



# Technical Memorandum – Evaluation of Alternative Solutions for Wastewater Servicing

---

**Date:** January 10, 2025 **Project No.:** 300058184.0000

**Project Name:** Forest Glade North Environmental Assessment

**Client Name:** City of Windsor

**Submitted To:** Juan Paramo, P.Eng. – Development Engineer, City of Windsor

**Prepared By:** Shannon Glassford, M.A.Sc., P.Eng.

**Reviewed By:** Jeff Paznar, P.Eng., EP

---

## 1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the City of Windsor (City) to undertake a Municipal Class Environmental Assessment for the Forest Glade North planning area.

The City has requested that an Environmental Assessment process for the Forest Glade North area, with regard to infrastructure including roads, intersections, sanitary sewers, and storm water management, be conducted concurrently with the Official Plan Amendment and Zoning By-law amendment process for the lands identified as 0 Catherine Street in Windsor.

This technical memorandum provides background information and an evaluation of wastewater servicing alternatives for the planning area.

## 2.0 Background

The subject lands are located in the Forest Glade North Planning Area at the northwest quadrant of the intersection of Lauzon Parkway and Tecumseh Road East. The projected development consists of commercial, mixed use and residential space.

The land uses for the different parcels in the project area are summarized in Table 1 below. Refer to Attachment A for a figure showing the property parcels.

**Table 1: Forest Glade North Property Parcel Descriptions and Associated Areas**

| Parcel Number | Land Use Type              | Parcel Area<br>[ha] |
|---------------|----------------------------|---------------------|
| 1             | Commercial / Business Park | 6.51                |
| 2             | Commercial / Business Park | 4.54                |
| 3             | Commercial / Business Park | 13.80               |
| 4             | Mixed Use                  | 4.04                |
| 5             | Mixed Use                  | 5.43                |
| 6             | Residential                | 5.44                |
| 7             | Commercial / Business Park | 4.38                |
| 8             | Mixed Use                  | 4.46                |
| 9             | Commercial / Business Park | 0.87                |

In the Forest Glade North area there are existing commercial businesses including but not limited to Home Depot, Walmart and Rona. There are currently sanitary sewers located on Tecumseh Rd E and Lauzon Parkway. The sanitary sewers do not connect together and ultimately take different routes prior to the wastewater reaching its ultimate destination, the Little River Wastewater Treatment Plant. Please refer to Attachment A for a figure illustrating the existing sanitary sewer network.

A sanitary sewer was installed along Catherine Street, a road that has been partially developed into the Forest Glade North area, that was originally designed to service the entire planning area. The sanitary sewer along Catherine Street was constructed in segments. The first section branching off Lauzon Parkway was constructed in 2001. At that time, one service connection was made for Rona, and two plugs were installed for potential service connections. In 2003, the Catherine Street sanitary sewer was extended, and four additional plugs were installed for potential service connections.

However, when some of the existing commercial businesses were constructed (i.e., Walmart and Home Depot), the sanitary services were connected to the sanitary sewer that was extended along Tecumseh Road E in 2005 / 2006. This wastewater servicing evaluation will explore potential connections to both sanitary sewer networks.

### **3.0 Determination of Wastewater Flows for Proposed Development**

To determine which wastewater servicing alternatives will be potentially viable for the Forest Glade North planning area, the flows associated with the land parcels must be estimated. The City provided densities for each type of land use as well as a per capita flow rate and an extraneous flows rate as follows:

- Mixed Use Density: 160 people per hectare (ppl/ha)
- Commercial / Business Park Density: 78 ppl/ha
- Residential Density (specific to Parcel 6): 2.2 people per unit (ppl/unit)
- Per Capita Flow: 362.88 L/cap/day
- Extraneous Flows: 0.28 L/s/ha



The City's Development Manual specifies the following equation for determining the ultimate flow for an area:

$$Q(Ultimate) = Residential\ Sewage\ Flow \times Ultimate\ Population\ Served \times Ultimate\ Flow\ Factor + Infiltration$$

In the equation, "Residential Sewage Flow" is referring to the per capita or per person flow rate and "Infiltration" is referring to extraneous flows that enter the sanitary sewer network such as runoff infiltration. The "Ultimate Flow Factor" is a peaking factor referenced from a table in the Development Manual that is dependent on the population being serviced. The following table (Table 2) shows the determination of both average day and extraneous flows, both of which were utilized to determine the ultimate flow rate for the planning area.

**Table 2: Flow Rate Determination for Forest Glade North Property Parcels**

| Parcel Number | Area [ha] | Density                    |              | Population <sup>1</sup> | Average Day Flow [L/day] <sup>1</sup> | Extraneous Flows [L/day] <sup>1</sup> |
|---------------|-----------|----------------------------|--------------|-------------------------|---------------------------------------|---------------------------------------|
|               |           | Type                       | Value        |                         |                                       |                                       |
| 1             | 6.51      | Commercial / Business Park | 78 ppl/ha    | 508                     | 184,343                               | 157,490                               |
| 2             | 4.54      | Commercial / Business Park | 78 ppl/ha    | 355                     | 128,822                               | 109,832                               |
| 3             | 13.80     | Commercial / Business Park | 78 ppl/ha    | 1,077                   | 390,822                               | 333,850                               |
| 4             | 4.04      | Mixed Use                  | 160 ppl/ha   | 647                     | 234,783                               | 97,736                                |
| 5             | 5.43      | Mixed Use                  | 160 ppl/ha   | 869                     | 315,343                               | 131,363                               |
| 6             | 5.44      | Residential                | 2.2 ppl/unit | 1,320                   | 479,002                               | 131,604                               |
| 7             | 4.38      | Commercial / Business Park | 78 ppl/ha    | 342                     | 124,105                               | 105,961                               |
| 8             | 4.46      | Mixed Use                  | 160 ppl/ha   | 714                     | 259,096                               | 107,896                               |
| 9             | 0.87      | Commercial / Business Park | 78 ppl/ha    | 68                      | 24,676                                | 21,047                                |
|               |           |                            |              | <b>5,900</b>            | <b>2,140,992</b>                      | <b>1,196,779</b>                      |

**Notes:**

<sup>1</sup> Values rounded to the nearest whole number.

Table 3 below shows the determination of the ultimate flow factor and the ultimate flow for the planning area.

**Table 3: Determination of Ultimate Flow for Planning Area**

|                                       |                                                                                                                                                                                                                    |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total Population Served               | 5,900 ppl                                                                                                                                                                                                          |
| Ultimate Flow Factor                  | 4.5211                                                                                                                                                                                                             |
| Ultimate Flow<br>(units noted in [ ]) | Average Day Flow [L/day] x Ultimate Flow Factor [-] +<br>Extraneous Flows [L/day]<br>= 2,140,992 L/day x 4.521 + 1,196,779 L/day<br>= 10,876,204 L/day<br>= <b>10,876 m<sup>3</sup>/day</b><br>= <b>125.88 L/s</b> |

**Notes:**

<sup>1</sup> Interpolated value from City of Windsor's Development Manual. The population range between 4,000 and 6,000 has an ultimate flow factor between 4.92 and 4.50, respectively.

## 4.0 Sanitary Sewer Capacity

Based on the estimated wastewater flows determined in the previous section, the diameter of the sanitary sewer recommended to service the planning area can be estimated.

Table 4 provides a summary of the existing sanitary sewer dimensions and materials along Tecumseh Rd E, Lauzon Parkway and Catherine Street based on available drawings. The Catherine Street sanitary sewer flows to the Lauzon Parkway sanitary sewer so they will be treated as one entity. Please refer to Attachment A for a figure illustrating the existing sanitary sewer network.

**Table 4: Existing Sanitary Sewer Details**

| Street Name      | Sanitary Sewer Size / Material                      |
|------------------|-----------------------------------------------------|
| Tecumseh Rd E    | 250 mm dia. / PVC <sup>1</sup>                      |
| Lauzon Parkway   | 525 mm dia. / Concrete <sup>2</sup>                 |
| Catherine Street | 450 mm dia. and 525 mm dia. / Concrete <sup>3</sup> |

**Notes:**

<sup>1</sup> Referenced from Catherine Street Extension and Tecumseh Road Improvements As-Built Drawing Set (S-1675) Drawing 9.

<sup>2</sup> 525 mm diameter referenced from Catherine Street and Associated Improvements Record Drawing Set (S-1596) Sheet 2 of 7.

<sup>3</sup> 450 mm diameter referenced from Catherine Street Extension and Tecumseh Road Improvements As-Built Drawing Set (S-1675) Drawing 3. 525 mm diameter referenced from Catherine Street and Associated Improvements Record Drawing Set (S-1596) Sheet 2 of 7.

The City's Development Manual notes the following stipulations for the design of sanitary sewer networks:

- A minimum pipe diameter for sanitary sewers of 250 mm;
- A minimum velocity of 0.75 m/s (which is more stringent than the Ministry of the Environment, Conservation and Parks (MECP) guideline of 0.6 m/s); and
- A maximum velocity of 3.0 m/s.

The Development Manual does not specify a percent full that should be utilized in sanitary sewer design. Based on Burnside's experience with other municipalities and engineering best practices, the proposed sanitary sewer pipe to service the planning area should be designed to run approximately 60% full at peak flow.

Burnside completed some high-level sanitary sewer sizing calculations to aid in determining the preferable connection location. A copy of the high-level calculations is included in Attachment B. Based on the ultimate flow of 125.88 L/s, calculated in Section 3.0 above, a minimum pipe diameter of 450 mm at a pipe slope of 0.5% would result in the pipe flowing approximately 62 % full. To be able to achieve a smaller pipe diameter, the slope of the pipe would need to increase substantially which impacts the pipe velocity and may be limited based on existing sanitary sewer elevations and depth of cover available.

A detailed design of the preferred sanitary servicing alternative will be required to confirm the sanitary service connection locations and the resulting sanitary sewer diameter and slope.

Burnside has not reviewed the capacity of the downstream collection system (i.e., sanitary sewers and pumping stations) or the WWTP as part of this assignment.

## **5.0 Wastewater Servicing Alternatives**

Since there are limited sanitary sewer connections available to the Forest Glade North area, there are three wastewater servicing alternatives being considered. The alternatives include:

- Alternative No. 1: Do Nothing;
- Alternative No. 2: Connection to existing system at Catherine Street / Lauzon Parkway and treatment at WWTP; and
- Alternative No. 3: Connection to existing system on Tecumseh Rd E and treatment at WWTP.

### **5.1 Alternative No. 1 – Do Nothing**

It shall be noted that Alternative No. 1 is a mandatory alternative for consideration under the Master Plan Class Environmental Assessment process and serves as a reference point for comparing other alternative solutions. The “Do Nothing” alternative means no action is taken in addressing the problem / opportunity statement. This would result in no wastewater servicing connection for the Forest Glade North planning area and therefore, does not accommodate planned growth.

### **5.2 Alternative No. 2 – Connection to existing system at Catherine Street / Lauzon Parkway and treatment at WWTP**

This alternative looks at servicing the planning area by extending the sanitary sewer along Catherine St. As noted previously, the sanitary sewer currently installed along a section of Catherine St. is 450 mm in diameter and increases to 525 mm diameter closer to the Lauzon Parkway intersection. The size of the sanitary sewer provides a larger available capacity than other available connections being considered.

Based on available drawings, the 450 mm diameter sanitary sewer currently installed along Catherine St. has a 0.2% slope. At this slope, the projected ultimate flow for the planning area is anticipated to surcharge the pipe (i.e., almost running at 100% full). Depending on where the parcel service connections are tied into the sanitary sewer, a portion of the already installed 450 mm diameter sanitary sewer may need to be upsized to a 525 mm diameter pipe or the 450 mm diameter pipe may require replacement and installation at a steeper slope to accommodate the flow. This will all need to be reviewed during the design phase.

Please refer to Attachment A for a figure illustrating the proposed sanitary sewer connection.

### **5.3 Alternative No. 3 – Connection to existing system on Tecumseh Rd E and treatment at WWTP**

This alternative looks at servicing the planning area by installing a new section of sanitary sewer to connect to the existing sanitary sewer on Tecumseh Rd E. As noted previously, the sanitary sewer currently installed along Tecumseh Rd E is 250 mm in diameter which is the minimum diameter approved by the City. The existing 250 mm diameter sewer already accommodates some large commercial properties including Home Depot and Walmart. Based on the projected wastewater flows for the planning area, the existing sanitary sewer on Tecumseh Rd E does not have sufficient capacity.

## **6.0 Evaluation of Alternative Solutions for Wastewater**

This section identifies the wastewater alternatives that were considered for the Master Plan / Environmental Assessment. The above noted alternatives were evaluated using natural environment, social/cultural environment, financial and technical factors. An evaluation of the alternatives is presented in the following table (Table 6). Each alternative provides a rating between least and most preferred which is illustrated based on the following symbols.

**Table 5: Evaluation Ratings and Corresponding Symbols**

| <b>Rating</b>      | <b>Symbol</b> |
|--------------------|---------------|
| Least Preferred    | ○             |
| Less Preferred     | ◐             |
| Somewhat Preferred | ◑             |
| More Preferred     | ◒             |
| Most Preferred     | ●             |

Table 6: Evaluation of Wastewater Servicing Alternatives

| Criteria for Evaluating Alternatives |                                                                                                                    | Alternative No. 1<br>Do Nothing                                                                                    | Alternative No. 2<br>Connection to Existing System at Catherine<br>Street / Lauzon Parkway and Treatment at<br>WWTP                                                                                                                                                                                             | Alternative No. 3<br>Connection to Existing System on<br>Tecumseh Rd E and Treatment at WWTP                                                                                                                                                                                                                    |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b>                             | <b>Natural Environment</b>                                                                                         |                                                                                                                    |                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                 |
| 1                                    | Impact migratory birds                                                                                             | By doing nothing, there will be no impact to migratory birds.                                                      | The proposed sanitary sewer would be constructed within the proposed road ROW. As such, no tree or shrub removal is required to accommodate the proposed development, and no impacts are expected to migratory birds.                                                                                           | The proposed sanitary sewer would be constructed within the proposed road ROW. As such, no tree or shrub removal is required to accommodate the proposed development, and no impacts are expected to migratory birds.                                                                                           |
|                                      | <i>Rating</i>                                                                                                      | ●                                                                                                                  | ●                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                               |
| 2                                    | Impact to Woodland and Wildlife Habitat                                                                            | By doing nothing, there will be no impact to woodland and wildlife habitat.                                        | The proposed sanitary sewer would be constructed within the proposed road ROW. Tall Boneset, a provincially rare plant species is located within the future ROW. The plant will be transplanted, or seeds will be collected and dispersed prior to construction. No impacts at a population level are expected. | The proposed sanitary sewer would be constructed within the proposed road ROW. Tall Boneset, a provincially rare plant species is located within the future ROW. The plant will be transplanted, or seeds will be collected and dispersed prior to construction. No impacts at a population level are expected. |
|                                      | <i>Rating</i>                                                                                                      | ●                                                                                                                  | ●                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                               |
| 3                                    | Impact to Aquatic Habitat                                                                                          | By doing nothing, there will be no impact to aquatic habitat.                                                      | Construction is located well away from the Hawkins Drain. The sanitary sewer will be connected to the City's WWTP. Wastewater will be treated appropriately prior to discharge into the environment. No impacts are anticipated.                                                                                | Construction is located well away from the Hawkins Drain. The sanitary sewer will be connected to the City's WWTP. Wastewater will be treated appropriately prior to discharge into the environment. No impacts are anticipated.                                                                                |
|                                      | <i>Rating</i>                                                                                                      | ●                                                                                                                  | ●                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                               |
| 4                                    | Impact to Species at Risk                                                                                          | There would be no impact to species at risk.                                                                       | Provincially protected snake species could potentially inhabit the area. All work areas will be fenced to exclude snakes and will be monitored regularly. No impacts are expected.                                                                                                                              | Provincially protected snake species could potentially inhabit the area. All work areas will be fenced to exclude snakes and will be monitored regularly. No impacts are expected.                                                                                                                              |
|                                      | <i>Rating</i>                                                                                                      | ●                                                                                                                  | ●                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                               |
|                                      | <b>Summary – Natural Environment</b>                                                                               | ●                                                                                                                  | ●                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                               |
| <b>B</b>                             | <b>Socio-Cultural Environment</b>                                                                                  |                                                                                                                    |                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                 |
| 1                                    | Property Acquisition                                                                                               | No property will be acquired.                                                                                      | The sanitary sewer collection system will be constructed within existing or future road ROWs. No property acquisition will be needed beyond the property needed for the Collector Roads.                                                                                                                        | The sanitary sewer collection system will be constructed within existing or future road ROWs. No property acquisition will be needed beyond the property needed for the Collector Roads.                                                                                                                        |
|                                      | <i>Rating</i>                                                                                                      | ●                                                                                                                  | ●                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                               |
| 2                                    | Impacts to Cultural Heritage Resources (archaeological features, built heritage, and cultural heritage landscapes) | No archaeological resources, built heritage, or cultural heritage landscapes are present. No impacts are expected. | No archaeological resources, built heritage, or cultural heritage landscapes are present. If undocumented archaeological resources are uncovered during construction, all requirements under the Ontario Heritage Act will be met.                                                                              | No archaeological resources, built heritage, or cultural heritage landscapes are present. If undocumented archaeological resources are uncovered during construction, all requirements under the Ontario Heritage Act will be met.                                                                              |

| Criteria for Evaluating Alternatives |                                                                          | Alternative No. 1<br>Do Nothing                                                                                                                                                                                                                                                                                                                                                 | Alternative No. 2<br>Connection to Existing System at Catherine<br>Street / Lauzon Parkway and Treatment at<br>WWTP                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Alternative No. 3<br>Connection to Existing System on<br>Tecumseh Rd E and Treatment at WWTP                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                 | Indigenous communities will be contacted. No impacts are expected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Indigenous communities will be contacted. No impacts are expected.                                                                                                                                                                                                                                                                                                                                                  |
|                                      | Rating                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3                                    | Impacts to Indigenous Treaty Rights, Claims and Interests                | The Study Area is within Treaty 2, known as the McKee Purchase. The Treaty was signed by the representatives of the British Crown, the Potawatomi, Huron, Chippewa and Ottawa in May 1790. There are no known land claims. Indigenous communities likely have an interest in natural features, including the woodlot and Hawkins Drain. No impact to the features are expected. | The Study Area is within Treaty 2, known as the McKee Purchase. The Treaty was signed by the representatives of the British Crown, the Potawatomi, Huron, Chippewa and Ottawa in May 1790. There are no known land claims. Indigenous communities likely have an interest in natural features, including the woodlot and Hawkins Drain. No impacts to the features are expected as a result of the Collector Roads.                                                                                                                                                 | The Study Area is within Treaty 2, known as the McKee Purchase. The Treaty was signed by the representatives of the British Crown, the Potawatomi, Huron, Chippewa and Ottawa in May 1790. There are no known land claims. Indigenous communities likely have an interest in natural features, including the woodlot and Hawkins Drain. No impacts to the features are expected as a result of the Collector Roads. |
|                                      | Rating                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Summary – Socio-Cultural Environment |                                                                          | ●                                                                                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                                                                   |
| C Technical Environment              |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1                                    | Ability to adequately address wastewater volumes from future development | The future development would remain unconnected to a sanitary sewer thereby not addressing wastewater volumes for the area.                                                                                                                                                                                                                                                     | The Catherine St. / Lauzon Parkway sanitary sewer is a larger diameter pipe compared to other connections being considered providing more potential for capacity. Based on preliminary calculations, a minimum sanitary sewer diameter of 450 mm is recommended to service the area. However, the existing 450 mm sanitary sewer on Catherine St. has a slope of 0.2% which is not adequate to accommodate the ultimate flow. The flow and pipe size will be dependent on where the service connections are made and ultimately determined during the design phase. | The Tecumseh Rd E sanitary sewer is a 250 mm diameter pipe that already services large commercial businesses in the Forest Glade North area. Based on the ultimate flow determined for the area, a 250 mm diameter sanitary sewer would only be adequate if placed at a very high slope (approximately 10%) which results in a velocity that exceeds the stipulated maximum, 3.0 m/s.                               |
|                                      | Rating                                                                   | ○                                                                                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ◐                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 2                                    | Operation & Maintenance requirements and complexity                      | Not applicable.                                                                                                                                                                                                                                                                                                                                                                 | Maintenance on sanitary sewer pipes is minimal. Flushing when grit builds up can be completed along with CCTV inspections to check for leaks, or degradation.                                                                                                                                                                                                                                                                                                                                                                                                       | Maintenance on sanitary sewer pipes is minimal. Flushing when grit builds up can be completed along with CCTV inspections to check for leaks, or degradation.                                                                                                                                                                                                                                                       |
|                                      | Rating                                                                   | ○                                                                                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ●                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Summary – Technical Environment      |                                                                          | ○                                                                                                                                                                                                                                                                                                                                                                               | ●                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ◐                                                                                                                                                                                                                                                                                                                                                                                                                   |
| D Economic Environment               |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1                                    | Relative capital costs                                                   | None                                                                                                                                                                                                                                                                                                                                                                            | Approximately \$1,215,000 - \$2,330,000<br>The low end of the cost range is based on an extension of the 450 mm diameter sanitary sewer along Catherine St. The high end of the cost range is based on the extension of the sanitary sewer as                                                                                                                                                                                                                                                                                                                       | Not applicable – sanitary sewer does not have sufficient capacity to support the planning area. Upgrading the sanitary sewer on Tecumseh Rd. E is likely prohibitively costly.                                                                                                                                                                                                                                      |

| Criteria for Evaluating Alternatives |                                                     | Alternative No. 1<br>Do Nothing                                   | Alternative No. 2<br>Connection to Existing System at Catherine<br>Street / Lauzon Parkway and Treatment at<br>WWTP                   | Alternative No. 3<br>Connection to Existing System on<br>Tecumseh Rd E and Treatment at WWTP                                                                                   |
|--------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |                                                     |                                                                   | well as the replacement of the existing 450 mm diameter sewer to accommodate a steeper slope. The costs include engineering services. |                                                                                                                                                                                |
|                                      | Rating                                              | ●                                                                 | ●                                                                                                                                     | ○                                                                                                                                                                              |
| 2                                    | Relative operation and maintenance costs            | None                                                              | Approximately \$5,000/year<br>Cost estimate based on typical sanitary sewer maintenance including CCTV inspections and flushing.      | Not applicable – sanitary sewer does not have sufficient capacity to support the planning area. Upgrading the sanitary sewer on Tecumseh Rd. E is likely prohibitively costly. |
|                                      | Rating                                              | ●                                                                 | ●                                                                                                                                     | ○                                                                                                                                                                              |
|                                      | Summary – Economic Environment                      | ●                                                                 | ●                                                                                                                                     | ○                                                                                                                                                                              |
| E                                    | Problem Statement                                   |                                                                   |                                                                                                                                       |                                                                                                                                                                                |
| 1                                    | Addresses Project Problem and Opportunity Statement | Do Nothing does not address the Problem and Opportunity Statement | This Alternative addresses the Problem and Opportunity Statement                                                                      | This Alternative addresses the Problem and Opportunity Statement                                                                                                               |
|                                      | Summary – Problem Statement                         | Do Not Move Forward                                               | Move Forward                                                                                                                          | Move Forward                                                                                                                                                                   |
|                                      | Overall Summary                                     | Do Not Move Forward                                               | Most Preferred                                                                                                                        | Least Preferred                                                                                                                                                                |

## 7.0 Recommended Wastewater Servicing Alternative

Based on the evaluation, Burnside recommends that the Forest Glade North planning area be serviced by a sanitary sewer extension along Catherine St. / Lauzon Parkway. This alternative provides the most available capacity and is easily accessible from all the property parcels. Detailed design will confirm whether the existing 450 mm diameter sanitary sewer on Catherine St. will require upsizing or installation at a steeper slope.

### R.J. Burnside & Associates Limited



Shannon Glassford, M.A.Sc., P.Eng.  
Project Engineer  
SG/JP:js

Enclosure(s)      Attachment A – Existing and Proposed WW Servicing Figures  
Attachment B – Sewer Sizing Calculation Spreadsheet

Other than by the addressee, copying or distribution of this document, in whole or in part, is not permitted without the express written consent of R.J. Burnside & Associates Limited.

In the preparation of the various instruments of service contained herein, R.J. Burnside & Associates Limited was required to use and rely upon various sources of information (including but not limited to: reports, data, drawings, observations) produced by parties other than R.J. Burnside & Associates Limited. For its part R.J. Burnside & Associates Limited has proceeded based on the belief that the third party/parties in question produced this documentation using accepted industry standards and best practices and that all information was therefore accurate, correct and free of errors at the time of consultation. As such, the comments, recommendations and materials presented in this instrument of service reflect our best judgment in light of the information available at the time of preparation. R.J. Burnside & Associates Limited, its employees, affiliates and subcontractors accept no liability for inaccuracies or errors in the instruments of service provided to the client, arising from deficiencies in the aforementioned third party materials and documents.

R.J. Burnside & Associates Limited makes no warranties, either express or implied, of merchantability and fitness of the documents and other instruments of service for any purpose other than that specified by the contract.





BURNSIDE

[ THE DIFFERENCE IS OUR PEOPLE ]



## Attachment A

### Existing and Proposed WW Servicing Figures





Existing Sanitary Manhole

Existing Sanitary Sewer

- 250mm, PVC
- 300mm, AC
- 450mm, CONC
- 525mm, CONC

Land Use:

- Commercial
- Mixed-Use
- Residential

- Sources:
- Ministry of Natural Resources, © Queen's Printer for Ontario
  - Natural Resources Canada © Her Majesty the Queen in Right of Canada.

Disclaimer:

R.J. Burnside & Associates Limited and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

|                                      |                       |
|--------------------------------------|-----------------------|
| Datum: North American 1983           |                       |
| Coord. System: NAD 1983 UTM Zone 17N |                       |
| Projection: Transverse Mercator      |                       |
| Central Meridian: 81°0'0.00"W        |                       |
| False Easting: 500,000m              | False Northing: 0m    |
| Page Orientation: -13.45°            | Scale Factor: 0.99960 |

Grid North

0 50 100 150 200 250  
Metres



Client

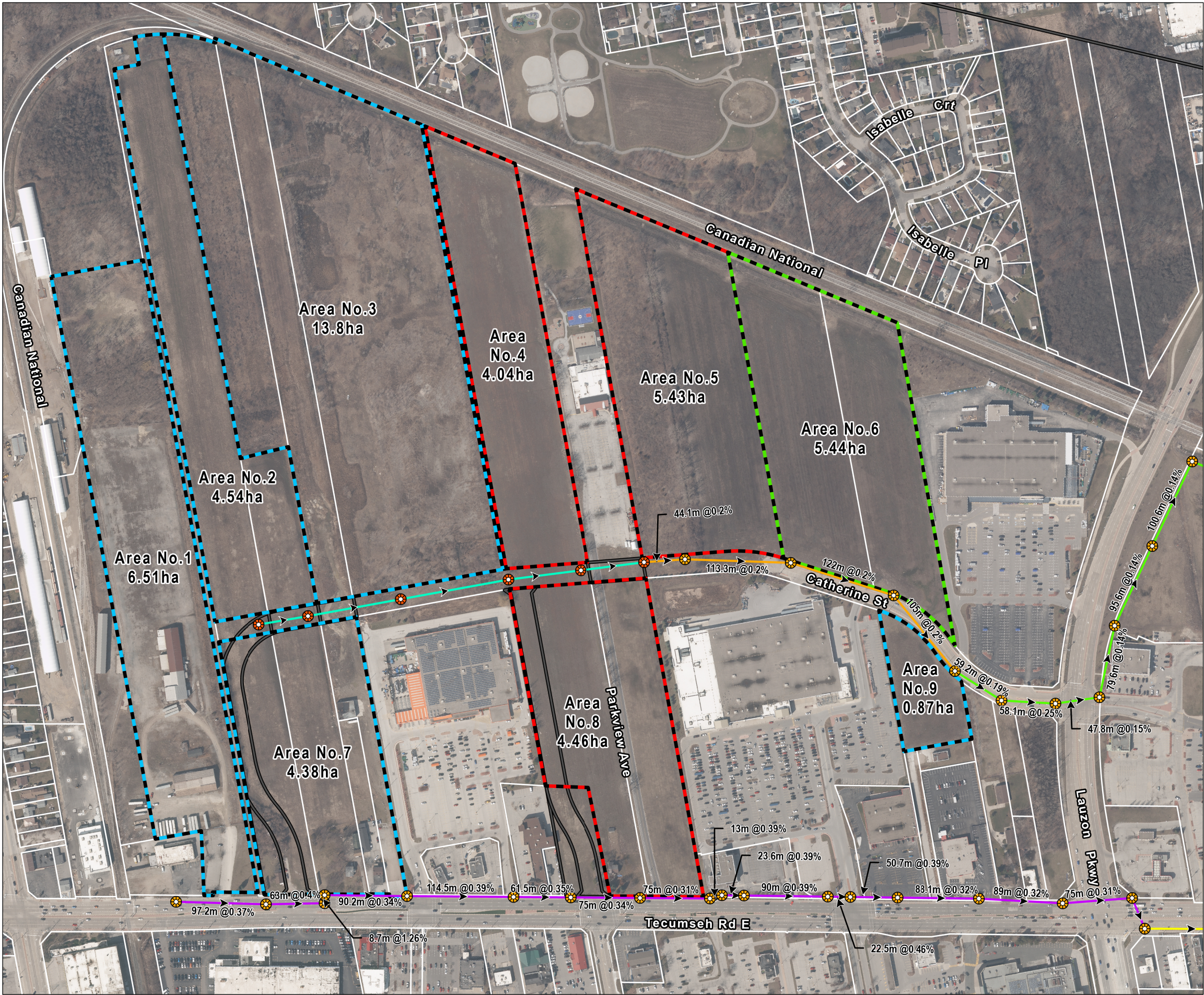
**CITY OF WINDSOR**

Figure Title

**CITY OF WINDSOR  
FOREST GLADE NORTH PLANNING AREA  
WASTEWATER SERVICING EXISTING  
CONDITIONS**

|       |         |                          |                        |
|-------|---------|--------------------------|------------------------|
| Drawn | Checked | Date                     | Figure No.<br><b>1</b> |
| HN    | SG      | 2024/10/30               |                        |
| Scale |         | Project No.<br>300058184 |                        |





- Proposed Right of Way
- Proposed Sanitary Manhole
- Proposed Sanitary Sewer
- Existing Sanitary Manhole

Existing Sanitary Sewer

- 250mm, PVC
- 300mm, AC
- 450mm, CONC
- 525mm, CONC

Land Use:

- Commercial
- Mixed-Use
- Residential

Sources:

- Ministry of Natural Resources, © Queen's Printer for Ontario
- Natural Resources Canada © Her Majesty the Queen in Right of Canada.

Disclaimer:

R.J. Burnside & Associates Limited and the above mentioned sources and agencies are not responsible for the accuracy of the spatial, temporal, or other aspects of the data represented on this map. It is recommended that users confirm the accuracy of the information represented.

This map is the product of a Geographic Information System (GIS). As such, the data represented on this map may be subject to updates and future reproductions may not be identical.

Datum: North American 1983

Coord. System: NAD 1983 UTM Zone 17N

Projection: Transverse Mercator

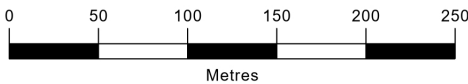
Central Meridian: 81°0'0.00"W

False Easting: 500,000m

Page Orientation: -13.45°

False Northing: 0m

Scale Factor: 0.99960



Client

CITY OF WINDSOR

Figure Title

CITY OF WINDSOR  
FOREST GLADE NORTH PLANNING AREA  
WASTEWATER SERVICING PROPOSED  
CONDITIONS

| Drawn     | Checked | Date        | Figure No. |
|-----------|---------|-------------|------------|
| HN        | SG      | 2024/11/18  | 2          |
| Scale     |         | Project No. |            |
| H 1:4,250 |         | 300058184   |            |





BURNSIDE

[ THE DIFFERENCE IS OUR PEOPLE ]

---

## Attachment B

### Sewer Sizing Calculation Spreadsheet

[illegible]