### Primary 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)

Assess the initial sewage strength against the requirements of 2.2.2.1.(1) (p.21)

**Note:** Effluent loading rate MUST be determined from soil texture, structure, and grade classification according to Imperial Table A.1.E.1. (p.129) (For metric measurement use Table 8.1.1.10 on Page 79)

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

<table>
<thead>
<tr>
<th>Texture</th>
<th>Structure</th>
<th>Grade</th>
<th>Soil Effluent Loading Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>[30 - 150 mg/L cBOD₅ column]</td>
</tr>
</tbody>
</table>

If result is less than 0.2 gal/ft²/day a treatment field cannot be used. Article 8.2.1.13. (1) Page 85

#### Step 3) Calculate optional credits for effluent loading rate:

Primary treated effluent requires a minimum 5 feet Vertical Separation below infiltration surface area. *Refer to Article 8.1.1.4. (1a) and 8.1.1.4. (1d) p. 75 & 76.*

Effluent loading rate factors cannot be taken for soils with textures Coarse Sand (COS), Medium Sand (MS), Loamy Coarse Sand (LCOS), Loamy Medium Sand (LMS) and Coarse Sandy Loam (COSL) or Medium Sandy Loam (MSL) having Prismatic, Blocky or Granular structure of Grade 2 or 3.

<table>
<thead>
<tr>
<th>Effluent Loading Rate with Factor Applied</th>
<th>Effluent Loading Rate</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe &amp; Rock Trench - Gravity Distribution</td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>OR</td>
<td>From F2</td>
<td></td>
</tr>
<tr>
<td>Pipe &amp; Rock - Pressure Distribution</td>
<td>X</td>
<td>1.2</td>
</tr>
<tr>
<td>OR</td>
<td>From F2</td>
<td></td>
</tr>
<tr>
<td>Chambers - Gravity Distribution¹</td>
<td>X</td>
<td>1.1</td>
</tr>
<tr>
<td>OR</td>
<td>From F2</td>
<td></td>
</tr>
<tr>
<td>Chambers - Pressure Distribution¹</td>
<td>X</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*See Article 8.2.1.8.1) regarding calculation of trench bottom using gravel. Page 84 AB SOP 2015. See Article 8.3.1.5.(1) regarding calculation of trench bottom area using chambers. Page 90 AB SOP 2015***

Note: Ensure infiltration loading rate chosen does not exceed loading rates as set out in 8.1.2.2. (p. 81).
Step 4) Calculate the minimum required infiltration surface area for the soil using adjusted effluent loading rates:

\[
\text{Expected Peak Volume of Sewage per day} \div \text{Effluent Loading Rate with Factor Applied} = \text{Minimum Soil Infiltration Area Required}
\]

\[
\text{Imp. gal/day} \quad \text{Imp. gal/ft}^2/\text{day} \quad \text{ft}^2
\]

From F1

From F3, F3A, F3B or F3C

Step 5) Type and width of trench bottom used:

\[
\frac{\text{Actual Pipe & Rock Trench Width in inches}}{12} = \text{feet}
\]

\[
\frac{\text{Actual Chamber Width in inches}}{12} = \text{feet}
\]

Note: Chamber width is calculated using the exterior width at the base of the chamber. (Article 8.3.1.4, p. 90)

Step 6) Determine total weeping lateral trench length required:

\[
\frac{\text{Infiltration Area Required ft}^2}{\text{Width of Trench ft}} = \text{Minimum Weeping Lateral Trench Length Required ft}
\]

From F4

From F5 or F5A

Step 7) Select number of weeping lateral trenches and determine length of each of trench:

\[
\frac{\text{Minimum Weeping Lateral Trench Length Required ft}}{\text{Number of Weeping Lateral Trenches Required}} = \text{Minimum Length of Each Weeping Lateral Trench ft}
\]

From F6

F7

See Note Below²

² Refer to Article 8.2.1.12. (p.84) Treatment Field Layout with regards to Linear Loading and potential for groundwater mounding

Step 8) Summary:

| F1 | Imp gal/day - Peak Daily Flow, including any additional fixtures. |
| F2 | Imp gal/ft²/day - Soil Effluent Loading Rate. |
| F3 - F3C | Imp gal/ft²/day - Effluent Loading Rate with Factor Applied |
| F4 | Ft² - Minimum Soil Infiltration Area Required |
| F5 or F5A | Ft - Actual Width of Gravel Trench or Chambers. |
| F6 | Ft - MINIMUM Weeping Lateral Trench Length Required. |
| F7 | Total Number of Weeping Lateral Trenches. |
| F8 | Ft - Length of Each Weeping Lateral Trench. |