# Open Discharge
# Design Considerations & Details

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Permit Number: **PRPSW** Roll Number:

The following information is to **accompany** the **Private Sewage Disposal Permit Application** for an **Open (Surface) Discharge.**

## Required Information:

- ☐ **Private Sewage Disposal Permit Application** - Completed (please put N/A in spaces which are not applicable).
- ☐ **Signature of Applicant on Permit Applicant Declaration**
- ☐ **Open Discharge Design Considerations & Details** - This form Completed.
- ☐ **Site Evaluation Diagram - *Appendix A*** - Attach a *detailed* site diagram including the system location in relation to buildings, distance to water supply and /or surface water bodies, and other pertinent information *(as per Part 7 of the Private Sewage Standard of Practice 2009)* .
- ☐ **Soil Log Report from *one (1) test pit and basement excavation OR two (2)* test pits with Soil Analysis Report** - ***Appendix B*** - Completed.
- ☐ **Specifications for System Components -** Attached for Initial Treatment Component Design Details, including Septic Tank, Dose Tank, Effluent Pump.
- ☐ **Detailed System Schematics and Drawings** - Attached
- ☐ **Any other qualifications of limitations that in your opinion as the designer/installer are needed.**

**The sewage system includes a septic tank and open discharge system. This system is suitable for the site and soil conditions of this property. The design reflected in the following applies, and meets, the requirements of the current Alberta Private Sewage Systems Standard of Practice (Standard) to achieve effective treatment of the wastewater from this residence.**

This sewage system serves a _____ (# of) bedroom single family dwelling. Based on the characteristics of the home identified during our review, the total peak wastewater flow that must be used for this design is _____ Imp. Gallons per day. Although peak flow used in the design is _____ Imp. Gallons per day, an average operating flow of _____ Imp. Gallons per day is expected.

## Wastewater Characteristics:

Wastewater Peak Flow:

- The development served is a _____ (# of) bedroom single family dwelling.
- Fixture Unit Loads **(please check all that apply)**:

- ☐ Main Bathroom = 6 fixture units
- ☐ Ensuite with Shower = 6 fixture units
- ☐ Kitchen Sink = 1.5 fixture units
- ☐ Laundry Stand Pipe = 1.5 fixture units
- ☐ Bathroom in Basement = 6 fixture units
- ☐ High-volume plumbing fixtures were identified in the review of this development **(examples: garburator, soaker tubs)**. ***Please include total volume used by these fixtures in the calculation of flow, as per Table 2.2.2.3 of Alberta Private Sewage Systems Standard of Practice 2009.***
- ☐ No high-volume plumbing fixtures were identified in the review of this development **(examples: garburator, soaker tubs)**.

- Total plumbing fixture unit load in this residence: _____ (based on review of the building)
- Based on the total plumbing fixtures, _____ Imp. Gallons per day is required to be added to the base peak daily flow.
- *Note: When the combined total of fixture units exceeds 20 in an occupancy unit, add 50L for each fixture unit over 20* ***(as per Table 2.2.2.2.A. of the Alberta Private Sewage System Standard of Practice 2009)***

Summary:

| | | |
|---|---|---|
| Total peak daily flow used in the design is: | _____ | Imp. Gal/day |
| Base Flow: | _____ | Imp. Gal |
| Additional Flow: | _____ | Imp. Gal |

Wastewater Strength:

- ☐ Characteristics of the development were considered to assess sewage strength. **No garbage grinders or other characteristics** were identified that would cause typical wastewater strength to be exceeded.
- ☐ The Required wastewater strength for the design is:
  - BOD 220 mg/L
  - TSS 220 mg/L
  - Oil and Grease 50mg/L

Wastewater Flow Variation Considerations:

- ☐ The characteristics of this development indicate wastewater flow volumes will not vary substantially during the day, or from day to day. No flow variation management is needed.

**Site Evaluation Findings:**

Site Evaluation Diagram:

- Lot area: _____ ac / Ha

☐ The dimensions of the property are shown in the **Site Evaluation Diagram**, attached in ***Appendix A*** .

☐ The site evaluation assessed the area within a **100m (330ft) radius** of all components of the system design. The design conforms to all distances set out in the Standard of Practice (SOP), including the distances to adjacent property features.

☐ The proposed site has been reviewed as to consider the restrictions set out in Section 8.6.2.2 for prohibited open discharge installations. It has been confirmed that the number of subdivided parcels does not exceed 4, excluding the remnant parcel, as set out in the SOP.

☐ The property slopes _____ % in which direction from the Open Discharge? _____

**OR** ☐ The property is flat.

☐ Line locates confirmed there are existing utilities in along the _____ property line and an easement is in place.

☐ Water courses or other setback constraints were noted on the **Site Evaluation Diagram, *Appendix A*** . Please describe where:

_____

_____

_____

_____

☐ Pertinent features identified during the site review and required setback distances are noted on the **Site Evaluation Diagram, *Appendix A*** .

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Soil Evaluation:

☐ **One (1)** soil excavation and the **excavation for the basement** was investigated on this site. The excavation for the basement serves as the second soil profile investigated as it showed **little variability to Test Pit 1**, and as such is suitable for design purposes..

☐ Test Pit 1 is located at the proposed location of the open discharge outlet and soil profile descriptions are attached. **(See attached soil log, *Appendix B)***

**OR** ☐ **Two (2)** soil excavations have been investigated on this site. **(Required with variability between test pits, for example area with large amounts of sand)**

☐ Test Pit 1 is located at the proposed location of the open discharge outlet and soil profile descriptions are attached. **(See attached soil log, *Appendix B)***

☐ The location(s) of the Test Pits are shown on the **Site Evaluation Diagram, *Appendix A.***

☐ The area selected for the system **must be kept clear** of any utilities to be installed and **no** disturbance of the soil on that area can occur.

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Key Soil Characteristics:

Design Soil Conditions:

☐ **Redoximorphic** features (mottling/gleying) that indicate saturated soil are **not** present to a depth of **6 feet** below the surface.

- To a depth of **5 feet** the dominant soil is: _____
  with a blocky grade _____ structure.

Limiting Soil Condition:

☐ No limiting condition encountered.

☐ Yes, limiting condition encountered at a depth of _____

**Initial Treatment Component Design Details:**

☐ Details of the initial treatment components required for this design are attached.

Septic Tank:

- The working capacity of the septic tank specified for this design is _____ Imp. Gal.
- Tank Model Number: _____

☐ Specifications for the Model of Septic Tank used are attached.

- The minimum working capacity required for this development is _____ Imp. Gallons based on Table 4.2.2.2 of SOP 2009 for a _____ bedroom house **(**_____ **Imp. Gal/day plus the additional flow of** _____**Imp. Gal,** ***as summarized above under Wastewater Characteristics*** **).**

- Burial depth of the septic tank at finished grading will be _____ inches above the top of the tank.
- This tank is rated for a maximum burial depth of : _____
- Insulation of the tank required?

  ☐ Yes - _____

  ☐ No

Dose Tank:

- The dose chamber is integral to the septic tank. It has a total capacity of _____ Imp. Gal. This is sufficient capacity to deliver the _____ Imp. Gal required for each dose of effluent. It also provides _____ Imp. Gal emergency storage above the high effluent alarm setting **(a minimum of one (1) day emergency supply is required)**.

☐ Specifications for the Dose Tank are attached.

High Liquid Level Alarm:

- Alarm Model Number: _____
- The alarm is set to activate_____ inches above the floor of the dose tank.

Effluent Filter:

- Filter Model Number: _____
- Filter diameter: _____ inches

☐ The Filter creates a head loss of 0.5 feet at its rated flow of 80 Imp. Gal/min. A 5.5 foot pressure head allowance has been included in the pump selection to allow for partially clogged conditions.

☐ A one year service interval is expected with typical flow volumes and wastewater characteristics.

**Effluent Discharge Pipe Design Detail:**

Effluent Discharge Pipe:

☐ The open discharge delivery pressure piping design calculations are provided in detail in, and attached.

☐ The open discharge system schematic drawing is attached.

Pressure Head Loss Due to Friction:

- The friction loss through the _____ feet of piping and filter at the flow of _____Imp. Gal/min is _____ feet of head pressure.

Pressure Head to Meet Vertical Lift Requirements Included:

- The lift distance of effluent from the low effluent level in the tank to the end of the open discharge pipe is _____ feet.
- The design pressure head at the end of the open discharge pipe is _____ feet.
- The vertical lift and friction loss results in a **total pressure head** requirement of _____

Pump Specifications:

- Demand for this pressure effluent line are _____ Gal/min at _____ of pressure head.
- Effluent Pump Model specified for this system: _____
- Horsepower of Effluent Pump: _____

☐ The pump specifications with the effluent distribution system demands plotted on the pump curve are attached.

- The volume of effluent discharge in a single dose event will be approximately 20% of the peak flow which is _____ gallons.
- The liquid volume of _____ feet of _____ inch diameter polyethylene pipe = gallons.
- Therefore, for _____ feet of pipe, the volume is _____ gallons.
- The total dose volume between on and off float settings is_____ gallons.

Summary:

The **total individual dose volume** determining float settings is _____ **Imp. Gal in order to deliver** _____ **gallons per dose** to the end of the open discharge pipe.

Effluent Level Float Control Settings:

- The dose tank dimensions result in _____ gallons per inch of depth.
- The float control elevations shall be set at:
  - _____ inches between float off and on elevations.
  - Off: _____ inches off floor of dose tank.
  - On: _____ inches off floor of dose tank.
  - The alarm is set at _____ inches above pump on elevation.

☐ Redundant off float control is not required by this design.
☐ No manual pump on switch is included in the system.
☐ **The effluent level control floats will be attached to a 1 inch PVC pipe independent float mast that will withstand the dose tank environment.**

Effluent Quality Sampling:

☐ Effluent samples can be taken from the effluent dose tank if required.

**Initial Operational Setup Parameters:**

The following activities need to be conducted to commission the system:

☐ Clean the septic tank of any construction debris and flush effluent delivery line.
☐ Confirm the residual 2 foot head is achieved and the discharge is effectively controlled and directed to prevent erosion.
☐ Confirm float levels are set to deliver the dose volume required by this design.

**Operation and Maintenance Manual:**

☐ The Owner's Manual detailing the design, operation, and maintenance of the installed system will be provided to the owner in accordance with **Article 2.1.2.8.** of the **Standard of Practice**.

**Signature and Closing by the Designer/Installer:**

This design has been developed by _____. This design meets the requirements of the **Alberta Private Sewage System Standard of Practice 2009** unless specifically noted otherwise and in such case special approval is to be obtained prior to proceeding with installation of this design.

Signature of Designer/Installer: _____

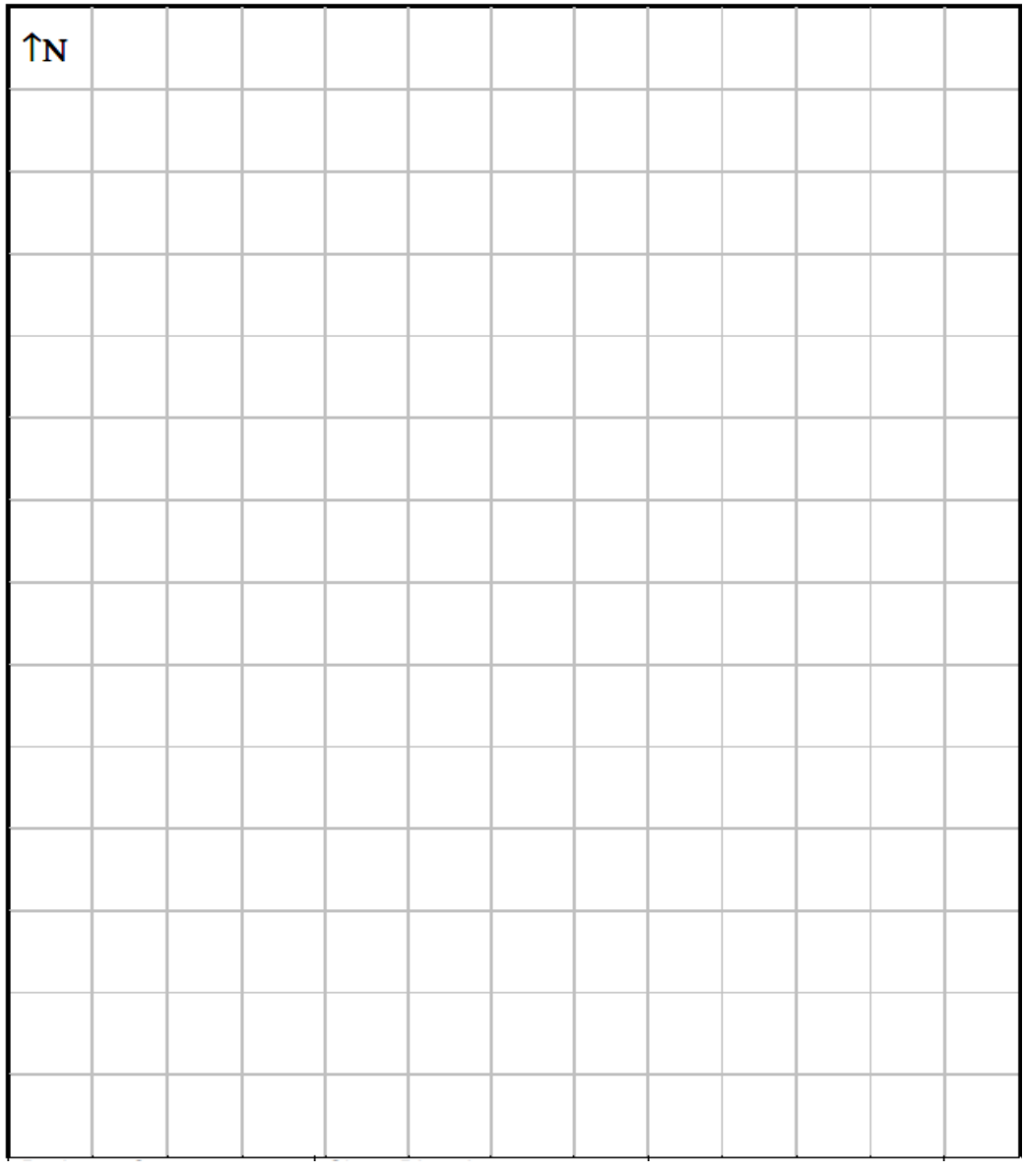
# Open Discharge

Permit Number: **PRPSW** Roll Number:

## Appendix A - Site Evaluation Diagram:

Please show the proposed location of the onsite sewage system and indicate the distances from the following:

| | | | |
|---|---|---|---|
| Trees | Bedrock | Driveways | Easement Lines |
| Floodplains | Outcrops | Existing Sewage Systems | Ditches or Interceptors |
| Wells | Buildings | Underground Utilities | Banks or Steep Slopes |
| Waste Sources | Property Lines | Soil Test Pits | Fills |




**Please indicate:**

| Drainage Course | Slope Direction | Test Pit 1 | Test Pit 2 |
|---|---|---|---|
| | | Test Pit 1 ☐ | Test Pit 2 ☐ |

# Open Discharge

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## Appendix B - Soil Log Report: Test Pit 1

**Alberta Private Sewage Treatment System Soil Profile Log Form**

Owner Name or Job ID.

| Legal Land Location | | | | | | | Test Pit GPS Coordinates | |
|---|---|---|---|---|---|---|---|---|
| LSD-1/4 | Sec | Twp | Rg | Mer | Lot | Block | Plan | Easting | Northing |
| | | | | | | | | | |

Vegetation notes:

Overall site slope %

Slope position of test pit:

| Test hole No. | Soil Subgroup | | | Parent Material | | Drainage | | Depth of Lab sample #1 | | | Depth of Lab sample #2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori-zon | Depth (cm) (in) | Texture | Lab or HT | Colour | Gleying | Mottling | Structure | Grade | Consistence | Moisture | % Coarse Fragments |
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|---|---|---|
| Depth to Groundwater | | Restricting Soil Layer Characteristic |
| Depth to Seasonally Saturated Soil | | Depth to restrictive Soil Layer |
| Site Topography | | Depth to Highly Permeable Layer Limiting Design |
| **Key Soil Characteristics applied to system design effluent loading** | | |

Weather Condition notes:

Comments: such as root depth and abundance or other pertinent observations:

# Open Discharge

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## Appendix B - Soil Log Report: Test Pit 2

**Alberta Private Sewage Treatment System Soil Profile Log Form**

Owner Name or Job ID.

| Legal Land Location | | | | | | Test Pit GPS Coordinates | |
|---|---|---|---|---|---|---|---|
| LSD-1/4 | Sec | Twp | Rg | Mer | Lot | Block | Plan | Easting | Northing |
| | | | | | | | | | |

Vegetation notes:

Overall site slope %

Slope position of test pit:

| Test hole No. | Soil Subgroup | Parent Material | Drainage | Depth of Lab sample #1 | Depth of Lab sample #2 |
|---|---|---|---|---|---|
| | | | | | |

| Hori-zon | Depth (cm) (in) | Texture | Lab or HT | Colour | Gleying | Mottling | Structure | Grade | Consistence | Moisture | % Coarse Fragments |
|---|---|---|---|---|---|---|---|---|---|---|---|
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|---|---|---|
| Depth to Groundwater | | Restricting Soil Layer Characteristic |
| Depth to Seasonally Saturated Soil | | Depth to restrictive Soil Layer |
| Site Topography | | Depth to Highly Permeable Layer Limiting Design |
| **Key Soil Characteristics applied to system design effluent loading** | | |

Weather Condition notes:

Comments: such as root depth and abundance or other pertinent observations: