Onsite Wastewater Management Systems

Manitoba Conservation maintains responsibility for the provincial regulations respecting onsite wastewater management systems under the *Onsite Wastewater Management Systems Regulation* M.R. 83/2003 of *The Environment Act*. This brochure will provide you with general information on the provincial requirements for installing and maintaining an onsite wastewater management system with a combined sewage or greywater flow of less than 10,000L (2,200 gallons) per day. Please note that distances cited are the minimum distances and site specific factors may influence them.

Municipalities may have bylaws which further restrict what can be installed in specific areas of the province, so check with your local municipality.

The safe disposal of all human and domestic wastewater is necessary to protect the health of the individual family, the community and the environment.

An onsite wastewater management system may consist of a holding system, a treatment and disposal system or a combination of these for any domestic wastewater (sewage and/or greywater). Each installation should be specifically designed for the premises to be served.

For more information, contact the Environment Officer serving your area.

---

**Site Evaluation**

A good site evaluation is the foundation for ensuring that the right wastewater treatment system is installed on the property. The site evaluation involves a number of activities that provide the minimum necessary information required by the installer to select and design the appropriate system from a wide range of design options. A good site evaluation should include the following actions:

- Evaluating soil conditions through conducting soils analysis and/or soil percolation tests and in some cases, digging a test hole at one or more locations on the property.
- Determining the best location of the system relative to:
  - required setbacks,
  - physical characteristics of the property (type of vegetation, topography, soil structure, existing buildings or other facilities),
  - adjoining properties,
  - zoning requirements, easements and existing caveats,
- Determining the proposed depth of the system through consideration of water table or bedrock depth or other limiting factors.
- Other considerations that may be site specific.

**Registration**

Prior to installation of, or repair to, an onsite wastewater management system (OWMS) you and/or your OWMS installer must complete a registration form. The form is in triplicate and must be submitted in full to your local Manitoba Conservation office, together with a site plan, the appropriate payment and any additional information that may be required.

**Authorization to Cover**

Once a system has been registered and you or your installer has received approval from your local Environment Officer you may proceed with construction. However, you or the installer must notify the local Environment Officer when construction on the system is to occur so that a time for inspection can be arranged. You should provide at least 48 hours notice to the Environment Officer to eliminate any delay in completing the installation. Once the work has been completed the Environment Officer will forward you a copy of the registration, which you should retain for your records.

*No person shall install, repair or cover an onsite wastewater management system without authorization from an Environment Officer.*
Various Onsite Wastewater Management Systems

Most onsite wastewater management systems consist of two parts;

1) A two chambered septic tank with:
   a) a sedimentation chamber for digestion and
   b) a control chamber for discharge.

2) A disposal area to which the effluent from the tank is discharged.

SEPTIC TANKS

All septic tanks must:
- be watertight
- have at least two compartments
- be constructed of concrete, fiberglass, polyethylene (or other approved material)
- have a covered, watertight, perpendicular access shaft extending above the ground surface
- have a child-resistant cover
- be CSA approved if prefabricated

The first and larger chamber of the septic tank, called the sedimentation chamber, is designed to allow the solids in the wastewater to settle to the bottom of the tank and be broken down in a process called digestion. This chamber must have a minimum size of the greater of 140% of the total daily sewage flow or 2,250L (500 gal).

The second chamber of the tank is called the control chamber. When spillover from the sedimentation chamber into the control chamber reaches a predetermined volume, the contents are abruptly pumped or discharged to the disposal field. The rapid discharge of the effluent ensures distribution over the entire disposal area. This chamber must have a minimum size of the greater of 20% of the total daily sewage flow or 340L (75 gal). (Fig. 1)

Septic Tank Location

<table>
<thead>
<tr>
<th>The septic tank must be at least:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1m (3.25’) from the building</td>
</tr>
<tr>
<td>3m (10’) from any property boundary</td>
</tr>
<tr>
<td>8m (26’) from any well</td>
</tr>
<tr>
<td>15m (50’) from a watercourse, excluding a ditch</td>
</tr>
<tr>
<td>8m (26’) from a cut or embankment</td>
</tr>
<tr>
<td>3m (10’) from a swimming pool</td>
</tr>
<tr>
<td>3m (10’) from a cistern</td>
</tr>
</tbody>
</table>

NB. In addition to the minimum set back requirements it is recommended that the tank be located to minimize access problems, to facilitate maintenance and pump-outs.

Fig. 1: Septic Tank
Septic Tank Maintenance

The septic tank is designed to dispose of all wastewater from the home; however there are some points to keep in mind to reduce potential problems.

- Wise water management is necessary. All OWMS systems have limitations and water conservation should be practiced.
- Do not discharge water from weeping tiles and water conditioners into the disposal system. The additional water may overtax the system.
- Do not use excessive quantities of bleaching and cleaning compounds. These may reduce the effectiveness of the digestion chamber by destroying bacteria.
- Inspect and have the tank pumped out regularly. Unless absolutely necessary, do not clean the tank during the winter months.
- If a pump is used to discharge wastewater effluent from the septic tank into the disposal field, you may want to install a filter to protect and extend the lifespan of the pump and/or field.

Disposal Fields

The disposal field handles the effluent from the septic tank. The effluent is naturally filtered through the soil where a lot of impurities are removed as it percolates down through the soil. Proper location, construction and maintenance of the disposal field is imperative as this is the final location of the effluent once discharged from the septic tank. The disposal field must not be located in a low area of your property and needs to have positive drainage so that spring runoff and rainwater do not collect in that area.

Two types of traditional subsurface disposal fields that are in general use are; the trench and the total area field, with variations and combinations to accommodate a wide variety of situations. Each of the traditional subsurface disposal field types are outlined briefly following, but first it is important to note that in heavy clay type soils (depending upon the soil analysis and/or the percolation rate) and in coarse sandy soils, traditional subsurface disposal fields can not be installed. In heavy clays there will be insufficient infiltration and percolation occurring while in certain coarse sandy soils the infiltration and percolation rate may be too fast and groundwater may be impacted. In certain "sensitive areas" neither type of field is permitted.

Check with your installer or environment officer for options on alternative systems that may be suitable for your soil type.

Soil Types

To determine whether a disposal field is permitted on your land, and if so what type and size it needs to be, soil testing is required. Before approving a registration for an onsite wastewater management system Manitoba Conservation requires, at minimum, a soils analysis (particle size analysis ASTM D422-63(2002)). A soils analysis will provide information on the soil composition. Environment officers may request other test methods that could include percolation test, test pits, etc. This will assist in providing detailed soil composition and evaluation for an onsite wastewater management system.

Soil Analysis and/or Percolation Test

The purpose of the soil analysis and/or percolation test is to provide an indication of the ability of the soil to accept the wastewater as disposal fields rely both on evapotranspiration and percolation to work. There are a number of people you can contact to perform a soil analysis and/or percolation test including the installers in your region and various engineering consultants. Details on the standards for conducting a percolation test are located in Schedule D of M.R. 83/2003.

To install a traditional subsurface total area field the soil analysis application rate must be between 0.60igpd/sf and 0.26 igpd/sf or a percolation rate between 11 minutes/inch and 60 minutes/inch. To install a traditional trench style field the soil analysis application rate must be between 0.60igpd/sf and 0.18igpd/sf or a percolation rate between 11 minutes/inch and 80 minutes/inch.

If the soil analysis application rate or the percolation rate is greater than or less than the above ranges, then alternative options will need to be investigated.

For alternative systems contact your OWMS installer or Environment Officer.

For more information on soil analysis and percolation tests contact your Environment Officer.

Sensitive Areas

Under Schedule H of M.R. 83/2003 certain lands have been designated as sensitive areas. On these lands no person shall construct, install or modify an onsite wastewater management system or have, use or permit the use of a disposal field or sewage ejector system, except where approved by an Environment Officer or the director.
Traditional Trench Disposal Field

This type of disposal field is constructed of trenches with a depth of 60cm – 1m (2-3.25') and trench width of 60cm – 1m (2-3.25'). The excavation is then filled with graded stone to a level of at least 30cm (12”). The perforated pipe is laid out in the trenches and covered by 10-15cm (4-6”) of graded stone. The surface shall be covered with a layer of geotextile fabric (or other approved material) to prevent soil infiltration. Or pre-constructed chambers may be used. The entire surface area is covered by top soil. The top should be sloped to achieve positive drainage and seeded to grass. (Fig. 2)

The minimum length of trenching required is dependent upon a number of factors: soil type; number of bedrooms in the dwelling; where stone is used, width of trench and depth of stone; and, where chambers are used, type and size of chamber.

Traditional Subsurface Total Area Disposal Field

This type of disposal field is constructed by digging a shallow excavation to a maximum of 1m (3.25') deep. The excavation is then filled with at least 60cm (24”) of graded stone. The perforated pipe is laid out from a central distribution box, most often in a pattern like the spokes of a wheel. The pipes are then covered by another 10-15cm (4-6”) of graded stone. The surface shall be covered with a layer of geotextile fabric (or other approved material) to prevent soil infiltration. Finally the entire surface is covered by a maximum of 30cm (12”) of topsoil. The topsoil should be sloped to achieve positive drainage, and seeded to grass. (Fig. 3)

The area of the field required depends upon the soil type or percolation rate and the number of bedrooms in the dwelling the system is to service.

Disposal Field Location

<table>
<thead>
<tr>
<th>The disposal field must be at least:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6m (20’) from</td>
<td>a dwelling without a basement</td>
</tr>
<tr>
<td>11m (36’) from</td>
<td>a dwelling with a basement</td>
</tr>
<tr>
<td>30m (100’) from</td>
<td>a water course, excluding a ditch</td>
</tr>
<tr>
<td>15m (50’) from</td>
<td>a cut or embankment</td>
</tr>
<tr>
<td>8m (26’) from</td>
<td>a swimming pool</td>
</tr>
<tr>
<td>8m (26’) from</td>
<td>water service pipes</td>
</tr>
<tr>
<td>15m (50’) from</td>
<td>a well (drilled and cased to a minimum of 6m (20’) below ground)</td>
</tr>
<tr>
<td>30m (100’) from</td>
<td>other wells and springs</td>
</tr>
<tr>
<td>8m (26’) from</td>
<td>property boundaries</td>
</tr>
</tbody>
</table>

Disposal Field Maintenance

Some things to keep in mind for improved operation of your septic field:

- Keep all traffic off the disposal field.
- Insulate the tank, field and lines with a blanket of straw about 30 cm (12”) deep, especially in the first winter of operation.
- Remove large deciduous trees near the field as their roots may block proper drainage.
- Investigate any signs of saturation or leakage and reduce water usage to allow the field to dry out.

Remember: It is an offence to discharge sewage, greywater or wastewater effluent into or onto the ground except in compliance with M.R. 83/2003. If your disposal field is failing you should take immediate action to remediate the problem.
Other Onsite Wastewater Management Systems

Sewage Ejector Systems

The sewage ejector system consists of a septic tank and pump, underground piping to the disposal area and an aboveground discharge point. The wastewater effluent is discharged onto the ground surface and percolates into the ground, with some evapotranspiration.

A sewage ejector may be installed when:
- all wastewater effluent will be maintained within the property and not run into any watercourses; and
- it is not connected to more than one single family dwelling; and
- it is sited on at least 4ha (10 acres).

In some instances a soil analysis and/or percolation test may be required.

<table>
<thead>
<tr>
<th>The discharge point must be at least:</th>
<th>any occupied building</th>
</tr>
</thead>
<tbody>
<tr>
<td>60m (200') from</td>
<td>any water course</td>
</tr>
<tr>
<td>60m (200') from</td>
<td>a cut or embankment</td>
</tr>
<tr>
<td>60m (200') from</td>
<td>a market garden</td>
</tr>
<tr>
<td>60m (200') from</td>
<td>a well</td>
</tr>
<tr>
<td>60m (200') from</td>
<td>a property boundary</td>
</tr>
<tr>
<td>460m (1500') from</td>
<td>the boundary of a city, town, village or hamlet</td>
</tr>
</tbody>
</table>

Other Considerations

- The area around the discharge point should be shallowly excavated and filled with graded stone to facilitate drainage of the wastewater effluent.
- The area around the discharge point should be fenced to exclude children, pets and livestock.
- The existence of a sewage ejector on a property could affect future subdivision of that property.

Privies (Outside Toilets)

Privies are normally installed in remote areas or where regular septic services are not readily available. Three types of privies are recognized by the regulation, those being "pit type" which is a hole dug into the ground, "vault type" which has a sealed tank under the unit and is pumped out by a sewage hauling service and "pail type" which has the sewage collected in a small pail and must be emptied on a regular basis. In some municipal jurisdictions privies are not permitted to be installed or used.

To have, install, use or permit the use of a pit privy it must be at least:

<table>
<thead>
<tr>
<th>Distance from</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6m (20')</td>
<td>any habitable building</td>
</tr>
<tr>
<td>15m (50')</td>
<td>a drilled well with casing to a depth of not less than 6m (20')</td>
</tr>
<tr>
<td>30m (100')</td>
<td>other wells and springs</td>
</tr>
<tr>
<td>30m (100')</td>
<td>the normal high-water level of a watercourse</td>
</tr>
<tr>
<td>3m (10')</td>
<td>a property boundary</td>
</tr>
</tbody>
</table>

In an area where the soil depth, measured from the bottom of the pit is at least 1m (3.25') from the bottom of the pit to bedrock or normal high water table.
Holding Tanks

Holding tanks are commonly used for sewage or greywater collection at cottages and in areas where septic fields are not permitted or cannot be properly installed or function. Holding tanks are generally one compartment tanks, which must be pumped out on a regular basis.

A holding tank must be watertight, be constructed of concrete, fiberglass, polyethylene or other approved material, have a covered, watertight, perpendicular access shaft which extends above ground surface, have a child resistant cover and must bear a CSA stamp.

The minimum capacity of a holding tank used in conjunction with a normal water closet is 4,500L (1,000 gal).

Holding tanks must be installed using the same minimum setback requirements as septic tanks, however since these tanks will require frequent pump-out the tank should be located so as to make truck access as easy as possible. A holding tank may not be installed in areas where a pump out service is not available, or facilities for final disposal of the wastewater are not provided.

Greywater Disposal

Greywater is all domestic wastewater from a dwelling and includes bathing, laundering, or food preparation activities and specifically excludes sewage or septage.

A greywater field can be constructed in conjunction with the use of a holding tank providing that all the soil conditions and setback requirements can be met. The disposal field location setback distances listed on page 4 apply. The holding tank is used for the collection of the sewage and the greywater field is used to dispose of the greywater. When disposing of greywater from a permanent home it may be necessary in certain instances to install a septic tank to intercept solids and provide limited primary treatment to prevent clogging of the field. In some cases a greywater treatment tank (340L/75 gal) may be of sufficient size to provide adequate pre-treatment. The type of tank installed will be dependent upon the volume of wastewater generated and whether the dwelling is used seasonally or permanently.

A greywater field must be constructed to the same design criteria and to at least 75% of the size of a standard disposal field for that location.

Greywater Pits

Grey water pits are only permitted where a building is not serviced by water under pressure. A greywater pit is nothing more than a covered hole in the ground filled with stone. It is used to collect small amounts of greywater and disperse it into the surrounding soil.

Greywater pits should not be:
- under the building;
- closer than 15m (50') to a drilled water well equipped with a casing to a depth of not less than 6m (20') below ground level;
- closer than 30m (100') to a spring or water well;
- closer than 30m (100') to the normal high water level of a watercourse;
- unless otherwise approved, closer than 3m (10') to any property boundary; or in an area where the soil depth, measured from the bottom of the pit is less than 1m (3.25') from the bottom of the pit to bedrock or normal high water table.

Systems not described by the Regulation

There are a number of OWMS not described by the current regulation. Other methods include composting, use of media such as peat moss to filter sewage and aeration tanks. For alternative methods a variance may be required prior to installation. Should you wish to install such a system talk to your local Environment Officer to learn more about what types of systems are approved for use.