



Source water

February 16, 2017

**Via: Email**

Mr. Steve Shiedel  
Greenhorizons Sod Farms  
2907 Upper James Street  
Mount Hope, Ontario L0R 1W0

Dear Mr. Schiedel:

**Re: Mr. Steve Shiedel  
Preliminary Sewage System Servicing Plan – 8475 English Church Road  
Project No.: 300040002.0000**

## **1.0 Introduction**

R.J. Burnside & Associates Limited (Burnside) has been retained by Greenhorizons Sod Farms to complete a feasibility assessment and preliminary onsite sewage system design in support of two (2) severance applications on English Church Road near the village of Mount Hope within the City of Hamilton. The retained property is described as Lot 7 Concession 4 in the geographic Township of Glanbrook and is known as the Willow Valley Golf Course. The proposed development will sever the parcels labelled Part 1 and Part 2 as shown on the legal survey produced by A.T. McLaren, dated May 1, 2015, attached.

This memo has been prepared in support of the severance applications to demonstrate the feasibility of onsite wastewater servicing for the proposed developments. A Hydrogeological Assessment Report has been prepared by Terraprobe.

## **2.0 Site and Subsurface Conditions**

Subsurface and groundwater conditions for the site were investigated by Terraprobe in their Hydrogeological Assessment report dated April 2005. This report has been submitted to the City under separate cover. According to the report, the site is located in the northern part of the region known as the "Haldimand Clay Plain". Topographically the site generally slopes to the southwest. In the area of the proposed severances, particularly Part 2, Three Mile Creek and its intermittent tributary streams have cut valleys into the generally level ground surface, and topography varies more than usual.

According to the Terraprobe report, two test pits were excavated on the proposed lands to be severed. Test pits extended to depths of 2.7m and 3.05 m. Dark brown clayey silt top soil was encountered to depths of 0.45 m, which was underlain with sandy silt to clayey silt soils. The Terraprobe report concluded that the native soils have an estimated T-time of 50 min/cm.

Based on the Terraprobe report, we have assumed that the native soils are unsuitable for in-ground treatment and dispersal of effluent.

Therefore, fill-based (raised) conventional absorption trench leaching beds constructed of imported septic sand are proposed for both severed lots in order to meet requirements of the Ontario Building Code (OBC).

Burnside Staff have conducted a site visit on February 1<sup>st</sup>, 2017 to visually observe site conditions and constraints. Part 1 slopes gently away from English Church Road then back up again toward the rear of the proposed severance. Some grading will be required to accommodate the proposed on-site sewage system. Part 2 exhibits more variable topography, particularly on the south and west sides where the proposed severance parcel slopes sharply down toward the tributary to Three Mile Creek and Three Mile Creek itself. However, there are two fairly large flatter areas closer to the road which can accommodate a raised absorption trench system with some grading.

The locations of existing drilled wells on the neighboring properties were also visually confirmed at the time of the site visit.

### 3.0 Design Flows

Daily design flows for the sewage system have been estimated in accordance with Table 8.2.1.3.A. of the OBC. The proposed development on Part 1 will consist of a three (3) bedroom, two (2) bathroom detached dwelling, with a total gross floor area of approximately 227 m<sup>2</sup>. Table 1 shows the total daily design sanitary sewage flow for Part 1.

**Table 1 - Design Flow for Part 1**

	Unit Flow	Total Units	Total Flow (L/day)
3-bedroom Dwelling <sup>a</sup>	1,600 L/day	1	1,600
Plus the greater of			
Floor Area <sup>b</sup>	100 L per 10 m <sup>2</sup> over 200 m <sup>2</sup>	227 m <sup>2</sup>	300
Fixtures	50 L for each fixture unit over 20 fixture units	19	0
<b>Total Sewage Flow</b>			<b>1,900</b>

Therefore, a total daily design sanitary sewage flow of 1,900 L/day will be used to estimate the required subsurface disposal area. It is assumed that the wastewater will be of domestic strength.

The proposed development on Part 2 will consist of a four (4) bedroom, four (4) bathroom dwelling with a gross floor area 436 m<sup>2</sup>. Table 2 shows the total daily design sanitary sewage flow for Part 2.

**Table 2 - Design Flow for Part 2**

	Unit Flow	Total Units	Total Flow (L/day)
4-bedroom Dwelling <sup>a</sup>	2,000 L/day	1	2,000
Plus the greater of			
Floor Area <sup>b</sup>	100 L per 10 m <sup>2</sup> over 200 m <sup>2</sup> to 400 m <sup>2</sup>	436 m <sup>2</sup>	2,000
	75 L per 10 m <sup>2</sup> over 400 m <sup>2</sup> to 600 m <sup>2</sup>	436 m <sup>2</sup>	300
Fixtures	50 L for each fixture unit over 20 fixture units	39	950
<b>Total Sewage Flow</b>			<b>4,300</b>

Therefore, a total daily design sanitary sewage flow of 4,300 L/day will be used to estimate the required subsurface disposal area for the preliminary on-site sewage system feasibility assessment. It is assumed that the wastewater will be of domestic strength.

## 4.0 Onsite Sewage System Design

Both developments will require a sewage system permit in accordance with Part 8 of the Ontario Building Code. At this time it is proposed to service both sites with a conventional septic tank/leaching bed system. Based on the underlying soil properties, a fill-based absorption trench leaching bed system is proposed. This calculation provides the most conservative estimate for the required footprint of the system. Should the proponent choose to include an advanced treatment system into the design of the sewage system, then the area required for the subsurface disposal system may be reduced by up to 50%, depending on the type of leaching bed utilized.

### 4.1 Part 1

The proposed preliminary onsite sewage system will consist of a septic tank and a raised absorption trench leaching bed. Note that the sizing of the sewage system components was done to identify minimum septic tank size and leaching bed footprint for the proposed severance in accordance with the OBC requirements, as well as sufficient area for a "reserve bed" as required by the City of Hamilton Rural Official Plan. Detailed design is not included at this time.

The OBC requires that a septic tank servicing a residential building have a working volume equal to at least two times the daily sewage flow (as per 8.2.2.3.1.(a) of the OBC). Therefore, the minimum required septic tank size is 3,800 L. The proposed septic tank is suggested to be located in the rear yard and must meet all OBC clearance distances in accordance with Table 8.2.1.6.A. of the OBC, typically with minimum of 1.5 m setback from any structures and minimum of 3 m away from property lines.

The T-time of the underlying receiving soils has been identified as 50 min/cm. Therefore, a fill-based absorption trench leaching bed is proposed. An imported sand fill with a T-time of 6 to 10 min/cm is required for the construction of the leaching bed and the mantle area.

Based on a design flow of 1,900 L/day, the minimum length requirement for the absorption trench is calculated as follows:

$$L = QT/200$$

Where: L = the minimum required length of the absorption trench (m)  
Q = the daily sewage design flow (L/day)  
T is the percolation rate of the imported sand for raised leaching bed = 10 min/cm

Therefore, the minimum required length for the absorption trench is 95 m. Should the elevation of the distribution piping be above the outlet of the septic tank, a pump and pump chamber will be required to dose the leaching bed.

According to OBC 8.7.4.2, a leaching bed constructed in fill must meet the loading rates described in Table 8.7.4.1. For native soils with a T-time greater than 50 min/cm, the maximum loading rate to the underlying soils is 4 L/m<sup>2</sup>/day. The loading area is calculated as follows:

$$A = Q/LR$$

Where:        A = minimum contact area (m<sup>2</sup>)  
                  Q = the daily sewage design flow (L/day)  
                  LR is the loading rate (4 L/ m<sup>2</sup> per day)

Therefore, the minimum loading area required is 475 m<sup>2</sup>. We have identified a total sand area of 550 m<sup>2</sup> which includes sufficient area for side slopes as well as a minimum of 15 m mantle extension beyond the edge of the absorption trench in the expected direction of effluent flow. The minimum depth of sand underlying the trenches must be 0.9 m. The mantle extension shall be a minimum of 250 mm thick. The proposed leaching bed shall meet all clearance distances in accordance with Table 8.2.1.6.B of the Ontario Building Code.

According to the City of Hamilton Rural Official Plan requirements, a proposed severance property must be able to accommodate a primary and reserve septic bed envelope. Figure 1 shows the preliminary layout of the sewage system for the proposed development on Part 1, including area for a reserve bed.

## 4.2        Part 2

Similar design rationale and approach have applied to the proposed severance on Part 2. The proposed preliminary onsite sewage system will consist of a septic tank and a fill based absorption leaching bed, as shown on Figure 2.

The minimum size required for the septic tank at Part 2 is 8,600 L. At this time it is proposed to be located on the east side of the proposed dwelling and must meet all OBC clearance distances in accordance with Table 8.2.1.6.A. of the OBC.

A conventional fill based absorption trench leaching bed is proposed. Based on a design flow of 4,300 L/day, the minimum length requirement for the absorption trench is calculated as follows:

$$L = QT/200$$

Where:        L = the minimum required length of the absorption trench (m)  
                  Q = the daily sewage design flow (L/day)  
                  T is the percolation rate of the imported sand for raised leaching bed (min/cm)

Therefore, the minimum required length of distribution piping is 215 m. A pump will be required to dose the leaching bed in accordance with Sentence 8.6.1.3. of the OBC.

The calculation for loading area is as follows:

$$A = Q/LR$$

Where:        A = minimum contact area (m<sup>2</sup>)  
                  Q = the daily sewage design flow (L/day)  
                  LR is the loading rate (4 L/ m<sup>2</sup> per day)

Therefore, the minimum loading area required is 1,075 m<sup>2</sup>. We have identified a total sand area of 1,190 m<sup>2</sup> which includes sufficient area for side slopes as well as a minimum of 15 m mantle extension beyond the edge of the absorption trench in the expected direction of effluent flow. The minimum depth of sand underlying the trenches must be 0.9 m. The mantle extension shall be a minimum of 250 mm thick. The proposed leaching bed shall meet all clearance distances in accordance with Table 8.2.1.6.B of the Ontario Building Code.

Figure 2 shows the preliminary layout of the sewage system for the proposed development on Part 2, including the area for a reserve bed.

## 5.0 Summary

The proposed residential lots can be serviced with individual onsite sewage treatment and disposal systems in accordance with design and construction standards outlined in the Ontario Building Code. The sewage system for Part 1 would need to be rated for 1,900 L/day and the system for Part 2 would need to be rated for 4,300 L/day. Both sewage systems have been sized in accordance with current OBC requirements and provide the most conservative estimate of the footprint required. Should the proponent choose to include an advanced treatment system into the design of the sewage system, then the area required for the subsurface disposal system may be reduced by up to 50%, depending on the type of leaching bed utilized. Detailed sewage system design and grading plans should be provided in support of a building permit application.

We trust this is sufficient. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

**R.J. Burnside & Associates Limited**



Katherine Rentsch, P. Eng.  
Project Engineer  
KR:lm

Enclosure(s)      Sketch for Land Severance, A.T. McLaren Land Surveyor  
Figure 1 – Preliminary Site Servicing Plan for Part 1  
Figure 2 – Preliminary Site Servicing Plan for Part 2

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**SKETCH FOR LAND SEVERANCE**

OF PART OF

**LOT 7**

**CONCESSION 4**

GEOGRAPHIC

TOWNSHIP OF GLANBROOK

IN THE

**CITY OF HAMILTON**

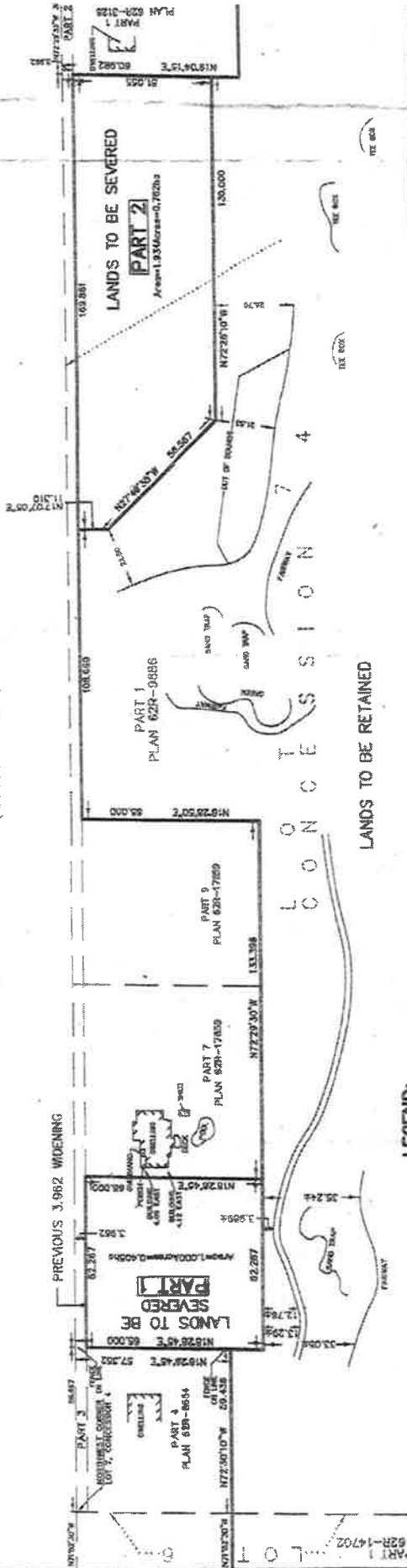
SCALE 1:1500 METRIC

30 15 0 30 60 90 metres

**S.D. McLaren, O.L.S. -- 2015**



**ENGLISH CHURCH ROAD**  
(GIVEN ROAD)



**METRIC NOTE**  
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

- LEGEND:**
- DISTRICTS
  - MONUMENT SET
  - MONUMENT FOUND
  - IRON BAR
  - STANDARD IRON BAR
  - STONED STANDARD IRON BAR
  - STONE MARKER
  - MEASURED
  - A.T. McLAREN, O.L.S.
  - D. J. PETER, O.L.S.
  - G. J. PETER, O.L.S.
  - MACKAY MACKAY & PETERS
  - WITNESS

**A.T. McLaren**  
LEGAL AND ENGINEERING  
89 JOHN STREET SOUTH, S  
HAMILTON, ONTARIO, L8N  
PHONE (905) 527-8559 FAX (905) 527-8558

From: 05      Checked: 05      Scale: 1:1500      D:  
DATE: MAY 1, 2015      S.D. McLAREN, O.L.S.



**LEGEND**

- PROPOSED DRILLED WELL WITH 15m SETBACK
- APPROXIMATE LOCATION OF EXISTING DRILLED WELL WITH 15m SETBACK
- APPROXIMATE SITE BOUNDARY (SURVEYED BY A.T. MCGLAREN LTD ON MAY 19 2005)
- PROPOSED LOT TO BE SEVERED (PART 1)
- PROPOSED RAISED LEACHING BED ENVELOPE (A=550 m<sup>2</sup>)
- PROPOSED ABSORPTION TRENCH (8 RUNS @ 12.5m EACH)
- RESERVE LEACHING BED ENVELOPE

 <b>BURNSIDE</b>		Figure Title <b>ONSITE SEWAGE PRELIMINARY SERVICING PLAN - PART 1 SITE AERIAL</b>	Figure No. <b>FIG1</b>
Client <b>GREENHORIZONS SOD FARMS</b>	Drawn KF Scale 1:750		



**LEGEND**

- PROPOSED DRILLED WELL WITH 15m SETBACK
- APPROXIMATE LOCATION OF EXISTING DRILLED WELL WITH 15m SETBACK
- APPROXIMATE SITE BOUNDARY (SURVEYED BY A.T. MCLAREN LTD ON MAY 19 2005)
- PROPOSED LOT TO BE SEVERED (PART 4&5)
- PROPOSED RAISED LEACHING BED ENVELOPE (A=1190 m<sup>2</sup>)
- PROPOSED ABSORPTION TRENCH (10 RUNS @ 25m EACH)
- RESERVE LEACHING BED ENVELOPE

**SCALE BAR**  
0 10 20 30 40 50 Meters

<p><b>BURNSIDE</b></p> <p>GREENHORIZONS SOD FARMS</p>	<p>Client</p>
	<p>Drawn</p> <p>KF</p> <p>Scale</p> <p>1:750</p>
<p>Figure Title</p> <p><b>ONSITE SEWAGE PRELIMINARY SERVING PLAN - PART 2</b></p> <p>SITE AERIAL</p>	<p>Checked</p> <p>KR</p>
	<p>Date</p> <p>01/12/2017</p> <p>Project No.</p> <p>40004002</p>
<p>Figure No.</p> <p><b>FIG2</b></p>	