

## **Water Servicing – Clair Maltby**

W-1 Existing Conditions Design Criteria & Level of Service Objectives  
Report

Project # TP168050; Client Name: City of Guelph

Prepared for:

**City of Guelph**

1 Carden Street, Guelph, ON N1H 3A1

1/23/2019

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### **Prepared by:**

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**1/23/2019**

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ISSUE	DATE	ORIG	REVIEW	DESCRIPTION
Initial Draft	January 2019	EA Poirier / Ali Aamir	R Sawhney	Initial Draft for Client Review

## 1.0 Introduction

The scope of this report involves the following:

- Review of Clair Maltby Water Planning models and necessary liaison with the City of Guelph (the City) to confirm our understanding of the model set-up and design criteria;
- Evaluation of the Existing Water System / Pressure Zone Configuration;
- Confirmation of Planning requirements: projected residential and employment populations and road layout concept;
- Evaluation of Site topography and suitability of lands for servicing within City of Guelph's existing and planned pressure districts;
- Confirmation of the capacity of the water services accessible to the Clair Maltby area;
- Development of Finalized Demand Projections for the Proposed Lands.

## 2.0 Planning Context

### 2.1 Study Area

The Clair Maltby Secondary Plan (CMSP) lands are situated in the Southern part of the City of Guelph and the lands are bounded by Victoria Road S to the North-East, Clair Road E to the North-West, Southgate Drive to the South-West, and Maltby Road W to the South-East and the location is given in **Figure 2.1**. The land ranges in elevation from approximately 331 to 359 meters above sea level (masl). The subject lands have a total area of 491 ha.

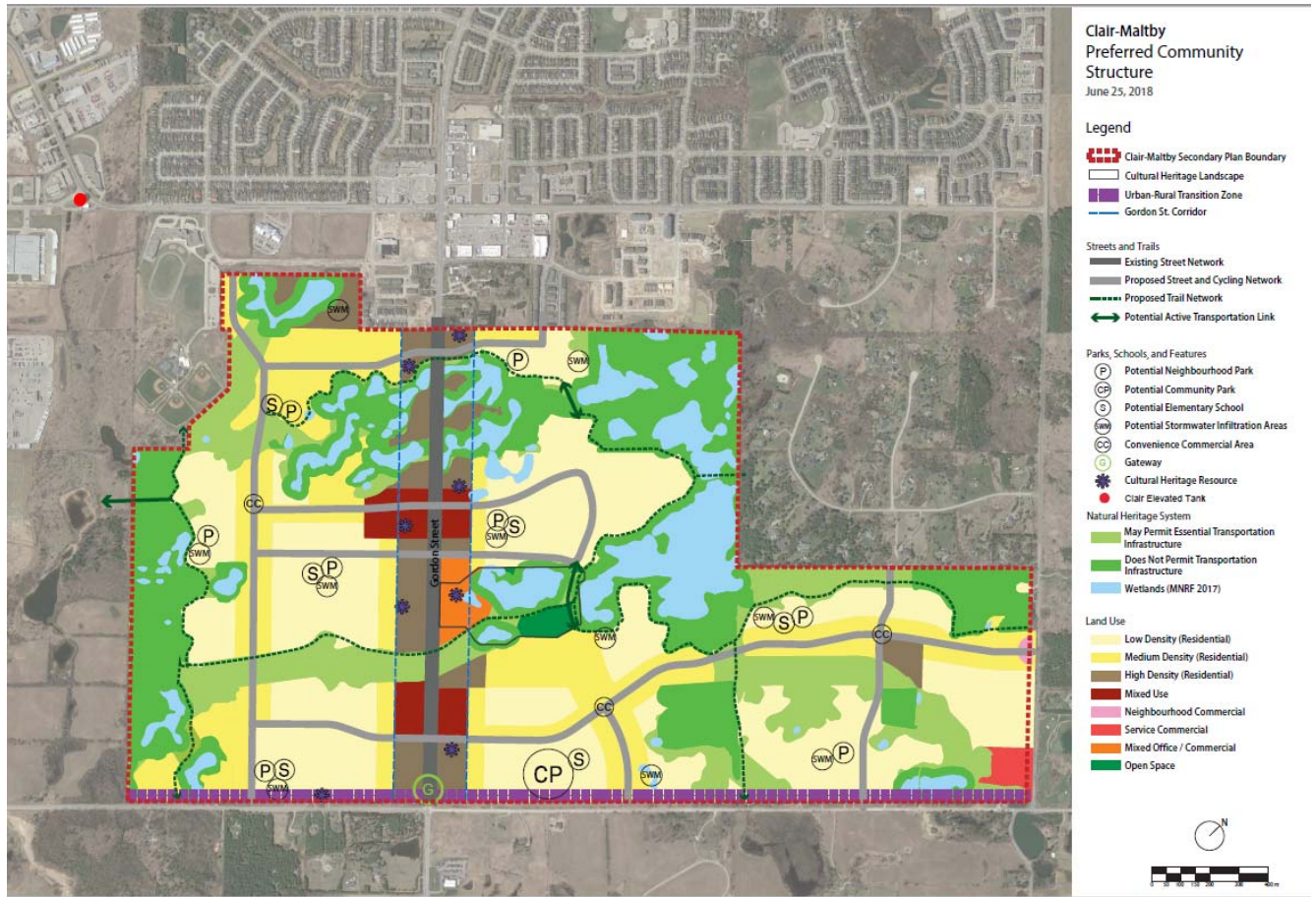
### 2.2 Proposed Land Use

As part of the CMSP planning process, a preferred land use plan was developed through an intensive stakeholder engagement process with a technical advisory composed of City Staff, planners, citizens and landowners.

The proposed land use layout used for this study is given in **Figure 2.1** and was provided in June 2018. The plan may have been refined since this time.

The planned service population for the Proposed Land Use is 25,059 and the proposed development area is 238.86 ha based on information provided in June 2018. Note, that as planning progresses, population projections may change. The intent of the current water servicing exercise is to provide practical solutions that have sufficient flexibility to accommodate planning changes.

Planning Input is provided in **Appendix B**.



**Figure 2.1. Preferred Lane Use for Clair Maltby**

### 3.0 Water Design Criteria

#### 3.1 Background Information

Design criteria is established based on a review of background information provided by the City of Guelph as follows:

- Development Engineering Manual Version 1.0 – City of Guelph Engineering and Capital Infrastructure Services;
- Region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS 2018);
- Hydraulic Modeling Update for the 2013 Guelph DC Study (Final);
- Technical Memorandum Clair Booster Pumping Station & Zone 3 Commissioning Plan (2016);
- MECP 2008 Design Guidelines for Drinking Water Systems;
- City of Guelph Planning Model (InfoWater) received November 2016.



## 3.2 Water Demand Estimates

The water demands in this planning process are described as “Average Day Demand”, “Maximum Day Demand”, “Peak Hour Demand”, and “Fire Demand”.

**Average Day Demand (ADD):** refers to the average daily demand observed in a system in a given year. The City of Guelph has a modelled average day demand for an existing condition (2018 scenario) and a projected future 2032 scenario. The 2032 average day demand scenario is modified in **Section 5.0** to reflect the planning framework for the Clair Maltby Secondary Plan Lands as described in Section 2.2.

**Maximum Day Demand (MDD):** refers to the highest daily demand observed in a system in a given year. City of Guelph has a modelled max day demand for an existing condition (2018 scenario) and a projected future 2032 scenario. The 2032 Max Day Demand scenario is modified in **Section 5.0** to reflect the planning framework for the Clair Maltby Secondary Plan Lands as described in Section 2.2.

**Peak Hour Demand (PHD):** refers to the highest hourly demand observed in a system in a given day. City of Guelph has a modelled max day demand for an existing condition (2018 scenario) and a projected future 2032 scenario. The 2032 Max Day Demand scenario is modified in **Section 5.0** to reflect the planning framework for the Clair Maltby Secondary Plan Lands as described in Section 2.2.

**Fire Demand & Available Fire Flow:** A **fire demand** criterion can be described in two ways, building specific fire demand criterion, and urban network fire demand criterion. In the building specific sense, the fire demand typically refers to the protection needs of a given building as estimated by Fire Underwriters’ Survey (FUS) method. In the urban network sense, fire demand is typically estimated based on the service population of a given distribution system or pressure zone. MECP guidelines have a population-based fire demand. **Available fire flow** refers to the amount of flow a network can deliver to a single point in the network without going below 140 KPa. The available fire flow typically does not consider the restrictions through a hydrant, i.e. in order to draw the available fire flow at a given point, there may need to be multiple hydrants.

## 3.3 Operating Pressures

### 3.3.1 Normal Operating Pressures

MECP guidelines require water distribution systems to operate, under normal operating conditions (Peak Hourly, Average Day, and Max Day), within the following pressure range:

1. 275 - 690 KPa (40 -100 psi)

Typically, municipalities operate pressure zones within a preferred operating range such as:

2. 350 - 550 KPa (50 - 80 psi)

### 3.3.2 Fire Flow Conditions

Under fire flow conditions, MECP guidelines require system pressure to be greater than 140 KPa (20 psi) in the vicinity of the point in the network where fire flow is drawn. Fire flow conditions are evaluated with MDD background demands in the system.

### 3.4 Pipe Network Hydraulics

Head losses in the system are a function of the network conditions specifically pipe inside diameters, pipe lengths, inside wall smoothness, network configuration, valving, bends and restrictions. The Hazen Williams friction loss method is the basis for determining and solving pressure conditions within the network. The City's model is deemed to be sufficiently calibrated to determine the boundary conditions for the existing and baseline network.

The new pipes input into the system to represent the future Clair Maltby servicing will be connected to the City model. For these new pipes, it is assumed that nominal diameter is equal to inside diameter, and a Hazen-Williams C factor of 120 is applied.

### 3.5 Pumping Station Design Capacity

Water pumping systems are designed with multiple pumps are designed to meet a firm capacity. The firm capacity of a given pumping station is defined as the system flow rate with all pumps running except one out-of-service. If the pumps do not have equal capacity the highest capacity pump is assumed out of service for the purpose of determining firm capacity.

The use of firm capacity introduces a safety/redundancy factor as the system flow rate can exceed the firm capacity when all pumps are running.

### 3.6 Zone Storage Requirements

Water storage planning is in consideration of the MECP's Design Guidelines for Drinking Water Systems (Section 8.4.2), where:

Total Treated Water Storage Requirement = A + B + C, where:

- A = Fire Storage:
  - Evaluated as the volume from MECP Table 8-1: Fire Flow Requirements via suggested flow rate x duration.
- B = Equalization Storage (25% of maximum day demand):
  - Max Day Demand, per capita consumption rates, and Max Day demand factors will be evaluated based on historical demands and updated on an annual basis to determine system requirements. Growth will be evaluated based on per capita unit consumption rates observed in the Clair Maltby distribution system.
- C = Emergency Storage (25% of A + B):
  - Emergency storage is evaluated as a function of the needs identified in A and B.

The fire flow requirements as per the MECP is based on a combination of the equivalent population, as well as suggested fire flow requirements as a basis of estimated fire flow duration from Table 8-1 from the MECP Guidelines as shown in **Table 1**.

**Table 1. Fire Flow Requirements (MECP Table 8-1)**

EQUIVALENT POPULATION <sup>1</sup>	SUGGESTED FIRE FLOW (L/s)	DURATION (HOURS)
500 – 1 000	38 (10 ft/s)	2
1 000	64 (17 ft/s)	2
1 500	79 (21 ft/s)	2
2 000	95 (25 ft/s)	2
3 000	110 (29 ft/s)	2
4 000	125 (33 ft/s)	2
5 000	144 (38 ft/s)	2
6 000	159 (42 ft/s)	3
10 000	189 (50 ft/s)	3
13 000	220 (58 ft/s)	3
17 000	250 (66 ft/s)	4
27 000	318 (84 ft/s)	5
33 000	348 (92 ft/s)	5
40 000	378 (100 ft/s)	6

Note <sup>1</sup>: When determining the fire flow allowance for commercial or industrial areas, it is recommended that the area occupied by the commercial/industrial complex be considered at an equivalent population density to the surrounding residential lands.

The maximum day demand is typically calculated using existing data where possible. Peaking factors (PFs) from MECP Table 8-2 (**Table 2**) can also be used, where the maximum day demand is the average day demand multiplied by the maximum day PF.

**Table 2. Maximum Day Peaking Factors (MECP Table 8-2)**

EQUIVALENT POPULATION <sup>1</sup>	MAXIMUM DAY FACTOR
500 – 1 000	2.75
1 001 – 2 000	2.50
2 001 – 3 000	2.25
3 001 – 10 000	2.00
10 001 – 25 000	1.90
25 001 – 50 000	1.80
50 001 – 75 000	1.75
75 001 – 150 000	1.65
Greater than 150 000	1.50

Note <sup>1</sup>: When determining the equivalent population for commercial or industrial areas, it is recommended that the area occupied by the commercial/industrial complex be considered at an equivalent population density to the surrounding residential lands.

### 3.7 Distribution and Transmission Main Design Approach

The following general approach will be undertaken to service the proposed development. This approach is a practical way of ensuring the pipe network is not a limiting factor in achieving the required levels of service (pressure, flow etc) while facilitating operations from a water quality / aging / chlorination perspective.

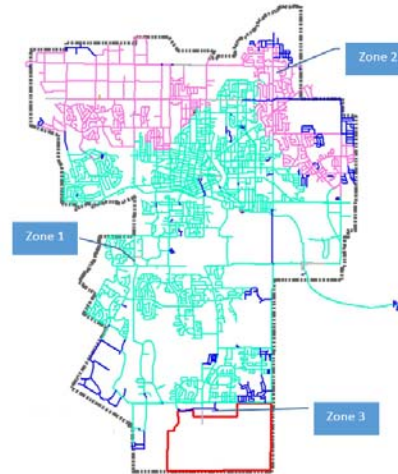


1. All new roads will be serviced with a 300 mm distribution main. Local service connections will be from this main;
2. Distribution mains will be looped, and where there are any dead-ends a looped solution will be envisaged (via easement or other opportunity);
3. Transmission mains will be constructed along major system connections (Pump to Storage) and distribution mains will be connected to the transmission mains in suitable locations. Transmission mains will be distributed sufficiently around the pressure zone to provide sufficient boundary pressure for the distribution mains.

## 4.0 Existing City of Guelph Distribution System

### 4.1 Existing City of Guelph Distribution System

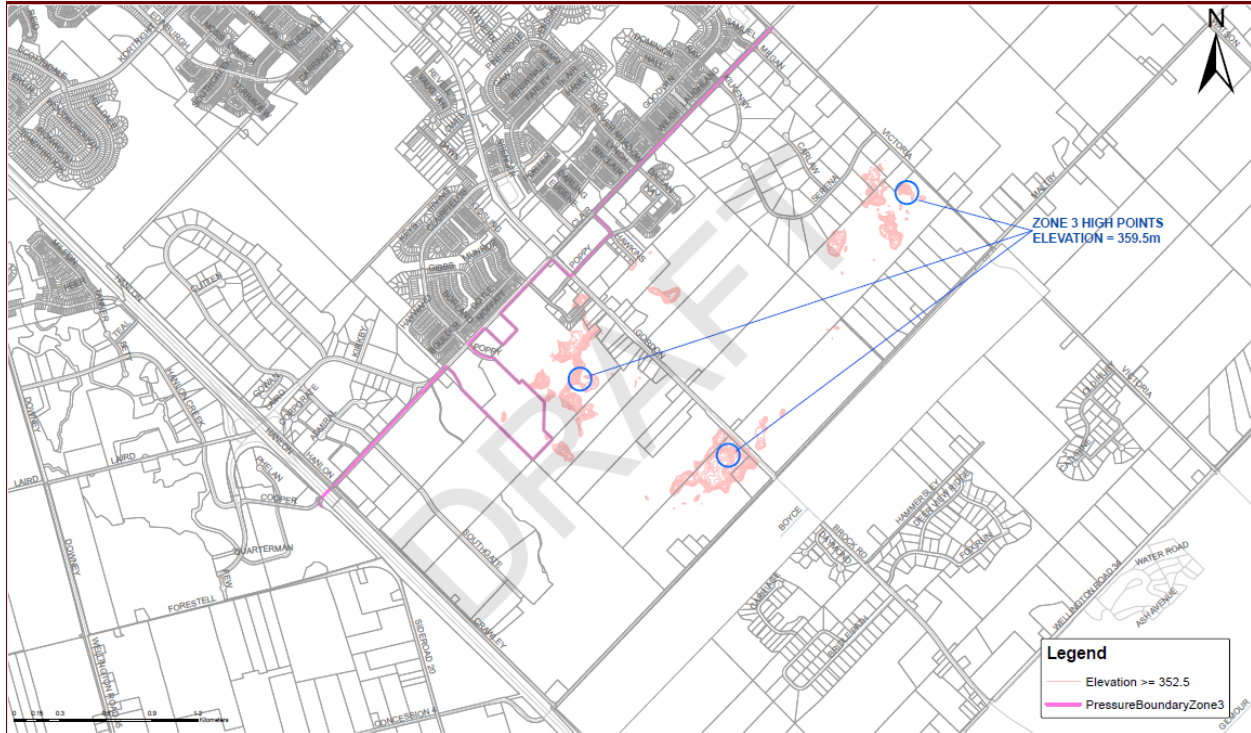
The City of Guelph is configured with 3 distribution zones as shown in **Figure 4.1**.



**Figure 4.1. Overview of City of Guelph Water Distribution Zones**

The Clair Maltby Lands are higher in elevation than much of the rest of the City. The City's water distribution system is currently being expanded in the South Side of Guelph through a new pressure zone (Zone 3) that will operate at levels that are suitable for the Clair Maltby Lands. Zone 3 is now live with pumping into the zone, however as demand increases in its service area, it will require storage to meet mandated operating requirements. A new underground storage tank, as well as an elevated storage can be considered to meet the water distribution demands for Zone 3.

The Clair Road Booster Pumping Station (BPS) was developed in 2012 to service new development areas consistent with the Clair Maltby Lands as a part of Zone 3 development. The Clair BPS increases water pressures from a Zone 1 Hydraulic Grade Line (HGL) of approximately 377 m to the proposed Zone 3 HGL of approximately 400 m (Zone 3 Commissioning Plan). The Zone 3 boundary is shown in **Figure 4.2**. This proposed HGL for Zone 3 will provide customers in that area with pressures between 275 - 690 KPa (40 - 100 psi) as per MECP guidelines.



**Figure 4.2. Zone 3 Pressure Boundary and Highest Ground Elevations**

Based on current information, the proposed CMSP developable lands will be graded between 335 to 359 m, which is considered suitable for this area. Note that low areas below 340 mASL may require pressure reducing components and plumbing systems. These grading elevations are for the ground surface elevations only and are still in the development stage. The final preferred grading values will likely change as the Plan develops towards its final stages.

**Table 3. Guelph Region Zone 3**

Descriptor	Required (MECP)	Preferred
<b>Minimum Operating Pressure</b>	275 kPa (28.0 m)	340 kPa (35.0 m)
<b>Maximum Operating Pressure</b>	690 kPa (70.0 m)	550 kPa (56.0 m)
<b>Zone 3 Pressure Zone Characteristics</b>		
<b>Minimum Suitable Ground Service Elevation</b>	330.0 mASL	344.0 mASL
<b>Maximum Suitable Ground Service Elevation</b>	360.0 mASL	353.0 mASL
<b>Minimum HGL</b>		388 mASL
<b>Maximum HGL</b>		400 mASL



## 5.0 Zone 3 Storage Requirements

The CMSP population is estimated to be 25,059. Storage requirements are calculated on a distribution zone basis and not solely for a single development. The ultimate planning population of Zone 3, currently, is not given. Application of the MECF fire flow storage requirements results in higher volumes than are typically implemented, especially when a zone relies on elevated tank storage. The reduced storage can be rationalized in combination with often redundant supply elements including multiple supply sources, backup power, and pump capacities.

Based on an assumed Zone 3 population of 30,000, and an elevated storage component equal to 50% of MECF fire flow times fire duration, the elevated storage requirement is established as approximately 7.5 ML. This process then assumes that 50% of the volume would be supplied by the distribution system feeding Zone 3. If 100% of MECF fire flows were being directed into the Zone 3 system, the elevated storage requirement could be established as approximately 11.2 ML (**Table 4**).

**Table 4. Estimated Storage Requirements**

Descriptor	Storage (50% $Q_{\text{fireMECF}}$ )	Storage (100% $Q_{\text{fireMECF}}$ )
<b>Population</b>	30,000	30,000
<b>Average Day Demand Factor</b>	225 L/pers-day	225 L/pers-day
<b>Average Day Demand (ADD)</b>	6.8 ML/day	6.8 ML/day
<b>Maximum Day Demand (MDD) Peaking Factor</b>	1.8	1.8
<b>Maximum Day Demand (MDD)</b>	12.2 ML/day	12.2 ML/day
<b>Fire Storage</b>	3.0 ML	6.0 ML
<b>Equalization Storage</b>	3.0 ML	3.0 ML
<b>Emergency Storage</b>	1.5 ML	2.2 ML
<b>Total</b>	7.5 ML	11.2 ML

## 6.0 Conclusions & Recommendations

The HGL elevations and storage requirements of Pressure Zone 3 have been assessed for the existing conditions for the Clair Maltby Secondary Plan area.

The design criteria as listed in this report are applied to the development of alternative servicing strategies which will be included in Technical Memorandum W-2.

The CMSP area can be adequately served via a connection to the expanded Zone 3.

Zone 3 currently has no dedicated storage, as such, where large populations such as in the CMSP lands are to be serviced, the need for additional storage is triggered. It is recommended that the CMSP approval should include the implementation of a storage strategy for Zone 3, that, at a minimum, is sufficient for the CMSP lands development and that is integral to the overall Zone 3 distribution zone implementation.

**APPENDIX A**  
**CLAIR MALTBY WATER MODELLING**





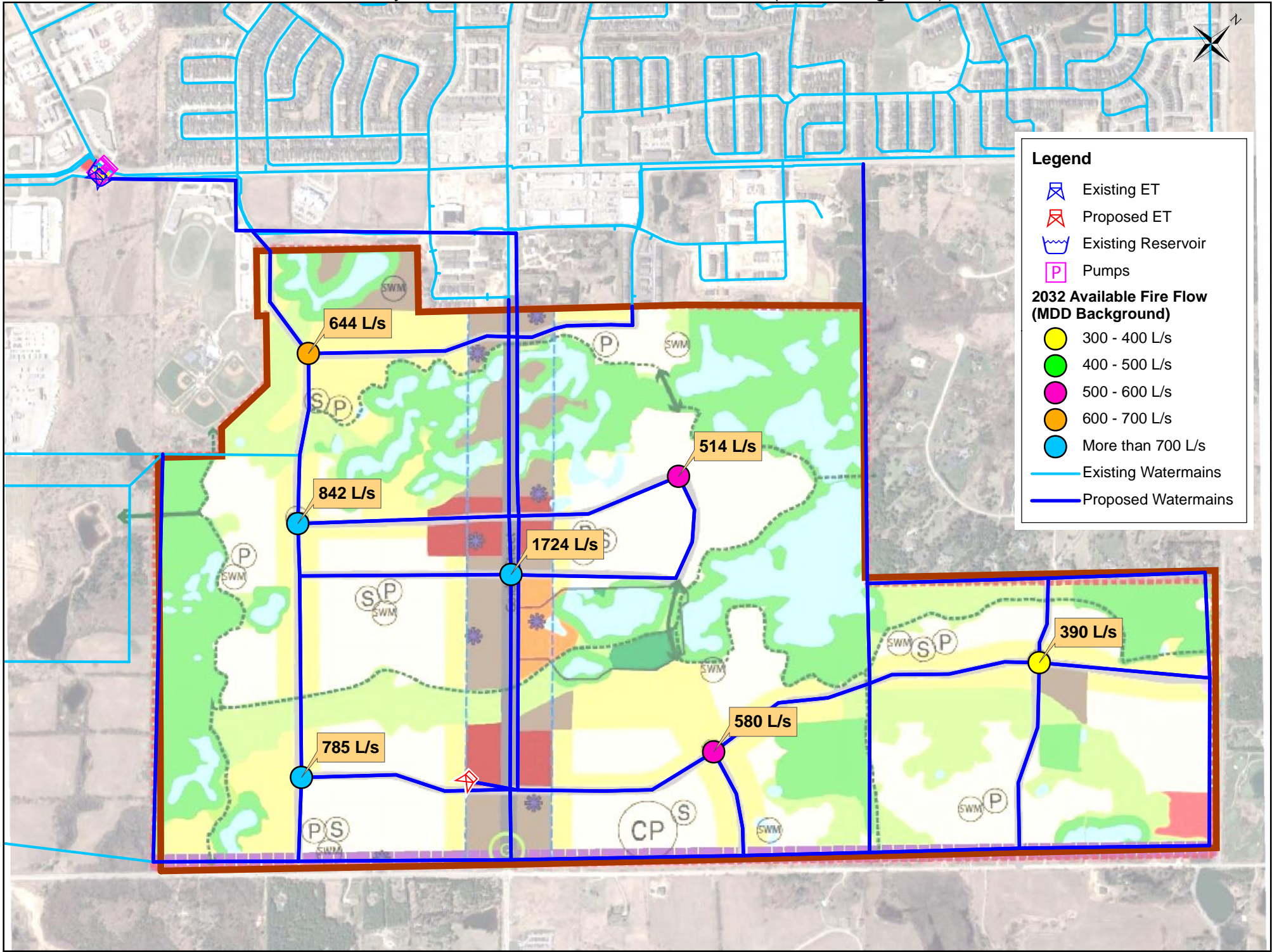
**Legend**

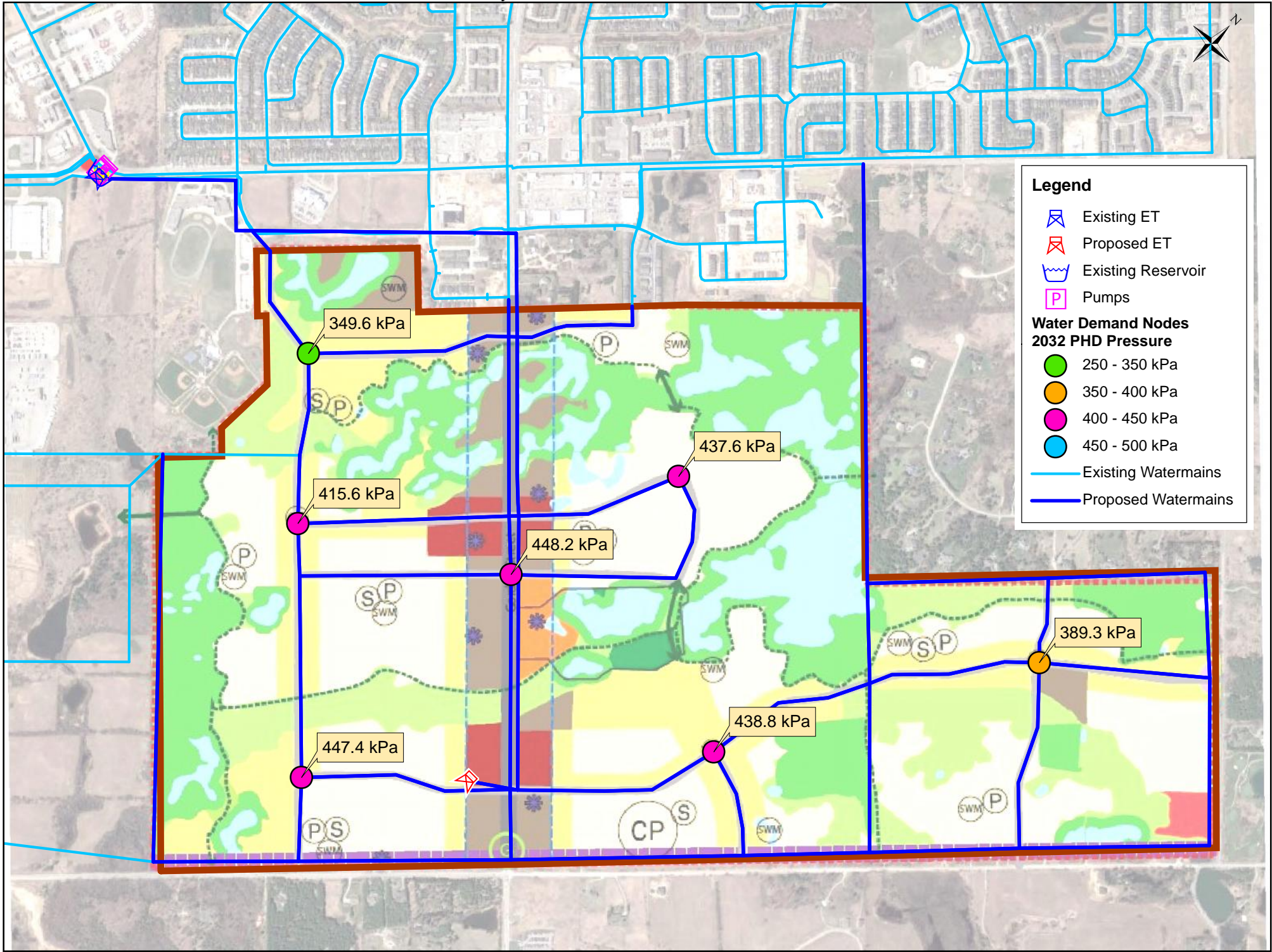
- Existing ET
- Proposed ET
- Existing Reservoir
- Pumps

**2032 Available Fire Flow (MDD Background)**

- 300 - 400 L/s
- 400 - 500 L/s
- 500 - 600 L/s
- 600 - 700 L/s
- More than 700 L/s

Existing Watermains  
 Proposed Watermains

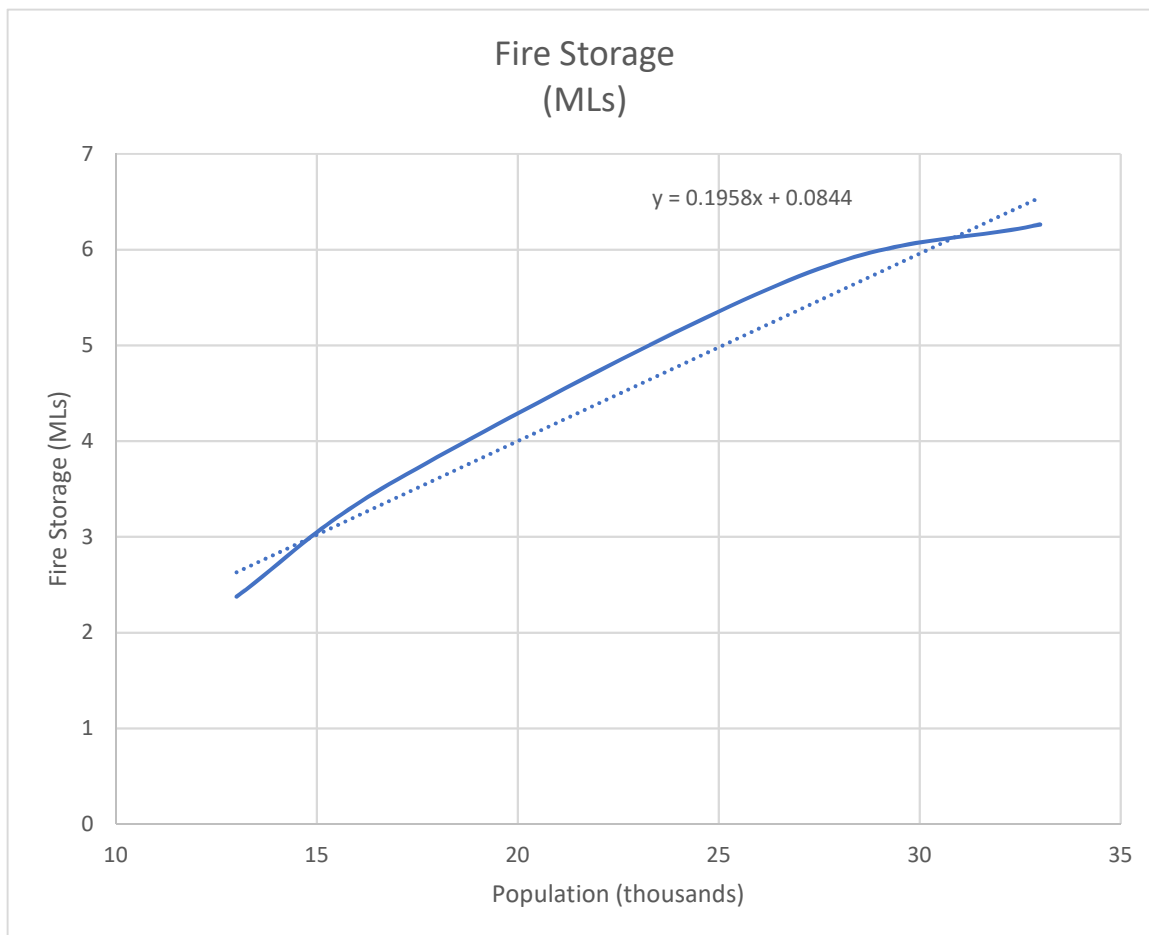




EQUIVALENT POPULATION <sup>1</sup>	SUGGESTED FIRE FLOW (L/s)	DURATION (HOURS)
500 – 1 000	38 (10 ft/s)	2
1 000	64 (17 ft/s)	2
1 500	79 (21 ft/s)	2
2 000	95 (25 ft/s)	2
3 000	110 (29 ft/s)	2
4 000	125 (33 ft/s)	2
5 000	144 (38 ft/s)	2
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17 000	250 (66 ft/s)	4
27 000	318 (84 ft/s)	5
33 000	348 (92 ft/s)	5
40 000	378 (100 ft/s)	6

Note <sup>1</sup>: When determining the fire flow allowance for commercial or industrial areas, it is recommended that the area occupied by the commercial/industrial complex be considered at an equivalent population density to the surrounding residential lands.

Population (thousands)	Flow (L/s)	Duration (hours)	Fire Storage (MLs)
13	220	3	2.376
17	250	4	3.6
27	318	5	5.724
33	348	5	6.264



	Storage (50% QMECP)	Storage (100% QMECP)
Population	30,000	30,000
Average Day Demand Factor	225 l/pers-day	225 l/pers-day
Average Day Demand (ADD)	6.8 ML/day	6.8 ML/day
Maximum Day Demand (MDD) Peaking Factor	1.8	1.8
Maximum Day Demand (MDD)	12.2 ML/day	12.2 ML/day
Fire Storage	3.0 ML	6.0 ML
Equalization Storage	3.0 ML	3.0 ML
Emergency Storage	1.5 ML	2.2 ML
Total	7.5 ML	11.2 ML



**wood.**

**APPENDIX B  
PLANNING INPUT**





Land Use Concept

Land Use	Gross Area (Ha)
<b>Study Area</b>	<b>414.97</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	2.00
NHS	174.11
<b>Total</b>	<b>176.11</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>124.52</b>	54.45	20	40	1,089	2,178	3.33		3,626	7,253			3,626	7,253
Proposed Local Roads	20%	24.90												
Proposed Collector Roads		6.96												
Neighbourhood Parks		7.00												
Community Park		10.00												
Elementary Schools		10.00												
SWM	9%	11.21												
<b>Medium Density Residential</b>	<b>71.57</b>	39.26	40	100	1,570	3,926	2.45		3,847	9,618			3,847	9,618
Proposed Local Roads	15%	10.74												
Proposed Collector Roads		12.13												
Neighbourhood Parks		1.00												
Elementary Schools		2.00												
SWM	9%	6.44												
<b>High Density Residential</b>	<b>24.47</b>	15.50	100	200	1,550	3,100	1.68		2,604	5,207			2,604	5,207
Proposed Local Roads	10%	2.45												
Existing Roads		2.92												
Proposed Collector Roads		1.41												
SWM	9%	2.20												
<b>Mixed Use</b>	<b>10.88</b>	6.30												
Proposed Local Roads	10%	1.09												
Existing Roads		1.37												
Proposed Collector Roads		1.14												
SWM	9%	0.98												
Commercial	25%	1.58						72			113	113	113	113
Residential	75%	4.73	100	200	473	945	1.68		794	1,588			794	1,588
<b>Neighbourhood Commercial</b>	<b>0.39</b>	0.19						72			14	14	14	14
Proposed Local Roads	10%	0.04												
Proposed Collector Roads		0.12												
SWM	9%	0.04												
<b>Service Commercial</b>	<b>1.91</b>	1.55						65			101	101	101	101
Proposed Local Roads	10%	0.19												
SWM	9%	0.17												
<b>Office/Commercial</b>	<b>5.12</b>	3.86												
Proposed Local Roads	10%	0.51												
Existing Roads		0.58												
Proposed Collector Roads		0.29												
SWM	9%	0.46												
Commercial	25%	0.96						72			69	69	69	69
Office	75%	2.89						92			266	266	266	266
<b>Undercount (3.5%)</b>									381	828			381	828
<b>Total Developable Lands</b>	<b>238.86</b>								<b>11,252</b>	<b>24,495</b>	<b>564</b>	<b>564</b>	<b>11,816</b>	<b>25,059</b>

acres 589.98

<b>Total Non-Developable &amp; Developable</b>	<b>414.97</b>
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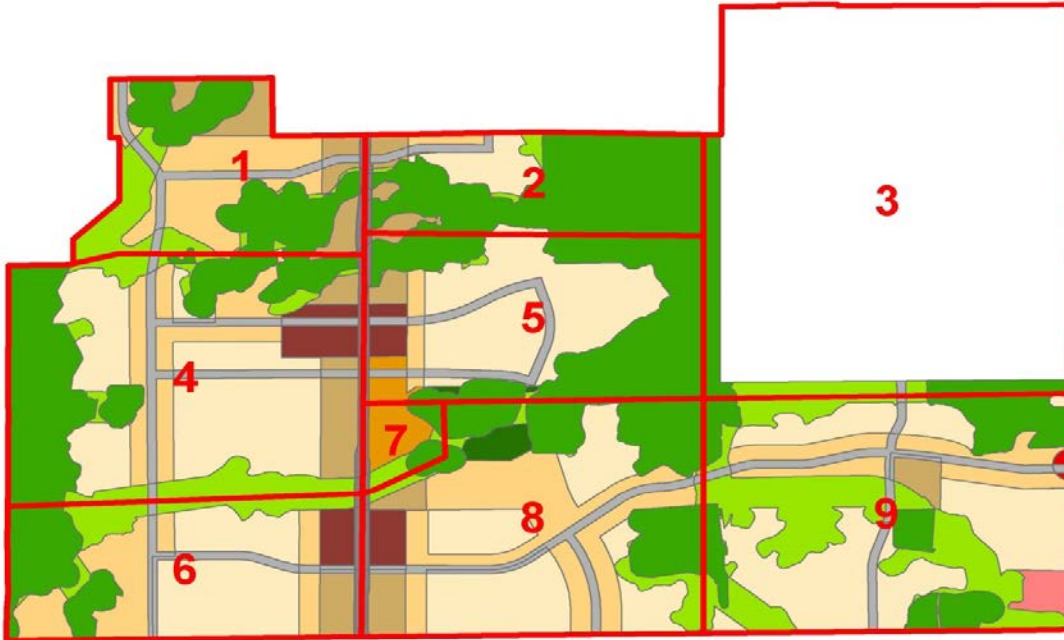
Area check 414.97

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.

Proposed Collector Roads	26m	City email 1/3/2018
Community park	10ha	City email 1/3/2018
Neighbourhood Park	1ha	City email 1/3/2018
Elementary School	2ha	City email 1/3/2018
Trail Outside NHS	5m	City email 1/3/2018
Densities	as per table	City emails 1/3/2018, 2/8/2018
SWM		9% Schekenberger email Jan 10, 2018
Undercount		3.50% Jamie Cook email Jan 25, 2018
PPUs	as per table	Jamie Cook email Jan 25, 2018
Jobs	as per table	Jamie Cook email May 8, 2018



Land Use Concept - Traffic Zone 1

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>37.73</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	18.36
<b>Total</b>	<b>18.36</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>0.00</b>	0.00	20	40	0	0	3.33		0	0			0	0
Proposed Local Roads	20%	0.00												
Proposed Collector Roads		0.00												
Neighbourhood Parks		0.00												
Community Park		0.00												
Elementary Schools		0.00												
SWM	9%	0.00												
<b>Medium Density Residential</b>	<b>13.35</b>	4.92	40	100	197	492	2.45		482	1,206			482	1206
Proposed Local Roads	15%	2.00												
Proposed Collector Roads		2.23												
Neighbourhood Parks		1.00												
Elementary Schools		2.00												
SWM	9%	1.20												
<b>High Density Residential</b>	<b>6.03</b>	4.02	100	200	402	804	1.68		675	1,350			675	1350
Proposed Local Roads	10%	0.60												
Existing Roads		0.57												
Proposed Collector Roads		0.29												
SWM	9%	0.54												
<b>Mixed Use</b>	<b>0.00</b>	0.00												
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Residential	75%	0.00	100	200	0	0	1.68		0	0			0	0
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00												
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									41	89			41	89
<b>Total Developable Lands</b>	<b>19.38</b>								<b>1,198</b>	<b>2,645</b>	<b>0</b>	<b>0</b>	<b>1,198</b>	<b>2,645</b>

acres **47.87**

<b>Total Non-Developable &amp; Developable</b>	<b>37.73</b>
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Area check 37.73

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.

Land Use Concept - Traffic Zone 2

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>32.06</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	23.67
<b>Total</b>	<b>23.67</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>4.29</b>	1.40	20	40	28	56	3.33		93	186			93	186
Proposed Local Roads	20%	0.86												
Proposed Collector Roads		0.65												
Neighbourhood Parks		1.00												
Community Park		0.00												
Elementary Schools		0.00												
SWM	9%	0.39												
<b>Medium Density Residential</b>	<b>1.56</b>	0.44	40	100	18	44	2.45		43	108			43	108
Proposed Local Roads	15%	0.23												
Proposed Collector Roads		0.74												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	0.14												
<b>High Density Residential</b>	<b>2.54</b>	1.42	100	200	142	284	1.68		238	476			238	476
Proposed Local Roads	10%	0.25												
Existing Roads		0.35												
Proposed Collector Roads		0.30												
SWM	9%	0.23												
<b>Mixed Use</b>	<b>0.00</b>	0.00												
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Residential	75%	0.00	100	200	0	0	1.68		0	0			0	0
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									13	27			13	27
<b>Total Developable Lands</b>	<b>8.39</b>								<b>388</b>	<b>798</b>	<b>0</b>	<b>0</b>	<b>388</b>	<b>798</b>

acres **20.72**

<b>Total Non-Developable &amp; Developable</b>	<b>32.06</b>
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Area check 32.06

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.

Clair-Maltby Secondary Plan Study Area Population and Employment August 27 2018  
 Land Use Concept - Traffic Zone 3

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>9.23</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	9.23
<b>Total</b>	<b>9.23</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max		
<b>Low Density Residential</b>	<b>0.00</b>	0.00	20	40	0	0	3.33		0	0			0	0
Proposed Local Roads	20%	0.00												
Proposed Collector Roads		0.00												
Neighbourhood Parks		0.00												
Community Park		0.00												
Elementary Schools		0.00												
SWM	9%	0.00												
<b>Medium Density Residential</b>	<b>0.00</b>	0.00	40	100	0	0	2.45		0	0			0	0
Proposed Local Roads	15%	0.00												
Proposed Collector Roads		0.00												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	0.00												
<b>High Density Residential</b>	<b>0.00</b>	0.00	100	200	0	0	1.68		0	0			0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Mixed Use</b>	<b>0.00</b>	0.00												
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Residential	75%	0.00	100	200	0	0	1.68		0	0			0	0
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									0	0			0	0
<b>Total Developable Lands</b>	<b>0.00</b>								0	0	0	0	0	0

acres 0.00

<b>Total Non-Developable &amp; Developable</b>	<b>9.23</b>
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Area check 9.23

Notes:  
 The Gross areas (in red) represent the total gross area of the land use.  
 Net area is the gross area of the land use, subtract the hard/soft servicing.

Land Use Concept - Traffic Zone 4

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>81.05</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	30.85
<b>Total</b>	<b>30.85</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>28.00</b>	14.60	20	40	292	584	3.33		973	1,945			973	1945
Proposed Local Roads	20%	5.60												
Proposed Collector Roads		1.28												
Neighbourhood Parks		2.00												
Community Park		0.00												
Elementary Schools		2.00												
SWM	9%	2.52												
<b>Medium Density Residential</b>	<b>12.22</b>	6.59	40	100	264	659	2.45		646	1,615			646	1615
Proposed Local Roads	15%	1.83												
Proposed Collector Roads		2.70												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	1.10												
<b>High Density Residential</b>	<b>6.07</b>	3.82	100	200	382	764	1.68		642	1,284			642	1284
Proposed Local Roads	10%	0.61												
Existing Roads		0.81												
Proposed Collector Roads		0.28												
SWM	9%	0.55												
<b>Mixed Use</b>	<b>3.91</b>	2.33												
Proposed Local Roads	10%	0.39												
Existing Roads		0.26												
Proposed Collector Roads		0.58												
SWM	9%	0.35												
Commercial	25%	0.58						72			42	42	42	42
Residential	75%	1.74	100	200	174	349	1.68		293	586			293	586
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									89	190			89	190
<b>Total Developable Lands</b>	<b>50.20</b>								<b>2,643</b>	<b>5,620</b>	<b>42</b>	<b>42</b>	<b>2,685</b>	<b>5,661</b>

acres 123.99

<b>Total Non-Developable &amp; Developable</b>	<b>81.05</b>
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Area check 81.05

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.

Land Use Concept - Traffic Zone 5

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>53.07</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.22
NHS	21.95
<b>Total</b>	<b>22.17</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>23.44</b>	11.03	20	40	221	441	3.33		735	1,469			735	1469
Proposed Local Roads	20%	4.69												
Proposed Collector Roads		2.61												
Neighbourhood Parks		1.00												
Community Park		0.00												
Elementary Schools		2.00												
SWM	9%	2.11												
<b>Medium Density Residential</b>	<b>1.93</b>	1.20	40	100	48	120	2.45		118	295			118	295
Proposed Local Roads	15%	0.29												
Proposed Collector Roads		0.26												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	0.17												
<b>High Density Residential</b>	<b>1.47</b>	0.98	100	200	98	196	1.68		164	329			164	329
Proposed Local Roads	10%	0.15												
Existing Roads		0.21												
Proposed Collector Roads		0.00												
SWM	9%	0.13												
<b>Mixed Use</b>	<b>2.13</b>	1.18												
Proposed Local Roads	10%	0.21												
Existing Roads		0.26												
Proposed Collector Roads		0.29												
SWM	9%	0.19												
Commercial	25%	0.29						72			21	21	21	21
Residential	75%	0.88	100	200	88	177	1.68		148	297			148	297
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>1.94</b>	1.65									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.22												
Proposed Collector Roads		0.29												
SWM	9%	0.00												
Commercial	25%	0.41						72			30	30	30	30
Office	75%	1.24						92			114	114	114	114
<b>Undercount (3.5%)</b>									41	84			41	84
<b>Total Developable Lands</b>	<b>30.90</b>								<b>1,206</b>	<b>2,473</b>	<b>165</b>	<b>165</b>	<b>1,371</b>	<b>2,638</b>

acres **76.33**

<b>Total Non-Developable &amp; Developable</b>	<b>53.07</b>
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Area check 53.07

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.

Land Use Concept - Traffic Zone 6

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>46.09</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	13.50
<b>Total</b>	<b>13.50</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>16.52</b>	7.36	20	40	147	294	3.33		490	980			490	980
Proposed Local Roads	20%	3.30												
Proposed Collector Roads		1.37												
Neighbourhood Parks		1.00												
Community Park		0.00												
Elementary Schools		2.00												
SWM	9%	1.49												
<b>Medium Density Residential</b>	<b>10.98</b>	7.43	40	100	297	743	2.45		728	1,821			728	1821
Proposed Local Roads	15%	1.65												
Proposed Collector Roads		0.92												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	0.99												
<b>High Density Residential</b>	<b>2.68</b>	1.56	100	200	156	312	1.68		262	525			262	525
Proposed Local Roads	10%	0.27												
Existing Roads		0.48												
Proposed Collector Roads		0.13												
SWM	9%	0.24												
<b>Mixed Use</b>	<b>2.40</b>	1.36												
Proposed Local Roads	10%	0.24												
Existing Roads		0.46												
Proposed Collector Roads		0.13												
SWM	9%	0.22												
Commercial	25%	0.34						72			24	24	24	24
Residential	75%	1.02	100	200	102	204	1.68		171	343			171	343
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									58	128			58	128
<b>Total Developable Lands</b>	<b>32.59</b>								<b>1,710</b>	<b>3,797</b>	<b>24</b>	<b>24</b>	<b>1,734</b>	<b>3,821</b>

acres **80.49**

<b>Total Non-Developable &amp; Developable</b>	<b>46.09</b>
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Area check 46.09

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.



Land Use Concept - Traffic Zone 7

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>5.64</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	2.42
<b>Total</b>	<b>2.42</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max		
<b>Low Density Residential</b>	<b>0.00</b>	0.00	20	40	0	0	3.33		0	0			0	0
Proposed Local Roads	20%	0.00												
Proposed Collector Roads		0.00												
Neighbourhood Parks		0.00												
Community Park		0.00												
Elementary Schools		0.00												
SWM	9%	0.00												
<b>Medium Density Residential</b>	<b>0.00</b>	0.00	40	100	0	0	2.45		0	0			0	0
Proposed Local Roads	15%	0.00												
Proposed Collector Roads		0.00												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	0.00												
<b>High Density Residential</b>	<b>0.04</b>	0.00	100	200	0	0	1.68		0	0			0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.04												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Mixed Use</b>	<b>0.00</b>	0.00												
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Residential	75%	0.00	100	200	0	0	1.68		0	0			0	0
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>3.18</b>	3.18									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.36												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.80						72			57	57	57	57
Office	75%	2.39						92			219	219	219	219
<b>Undercount (3.5%)</b>									0	0			0	0
<b>Total Developable Lands</b>	<b>3.22</b>								0	0	277	277	277	277

acres 7.95

<b>Total Non-Developable &amp; Developable</b>	<b>5.64</b>
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Area check 5.64

Notes:

The Gross areas (in red) represent the total gross area of the land use.

Net area is the gross area of the land use, subtract the hard/soft servicing.

Clair-Maltby Secondary Plan Study Area Population and Employment August 27 2018  
 Land Use Concept - Traffic Zone 8

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>69.24</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	1.78
NHS	18.75
<b>Total</b>	<b>20.52</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>21.58</b>	2.84	20	40	57	114	3.33		189	378			189	378
Proposed Local Roads	20%	4.32												
Proposed Collector Roads		0.48												
Neighbourhood Parks		0.00												
Community Park		10.00												
Elementary Schools		2.00												
SWM	9%	1.94												
<b>Medium Density Residential</b>	<b>20.86</b>	13.09	40	100	524	1,309	2.45		1,283	3,207			1,283	3,207
Proposed Local Roads	15%	3.13												
Proposed Collector Roads		2.77												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	1.88												
<b>High Density Residential</b>	<b>3.84</b>	2.51	100	200	251	503	1.68		422	845			422	845
Proposed Local Roads	10%	0.38												
Existing Roads		0.46												
Proposed Collector Roads		0.14												
SWM	9%	0.35												
<b>Mixed Use</b>	<b>2.44</b>	1.44												
Proposed Local Roads	10%	0.24												
Existing Roads		0.40												
Proposed Collector Roads		0.14												
SWM	9%	0.22												
Commercial	25%	0.36						72			26	26	26	26
Residential	75%	1.08	100	200	108	216	1.68		181	363			181	363
<b>Neighbourhood Commercial</b>	<b>0.00</b>	0.00						72			0	0	0	0
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>0.00</b>	0.00						65			0	0	0	0
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									73	168			73	168
<b>Total Developable Lands</b>	<b>48.72</b>								<b>2,148</b>	<b>4,960</b>	<b>26</b>	<b>26</b>	<b>2,174</b>	<b>4,986</b>

acres 120.34

<b>Total Non-Developable &amp; Developable</b>	<b>69.24</b>
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Area check 69.24

Notes:

The Gross areas (in red) represent the total gross area of the land use.  
 Net area is the gross area of the land use, subtract the hard/soft servicing.

Clair-Maltby Secondary Plan Study Area Population and Employment August 27 2018  
 Land Use Concept - Traffic Zone 9

Land Use	Gross Area (Ha)
<b>Traffic Zone Area</b>	<b>80.85</b>

<b>Gross to Net</b>	
<b>Non-Developable Lands</b>	
Open Space	0.00
NHS	35.39
<b>Total</b>	<b>35.39</b>

Land Use	Gross Area (Ha)	Net Area	Units per Net Hectare		Units (Res)		PPU	Jobs per hectare	Pop		Jobs		Pop + Jobs (Total)	
			Min	Max	Min	Max			Min	Max	Min	Max	Min	Max
<b>Low Density Residential</b>	<b>30.69</b>	16.57	20	40	331	663	3.33		1,104	2,208			1,104	2,208
Proposed Local Roads	20%	6.14												
Proposed Collector Roads		1.21												
Neighbourhood Parks		2.00												
Community Park		0.00												
Elementary Schools		2.00												
SWM	9%	2.76												
<b>Medium Density Residential</b>	<b>10.66</b>	5.58	40	100	223	558	2.45		547	1,368			547	1,368
Proposed Local Roads	15%	1.60												
Proposed Collector Roads		2.52												
Neighbourhood Parks		0.00												
Elementary Schools		0.00												
SWM	9%	0.96												
<b>High Density Residential</b>	<b>1.80</b>	1.19	100	200	119	239	1.68		201	401			201	401
Proposed Local Roads	10%	0.18												
Existing Roads		0.00												
Proposed Collector Roads		0.27												
SWM	9%	0.16												
<b>Mixed Use</b>	<b>0.00</b>	0.00												
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Residential	75%	0.00	100	200	0	0	1.68		0	0			0	0
<b>Neighbourhood Commercial</b>	<b>0.39</b>	0.27						72			19	19	19	19
Proposed Local Roads	10%	0.00												
Proposed Collector Roads		0.12												
SWM	9%	0.00												
<b>Service Commercial</b>	<b>1.91</b>	1.91						65			124	124	124	124
Proposed Local Roads	10%	0.00												
SWM	9%	0.00												
<b>Office/Commercial</b>	<b>0.00</b>	0.00									0	0	0	0
Proposed Local Roads	10%	0.00												
Existing Roads		0.00												
Proposed Collector Roads		0.00												
SWM	9%	0.00												
Commercial	25%	0.00						72			0	0	0	0
Office	75%	0.00						92			0	0	0	0
<b>Undercount (3.5%)</b>									65	139			65	139
<b>Total Developable Lands</b>	<b>45.46</b>								<b>1,916</b>	<b>4,116</b>	<b>144</b>	<b>144</b>	<b>2,060</b>	<b>4,260</b>

acres **112.29**

<b>Total Non-Developable &amp; Developable</b>	<b>80.85</b>
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Area check 80.85





Notes:

The Gross areas (in red) represent the total gross area of the land use.  
 Net area is the gross area of the land use, subtract the hard/soft servicing.





# Clair-Maltby Preferred Community Structure

June 25, 2018








## Legend

-  Clair-Maltby Secondary Plan Boundary
-  Cultural Heritage Landscape
-  Urban-Rural Transition Zone
-  Gordon St. Corridor




## Streets and Trails

-  Existing Street Network
-  Proposed Street and Cycling Network
-  Proposed Trail Network
-  Potential Active Transportation Link

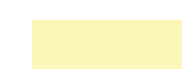







## Parks, Schools, and Features

-  Potential Neighbourhood Park
-  Potential Community Park
-  Potential Elementary School
-  Potential Stormwater Infiltration Areas
-  Convenience Commercial Area
-  Gateway
-  Cultural Heritage Resource

## Natural Heritage System

-  May Permit Essential Transportation Infrastructure
-  Does Not Permit Transportation Infrastructure
-  Wetlands (MNRF 2017)

## Land Use

-  Low Density (Residential)
-  Medium Density (Residential)
-  High Density (Residential)
-  Mixed Use
-  Neighbourhood Commercial
-  Service Commercial
-  Mixed Office / Commercial
-  Open Space

