

# Secondary Treated Effluent Treatment Field

## Trench Bottom Surface Area & Length Sizing

This design worksheet was developed by Alberta Municipal Affairs and Alberta Onsite Wastewater Management Association.

The complete system is to comply with Alberta Private Sewage Standard of Practice 2015

**This worksheet does NOT consider all of the requirements of the mandatory Standard**

**\*\*Use only Imperial units of measurement throughout (feet, inches, Imperial gallons, etc...)**

### Step 1) Determine the expected volume of sewage per day:

Note: Use Table 2.2.2.2.A. (p.23) & 2.2.2.2.B. (p.24) to determine expected volume of sewage per day. Provide allowance for additional flow factors as detailed in Table 2.2.2.3. (p.25)

Expected Peak Volume of Sewage  
per Day

Imp.gal/day

F1

Assess the initial sewage strength against the requirements of 2.2.2.1.(2) (p 21)  
Effluent quality must meet the requirement of Article 8.1.1.6(1)(b) [p. 77].

### Step 2) Determine the design soil effluent loading rate:

Soil Effluent Loading Rate  
[From <30 mg/L cBOD<sub>5</sub> column]

Soil Texture

&

Structure

&

Grade

=

Imp. gal/  
ft<sup>2</sup>./day

F2

If result is less than 0.2 Imp. Gal/ft<sup>2</sup>/day a treatment field cannot be installed. Article 8.2.1.13. (1) (p 85)

**Note:** Effluent loading rate MUST be determined from soil texture, structure, and grade classification according to Imperial Table A.1.E.1. (p.129).

**Note:** Ensure infiltration loading rate chosen does not exceed loading rates as set out in 8.1.2.2. (p. 81).

### Step 3) Determine Hydraulic Linear Loading Rate:

Use Table A.1.E.1. (p. 129)

Soil Texture

&

Structure

& Grade

& Slope

& Infiltration  
Depth

-

Imp. gal/ lineal  
ft./day

F3

**Note:** System Geometry and Linear Loading Rate Design Article 8.1.1.7. (p. 77)

### Step 4) Chamber Width Selected:

Actual Chamber Width in inches

inches

÷

inches/foot

=

feet

F4

Articles 8.3.1.3. & 8.3.1.4. (p.90)

**Step 5) Calculate optional loading rate factor for effluent soil loading rate:**

Chambers - Pressure Distribution 8.3.1.5. 1)c Page 90	Article	Effluent Loading Rate
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From F2

Loading Rate Factor  $\times$   = Effluent Loading Rate with Factor Applied  **F5**

Chambers - Pressure Distribution & Timed Dosing 8.3.1.5. 1)d Page 90	Article	Effluent Loading Rate
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From F2

Loading Rate Factor  $\times$   = Effluent Loading Rate with Factor Applied  **F5A**

\* If result is less then 0.2 gal/ft<sup>2</sup>/day a treatment field cannot be installed. Article 8.2.1.13. (1) Page 85

**Step 6) Determine minimum soil infiltration required:**

Expected Peak Volume of Sewage per Day  Imp.gal/day  $\div$  Effluent Loading Rate with Factor Applied  Imp.gal/ft<sup>2</sup>/day = Minimum Soil Infiltration Area Required  ft<sup>2</sup> **F6**  
 From F1  From F5 or 5A

**Step 7) Calculate Treatment Field Minimum Length required:**

Expected Peak Volume of Sewage per Day  Imp.gal/day  $\div$  Hydraulic Linear Loading Rate  Imp.gal/ft/day = Minimum Treatment Field System Length Required  Lineal Feet **F7**  
 From F1  From F3

\*Note System May be longer than calculated as this actually reduces the Hydraulic Linear Loading

**Step 8) Determine the total Trench Bottom length required:**

Minimum Soil Infiltration Area Required  ft<sup>2</sup>  $\div$  Actual Chamber Width  feet = Total Trench Bottom length Required  lineal feet **F8**  
 From F6  F4

**Step 9) Determine the number of lateral trenches required:**

Total Length of Trench Bottom Required  lineal feet  $\div$  Length Determined by Linear Loading  lineal feet = Number of Trenches Required  **F9**  
 From F8  F7  
 Article 8.2.1.12. (p.84)  \*Round down to whole number of trenches required

**Step 10) Determine the number of lateral trenches required:**

Total Length of Trench Bottom Required  lineal feet  $\div$  Number of Trenches  = Length of Each Lateral Trench  feet **F10**  
 From F8  F9  Equal to or greater than F7

\*System may be larger than required to accommodate linear loading rates and number of trenches required

**Step 11) Summary:**

<b>F1</b>	<input type="text"/>	Imp. gal/day	Peak Daily Flow, including allowance for any additional flow volumes
<b>F2</b>	<input type="text"/>	Imp. gal/ft <sup>2</sup> /day	Soil Effluent Loading Rate.
<b>F3</b>	<input type="text"/>	Imp. gal/ft/day	Hydraulic Linear Loading Rate
<b>F4</b>	<input type="text"/>	feet	Chamber Width
<b>F5 or F5A</b>	<input type="text"/>		Effluent Loading Rate with Factor Applied

F5 or F5A

Imp. gal/ft<sup>2</sup>/day

Effluent Loading Rate with Factor Applied

F6

ft<sup>2</sup>

Minimum Soil Infiltration Area Required

F7

feet

Minimum Treatment Field System Length

F8

feet

Total Trench Bottom Length Required

F9

Number of Lateral Trenches

F10

feet

Length of Each Lateral Trench