

Septic System Information & Operation for Homeowners



Richland County Zoning
181 W Seminary St
Richland Center, WI 53581
(608) 647-2447

YOUR INFORMATION

PRIVATE ONSITE WASTEWATER TREATMENT SYSTEM (POWTS)

Date of Installation _____

Installing Plumber _____

Address _____

Phone _____

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 Cells(s):	
Dispersal Cell(s)	Sq. Ft.
Cell Dimensions	
Number of Vents/Observation Pipes	

NOTE: No one should enter a septic, other treatment or holding tank for any reason without being in full compliance with OSHA standards for entering a confined space.

In addition to harboring infectious agents, decomposing wastes in the septic tank produce hazardous gases that can displace oxygen, creating a dangerous atmosphere with very little oxygen to breathe. Methane gas produced in the septic tank is also explosive. Make sure that work area is ventilated, use caution when operating electrical devices, and never smoke or light a flame near a septic tank. Reduce your contact with sewage by using tools to reach components, lift up floats or screens, and take measurements.

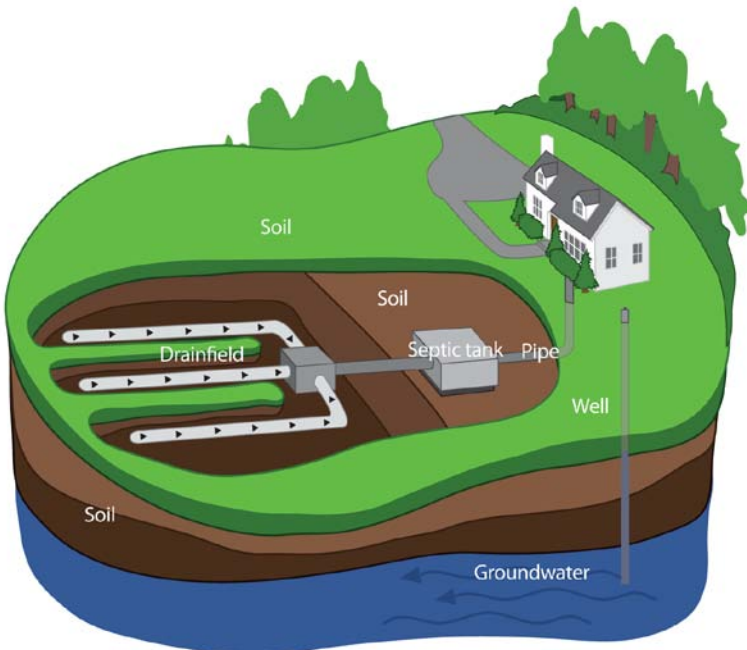
SYSTEM PLAN

Buried beneath your back yard, it is out there.....constantly working. When you are at work...it is working. When you are eating dinner...it continues working. Even when you are sleeping, it's still out there in the dark...working. What is it you ask? Your septic system! It may be the most overlooked and undervalued utility in your home; but with proper maintenance and care your septic system can continue working for you for 25 to 30 years.

If you are like most homeowners, you probably haven't given much thought into what happens when waste goes down the drain. But if you expect your septic system to continue to treat and dispose of your household wastewater, what you don't know *can* hurt you.

Proper maintenance and use of your septic system can have a significant impact on how well it works and how long it will last. In Wisconsin the septic system maintenance is the homeowner's responsibility.

So let's break it down for you.

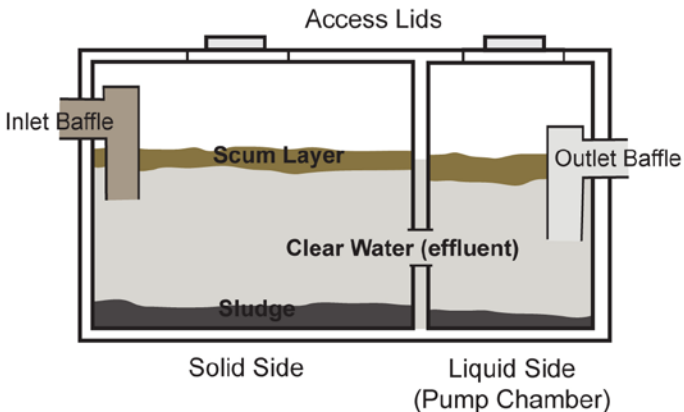


SEPTIC TANK

A septic tank is typically the first component of a septic system. The tank is designed to retain waste water and allow heavy solids to settle to the bottom. These solids are partially decomposed by beneficial bacteria to form sludge. Grease and light particles float, forming a layer of scum on

the top of the wastewater. Baffles installed at the inlet and outlet of the tank help prevent scum and solids from escaping. Filters are installed at the outlet that needs periodic cleaning. Manholes are installed over the filter so it can be serviced. A system can be as simple as a septic tank with an effluent filter screen and drainfield or include any number of additions, such as an aeration tank, sand filter, or pump/siphon chamber.

A septic tank looks like the illustration below. 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 a two compartment septic tank (or two separate septic tanks) increases detention time of the wastewater, which helps to further reduce the suspended solids that could flow into the drainfield.



The waste water entering the septic tank separates into 3 layers

1. Solid waste that settles to the bottom of the tank; (sludge)
2. Grease, fat and floating solid materials which rise to the top of the tank; (scum)
3. A partially clarified liquid zone; (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 accumulated in the septic tank, so the tank must be serviced (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.

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 wastewater into the ground. Effluent filters can prevent larger suspended solids in wastewater from getting out of the septic tank, which may clog pumps, distribution pipes and soil. These filters are commonly serviced with routine septic tank pumping.

When the effluent has to be lifted uphill into a drainfield, a two compartment tank is used or another tank is installed after the septic tank. This chamber or tank contains a pump with floating on and off switches to send the effluent into the drainfield at preset intervals. This pump tank (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.

Pump tanks have about a one-day's reserve capacity once the pump fails and the alarm sounds. However, most septic systems effluent pumps provide maintenance free service for many years.

OUTLET FILTER/SCREEN

The outlet filter screen of the primary treatment tank should be cleaned as needed to ensure proper operation. Cleaning frequency will depend on the size of the filter, environmental conditions, number of people living in the house, the size of the septic tank and the overall nature of the wastewater being discharged to the septic tank from the house. The filter cartridge must not be removed unless provisions are made to retain the 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. It is recommended that a licensed plumber or a contractor for pumping out septic tanks, who is familiar with cleaning precautions and procedures, conduct filter maintenance. The main consideration is to ensure that the filter is maintained so that it continues to be effective.

Things to look for to determine if your filter requires maintenance between scheduled maintenance include:

- Water drains away from household fixtures slower than normal
- Wastewater is overflowing from the overflow relief gully located outside the house

SOIL INFILTRATION SYSTEM (DRAINFIELD)

The drainfield (soil infiltration) is the final and most important step of the effluent treatment and dispersal. 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. Usually the more pervious the soil, the smaller the drainfield, however, a certified soil tester makes this determination based on the many physical features within the soil, such as texture, structure, consistency and layering of the soil. This information is recorded on a "Soil and Site Evaluation Report" form.

The elevation and location of the drainfield is determined by the soil characteristics and depth of limiting conditions such as seasonal water table, saturation zones with 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 limiting conditions for proper treatment and renovation of effluent.

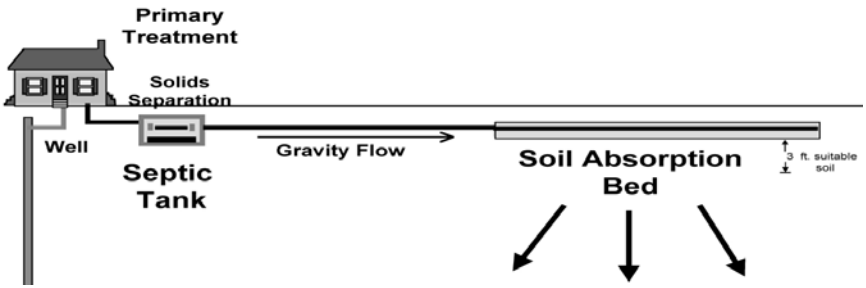
The drainfield is the area where the liquid from the septic tank soaks into the ground. The clarified sewage is called effluent. The effluent slowly flows by gravity or pump to one or more perforated pipes that are laid in the gravel. The drainfields may have polystyrene bundles or leaching chambers used for wastewater storage prior to soil absorption. When a pressure distribution drainfield is lower in elevation than the septic tank, 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.

The soil is the secondary portion of the treatment process. The soil and micro-organisms remove viruses, bacteria, and most other contaminants 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. One or more observation tubes are placed in the drainfield area to monitor the infiltrative surface.

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

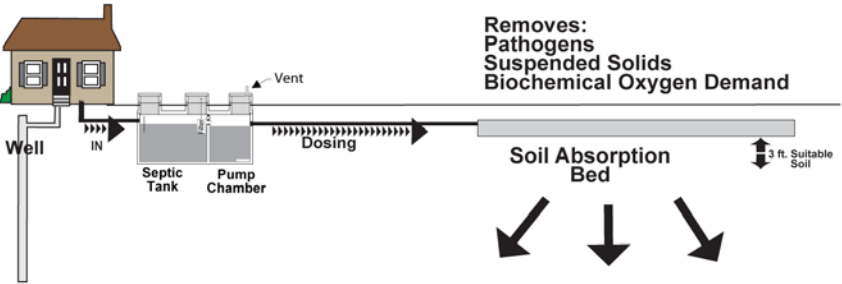
Gravity Conventional

Conventional is the 2nd most common system used in Richland County.



Pumped Conventional

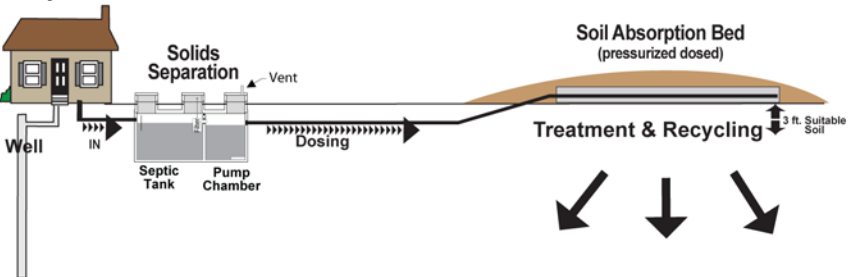
Conventional with a pump are used when the dispersal cell is higher than the tank or where pressure distribution is desired.



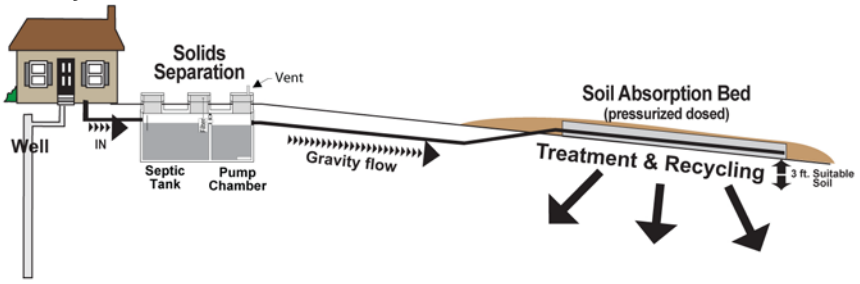
At-Grade

At-Grade is the most common system in Richland County. 36% of the Systems installed in the last 10 years are At-Grades. The dispersal cell is built on top of the original grade covered with approximately 2' of soil above grade. If the tank is on a higher elevation than then the dispersal cell it may not require a pump but instead be a gravity feed field.

Pumped At-Grade

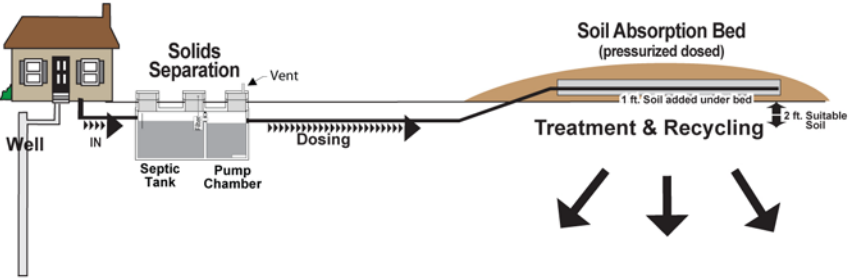


Gravity At-Grade



Mound

The mound is similar to the At-Grade but washed sand is added on top of the original grade under the dispersal cell. A mound will extend above grade 3-4'. Mounds will have a pump.



There is a Sand Filter System and Aerobic Treatment System which are advanced pretreatment systems. There is also experimental systems which is site designed. These types of systems are seldom used in Richland County.

A NOTE ABOUT HOLDING TANKS

The most expensive alternative to on-site treatment is a holding tank, which retains waste in a large sealed tank. Periodically, wastes are pumped out by a licensed septage hauler and transported away for treatment. Holding tanks cost less than mound or conventional systems to install, but the annual pumping and hauling costs can be substantial. In Richland County, holding tanks can only be installed as a last resort when no suitable soils for a drainfield can be found or when an Affidavit can be signed stating usage will not exceed 150 gallons per day.

There are Circumstances that shorten 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;

- A. drainfield is undersized for the current usage;
- B. leaking plumbing fixtures;
- C. surface water into system;
- D. surge loading (e.g. doing all the clothes washing on one day, laundry should be spaced out).

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 & tampons, condoms, cotton swabs, dental floss, handi-wipes, infant wipes, disposable diapers, pop-off toilet wands scrubbers, bandages, coffee grounds, paper towels, cigarette butts, anti-bacterial soaps, hard toilet paper, dead fish or small animals and cat litter

They may plug the sewer lines, baffles and drainfield perforations, lodge in the pump or destroy the bacteria. For a complete list, visit www.epa.gov/septicmart

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 and water softener discharges are considered clear water, which may be disposed into the ground separate from the septic system. Discharge from the softener during the recharge cycle is salt brine which, in excessive amounts, could have an adverse affect on septic system 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 AND ANSWERS

Should I add anything to my septic tank?

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. Although if tree roots are discovered in your tank or field during your 3 year inspection, flushing 2 pounds of granular copper sulfate down a toilet for every 300 gallons of water that the septic tank holds should kill and dissolve tree roots as they absorb the tank's water.

Do I have to keep the chain and lock on the septic tank after it is inspected?

The owner of a POWTS is responsible for ensuring that access opening covers remain locked or secured except for inspections, evaluations, and maintenance or servicing purposes per Chapter SPS 383.52. 6" of soil over the lid is considered secured.

How often should I have my septic tank pumped?

Septic tanks require pumping when 1/3 full of scum or sludge. Per Chapter SPS 383.54(4)(d); A treatment or dispersal component consisting in part of in situ soil shall be visually inspected at least once every 3 years to determine whether wastewater or effluent from the POWTS is ponding on the surface of the ground. If the tank is not cleaned periodically, the solids are carried into the dispersal cell, or leach field as it's more commonly referred to. Rapid clogging occurs, premature failure follow and finally, the leach field must be replaced. Pumping your septic tank is less expensive than replacing your leach field. The inspection, evaluation, maintenance and servicing report must be submitted to Richland County Zoning within 30 calendar days from the date of inspection, evaluation, maintenance or servicing per Chapter SPS 383.55(2)(b).

Holding tanks are to be pumped and inspected when full per Chapter SPS 383.54(3).

What should a pumper look at when pumping my tank?

It is a good idea to be present when your tank is being pumped.

1. Make sure that the contractor uses the manhole, not the inspection ports to pump the tank to avoid damaging the baffles or tees.
2. Make sure all the material in the tank(s) is removed.
3. A proper inspection will include a visual observation of the scum and sludge layers.
4. Check the condition of the baffles or tees.
5. The walls of the tank for cracks.
6. The drainfield for any signs of failure.

7. If the system includes a distribution box, drop box or pump, these need to be checked too.
8. If your system has a pump chamber or tank, make sure the contractor pumps and inspects it as well.

Notes about the inspection: Baffles are made of the same material as the tank and are usually fitted during manufacturing of the tank. If you have a concrete tank, the concrete baffle must be checked for corrosion or cracks. If the concrete baffle is corroded or missing, instead of replacing the tank, a tee will be fitted to the tank. If water is running into the tank, it may indicate a leak within the plumbing of the home or infiltration in the inlet pipe. Water draining back in the septic tank from the outlet pipe may indicate a drainfield problem.

The inspector will check the effluent filter. Maintenance consists of pulling the filter and hosing the contents into the septic tank.

Should cracks be found in the riser (if one is installed), the riser can be replaced without replacing the tank.

What are the warning signs of a failing septic systems?

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.

Can garbage disposals be used with septic systems?

Yes. But try to avoid allowing grease or slowly biodegradable products such as core fruit, vegetable peelings and bones to get into the disposal.

Can I plant trees or shrubs over my drainfield?

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 cannot stand "wet feet" and are safe to plant over or near drainfields. Your local landscape contractor or garden center is a good source of information.

What if liquid is observed in the drainfield vent or observation tubes?

Liquid observed in the drainfield usually indicated that the soil absorption capability of the drainfield is reduced and ponding is progressing. Many systems begin ponding within the first few years. The ponding 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 consistently rising level of ponding 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 observation 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 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 of a saturation zone, groundwater, bedrock or impervious soil.

What can I do to prolong the life of my drainfield?

There are a variety of things you can do:

1. Install water-conserving devices where possible. Low flush toilets and shower heads are commonly available. Install low usage water fixtures. Examples are showerheads (2.5 gallons/minute), toilets (1.6 gallons), dishwashers (5.3 gallons), and washing machines (14 gallons). By installing fixtures such as these, the average family can reduce the amount of water entering the septic system by 20,000 gallons per year!
2. Have the tank(s) pumped and inspected regularly.
3. Keep surface water away from the septic system area, including the septic and pump tanks.
4. Keep driveway, 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. Do not allow heavy animals to graze on the septic field. **Heavy animals are likely to damage the drainfield** by compressing the soil and possibly by damaging buried piping. Compressing the soil over a septic drainfield interferes with soil transpiration, cutting the

oxygen level needed by soil bacteria in the biomat and reducing removal of septic effluent through evaporation.

6. Installing an effluent filter to confine most of the suspended solids to the septic tank.
7. The use of pretreatment components has been shown to improve effluent quality and moderate or reduce ponding.
8. Understand what can and cannot be put into the septic tank.

Can I disconnect my washer drain from my septic and run it into my yard?

Codes and Statutes do not allow for washer drains to be discharge anywhere but into the septic.

The volume of water from home washing machines use should not be a problem with a normal septic system in good working order. The volume of detergent from a residential clothes washer entering the septic tank is diluted enough that it is not going to harm the septic tank bacteria at normal levels or residential dishwasher use.

Sometimes we find that dry powder clothes washer soap appears as clots and clogs in the septic, usually because the homeowner is pouring in too much detergent and is not following the manufacturer's instructions.

Passing solid clumps of detergent into the septic tank speed clogging of the system and in severe cases can even block a building drain.

- **Avoid using more than the necessary amount** of powdered laundry or dishwasher detergent. Excessive amounts of powdered laundry detergent often fail to buildup of solids in the septic tank and potentially plug the disposal area.
- **Use liquid laundry detergent.** Powdered laundry detergents use clay as a 'carrier'. This clay can hasten the buildup of solids in the septic tank and potentially plug the disposal area.
- **Install a lint filter** on the washing machine water drain line to avoid sending lint into the septic tank and fields or install a graywater filter ahead of your drywell if you are using one to receive washing machine discharge waters.
- **Spread laundry use over the week** rather than many loads on one day. While it might be convenient to do so, dedicating an entire day to doing laundry will put a severe strain on your septic system. Space out your laundry loads and wash only full loads. The average load of laundry uses 47 gallons of water. One load per day rather than 7 loads on Saturday makes a big difference to your septic tank. Also, front loading washers use less water than top loaders.

- **Cleaning out the septic tank** more often than the minimum schedule will extend the life of your drainfield. In turn, this will permit the drainfield to better absorb the extra volume of wastewater generated by clothes washing.

Experiments were conducted using laboratory-scale septic tanks and drainfield systems. Addition of water containing 20% of bleached or unbleached laundry wash water did not affect the performance of the septic tanks or the leach fields.

OPERATION AND MAINTENANCE

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

Richland County Zoning, the Wisconsin Department of Safety and Professional Services 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 Richland County Zoning within 30 calendar days from the date of inspection, evaluation, maintenance or servicing per Chapter SPS 383.55(2)(b).

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.

Run water regularly in seldom used drains such as sinks, tubs, showers, etc. to avoid noxious gases from building up and causing odors inside.

ROUTINE & PREVENTATIVE MAINTENANCE

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 pump the tank every two to three years depending on the use. Although the system must be visually inspected at least once every 3 years to determine whether wastewater or effluent from the POWTS is ponding on the surface of the ground per Chapter SPS 383.54(4)(d).

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.

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).

Dispersal Cell(s): Complete a walk-over inspection every six months for visual signs of lush vegetation, soil saturation or effluent surfacing. Check observation ports for evidence of ponding inside the dispersal cell.

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 and 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.
- D. **Pressure Distribution Piping:** Partial clogging of the distribution network may result in unduly long dosing cycles. The ends of the distribution laterals may be exposed and the threaded end caps removed. The piping can be disconnected on the outlet end of the pump. The distribution piping may then be back flushed to cleanse any accumulated matter from the piping. It is recommended that the dosing chamber then be pumped by a licensed septic waste hauler to remove the material flushed from the piping. The end caps can then be replaced and the system can be put back into service.
- E. **Soil Absorption Cell:** The discharge of sewage or wastewater to the ground surface is strictly prohibited due to the human health hazard created by the effluent. All failures created by surface discharge shall immediately be reported to Richland County Zoning. The pump shall then be immediately disconnected to prevent further discharge to the ground surface via the soil absorption cell. The existing septic tank and dosing tank shall be used as a temporary holding tank until the necessary 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.

ABANDONMENT PROCEDURE

- A. Treatment Tank and Dosing Tank: When the treatment tank and pump chamber are no longer a component of the POWTS, the contents of the tank(s) must be emptied by a properly licensed septic water hauler in accordance with the requirements of Ch. NR 113 or acts amendatory thereto. The cover of the tank(s) must then be removed or collapsed. The remaining tank(s) must then be filled with native soil materials.
- B. Soil dispersal or treatment cell: There are no mandatory actions for abandoning a soil dispersal or treatment cell. The vent(s) or observation pipe(s) may be removed and the void left where the pipe was may be filled with native soil material.

We hope this pamphlet informed you about the workings of your septic system. This system needs care and maintenance much like any other component of your home. Installing a new septic system or replacing a drainfield can be expensive, but remember that you now have a modern, economical sanitary waste disposal system. If you should have any further question concerning your septic system, call Richland County Zoning at 608-647-2447.

**Richland County Zoning
181 W Seminary St
Room 309**

**Richland Center, WI 53581
608-647-2447**

<http://co.richland.wi.us/departments/zoning>

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