Functional Servicing Brief
665 Dundas Street East, Belleville

Submitted to:
Canadian Fiber & Linen Inc.
Attn: Mr. Shehzad Haroon
2 Shale Gate
Toronto ON
M3J 2Y8
T: (416) 667-1333

Submitted by:
The Greer Galloway Group Inc.
Engineering Consultants
1620 Wallbridge-Loyalist Road R.R.
#5 Belleville, ON K8N 4Z5
T: (613) 966-3068
F: (613) 966-3087
www.greergalloway.com
Project # 19-3-2664
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1. Introduction

The Greer Galloway Group has been retained by Canadian Fiber & Linen Inc to provide a Site Service Report in support of the proposed purchase and repurposing of property at 665 Dundas Street East, Belleville, Ontario.

The subject property is located in the east end of Belleville, southeast of the intersection of Haig Road and Dundas Street East. The total building area occupies approximately 11,000 m². The plan is to convert a portion of the building (5982 m²/64390 ft²) for a cannabis production facility.

The site sketch for the proposed use can be found in Appendix A.

2. Purpose of This Report

This report will summarize how the municipal water and sanitary services to the site will support the proposed use of the building. Sanitary flows and water demand requirements will be provided to allow the City of Belleville to confirm the surrounding infrastructure has the available capacity for the proposed use.
3. Existing Conditions

The property is an industrial lot, with developed parking areas, a warehouse structure, grass and tree areas. The warehouse is protected by a sprinkler system. There are 7 washrooms in the warehouse with the following characteristics:

<table>
<thead>
<tr>
<th>Washroom</th>
<th>Water Closets</th>
<th>Urinals</th>
<th>Lavatories</th>
<th>Mop Sink</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>2</td>
<td>2*</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td><strong>3</strong></td>
<td><strong>10</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

* The lavatory in washroom D is a semi-circular wash fountain. For the purposes of this report it shall be treated as having the characteristics of two individual lavatories.

There are 3 break rooms in the facility with the following characteristics:

<table>
<thead>
<tr>
<th>Break Room</th>
<th>Sink</th>
<th>Double Sink</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

There are no floor drains in the facility.

4. Process Details

The proposed cultivation process will consume water from the city services. The section of the building to be used for cultivation will account for 65% of the total floor area set aside as a cannabis production facility.

The maximum rate of process water use will be 0.16 gal (us)/ft²/day. Within the process, 85 to 90% of the water will be recycled. Up to 15% of the daily process water will come from the city supply and an equal amount will be discharged to the sanitary network. Some process water will be lost through evaporation or transpiration; this report assumes a conservative scenario where the 15% of process water not recycled is lost in the form of waste water.

\[
V = 65\% \times A \times (P \times 15\%)
\]

\[
V = \text{Volume of water taken from and discharged to the water network (gal (us)/day)}
\]

\[
A = \text{Cannabis production floor area (64,390 ft}^2 / 5,982m^2)
\]

\[
P = \text{Process water rate (0.16 gal (us)/ft}^2/\text{day})
\]
The maximum expected average daily volume taken from the water supply and discharged to the sanitary sewer will be 1004 gal (us)/day. The following table shows the equivalent flow values for the various measurement systems used in this report.

<table>
<thead>
<tr>
<th>Flow equivalents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1004 gal (us)/day</td>
<td>0.69 gal (us)/min</td>
</tr>
<tr>
<td></td>
<td>0.04 L/s</td>
</tr>
<tr>
<td></td>
<td>3.8 m3/day</td>
</tr>
</tbody>
</table>

5. Sanitary Sewer Servicing

1. Existing Sanitary Sewer Infrastructure

The City of Belleville sanitary network includes a 24” trunk sewer along Haig Road. Using correspondence with City staff and the water network presented in the Belleville Wet Weather and Wastewater Servicing Master Plan 2019 we identified the trunk sewer turning west at a point 20 feet south of Dundas Street. We anticipate the facility at 665 Dundas Street East connects to the trunk sewer here.

2. Proposed Sanitary Sewer Infrastructure

To determine whether the existing sanitary sewer on Dundas Street East has sufficient capacity for the development, it is necessary to calculate the anticipated sanitary flows.

The method for determining the anticipated sanitary flow will use the information on existing fixtures to calculate historic flows and the anticipated process characteristics provided by the client to determine proposed increases.

Using Table 7.4.9.3 from the 2012 Ontario Building Code, the existing sanitary hydraulic load in fixture units is determined as follows:

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Hydraulic Load, fixture units</th>
<th>Quantity of Fixtures</th>
<th>Total Fixture Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Closet</td>
<td>4</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Urinal</td>
<td>1.5</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>Lavatory</td>
<td>3</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td>Mop Sink</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kitchen Sink</td>
<td>1.5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Double Kitchen Sink</td>
<td>1.5</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Drinking Fountain</td>
<td>0.5</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Total 89.5
Sanitary Service:

Hydraulic Load – 89.5 drainage fixture units,

Approximate maximum probable sanitary drainage rate based on fixture units (Table 7.4.10.5 from the 2012 Ontario Building Code) – 50.9 gal(us)/min (3.21 L/s)

The historic flows from the facility are 50.9 gal (us)/min (3.21 L/s). The addition of the process discharge (0.69 gal (us)/min) or 0.04 L/s) will bring the total sanitary flows to 51.59 gal(us)/min (3.26 L/s). This is a conservative estimate of sanitary flows based on the minimum recycling of process water. Therefore, a sanitary flow of 3.26 L/s should be used by the City of Belleville to confirm capacity of the existing downstream sanitary sewer system.

The increase over existing flows will be typical to an industrial facility and therefore typical Ontario Building Code sanitary service design requirement will be appropriate.

3. Belleville Wastewater Treatment Plant

The Belleville Wastewater Treatment Plant (WWTP) is located at 131 St. Paul Street and serves the City of Belleville with a supporting network of 13 pumping stations.

The Belleville WWTP has the following characteristics:

1. Water Receiver: The Bay of Quinte
2. Average Daily Rated Capacity: 54,500 m³/day
3. Flow/Demands: see excerpts from the Belleville Wet Weather and Wastewater Servicing Master Plan 2019

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Average Daily Flow (m³/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>24,972</td>
</tr>
<tr>
<td>2013</td>
<td>25,383</td>
</tr>
<tr>
<td>2014</td>
<td>28,042</td>
</tr>
<tr>
<td>2015</td>
<td>22,311</td>
</tr>
<tr>
<td>2016</td>
<td>21,348</td>
</tr>
<tr>
<td>2017</td>
<td>34,406</td>
</tr>
</tbody>
</table>

The current population and more specifically the number of service connections is not specifically known at this time. The City of Belleville Municipal website suggests there are approximately 19500 service connections within the City of Belleville, served by the WWTP. This is a combination of residential, general, and apartment connections. Understanding that this number has likely increased over time, for the purpose of this report we will assume there are approximately 21,000 service connections in the system today.
Reserve Capacity Calculation

It is the position of the Province that the number of lots in approved plans of subdivisions, developments committed by virtue of approved zoning, new official plans or site-specific official plan amendments should not exceed the design capacity of the sewage and/or water system. In order to ensure that capacity is not exceeded, it is necessary to determine what uncommitted reserve capacity is available. The calculation assumes residential lots and municipalities may choose to apply separate factors for industrial water users. For this report we will use residential lot equivalents.

To determine what capacity is available at a municipal wastewater treatment plant the Ministry of Environment “Procedure D-5-1 Calculating and Reporting Uncommitted Reserve Capacity at Sewage and Water Treatment Plants” has been followed and summarized below:

\[
C_u = C_r - \left( L \times F \times P \right) / H
\]

- \( C_u \) = Uncommitted Hydraulic Reserve Capacity (m\(^3\)/d)
- \( C_r \) = Hydraulic Reserve Capacity (m\(^3\)/d)
- \( L \) = Number of Unconnected Approved Lots
- \( P \) = Existing Connected Population
- \( H \) = Number of Households or Residential Connections

Wastewater Treatment Plant:
\( F \) = Average Day Flow per Capita (m\(^3\)/capita/day)

Note: In this calculation average day flow is used for wastewater treatment plants while max day flow is used for water treatment plants.

From the Belleville Wet Weather and Wastewater Servicing Master Plan 2019 we know:

- Plant Rated Capacity = 54,500 m\(^3\)/day
- Average Daily Flow = 26,077 m\(^3\)/day

Hydraulic Reserve Capacity (Cr) = 28,423 m\(^3\)/day

The number of unconnected approved lots includes:

1. Vacant lots/units in registered plans of subdivision and condominium.
2. Lots/units in draft approved plans of subdivision and condominium.
3. The maximum development potential of lands as permitted under existing zoning.
4. Registered plans of condominium.
5. Vacant lots created by consent in serviced areas.

For the purpose of this document, the number of unconnected approved lots is assumed to be zero.
This assumption is made to calculate the actual current hydraulic capacity available for additional development and acknowledges that only the Municipality will be aware of the status of all lands within the serviced boundary and therefore only the Municipality will have this information. The calculation assumes residential lots and municipalities may choose to apply separate factors for industrial water users. For this report we will use residential lot equivalents.

Number of Unconnected Approved Lots (L) = 0

The Municipality will need to determine if there are other developments already approved or in the process of being approved and how those developments may affect the allocation of the remaining capacity.

The existing Hydraulic Demand per residential lot equivalent is calculated by dividing Average Daily Flow (26,077 m$^3$/day) by the number of service connections (21,000) which equals 1.24 m$^3$/day/connection.

With a Hydraulic Reserve Capacity of 28,423 m$^3$/day and a demand per connection of 1.24 m$^3$/day there would be capacity at the wastewater treatment plant for approximately 22,921 additional residential lot equivalent connections.

The proposed use of the property increases the discharge to the sanitary system by 3.8 m$^3$/day. This is the equivalent of 3 additional residential lot equivalent connections being added to the network.

The calculations above indicate sufficient hydraulic capacity at the wastewater treatment plan for the proposed development at 665 Dundas Street East. The Greer Galloway Group also acknowledges the peak maximum daily flows identified in the Belleville Wet Weather and Wastewater Servicing Master Plan 2019 and the effect of those flows on recommended upgrades to the wastewater system. The master plan also identifies the portion of the network in the Haig and Dundas area is estimated for replacement in 10 to 20 years. These factors may affect the planning process by the City of Belleville.

6. Water Supply

1. Existing Water Infrastructure

Staff at the City of Belleville provided the connecting details for the property at 665 Dundas Street East. The property is served from the 8” watermain running along the path of Dundas Street. An 8” service line comes onto the property where it splits for an 8” fire service and a 2” domestic water service. Hydrant tests performed by the City of Belleville have identified a static pressure at the corner of Haig Road and Dundas Street East of 71 psi.
2. Proposed Water Infrastructure

To determine whether the existing watermain has the capacity to service the proposed use as a cannabis production facility, the anticipated water demand is calculated using the Ontario Building Code fixture unit flows and the proposed process details.

The Greer Galloway Group Inc. has determined the water demand based on the Ontario Building Code. Assumptions and calculations have been provided below:

**Building Details**
- Industrial
  - Single water service for domestic and process water uses
  - Secondary water service for fire protection

Alterations to the fire protection are outside the scope of this report. The fire protection is on a separate service and therefore is not expected to be impacted by the process water demands.

Using table 7.6.3.2 from the 2012 Ontario Building Code, the hydraulic load (fixture units) were determined, as follows:

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Hydraulic Load, fixture units</th>
<th>Quantity of Fixtures</th>
<th>Total Fixture Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Closet</td>
<td>5</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Urinal</td>
<td>4</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Lavatory</td>
<td>2</td>
<td>10*</td>
<td>20</td>
</tr>
<tr>
<td>Mop Sink</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Kitchen Sink</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Double Kitchen Sink</td>
<td>1.4</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Drinking Fountain</td>
<td>0.25</td>
<td>1</td>
<td>0.25</td>
</tr>
<tr>
<td>Hose Bib</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>106.65</strong></td>
</tr>
</tbody>
</table>

* One washroom is furnished with a semi-circular wash fountain. This is treated as 2 lavatories for the purposes of the calculation.

**Water Service**
- Hydraulic load – 106.65 water supply fixture units (*Table 7.6.3.2.A of the Ontario Building Code*);
- Approximate water flow rate based on water supply fixture units (*ASHRAE Modified Hunter Curve D*) – 16.8 gal (us)/min (1.06 L/s);
These fixtures are existing and served by the water distribution network. The additional flow for the process water will account for the addition of 0.69 gal (us)/min (0.04 L/s). This creates an average total water demand of 17.49 gal(us)/min (1.10 L/s).

As shown above, GGG has calculated a water demand of 1.10 L/s based on the Ontario Building Code, the ASHRAE Modified Hunter Curve, and the process calculations.

3. Belleville Water Treatment Plant

The Belleville Water Treatment Plant is located at 2 Sidney Street and serves the City of Belleville as well as connections south of the Bay of Quinte and in the former Thurlow Township.

As stated in the 2018 Summary Report the Belleville Water Treatment Plant has the following characteristics:

1. Drinking Water System Number 220001628
2. Large Municipal Residential System
3. Water Source: Bay of Quinte (south of Sidney Street)
4. Granular Activated Carbon Filtration System
5. Maximum Allowable Daily Volume: 72.700 ML/day

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ML</td>
<td>ML</td>
<td>ML</td>
<td>ML</td>
</tr>
<tr>
<td>January</td>
<td>799.973</td>
<td>22.778</td>
<td>25.806</td>
<td>28.113</td>
</tr>
<tr>
<td>February</td>
<td>719.605</td>
<td>22.982</td>
<td>25.700</td>
<td>27.163</td>
</tr>
<tr>
<td>March</td>
<td>769.933</td>
<td>22.532</td>
<td>24.837</td>
<td>26.062</td>
</tr>
<tr>
<td>April</td>
<td>713.118</td>
<td>20.679</td>
<td>23.771</td>
<td>25.898</td>
</tr>
<tr>
<td>May</td>
<td>721.709</td>
<td>21.721</td>
<td>23.281</td>
<td>25.486</td>
</tr>
<tr>
<td>June</td>
<td>711.724</td>
<td>20.696</td>
<td>23.724</td>
<td>26.305</td>
</tr>
<tr>
<td>July</td>
<td>783.255</td>
<td>21.490</td>
<td>25.266</td>
<td>29.050</td>
</tr>
<tr>
<td>August</td>
<td>770.860</td>
<td>22.560</td>
<td>24.866</td>
<td>28.150</td>
</tr>
<tr>
<td>September</td>
<td>673.081</td>
<td>20.210</td>
<td>22.436</td>
<td>24.520</td>
</tr>
<tr>
<td>October</td>
<td>661.320</td>
<td>19.780</td>
<td>21.333</td>
<td>22.980</td>
</tr>
<tr>
<td>November</td>
<td>656.030</td>
<td>19.300</td>
<td>21.868</td>
<td>23.520</td>
</tr>
<tr>
<td>December</td>
<td>682.474</td>
<td>17.300</td>
<td>22.015</td>
<td>24.400</td>
</tr>
<tr>
<td>Annual Total</td>
<td>8663.082</td>
<td>17.300</td>
<td>23.74</td>
<td>29.050</td>
</tr>
</tbody>
</table>

**Belleville Water Treatment Plant: Raw Water Flow Comparison**

<table>
<thead>
<tr>
<th></th>
<th>72.700 ML</th>
<th>% of Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Daily Water Taking Volume as per PTTW</td>
<td>72.700 ML</td>
<td>100.00%</td>
</tr>
<tr>
<td>Actual Maximum Daily Water Taking</td>
<td>29.050 ML</td>
<td>39.95%</td>
</tr>
<tr>
<td>Actual Mean Daily Capacity</td>
<td>23.74 ML</td>
<td>32.65%</td>
</tr>
</tbody>
</table>
The number of connections served by the water treatment plant as indicated on the City of Belleville public information website are 12,000 Residential, 1,500 General and 6,000 Apartment Unit service connections within the Belleville Ward, 400 Residential and 20 General service customers in Thurlow Ward, and 400 Residential and 20 General service customers south of the Bay of Quinte. The total number of connections is 20,340. To acknowledge growth and variability in connections, for the purpose of this report we will assume there are approximately 21,500 service connections to the drinking water system.

**Reserve Capacity Calculation**

The process for determining the reserve capacity of the drinking water plant is similar to the wastewater treatment plant and follows MOE Procedure D-5-1. As above for the waste water calculation, the calculation assumes residential lots and municipalities may choose to apply separate factors for industrial water users. For this report we will use residential lot equivalents. The calculation is summarized below:

\[ C_u = C_r - \left( L \times F \times P \right) / H \]

- \( C_u \): Uncommitted Hydraulic Reserve Capacity (m\(^3\)/d)
- \( C_r \): Hydraulic Reserve Capacity (m\(^3\)/d)
- \( L \): Number of Unconnected Approved Lots
- \( P \): Existing Connected Population
- \( H \): Number of Households or Residential Connections

Water Treatment Plant:
- \( F \): Maximum Daily Flow per Capita (m\(^3\)/capita/day)

As noted previously, we know:

- Maximum Allowable Daily Volume = 72.700 ML/day
- 2018 Maximum Daily Flow = 29.050 ML/day
- Number of Connections = 21,500

Hydraulic Reserve Capacity (\( C_r \)) = 2.502 ML/day

Similar to the wastewater calculation, for the purpose of this document the number of unconnected approved lots is assumed to be zero. This assumption is made to calculate the actual current hydraulic capacity available for additional development (\( C_u = C_r \)).

Number of Unconnected Approved Lots (\( L \)) = 0

The Municipality will need to determine if there are other developments already approved or in the process of being approved and how those developments may affect the allocation of the remaining capacity.
The existing Hydraulic Demand per connection is calculated by dividing Maximum Daily Flow (29,050 ML/day) by the number of service connections (21,500) which equals 1.35 m$^3$/day/connection.

With a Hydraulic Reserve Capacity of 2,502 ML/day and a demand per connection of 1.35 m$^3$/d there would be capacity at the water treatment plant for approximately 32,305 additional residential lot equivalent connections.

The proposed use of the property increases the draw from the drinking water system by a maximum of 3.8 m$^3$/day. This is the equivalent of 2.8 residential lot equivalent connections being added to the network.

Based on these calculations, we anticipate there is sufficient capacity at the water treatment plant to allow for the proposed development.

### 7. Fire Flows

The property receives fire protection from two sources. There is an 8” connection to serve the sprinkler system inside the building. There is also a fire hydrant at the corner of Haig Road and Dundas Street East.

The sprinkler system received a visual examination in September 2019 by Quinte Fire Protection Services and was not flagged for deficiencies during the site visit on November 26, 2019.

A test of the fire hydrant was conducted by staff from the City of Belleville on November 27, 2019 and found fire flow of 1087 IGPM at 69 PSI (82.36 L/s at 475 kPa) and static pressure of 71 psi.

Both pressure and flow are acceptable and suggest the water distribution network can support the proposed cannabis production facility.
8. Conclusions

The following summarizes the findings of this report as it relates to the redevelopment of the facility at 665 Dundas St. E.

1. The proposed development plan will convert a portion of the existing facility for use as a cannabis production facility.

2. Total average sanitary flows of approximately 3.26 L/s have been calculated.

3. Total average water demands of 1.10 L/s have been calculated.

4. Relative to the existing demands in the facility, the calculated additional demands are negligible.

5. The wastewater treatment plant has an estimated uncommitted reserve capacity of 22,921 residential lot equivalent connections. This development represents an increase of 3 residential equivalent connections.

6. The water treatment plant has an estimated uncommitted reserve capacity of 32,305 residential lot equivalent connections. This development represents an increase of 3 residential equivalent connections.

7. While we understand there are various developments at various stages of approval and development, we believe there would be capacity at both water and wastewater treatment plants to accommodate this additional demand.

Based on the above, we believe there are sufficient services available to accommodate the proposed severance.

Respectfully Submitted,

Peter Zandbergen, P.Eng.
The Greer Galloway Group
Consulting Engineers
Appendix A
Existing Conditions Sketch