Septic System Information, Operation & Management Pamphlet for Homeowners

PIERCE COUNTY, WISCONSIN

Department of Land Management & Records
414 W. Main St.
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Ellsworth, WI 54011

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Office Hours: 8 AM to 5 PM Monday—Friday

To promote and protect public health, safety, aesthetics, and other aspects of general welfare.

Private Onsite Wastewater Treatment System (POWTS)

Installing Plumber/POWTS Maintainer:
Name:_____
Address:_____
_____
Phone:_____
Installation Date:_____

START UP & OPERATION

For new construction, prior to system use, check treatment tank(s) for the presence of painting products or other chemicals that may impede the treatment process and/or damage the drainfield. If high concentrations are detected, have the contents of the tank(s) removed by a septage servicing operator (pumper) prior to use. System start up shall not occur when soil conditions are frozen at infiltration surface.

SYSTEM SPECIFICATIONS

Septic Tank Capacity	gallons
Septic Tank Manufacturer	
Effluent Filter Manufacturer	
Effluent Filter Model #	
Pump Tank Capacity	gallons
Pump Tank Manufacturer	
Pump Manufacturer	
Pump Model #	
Dispersal Cell(s): □ In-ground (gravity) □ In-ground (pressurized) □ At-grade □ Mound □ Other:	
Dispersal cells (Sq. Ft.):	
Cell Dimensions:	
Number of vents/observation tubes:	

SEPTAGE SERVICING OPERATOR (PUMPER)

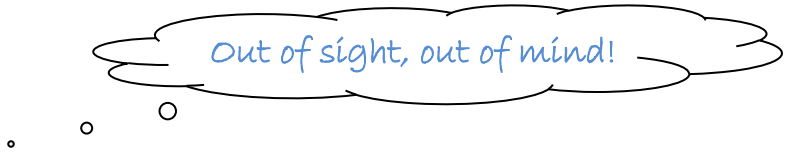
Name:_____
Phone:_____

LOCAL REGULATORY AUTHORITY

PIERCE COUNTY, WISCONSIN
Department of Land Management & Records
414 W. Main St. PO Box 647, Ellsworth, WI 54011
Zoning Office: 715-273-6747

SYSTEM PLOT PLAN:

Call your plumber or local regulatory authority to get a copy of your septic system plot plan and keep a copy inside this packet.



Is this the way you look at your septic system? But there is more…

Wastewater Recycling System

The septic system is really a wastewater recycling system that utilizes the natural soil to treat the wastewater before returning it to the groundwater. What happens when you flush the toilet?

A septic tank is typically the first component of a septic system. A system can be as simple as a septic tank with an efficient filter screen and drainfield or include any number of add-ons, such as an aeration tank, sand filter, pump/siphon chamber or sand mound.

No one should enter a septic or other treatment or holding tank for any reason without being in full compliance with the Occupational Safety & Health Administration (OSHA) standards for entering a confined space. The atmosphere within the septic or other treatment of holding tank may contain lethal gasses, and rescue of a person from the interior of the tank may be difficult or impossible.

A septic tank looks like the illustration in Figure 1. The size of the tank depends upon the number of bedrooms in the house, not the number of people or plumbing fixtures. The sizes range from 750 gallons on up and may be configured as one or two septic tanks. Having two septic tanks (or a two compartment septic tank) increases detention time of the wastewater, which helps to further reduce the suspended solids that could flow into the drainfield.

The drainfield is the area where the liquid from the septic tank soaks into the ground. The soil and micro-organisms remove viruses, bacteria, and most other contaminant's typically found in household wastewater. The drainfield area may consist of one or more trenches, a rectangular bed, or an above grade design like a mound (described later). One or more observation tubes are placed in the drainfield area to monitor the infiltrative surface.

When the effluent (the technical name for the treated liquid from the septic tank) has to be lifted up hill into the drainfield, another tank is installed after the septic tank. This tank contains a pump with floating on and off switches to send the effluent into the drainfield at preset intervals. This pump tank (also known as a pump chamber, dosing chamber, or lift station) has a high water alarm float switch connected to an alarm to warn the user when the pump has failed to come on.

Since 1980, pump tanks have about a one-day's reserve capacity once the pump fails and the alarm sounds. However, most septic system effluent pumps provide maintenance free service for many years provided all POWTS components are functioning correctly.

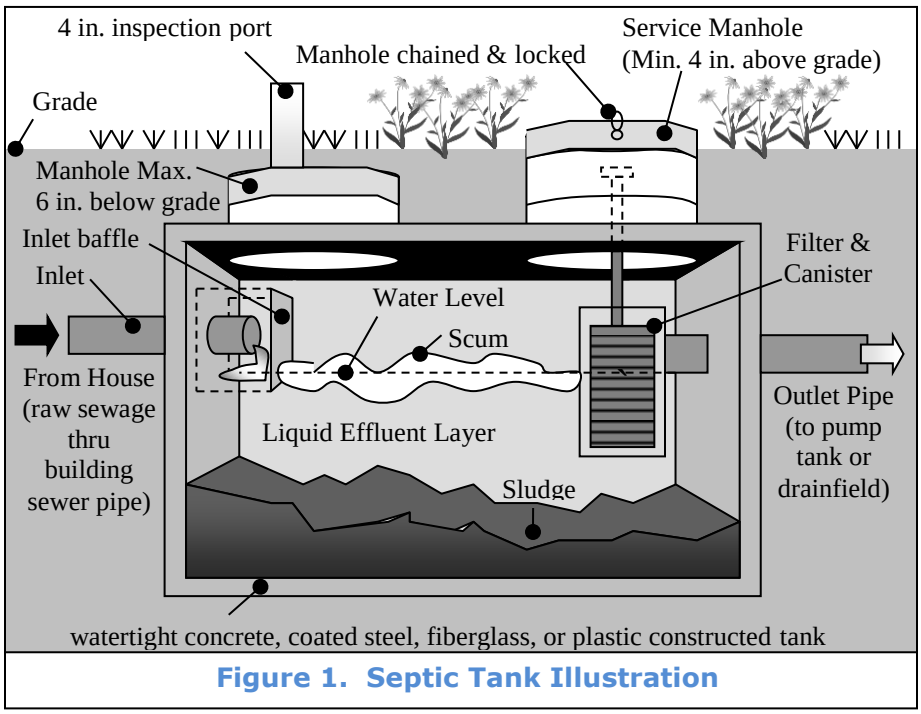


Figure 1. Septic Tank Illustration

The wastewater entering the septic tank separates into 3 layers:

- Sludge—heavy waste materials settle to the tank bottom.
- Effluent—liquid and suspended solids in the center of tank.
- Scum—grease, soap, toilet paper, etc. floating materials that rise to the top of the septic tank effluent.

The solid waste is food for anaerobic bacteria, which releases gas and liquid components. The gas is dispersed through the plumbing system vents in the house and drainfield vents. Solids do accumulate in the septic tank and separate from the effluent by gravity. Naturally occurring bacteria found in the sewage begin breaking down the waste materials. The tank must be serviced and/or pumped out every 3 years, or whenever the solid component of the tank exceeds 1/3 of the tank volume, to reduce the chance of solid material flowing into the drainfield. It is recommended to pump tanks in the summer when the ground is dry.

Grease and other floating solids are prevented from flowing out of the tank by a baffle, filter, or screen located on the inside of the tank at the outlet end. Another baffle is placed on the inlet side of the septic tank. This forces the incoming waste down into the tank, which prevents short-circuiting across the tank. These baffles can deteriorate over time and must be checked at each tank servicing. In theory, only liquid flows out of the septic tank and into the drainfield thereby recycling the household waste water into the ground.

Outlet Filter/Screen

There are tank effluent filters available that can prevent larger suspended solids in wastewater from getting out of the septic tank, which may clog pumps, distribution pipes, and soil. The outlet filter/screen of the primary treatment tank should be cleaned as necessary to ensure proper operation. The filter cartridge must not be removed unless provisions are made to retain solids in the tank that may slough off the filter when removed from its enclosure. If the filter is equipped with an alarm, the filter shall be serviced if/when the alarm is activated continuously. Occasional short duration filter alarms may indicate surge flows or an impending continuous alarm.

Soil Treatment & Infiltration System

The final step of septic treatment and dispersal of the septic tank effluent takes place in the drainfield that is in the soil. The size, elevation, location, and shape of the drainfield are all relative to the expected usage and soil characteristics.

The drainfield sizing is determined by the flow from the house (based on the number of bedrooms) and the type of soil. A certified soil tester makes this determination based on the many physical features within the soil, such as texture, structure, depth, limiting layer, consistence, and layering of the soil. This information is recorded on a "Soil Evaluation Report" form.

The elevation and location of the drainfield is determined by the soil characteristics and depth to a limiting factor, such as seasonal water table, saturation zones within the soil, or bedrock. For systems without pretreatment, it is necessary to maintain a safe vertical distance of 3 feet between the bottom of the drainfield and the limiting factor for proper treatment and renovation of effluent.

The shape of the drainfield is dependent upon the maximum length of suitable soil available along a contour of land. A drainfield design using narrow cells (or beds) has been shown to improve aeration in the soil beneath the gravel thereby enhancing system treatment performance and longevity. When there are several cells or beds, a distribution box may be incorporated to promote equal distribution of effluent.

Effluent inside the drainfield is dispersed two ways—gravity or pressure distribution. Pressure distribution uses small diameter pipes and relies on a pump to force the effluent into the piping network. Research has shown that a pressure distribution network will effectively disperse the effluent throughout the drainfield evenly thereby delaying the over saturation of any one part of the drainfield. Saturation promotes clogging of the infiltrative surface. When a pressure distribution drainfield is lower in elevation than the septic, a siphon may be used to force the effluent through the system instead of a pump. A siphon must be checked periodically to ensure that it is properly discharging effluent in doses rather than "trickling" effluent into the drainfield.

Figure 2 below illustrates cross-sectional views of four drainfield strategies: mound, at-grade, shallow in-ground, and in-ground septic systems. Other examples not shown include holding tank, sand filter, aerobic treatment, and experimental designs. Individual site designs for difficult sites require plan approval from Department of Commerce. Figures 3 & 4 on the next page depict two examples of drainfield layouts currently used in Wisconsin.

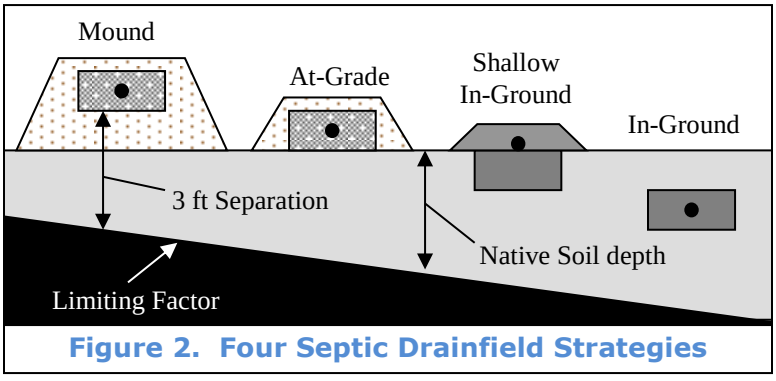


Figure 2. Four Septic Drainfield Strategies

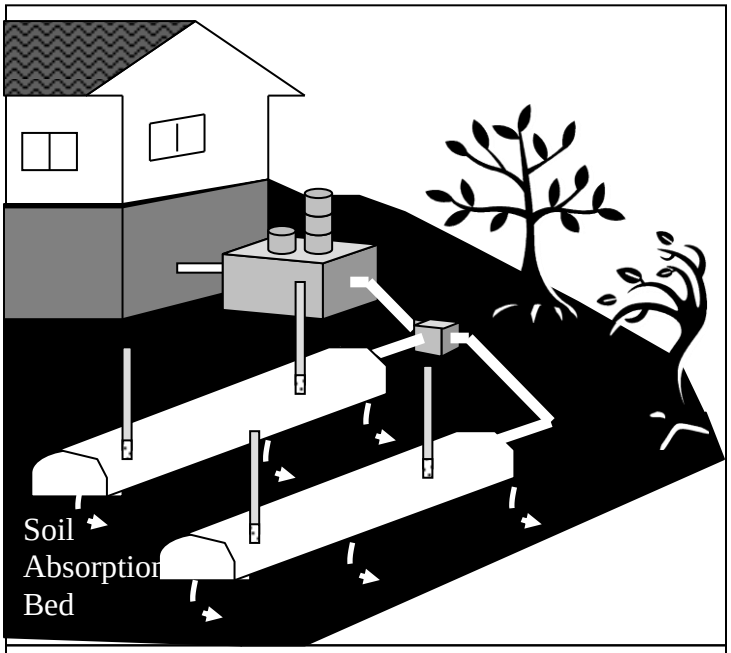


Figure 3. In-Ground System

What shortens the life of a drainfield?

1. **Hydraulic Overloading**. This is a condition where soil beneath the drainfield becomes saturated resulting in ponding. This condition can be caused by:
   - drainfield is undersized for the current usage
   - leaking plumbing fixtures
   - surface water into system
   - surge loading (i.e. washing clothes in one day, but laundry should be spread out over the entire week)
2. **Grease**. Excessive grease can congeal in the sewer line to the septic tank or inside the tank. The septic tank may accumulate a layer of solid fat, which cannot be readily broken down by bacterial action. Grease should be treated as garbage and kept out of the septic tank whenever possible.
3. **Sanitary napkins, condoms, cotton swabs, dental floss, tampons, hand wipes, infant wipes, disposable diapers, and cigarette filters**. These products are made of cellulose, plastic or other non-biodegradable components. They may plug the sewer lines, baffles and drainfield perforations or lodge in the pump.

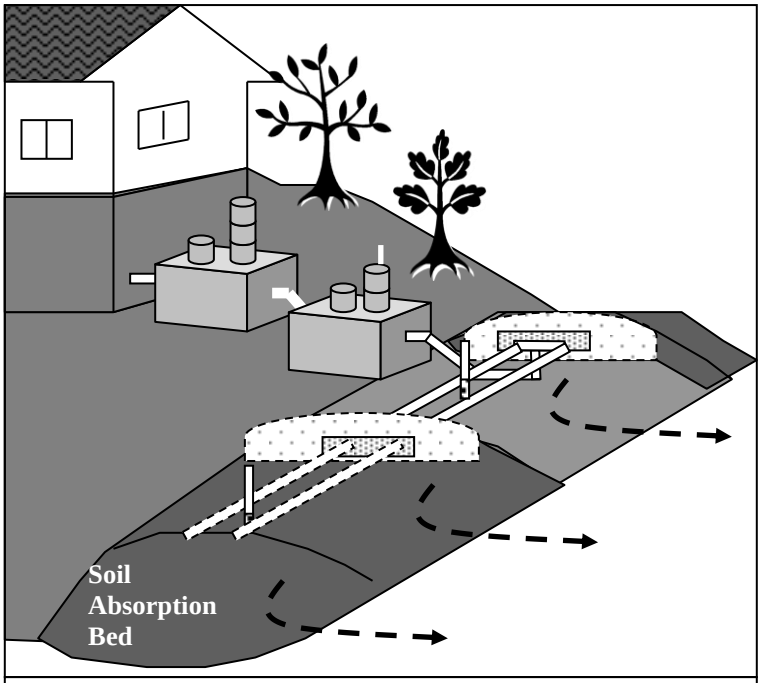


Figure 4. Mound System

4. **Antibiotics, other medicines, disinfectants, painting products, gasoline, oil, degreasers and pesticides**. When disposed of through the septic system, these chemicals may kill septic tank bacteria. This can result in a severe decline in decomposition of the septic tank solids. It can take several weeks for the bacteria in the septic tank to re-establish.
5. **Clear water discharges**. Building foundation drains, humidifier, high efficiency furnace condensate, and water softener discharges are considered clear water, which may be disposed into the ground separate from the septic system. However, a salt brine discharge from the softener during the recharge cycle, in excessive amounts, could have an adverse affect on septic tank bacteria.
6. **Surface drainage**. Roof downspouts, driveway runoff, and road ditches should be directed away from the septic system. The finished grade over the septic system should divert surface drainage of water away from the tanks and drainfield.

Frequent Questions & Answers

Q. Should I add anything to my septic tank?

A. Biological and chemical additives are not needed to aid or accelerate decomposition. At this time, there is no conclusive data to support the effectiveness of enzymes or any chemical treatment to rejuvenate a failing drainfield.

Q. How often should I have my septic tank pumped?

A. Septic tanks require pumping when 1/3 full of scum and sludge. A good pumping interval maybe every 3 years depending upon usage.

Q. What are the warning signs of a failing septic system?

A. These signs may be indicators that the drainfield is failing:

1. Plumbing backups.
2. Grass in the yard growing faster and greener in the area of the drainfield or tank(s).

3. Soft or mushy ground in the area of the drainfield.
4. Sluggish toilet flushing.
5. Septic pump runs constantly.
6. Solids accumulating in the drainfield vent or observation tubes.

Q. Can garbage disposals be used with septic systems?
A. Yes. But try to avoid allowing grease or slowly biodegradable products such as coarse fruit, vegetable peelings, and bones to get into the disposal.

Q. Can I plant trees or shrubs over my drainfield?
A. Generally no. Many tree species have roots that will attempt to grow into the drainfield to seek out moisture and nutrients. These may break sewer lines or disrupt the distribution of effluent. There are some trees and shrubbery whose root systems can not stand "wet feet" and are safe to plant over or near drainfields. A list of native prairie plants for landscaping around septic system drainfields is provided at the end of the pamphlet.

Q. What if liquid is observed in the drainfield vent or observation tubes?
A. Liquid observed in the drainfield usually indicates that the soil absorption capability of the drainfield is reduced and ponding is progressing. Many systems begin ponding within the first few years. The ponded state of a drainfield is usually a slowly developing condition. The estimated life of today's drainfields under normal usage is 15 to 25 years. The drainfield is ponded to some degree during most of these years. A consistent rising level of ponded effluent is a possible indicator as to the life expectancy of a drainfield. Sludge in a vent pipe or observation tube is an indicator of a more serious condition.

Many lending institutions have been using the observance of any liquid in a vent or observation tube as the sole criteria for rejecting a septic system from a proposed sale or purchase of a home. As noted above, this is a subjective and inaccurate conclusion. A more reasonable condition of sale would be to make sure that there is a suitable replacement drainfield area available for the future if, and when, the existing drainfield fails. Technical failure of a septic drainfield is when the effluent is bleeding out onto the ground surface, wastewater backing up into the building (not due to plugged or broken sewer lines) or the existing drainfield was installed less than 3 feet to a saturation zone, groundwater, bedrock or impervious soil.

Q. Can I use my old drainfield later once a new one is installed?
A. In most cases, yes. If the old drainfield was sized appropriately to its current use and there is at least 3 feet of suitable soil as described earlier, then the owner will be able to switch between the two drainfields by means of a diverter valve. It has been estimated that within a few years, an old ponded drainfield can recover much of its infiltrative capacity. For homes constructed after 1977 and having a below grade drainfield, a future-replacement area will have already been designated. Once a replacement drainfield is installed, the original drainfield will be allowed to rest and rejuvenate. Switching may occur every 1 to 5 years. Your Wisconsin Licensed Plumber will help you determine the proper time and method for switching drainfields.

Q. What can prevent my drainfield from freezing in winter?
A. In the fall, let the grass grow longer over the drainfield to create a thicker cover, like an insulation blanket. Cover the ground with hay or straw for another insulation layer. Avoid compacting or removal of snow, as the snow insulates the drainfield.

Q. What should I do if my drainfield freezes?
A. It is difficult or impossible to repair until conditions improve. Spread hay over the drainfield to add an insulation barrier. Contact a WI Licensed Pumper to pump and haul septic during the winter months to let the drainfield rest. If the drainfield still doesn't work in the spring, contact a WI Licensed Plumber.

Q. What can I do to prolong the life of my drainfield?
A. There are a variety of things you can do:

1. Install water-saving devices and be on-guard for leaky fixtures. Water conservation reduces the amount of liquid going into the drainfield.
2. Have the tank(s) pumped and inspected regularly.
3. Keep surface water away from the tank(s) and drainfield.
4. Keep driveways, parked vehicles and buildings off the drainfield area. Soil compaction can cause premature failure by restricting the infiltrative and evaporative capability of the soil.
5. Install a filter to confine suspended solids to the septic tank.
6. The use of pretreatment components has been shown to improve effluent quality and moderate or reduce ponding.
7. Know what can and cannot be put into the septic tank.

Operation & Maintenance-1

The owner of this Private Onsite Water Treatment System (POWTS) is responsible for the operation and maintenance of this component.

Local County Authorities, the Department of Commerce Safety & Buildings, or a POWTS servicing contractor may make periodic inspections of the components, checking for treated effluent levels, surface discharge, etc. The owner or owner's agent is required to submit necessary maintenance reports to the appropriate County or the Department of Commerce.

Traffic around or over the soil absorption should be avoided particularly during winter months. The compaction or removal of snow cover over the component may lead to hydraulic failure by freezing. This type of failure is usually temporary, but is difficult or impossible to repair until weather conditions improve. In general, soil compaction over this component will reduce diffusion of oxygen into the soil and dispersal cell, which may lead to more intense and earlier organic clogging of the soil.

Routine & Preventative Maintenance-2

Regular maintenance costs much less tan repair or replacement of a failed system.

- **Septic tank**: It is recommended that a septic tank be pumped when the sludge and scum volume equals 1/3 of the tank volume. Typical recommendations are to inspect the tank every three years to determine if pumping is needed. Tank maintenance is dependent on the amount of water you use, the organic sludge loading, and the septic tank capacity.
  Recommended Schedule_____

- **Outlet Filter/Screen**: This device should be inspected and cleaned per manufacturer's recommendations. In general, inspect annually and clean as needed and definitely during septic tank pumping events.
  Recommended Schedule_____
- **Pump Chamber**: Visually inspect tank, pump, and control components for corrosion or build-up annually. Manually test pump, float, and alarms (you may want to have pumper or POWTS maintainer complete this task.)
  Recommended Schedule_____
- **Drainfield**: Complete a walk-over inspection every six months for visual signs of lush vegetation, or soil saturation, or effluent surfacing. Check observation ports for evidence of ponding inside the dispersal cell.
  Recommended Schedule_____

Contingency Plan for Component Failure

A. **Septic Tank**. Any structural failure resulting in cracks or leaks in the tank must be corrected by replacement of the septic tank component. Leaks in the joints between manhole risers or covers shall be repaired by replacing faulty seals with approved materials to make joints water-tight.

B. **Outlet Filter**. The outlet filter shall be replaced or repaired when it is either no longer capable of preventing the discharge of particles larger than 1/8 inch or when it has become permanently degraded by clogging so as to interfere with the design flow out of the septic tank.

C. **Dosing chamber & pump**. The dosing chamber shall be replaced if any structural failure is found. Leaks in joints between manhole risers or covers shall be repaired by replacing faulty seals with approved materials to make joints water-tight. The pump and controls shall be replaced when they are no longer capable of functioning according to the design plan. Exposed manhole covers must be locked to prevent injury or unauthorized access.

D. **Pressure Distribution Piping**. Partial clogging of the distribution network may result in long dosing cycles. The distribution pipe may require back-flushing to remove accumulated matter from the piping. After the threaded end caps are removed and the pimp is disconnected, the laterals can be back-flushed into the pump chamber. It is recommended that the dosing chamber then be pumped by a licensed hauler to remove the material flushed from the piping. The system can be put back into service.

E. **Drainfield**. The discharge of sewage or wastewater to the ground surface is strictly prohibited due to the human health hazard created by the effluent. All septic system failures created by surface discharge shall immediately be reported to the appropriate county. The pump shall then be immediately disconnected to prevent further discharge to the drainfield. The existing septic tank and dosing chamber shall be used as a temporary holding tank until the necessary repairs to the soil absorption cell can be achieved. The replacement shall be initiated only after any necessary plan approvals have been obtained from the appropriate plan review authority and the required sanitary permit is obtained from the county. Recent changes in the wastewater industry provide options for system renovations without 100% reconstruction.

Abandonment Procedure

1. Treatment Tank and Dosing Chamber. Tank abandonment shall be in accordance with SPS 383.33 Wis. Adm. Code when the tank is no longer used as a POWTS component. When the treatment tank and dosing chamber are no longer a component of POWTS, the contents of the tanks must be emptied by a properly licensed septic waste hauler in accordance

with the requirements of WAC Chapter NR 113 or acts amendatory thereto. The remaining voids must then be filled with a native soil material.

2. Drainfield. There are no mandatory actions for abandoning a drainfield. The vent or observation pipe may be removed, and the void left where the pipe was may be filled with native soil material.

Landscaping Septic Systems

The following native prairie plants grow well on dry soils and would be good choices for a mound septic system:

Wildflowers

- prairie onion (Allium stellatum)
- pussytoes (Antennaria neglecta)
- butterflyweed (Asclepias tuberosa)
- heath aster (Aster ericodes)
- bigleaf aster (Aster macrophyllus)*
- Pennsylvania sedge (Carex pensylvanica)*
- pale purple coneflower (Echinacea angustifolia)
- prair ie clover (Dalea spp.)
- rattlesnake master (Eryngium yuccifolium)
- wild geranium (Geranium maculatum)*
- prairie smoke (Geum triflorum)
- oxeye (Helianthus helianthoides)
- rough blazing star (Liatris aspera)
- wild bergamot (Monarda fistulosa)
- penstemon (Penstemon spp.)
- pasqueflower (Pulsatilla patens)
- violets (Viola spp.)*

Grasses

- sideoats grama (Bouteloua curtipendula)
- blue grama (Bouteloua gracilis)
- little bluestem (Schizachyrium scoparium)
- prairie dropseed (Sporobolus heterolepis)
- June grass (Koeleria macrantha)

* shade tolerant

These plants are propagated by seed or plants. A combination of both will make a faster cover. Use a mulch of clean straw or a cover crop of annual ryegrass or oats to prevent erosion while the plants become established.

Information Provided By

- Pierce County, Wisconsin
- University of Minnesota-Extension Service
- University of Wisconsin-Madison
- Wisconsin Department of Commerce
- Wisconsin Onsite Wastewater Recycling Association

SERVICE DATE: COMMENTS:

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Department

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