RD

GTA WEST CORRIDOR NORTH PLANNING LIMIT

GTA WEST CORRIDOR SOUTH PLANNING LIMIT

600mm

400mm

750mm

Town of Caledon

City of Brampton

City of Vaughan

Township of King

Humber River (Main Branch)

Humber River (West Branch)

Humber River (Little Humber)

Centennial Creek

Castlederg Sdrd.

Mount Pleasant Rd.

Con. Rd. 11

King Rd.

King Vaughan Rd.

Cold Creek Rd.

Kirby Rd.

Hwy. 50

Regional Rd. 50

Figure1

LEGEND

- EXISTING URBAN BOUNDARY
- GTA WEST CORRIDOR ROUTE PLANNING STUDY AREA
- GTA WEST CORRIDOR FOCUSED DEVELOPMENT AREA
- GTA WEST POTENTIAL DEVELOPMENT AREA
- GREEN BELT
- WATER PRESSURE ZONE
- EXISTING TRUNK WATERMAIN
- FUTURE TRUNK WATERMAIN (Region of Peel 2031a Capital Plan)
- FUTURE TRUNK WATERMAIN (Post 2031)
- CN RAIL LINE

SCALE 1:15000 (APPROX.)

BRES
INFRASTRUCTURE REQUIREMENTS
OVERALL WATER DEVELOPMENT PLAN

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2.0 Background Documents

The following reports have been referenced to complete the hydraulic modelling discussed in this memorandum:

- Bolton Residential Expansion Study Infrastructure Report, prepared by GM BluePlan dated June 16, 2014.
- Region of Peel 2013 Water and Wastewater Master Plan for the Lake-Based Systems, Volume III – Water Master Plan, prepared by GM BluePlan and AECOM, dated March 31, 2014.
- Proposed Regional Official Plan Amendment, An Amendment to Establish the Bolton (2031) Residential Expansion Area Planning Justification Report, prepared by Meridian Planning, dated October 2014.
- Region of Peel 2020 Water and Wastewater Master Plan Update, Public Information Centre materials, prepared by GM BluePlan and Region of Peel, November 2019.
- Ministry of the Environment, Conservation and Parks (MECP), “Guidelines for the Design of Water Distribution Systems”, 2008.

2.1 System Pressure

As per the Region of Peel 2013 Water and Wastewater Master Plan for the Lake-Based Systems, Volume III – Water Master Plan, prepared by BluePlan and AECOM, dated March 31, 2014, a minimum operating pressure of 40 psi and a maximum operating pressure of 100 psi shall be maintained within the water distribution system under maximum day demand and a minimum operating pressure of 40 psi shall be maintained under peak hour demand. The allowable operating pressure during fire flow conditions is a minimum of 20 psi.

2.2 Roughness Coefficient (“C” Value)

The friction factors “C” used in the model are based on the Ministry of Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems (2008) and are as follows:

- 150 mm diameter: C=100
- 200 mm or 250 mm diameter: C=110
- 300 mm to 600 mm diameter: C=120
- > 600 mm diameter: C=130

2.3 Peaking Factor

Peaking factors have been referenced from ongoing discussions with Region staff in regard to the 2020 Water and Wastewater Master Plan update. The peaking factors used in the modelling are as follows:

- Residential Maximum Day Factor (MDF) = 1.8
- Non-Residential Maximum Day Factor (MDF) = 1.4
- Peak Hour Factor (PHF) = 3

2.4 Water Demand

The population for the Option 3 lands is based on population targets set in Town of Caledon Official Plan Amendment 226 arising from the completion of the Bolton Residential Expansion Study. These targets are as follows:

- Residential 10,348 persons
- Employment 2,250 jobs

The demands for the Option 3 lands have been calculated based on the following per capita demands:

Residential 270 L/cap/d
Employment 250 L/cap/d

These per capita demands are referenced through discussions with Region of Peel staff and reflect adjusted demand criteria arising from the 2020 Water and Wastewater Master Plan update. Refer to Appendix A for the demand calculations.

The Option 3 lands demands are:

- **Average Day Demand (ADD) = 38.8 L/s**
- **Maximum Day Demand (MDD) = 67.3L/s**
- **Peak Hour Demand (PHD) = 116.5L/s**

Given the preliminary nature of the concept plans, and the likelihood of further refinement, for preliminary modelling purposes it has been assumed that the demands have an even distribution across the Option 3 lands at an average density of approximately 69 residents and jobs per hectare. Therefore, the demands have been divided evenly between each junction in the model.

2.5 Fire Flow

The required fire flow for the Option 3 lands is 220 L/s while maintaining a minimum system operating pressure of 20 psi, as per Bolton Residential Expansion Study Infrastructure Report, prepared by GM BluePlan dated June 16, 2014.

3.0 Existing Water Distribution System

Bolton receives water supply from the Tullamore Pumping Station and Reservoir, through a transmission main along Mayfield Road and Coleraine Drive. Bolton's water distribution system is serviced in two pressure zones, Zone 5 and Zone 6. Zone 5 is serviced through Zone 6 by pressure reducing valves at the Bolton Zone 5 Standpipes. The Standpipes have a high-water level (HWL) of 274.1 m. Storage for Zone 6 is supplied by the Bolton ET and the North Bolton ET. The HWL of both ET's is 297.2 m.

The existing ground elevations within the Option 3 lands range from approximately 262 m to 280 m. These elevations fall outside of the range of elevations capable of being serviced by Zone 6 while maintaining adequate operating pressures within the system. The Region of Peel reports operating pressure issues within an existing residential subdivision fronting on King Street in close proximity to the Option 3 lands.

A new pressure Zone 7 with an elevated tower having a HWL of 327.7 m would adequately service all of the Option 3 lands, as well as address existing operating pressure issues for some existing residents.

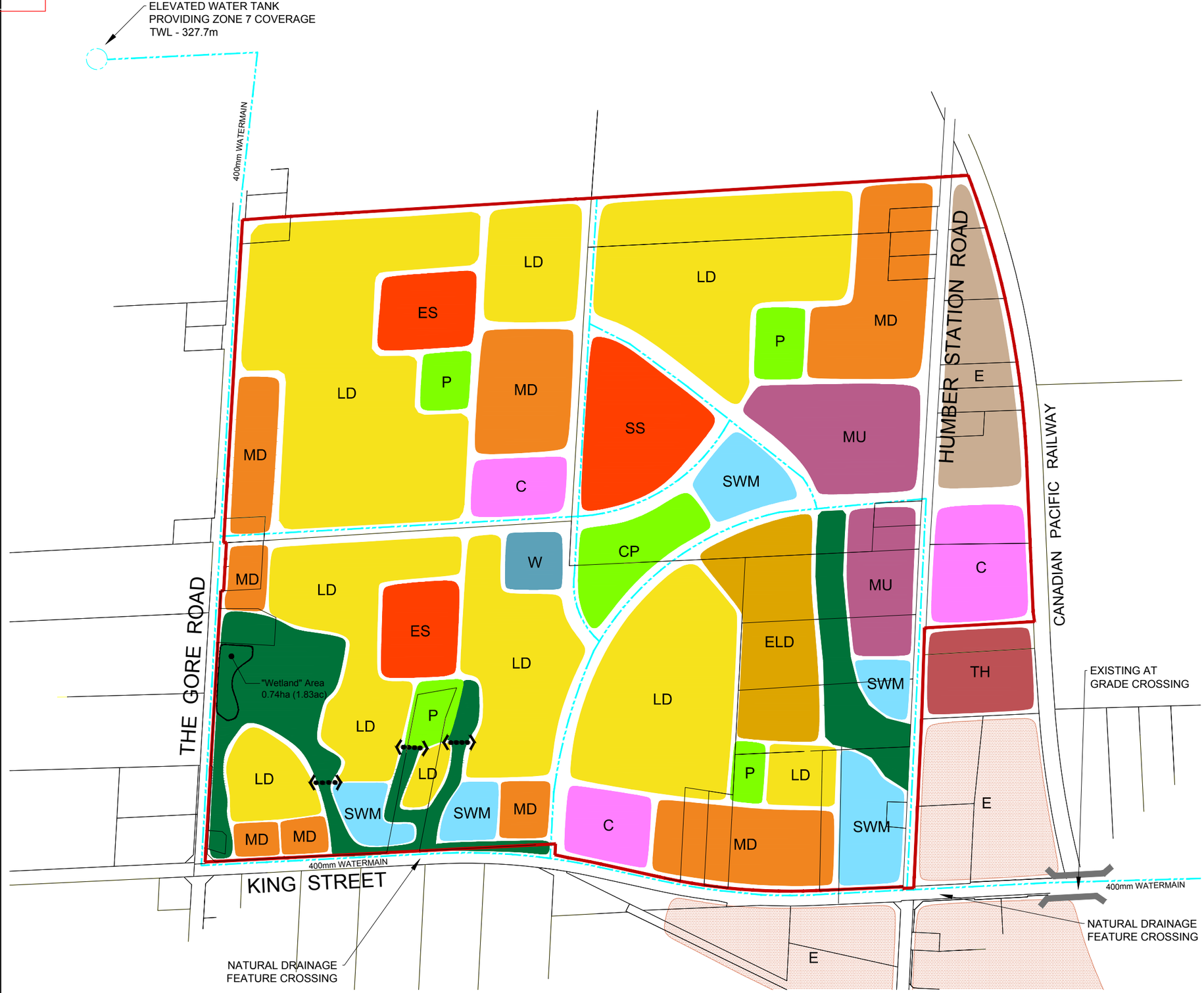
4.0 Hydraulic Modelling

The hydraulic model was developed using Infowater modelling software. The Option 3 lands water system was input into the model based on the proposed watermain layout to service a conceptual land use plan, shown in Figure 2 below.

As identified through previous studies undertaken by the Town of Caledon and Region of Peel, sufficient supply is available to service the domestic and fire flow requirements associated with the Bolton residential expansion. Therefore, we have not reviewed supply constraints. The servicing constraints are based on supply pressure and hydraulic losses, which is dependent on watermain size and ground elevations within the serviced area.

The existing Zone 6 Bolton ET's have been shown schematically in the model as a reservoir and set at a HWL of 297.2 m. Although the existing elevated tanks and booster pumping station are in relatively close proximity to the Option 3 lands, the pipe lengths have been modelled with the actual lengths to properly reflect the friction losses and actual location of the existing and proposed infrastructure.

Several scenarios were developed to simulate operating pressures under Maximum Day Demand, Peak Hour Demand, Fire Demand and Maximum Day plus Fire Demand. Model outputs are summarized on the attached figures to demonstrate what portion of the lands may be serviced in an interim water servicing situation.



LEGEND

WATERMAIN

ZONE 7 COVERAGE
ELEV 259m - 290m

Notes

1. This drawing is the exclusive property of R. J. Burnside & Associates Limited. The reproduction of any part without prior written consent of this office is strictly prohibited.
2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.
3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

NOT FOR CONSTRUCTION

No.	Issue / Revision	Date	Auth.

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Client

BOLTON OPTION 3 LAND OWNERS GROUP

Drawing Title

BOLTON - OPTION 3 LANDS

WATER SERVICING LAYOUT

Drawn	Checked	Date	Figure No.
DT	DT	14/08/27	2
Scale		Project No.	
1:7,500		300034976	

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4.1 Maximum Day Demand and Peak Hour Demand Scenarios

Scenario 1 was developed to estimate operating pressures within the Option 3 lands under MDD assuming a supply from Zone 6 without a booster pumping station or Zone 7 ET in place. Figure 3 in Appendix B shows the expected operating pressures under this scenario. The figure shows that only the southernmost and easternmost portions of the Option 3 Lands can be serviced by Zone 6 while maintaining pressures above 40 psi under MDD conditions.

Scenario 2 was developed to estimate pressures within the Option 3 lands under MDD assuming a supply from Zone 6 and including a booster pumping station, but without a Zone 7 ET in place. To represent the booster pumping station, a single equivalent pump was input into the model. In reality, the booster pumping station would include several pumps to deliver the range of flows experienced within the zone at acceptable pressures. A typical pumping system arrangement would include a jockey pump, an ADD pump, large domestic service pumps, and if required a fire pump, all with built-in redundancy as per the Region and MECP Drinking Water Guideline requirements. The specific pumping arrangement would be determined during detailed design. Figure 4 in Appendix B shows the expected operating pressures under Scenario 2. The equivalent pump was set to deliver the required MDD of 67.2 L/s at a total dynamic head (TDH) of 30.5 m to the Option 3 lands. The system can supply the MDD to the entirety of the Option 3 lands while maintaining system pressures between 40 psi and 100 psi.

Scenario 3 was developed to estimate pressures within the Option 3 lands under PHD assuming a supply from Zone 6, and including a booster pumping station, but without the Zone 7 ET in place. Figure 5 in Appendix B shows the expected operating pressures under this scenario. The equivalent pump was modelled to supply the PHD of 116.5 L/s at a TDH of 30.5 m. The figure shows that such an arrangement would provide adequate operating pressures between 40 psi and 100 psi under PHD to the Option 3 lands.

Scenario 4 was developed to estimate pressures within the Option 3 lands assuming the ultimate Zone 7 ET and booster pumping station to supply water from Zone 6 to Zone 7 are in place. Figure 6 located in Appendix B illustrates the operating pressures achieved under this scenario. A reservoir set at a HWL of 327.7 m has been used to model the Zone 7 ET. The system can supply the MDD to the entirety of the Option 3 lands while maintaining system pressures between 40 psi and 100 psi with the Zone 7 ET.

4.2 Fire Flow Scenario

Scenario 5 was developed to estimate available fire flows under the ultimate build out scenario for the Option 3 lands and to determine the required internal watermain sizes to deliver 220 L/s while maintaining a system pressure of 20 psi. This scenario assumes that the Zone 7 ET and the Zone 7 Booster Station are in engaged in the model, with the HWL of 327.7 m. Figure 7 in Appendix B shows the available fire flows under Scenario 5. The figure shows the internal watermain sizing recommended to deliver 220 L/s and maintain a minimum system pressure of 20 psi. These internal sizes are used in the other scenarios unless otherwise noted.

Scenario 6 was developed to estimate the fire flows that would be available assuming the Zone 7 Booster Pumping Station is in place and the supply for fire fighting comes from a one-way connection to Zone 6. In other words, no fire pump is included within the Booster Pumping Station configuration and fire flows are delivered from the existing infrastructure. Figure 8 in Appendix B shows available fire flows under Scenario 6. A 220 L/s fire flow cannot be supplied to the entirety of the Option 3 ands while maintaining a system pressure of 20 psi.

Scenario 7 was developed to estimate the fire flows that would be available assuming a fire pump is in place at the proposed Booster Pumping Station. A fire pump was modelled with a capacity of 287.2 L/s (MDD + 220 L/s fire flow) at a TDH of 27 m. A single equivalent pump was used to represent the pumping system. Figure 9 in Appendix B shows available fire flow under Scenario 7. A significant portion of the Option 3 lands can be supplied a fire flow of 220 L/s from the proposed fire pump. To provide the minimum required fire flow to the entirety of the Option 3 lands, oversizing the proposed 400 mm watermain to a 600 mm watermain from the Booster Pumping Station to a point approximately 1200 m southwest would overcome the head losses caused by friction. This watermain would be larger than that required under the ultimate scenario with both a Booster Pumping Station and Zone 7 ET in place. The resultant fire flows are shown on Figure 10 of Appendix B.

5.0 Conclusion

A hydraulic model of the proposed water distribution system has been developed for the Option 3 lands. Various scenarios have been modelled to determine how much of the Option 3 lands can be reasonably serviced on an interim basis without the construction of a Zone 7 ET.

The entirety of the Option 3 lands can be serviced under all modelling scenarios if a new Booster Pumping Station is constructed in the vicinity of Coleraine Drive and King Street and the diameter of the proposed trunk watermain from the Booster Pumping Station to a point approximately 1200 m southwest is increased to 600 mm, from the currently proposed 400 mm diameter required for the ultimate build out condition. The Booster Pumping Station will require appropriately sized booster pumps to provide the ADD, MDD and PHD within the 40 psi to 100 psi pressure range. The Booster Pumping Station will also require a fire pump to provide the Option 3 Lands with 220 L/s of fire flow. The specific arrangement of the Booster Pumping Station would be determined during detailed design.

The MDD scenarios modelled show that the entirety of the Option 3 lands can be serviced within the recommended pressure range of 40 psi to 100 psi with a MDD pump at the Booster Pumping Station.

The PHD scenario modelled shows that the entirety of the Option 3 lands can be serviced within the recommended pressure range of 40 psi to 100 psi with a PHD pump.

A fire flow scenario of the ultimate build out of the Option 3 lands, including the Zone 7 ET, was simulated to determine preliminary watermain sizes for the Option 3 lands. These watermain sizes were then used to determine the extent of Option 3 lands that could be serviced on an interim basis with an available fire flow of 220 L/s at 20 psi with no ET in place, both with and without a fire pump at the Zone 7 Booster Pumping Station.

Based on the modelling performed, in order to supply the entirety of the Option 3 lands with a 220 L/s fire flow drawn from the Zone 6 ET with a fire pump in place at the Zone 7 Booster Pumping Station, oversizing approximately 1,200 m of proposed watermain over that proposed in the ultimate build out scenario is necessary, as highlighted above. From an operational perspective, oversizing the watermains would improve the pressures to the northwestern portion of the Option 3 lands under normal operating conditions.

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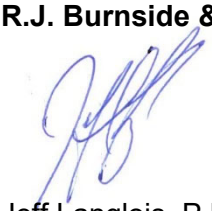

Jeff Langlois, P.Eng., MBA
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Rachel Walton, MASc., E.I.T.
Engineering Assistant

RW/JLL:sj

Enclosure(s) Appendix A and Appendix B

cc: Mr. Aaron Wisson, Argo Development Corporation
Mr. Dave Leighton, C.E.T., Urbantech

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Appendix A

Bolton Option 3 Zone 7 Demand Calculations

Prepared by:	RW
Checked by:	JMG/JLL
Project No:	300034976
Date:	5/12/2020

Assumptions

Population

Residential	10348
Employment (job)	2250

Fire Flow

220 L/s — Bolton Residential Expansion Study Infrastructure Report, June 16, 2014

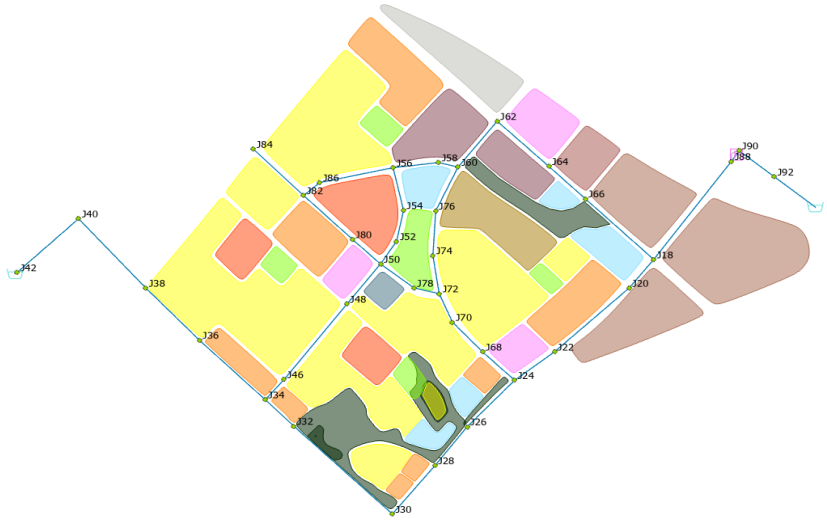
Water Demands

Residential	Residential Per Capita Flow	270	L/person/day
	Max Day Factor	1.8	
	Peak Hour Factor	3	
Employment	Employment Per Capita Flow	250	L/employee/day
	Max Day Factor	1.4	
	Peak Hour Factor	3	

Demands	**Residential (L/s)**	**Employment (L/s)**	**Total (L/s)**
ADD	32.3	6.5	**38.8**
MDD	58.2	9.1	**67.3**
PHD	97.0	19.5	**116.5**

Demand Allocation

Junction #	**ADD (L/s)**	**MDD (L/s)**	**PHD (L/s)**	**Elevation (m)**
J18	1.21	2.1	3.64	265
J20	1.21	2.1	3.64	265.5
J22	1.21	2.1	3.64	266.5
J24	1.21	2.1	3.64	265
J26	1.21	2.1	3.64	262.5
J28	1.21	2.1	3.64	262
J30	1.21	2.1	3.64	262.83
J32	1.21	2.1	3.64	269.98
J34	1.21	2.1	3.64	273.01
J36	1.21	2.1	3.64	279.34
J38	1.21	2.1	3.64	279.58
J40				280
J42				280
J46	1.21	2.1	3.64	273.26
J48	1.21	2.1	3.64	278.55
J50	1.21	2.1	3.64	274.68
J52	1.21	2.1	3.64	272.74
J54	1.21	2.1	3.64	273.8
J56	1.21	2.1	3.64	270
J58	1.21	2.1	3.64	268.94
J60	1.21	2.1	3.64	268
J62	1.21	2.1	3.64	267
J64	1.21	2.1	3.64	267.49
J66	1.21	2.1	3.64	265.45
J68	1.21	2.1	3.64	268.61
J70	1.21	2.1	3.64	270.69
J72	1.21	2.1	3.64	272.77
J74	1.21	2.1	3.64	270.84
J76	1.21	2.1	3.64	270.23
J78	1.21	2.1	3.64	273.68
J80	1.21	2.1	3.64	273.84
J82	1.21	2.1	3.64	272.33
J84	1.21	2.1	3.64	273.58
J86	1.21	2.1	3.64	272
J88				265
J90				265
J92				257
TOTAL	**38.72**	**67.2**	**116.5**	



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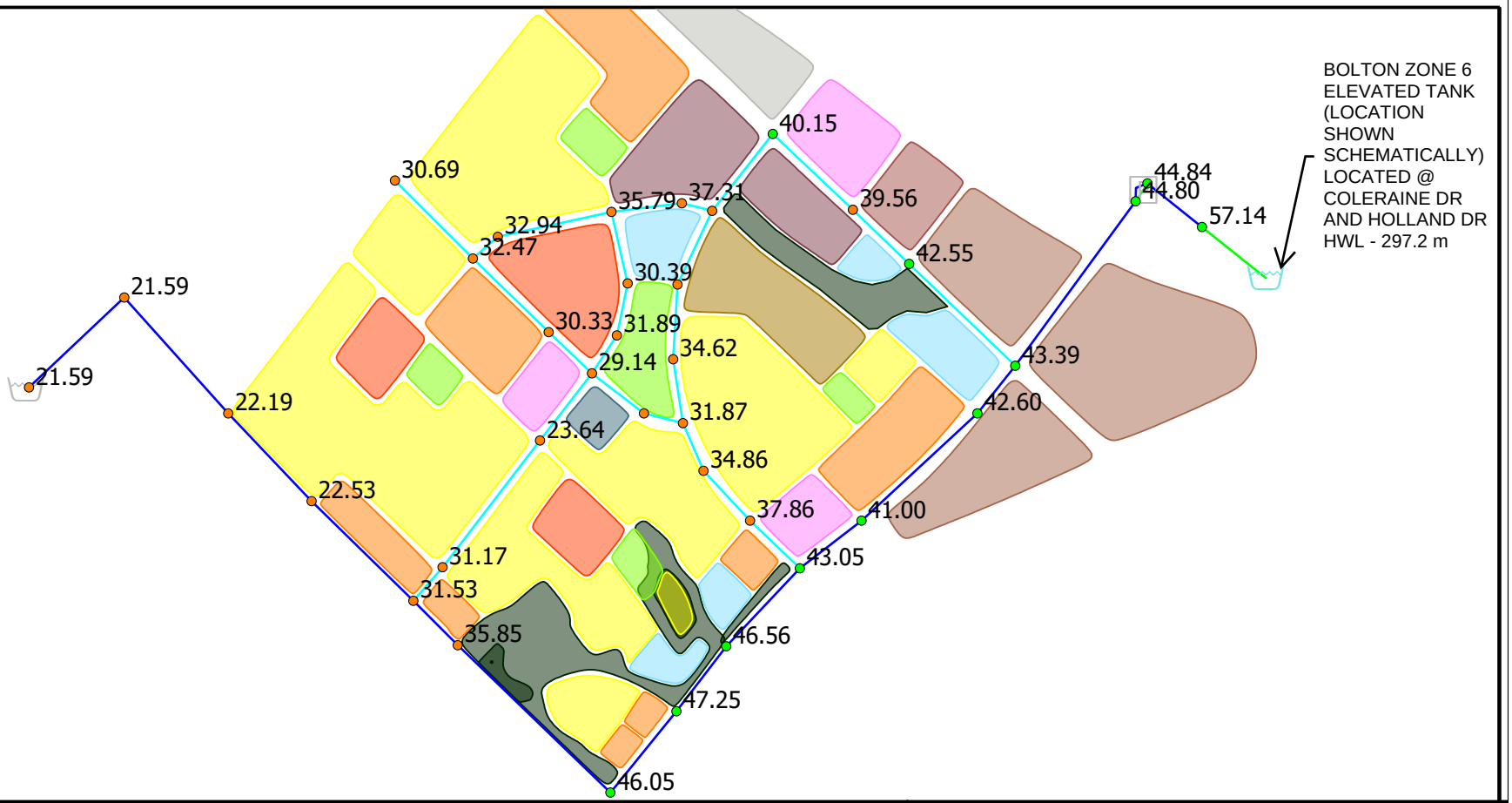
Appendix B

SCENARIO 1



LEGEND

Junction

PRESSURE (PSI)
- less than 20.00
- 20.00 ~ 40.00
- 40.00 ~ 70.00
- 70.00 ~ 80.00
- 80.00 ~ 100.00

Reservoir

Type
- Active
- Domain
- Inactive

<All other values>

Pump

Type
- Active
- Domain
- Inactive
- <All other values>

Pipe

DIAMETER (MM)
- 200
- 300
- 400
- 1050

Land Classification
- 1-exist light industrial employment
- 1-employment
- 1-transit hub
- 1-commercial
- 1-swm pond
- 1-towns-med density
- 1-low density residential
- 1-institutional
- 1-parks
- 1-place of worship
- 1-NHS
- 1-mixed-use
- tb_text-small
- 1-executive residential

N

0 50100 200 300 400 500 600 700 800 900
Meters

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

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Client
BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7

MDD SERVICED WITH ZONE 6 ELEVATED TANK

Drawn	Checked	Date	Figure No.
RW	JMG/JLL	2020/05>	3
Scale		Project No.	
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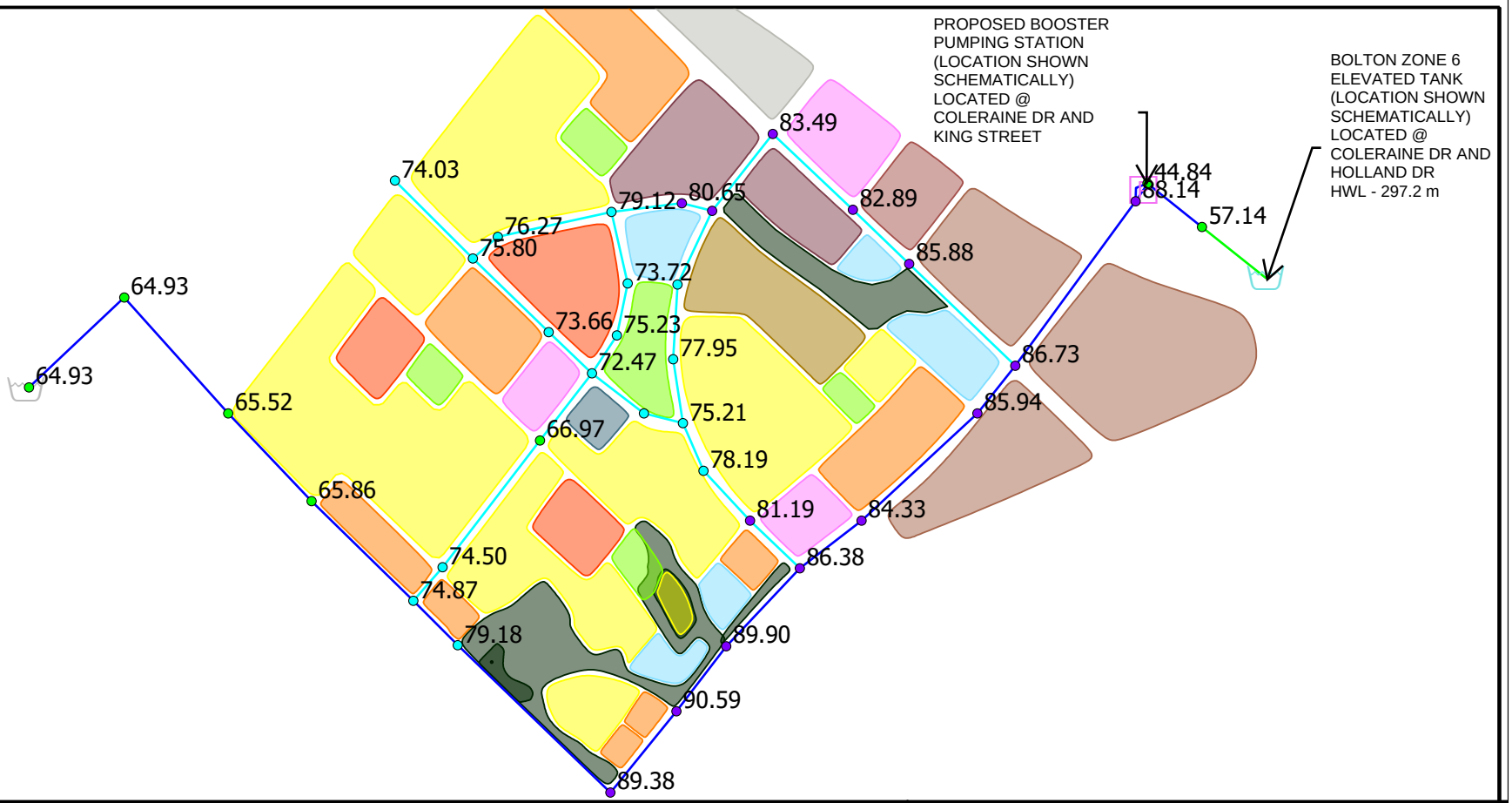
SCENARIO 2



LEGEND

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BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7
MDD SERVICED WITH PROPOSED BOOSTER PUMPS

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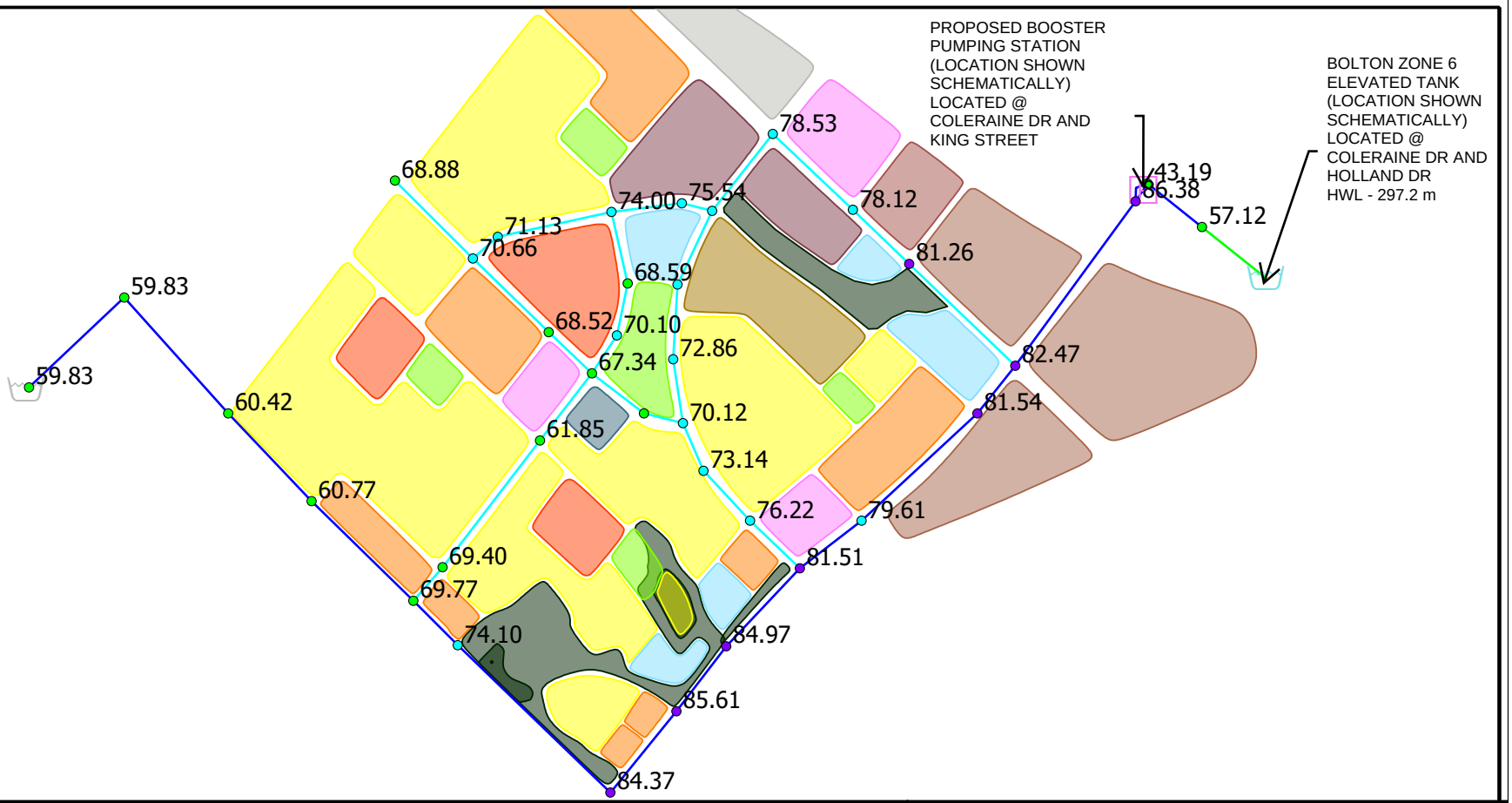
RW	JMG/JLL	2020/05>	4
Scale		Project No.	
1:		300034976	

SCENARIO 3



LEGEND

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N

0 50100 200 300 400 500 600 700 800 900
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3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

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BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7

PHD SERVICED WITH PROPOSED BOOSTER PUMPS

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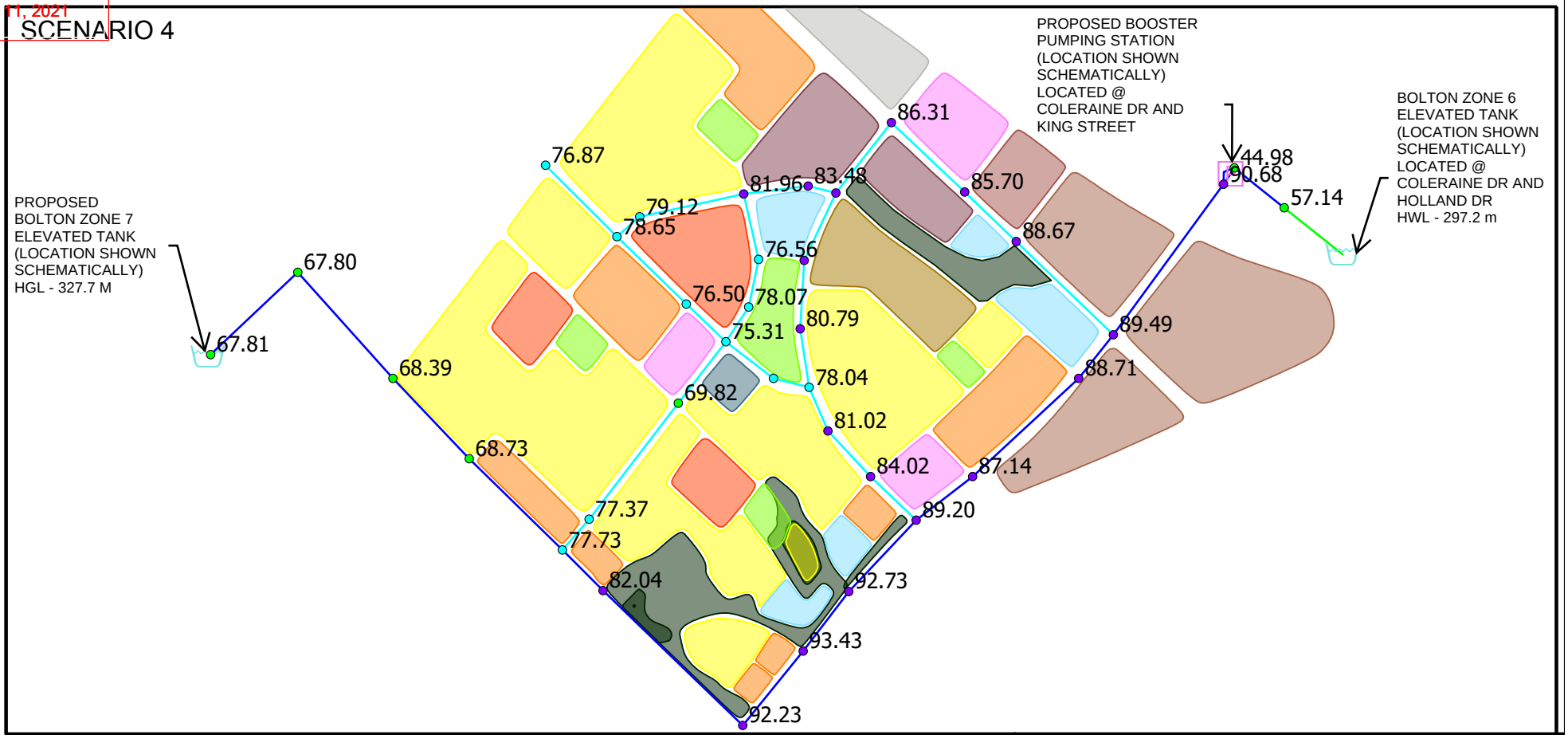
Scale		Project No.	
1:		300034976	

SCENARIO 4



LEGEND

Junction

PRESSURE
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- 20.00 ~ 40.00
- 40.00 ~ 70.00
- 70.00 ~ 80.00
- 80.00 ~ 100.00

Reservoir

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- Domain
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<All other values>

Pump

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- 1-commercial
- 1-swm pond
- 1-towns-med density
- 1-low density residential
- 1-institutional
- 1-parks
- 1-place of worship
- 1-NHS
- 1-mixed-use
- tb_text-small
- 1-executive residential

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

N

0 50100 200 300 400 500 600 700 800 900
Meters

BURNSIDE

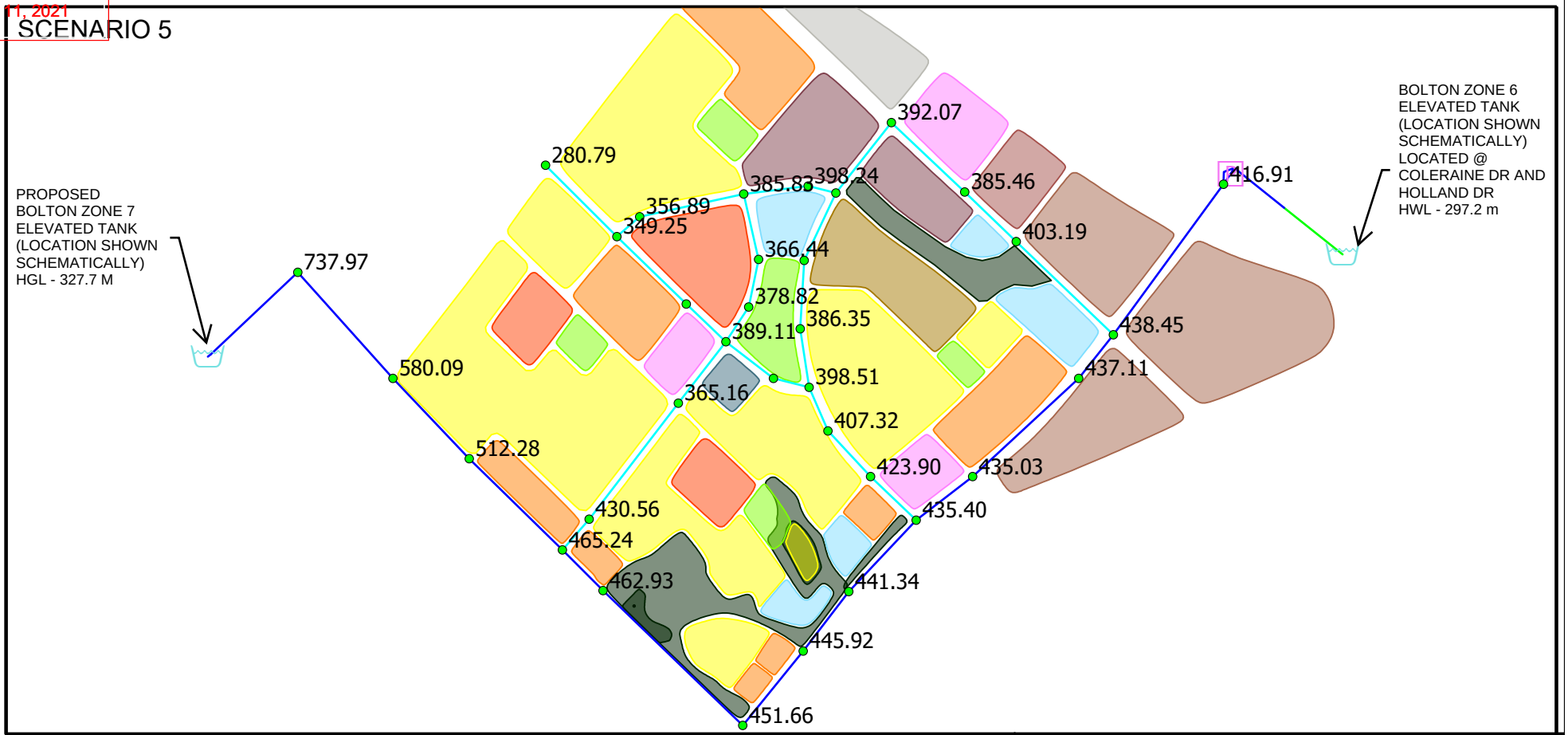
Client
BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7

MDD SERVICED WITH ZONE 7 ELEVATED TANK

Drawn	Checked	Date	Figure No.
RW	JMG/JLL	2020/05>	6
Scale		Project No.	
1:		300034976	

SCENARIO 5



LEGEND

Junction
FIRE FLOW (L/s)
AVAILABLE @ SYSTEM
PRESSURE OF 20 PSI
- less than 0.00
- 0.00 ~ 100.00
- 100.00 ~ 150.00
- 150.00 ~ 220.00
- 220.00 ~ 6,426.38

Reservoir
Type
- Active
- Domain
- Inactive
- <All other values>

Pump
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe
DIAMETER (MM)
- 200
- 300
- 400
- 1050

Land Classification
- 1-exist light industrial employment
- 1-employment
- 1-transit hub
- 1-commercial
- 1-swm pond
- 1-towns-med density
- 1-low density residential
- 1-institutional
- 1-parks
- 1-place of worship
- 1-NHS
- 1-mixed-use
- tb_text-small
- 1-executive residential

N

0 50100 200 300 400 500 600 700 800 900
Meters

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

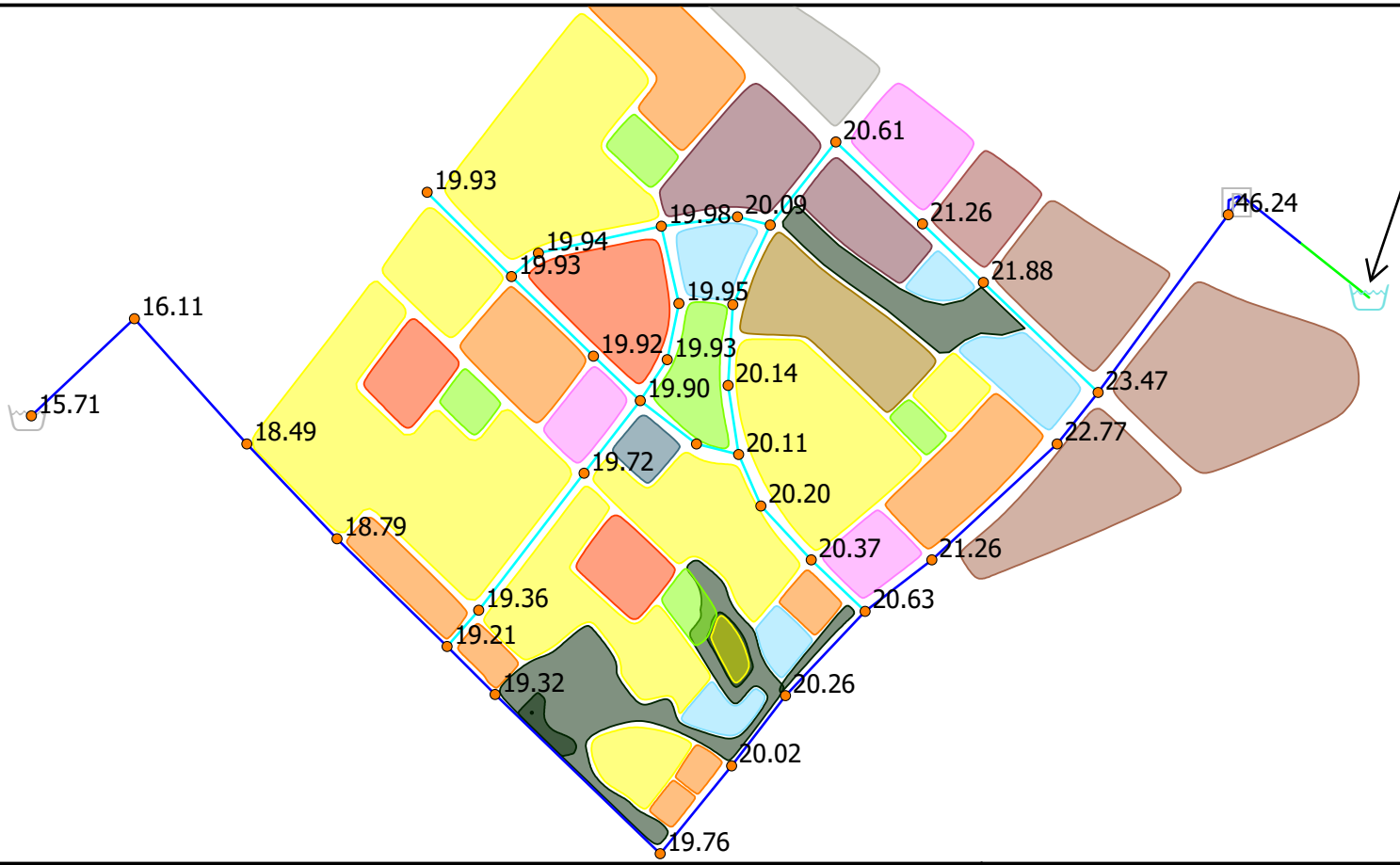
BURNSIDE

Client
BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7
FIRE FLOW FROM ZONE 7 ELEVATED TANK

Drawn	Checked	Date	Figure No.
RW	JMG/JLL	2020/05>	7
Scale		Project No.	
1:		300034976	

SCENARIO 6



LEGEND

Junction
FIRE FLOW (L/s)
AVAILABLE @ SYSTEM
PRESSURE OF 20 PSI
- less than 0.00
- 0.00 ~ 100.00
- 100.00 ~ 150.00
- 150.00 ~ 220.00
- 220.00 ~ 6,426.38

Reservoir
Type
- Active
- Domain
- Inactive

<All other values>

Pump
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe
DIAMETER (MM)
- 200
- 300
- 400
- 1050

Land Classification
- 1-exist light industrial employment
- 1-employment
- 1-transit hub
- 1-commercial
- 1-swm pond
- 1-towns-med density
- 1-low density residential
- 1-institutional
- 1-parks
- 1-place of worship
- 1-NHS
- 1-mixed-use
- tb_text-small
- 1-executive residential

N

0 50100 200 300 400 500 600 700 800 900
Meters

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

BURNSIDE

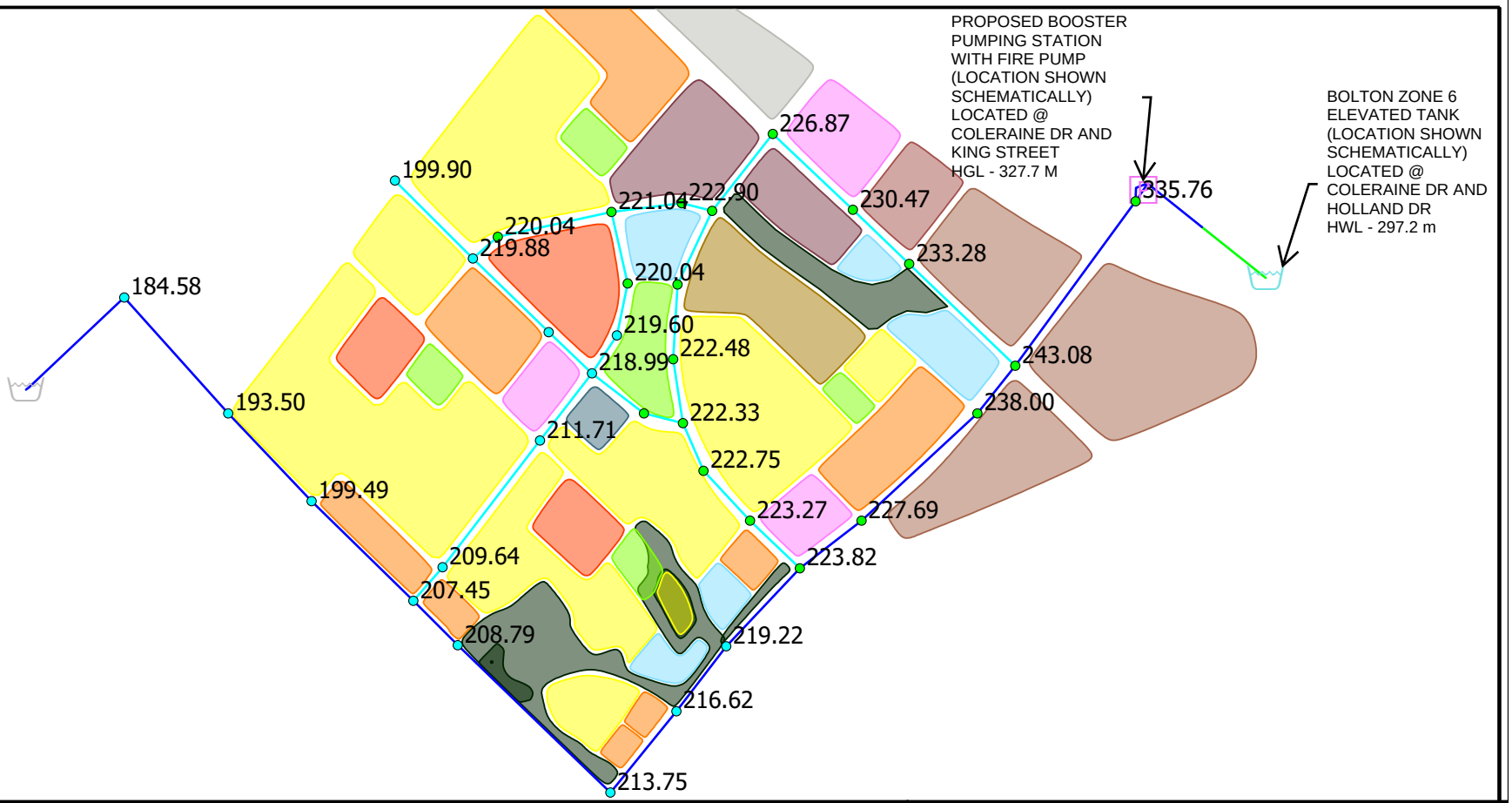
Client
BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7

FIRE FLOW FROM ZONE 6 ELEVATED TANK

Drawn	Checked	Date	Figure No.
RW	JMG/JLL	2020/05>	8
Scale		Project No.	
1:		300034976	

SCENARIO 7



LEGEND

Junction
FIRE FLOW (L/s) AVAILABLE @ SYSTEM PRESSURE OF 20 PSI
- less than 0.00
- 0.00 ~ 100.00
- 100.00 ~ 150.00
- 150.00 ~ 220.00
- 220.00 ~ 6,426.38

Reservoir
Type
- Active
- Domain
- Inactive
- <All other values>

Pump
Type
- Active
- Domain
- Inactive
- <All other values>

Pipe
DIAMETER (MM)
- 200
- 300
- 400
- 1050

Land Classification
- 1-exist light industrial employment
- 1-employment
- 1-transit hub
- 1-commercial
- 1-swm pond
- 1-towns-med density
- 1-low density residential
- 1-institutional
- 1-parks
- 1-place of worship
- 1-NHS
- 1-mixed-use
- tb_text-small
- 1-executive residential

N

0 50100 200 300 400 500 600 700 800 900
Meters

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2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

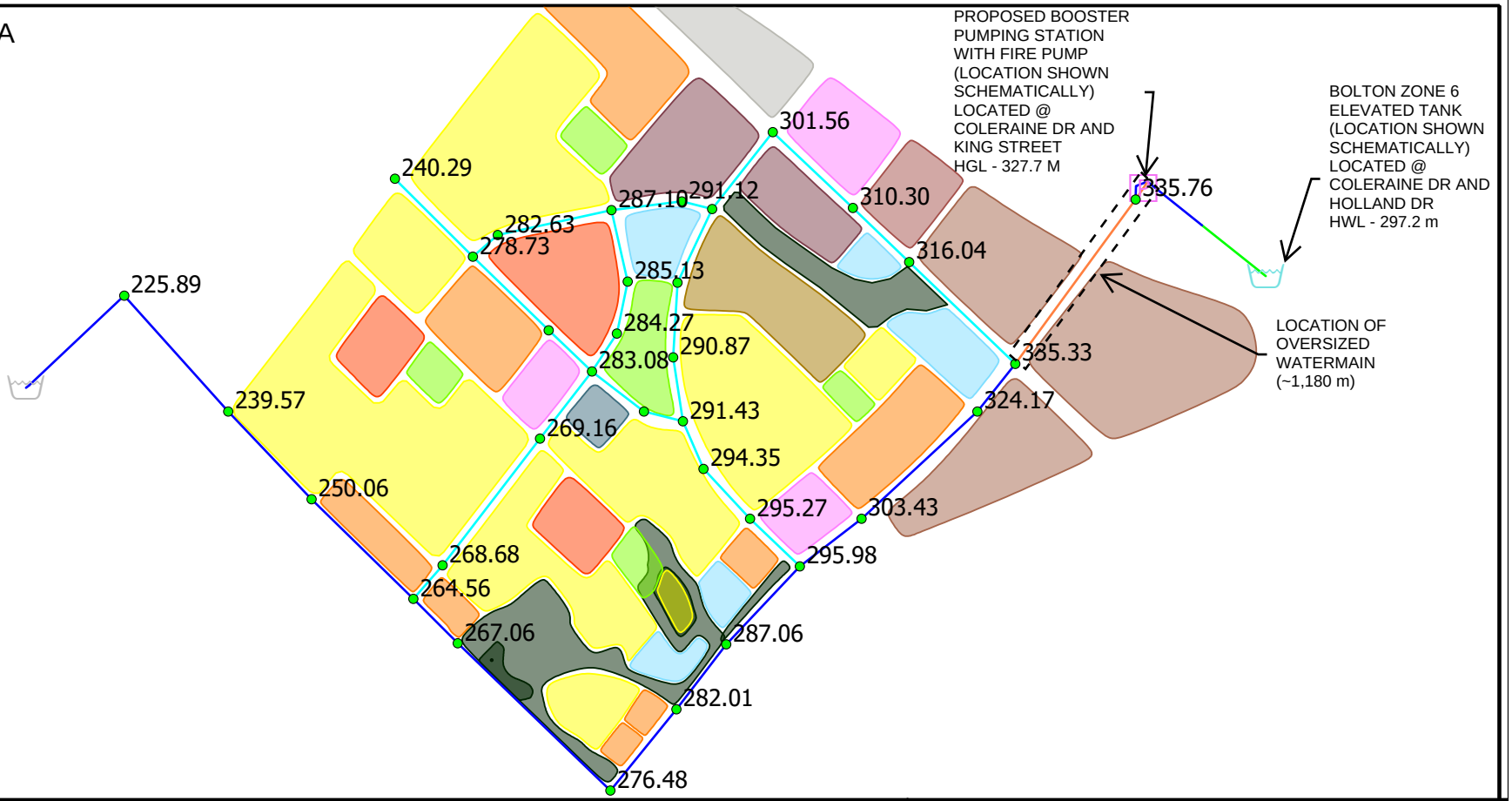
BURNSIDE

Client
BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7
FIRE FLOW FROM FIRE PUMPS

Drawn	Checked	Date	Figure No.
RW	JMG/JLL	2020/05>	9
Scale		Project No.	
1:		300034976	

SCENARIO 7A



LEGEND

Junction

FIRE FLOW (L/s) AVAILABLE @ SYSTEM PRESSURE OF 20 PSI

- less than 0.00
- 0.00 ~ 100.00
- 100.00 ~ 150.00
- 150.00 ~ 220.00
- 220.00 ~ 6,426.38

Reservoir

Type
- Active

Domain
- Inactive
- <All other values>

Pump

Type
- Active
- Domain
- Inactive
- <All other values>

Pipe

DIAMETER (MM)
- 200
- 300
- 400
- 600
- 1050

Land Classification
- 1-exist light industrial employment
- 1-employment
- 1-transit hub
- 1-commercial
- 1-swm pond
- 1-towns-med density
- 1-low density residential
- 1-institutional
- 1-parks
- 1-place of worship
- 1-NHS
- 1-mixed-use
- tb_text-small
- 1-executive residential

N

0 50100 200 300 400 500 600 700 800 900
Meters

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3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128.

BURNSIDE

Client
BOLTON OPTION 3 LANDOWNERS GROUP

Map Title
BOLTON OPTION 3 ZONE 7
FIRE FLOW FROM FIRE PUMPS WITH OVERSIZED WATERMAINS

Drawn	Checked	Date	Figure No.
RW	JMG/JLL	2020/05>	10
Scale		Project No.	
1:		300034976	