

Important Information on Septic Systems (POWTS)

- 1. Private Onsite Wastewater Treatment Systems (POWTS) Maintenance**
- 2. Have the septic tank pumped regularly**
- 3. Conserve water and spread out water usage**
- 4. Manage solids in wastewater**
- 5. Keep potentially hazardous materials out of wastewater**
- 6. Let the system work naturally**
- 7. Protect the drain field**
- 8. Keep records**
- 9. Secure the septic tank cover and other safety tips**
- 10. Special winter precautions**
- 11. Troubleshooting septic tank / drain field problems**

Many Wisconsinites rely on their own Private Onsite Wastewater Treatment System (POWTS) for wastewater treatment and disposal. The most common onsite system used is a septic tank in combination with a traditional drain field. A properly designed, installed and maintained system should operate for 20 to 40 years or more, treating wastewater to minimize the negative impact on groundwater, surface water and human health.

Proper maintenance includes having the tank pumped regularly, conserving water and spreading out water usage, managing solids in wastewater, keeping potentially hazardous materials out of wastewater, not using additives, and protecting the drain field.

In a septic tank/drain field system, wastewater flows from the household plumbing into an underground septic tank. There, waste components naturally separate, with heavier solids settling to the bottom, forming sludge, and lighter solids floating to the top, forming scum). Bacteria begin to treat wastewater by partially decomposing the solids. The liquid (effluent) flows through the tank outlet and through laterals to the subsurface drain field, also called a soil absorption field or leach field laterals. A system may have a distribution box between the septic tank and the drain field to distribute effluent evenly between multiple drain field trenches.

The drain field usually consists of a series of underground parallel trenches. Each trench may contain a distribution pipe embedded in gravel or rock, or may have gravelless chambers. The effluent flows through the distribution pipes or chambers where it moves through holes in the pipe or chambers down into the soil. The draining water slowly moves down through the soil, eventually reaching groundwater. The soil filters out remaining small solids and pathogens (disease-causing microorganisms). Also, bacteria and other microorganisms in the soil treat pathogens and other contaminants in the effluent.

System Maintenance

Proper maintenance of a septic tank and drain field is critical to keep the system functioning properly. This protects human health and the environment. In addition, it delays the need to repair or replace a system, thereby saving the homeowner money.

Have the septic tank pumped regularly

One of the most important things you can do to keep the system functioning properly is to have the septic tank pumped regularly. Scum and/or sludge could build up and be carried to the drain field if the tank is not pumped regularly. This would clog the drain field and not allow wastewater to be treated, and wastewater might form a pond in the yard or back up into the house. At this point, the owner could be facing costly repairs or replacement instead of minimal maintenance expenses.

Several factors determine tank-pumping frequency, including the number of people living in the home, water usage and whether a garbage disposal is used. Many experts recommend pumping a tank every two to three years. Depending on the factors listed above, a tank may need to be pumped more or less frequently. A safe approach is to have the tank checked annually until it is determined that pumping is required. Once the pumping interval is established, use that time frame until there is a change in water use patterns. Additional people living in the home, children becoming teenagers, the installation of a garbage disposal, or the addition of a whirlpool tub could all increase water usage and wastewater generation. Conversely, fewer people living in the home could decrease water use and wastewater generation.

The drain field usually consists of a series of underground parallel trenches. Each trench may contain a distribution pipe embedded in gravel or rock, or may have gravelless chambers. The effluent flows through the distribution pipes or chambers where it moves through holes in the pipe or chambers down into the soil. The draining water slowly moves down through the soil, eventually reaching groundwater. The soil filters out remaining small solids and pathogens (disease-causing microorganisms). Also, bacteria and other microorganisms in the soil treat pathogens and other contaminants in the effluent.

Pumping a septic tank

In Wisconsin, a certified septage servicing operator (pumper) may legally pump a septic tank. A good pumper will:

- Inspect the tank first to determine if pumping is necessary.
- Pump wastewater through the manhole or access port, not the inspection pipe. The inspection pipe is too small to see if the tank is sufficiently emptied, or if there are any problems.
- Loosen and stir up materials by pumping, back flushing and repumping, or using a mechanical agitator.
- Check that baffles or tees (or filters on newer systems) are in place and working. These are vital to prevent the drain field from clogging.
- Dispose of septage from the tank in a safe, legal manner. This may be at a municipal wastewater treatment plant or through land application if allowed by local codes and done according to septage disposal regulations.
- Not allow anyone to smoke in the vicinity because volatile gases may be present.

According to the federal Environmental Protection Agency, "[Onsite Wastewater treatment Systems Manual](#)": "Tanks should be pumped when sludge and scum accumulations exceed 30 percent of the tank volume or are encroaching on the inlet and outlet baffle entrances. Periodic pumping of septic tanks is recommended to ensure proper system performance and reduce the risk of hydraulic failure. If systems are not inspected, septic tanks should be pumped every 3 to 5 years depending on the size of the tank, the number of building occupants, and household appliances and habits.

Commercial systems should be inspected and/or pumped more frequently, typically annually. There is a system available that provides continuous monitoring and data storage of changes in the sludge depth, scum or grease layer thickness, liquid level, and temperature in the tank. Long-term verification studies of this system are under way.

Accumulated sludge and scum material stored in the tank should be removed by a certified, licensed, or trained service provider and reused or disposed of in accordance with applicable federal, state, and local codes."

Conserve water and spread out water usage

- Conserving water to reduce the amount of wastewater that needs to be treated and distributing water flow to the septic tank over an extended period of time will extend the life of a system. Wastewater should remain in the septic tank long enough, at least 24 hours, for heavy solids to settle out forming sludge and light solids to float to the top forming scum. Except immediately after pumping, a septic tank contains wastewater to its full capacity at all times. As a gallon of wastewater flows into the tank from the house, a gallon of effluent flows out of the tank into the drain field. If wastewater moves in and out of the tank too rapidly due to constant flow for extended periods of time or heavy water flow at any given time, solids remain suspended in the wastewater and may move with the effluent out of the tank and into the drain field. Solids can clog a drain field, decreasing its ability to disperse wastewater into the soil. This can lead to costly repairs or even replacement.

Spread out water usage by following these suggestions:

- Wash one or two loads of laundry a day, rather than three or more loads in one day.
- Install low-flow water fixtures, low volume toilets, and low water use appliances when replacing.
- Check for and repair leaky faucets, toilets and other leaks in the plumbing system.
- Take short showers rather than baths.
- Turn off the faucet while brushing teeth or shaving.
- If you use a water softening unit, select one with demand initiated regeneration in which the need to regenerate is determined by measuring gallons of water used, or by measuring the change in the electrical conductivity of the resin bed, or by sensing a change in water hardness.

Manage solids in wastewater

Manage what is flushed down the toilet or drain to reduce the amount of solids in wastewater. More solids in wastewater will require more frequent septic tank pumping.

- Do not flush cigarettes, diapers, feminine hygiene products, paper toweling or facial tissue. They may not break down readily and will contribute to the scum or sludge layers. Dispose of these items with other solid waste.
- Do not overuse the garbage disposal. It grinds up food products that settle out in the tank, adding considerably to the sludge buildup and the amount of organic matter that needs treatment.
- Do not put grease or oils down the drain. Grease and oils from cooking, frying and skin lotions increase the

scum layer in the septic tank.

- Use liquid detergents instead of powdered detergents. Powdered detergents have “fillers” in them that add to the sludge layer.
- Use toilet tissue that breaks down rapidly. Test by placing a tissue sample in a jar of water, cover the jar opening, and shake vigorously. The toilet paper should fall apart rapidly when shaken.
- Install a filter on the washing machine water discharge line to trap lint and clean according to manufacturer’s directions.
- Have an effluent filter installed at the outlet of the septic tank to help prevent solids from flowing into the drain field. Have it cleaned according to manufacturer’s directions.

Keep potentially hazardous materials out of wastewater

The septic system is not the best way to dispose of some materials. While a septic tank and drain field system can adequately treat many pathogens in wastewater, it cannot effectively treat all hazardous materials.

- Do not dump unwanted pesticides such as herbicides, fungicides or insecticides down the drain.
- Do not dump paints, thinners or solvents down the drain.
- Do not dump excess medications down the drain.
- Do not overuse cleaning products, including bleach and drain cleaners, and do not dump excess cleaning products down the drain. A septic system can handle typical amounts used for routine cleaning, as well as normal use amounts of anti-bacterial soaps.
- Avoid using automatic toilet cleaning dispensers that release bleach with every flush. This deteriorates the rubber parts and seals in the toilet, and can reduce populations of bacteria in the septic tank that break down waste.

Let the system work naturally

Septic system starters, additives or feeders are not necessary to keep a system working and are not a solution for improperly installed, designed or maintained systems. In some cases, additives may keep materials suspended in the wastewater and allow them to flow out of the tank where they can clog the drain field or the soil that must assimilate the wastewater.

- Do not use septic system starters.
- Do not use septic system additives.
- Do not use septic system feeders.

Protect the drain field

While the drain field does not require maintenance, a few precautions will help ensure proper functioning and a long service life. The drain field should not be inundated with excess water, as extra water will reduce the ability of wastewater to percolate through the soil as needed for proper treatment. The drain field should not be compacted; compaction will prevent the drain field from treating wastewater properly. The structural integrity of the drain field must be maintained. (Note: Some newer system drain fields contain small diameter pipes that must be cleaned periodically.)

- Divert water from roofs, downspouts, or any other surface water runoff away from the area of the drain field.
- Do not add large amounts of water to the drain field by using underground sprinklers. Use a manually operated sprinkler only as it is necessary to maintain the vegetative cover.
- Do not drive vehicles or agricultural equipment over the drain field.
- Do not site dog kennels or other animal confinement units over the drain field.
- Do not construct driveways, parking lots, sidewalks, patios or buildings over the septic tank or drain field.
- Maintain all required setback distances when adding buildings or other improvements to the property. These

are minimum distances required between the tank or laterals and items such as surface water, wells, and foundations.

- Do not place additional soil over the drain field other than to fill slight depressions. A slight mounding will ensure runoff of surface water.
- Keep rodents and other burrowing animals out of the drain field area.
- Do not plant trees or other deep-rooted plants within 5-10 feet of the drain field. Do not plant trees, such as cottonwoods, with invasive root systems, as they may clog or damage pipes.
- Establish and maintain grass or other suitable vegetative over the drain field.
- Do not plant vegetables or other annuals that require digging in the soil due to potential contact with pathogens. In addition, the soil will be bare at times, reducing evapotranspiration of water to the air.
- Mow grass frequently to encourage growth, but remember to let it grow longer before winter.
- Reserve a replacement drain field area and manage it the same as the present drain field.

Special winter precautions

Common reasons private onsite wastewater treatment systems (POWTS) freeze are a lack of snow cover and cold temperatures, combined with construction or “use” issues. These can include a waterlogged system, cold air entering the system, compacted soil, or lack of plant cover. Others include irregular use of the system, leaking plumbing fixtures or a pipe that does not have the proper change of elevation.

Low snowfall amounts can mean potential danger for your POWTS. For some recent winters, there has been a pattern of sub-zero weather arriving before major snowfall. This may cause a deeper than usual frost level in the ground.

If the soil over a pipe is compacted, or the pipe is not properly bedded when it is installed the elevation of the pipe may shift, causing a loss of gravity flow. This results in water left standing in pipes, and the water can easily freeze. The risk of water freezing also increases if cold air is allowed to enter the system and if there is a lack of vegetative cover over the system.

Here are some precautions:

- Stop mowing the grass over the drain field in early fall. Let it grow stronger to trap more snow.
- Add a layer of mulch (8-12 inches) over the pipes, tank and soil treatment area to provide insulation. A mulch of loose hay or straw works well, as do leaves. The key is to keep it loose to form air pockets, which act as the insulators. This is particularly important if your system is new, and vegetative cover has not been well established. If you live in an area without a natural windbreak, you may want to consider installing a snow fence to help keep the mulch in place and to trap snow.
- Use normal amounts of water; the warmer the better. Spread out your laundry schedule to one warm/hot load per day, year around. (Spreading you laundry schedule out is something that should be done all year.)
- Don't leave water running all the time to prevent freezing. A slow trickle could freeze, while a steady stream could overload the system with water.
- Don't add antifreeze to the system.
- If you will be gone for more than a day or two, plan accordingly. Have someone visit and use water regularly. If you are going to be gone for an extended period (weeks or months), pumping the tank before leaving may be the best option. But make sure to consult with a professional before having a tank pumped to make sure that leaving an empty tank for an extended period of time will not cause damage to the tank or other parts of the system.
- Reroute the drip water from your furnace. This slow drip can freeze in the pipes. Route this clean water into

the sump or a bucket.

- Fix any leaky plumbing. The small trickles of water going into the system can freeze as thin ice layers within pipes, and eventually close them.
- Keep all vehicles (including ATV's and snowmobiles) and high-traffic (people or animal) activities off the system, all year.
- Make sure all risers, inspection pipes and manholes have tight covers. Adding insulation is a good idea. Check for any cracks in the covers in the fall. All access opening covers must be properly secured to prevent unauthorized or accidental entry. There is grave danger in unsecured covers.
- Keep an eye on your system. If any seeping or ponding occurs, contact an onsite professional.

Keep records

Keep detailed records of repairs, pumping and other maintenance activities. Keep a sketch of the location of the septic tank and drain field for future maintenance. This is important information for potential buyers if the property is ever for sale. Plot plans for your use or other information can often be obtained at the local zoning or health department office.

Secure the septic tank cover and other safety tips

Properly designed, installed, operated and maintained, private onsite wastewater treatment systems (POWTS) provide economical and effective sewage treatment. But there are aspects of the systems that can be gravely dangerous to your family's safety and health.

“Benaiah had fallen into a septic tank. Exactly how that happened isn't known, but his parents later determined the access cover, despite being fitted with screws, could be lifted off, or kicked off, with little effort. The boy had been pulled from the foul tank by his father, Tim, and his older brother, Timothy, who is 5, but by then he'd stopped splashing and had suffocated on the sewage he'd taken into his lungs. ... It worked. Benaiah made a choking noise and then began coughing up the toxic liquid in his lungs.” From an article in a summer 2007 Wisconsin newspaper

Be sure that the septic tank and its access ports have sound and secure covers that do not risk collapse and which cannot be removed by children.

When treating sewage, the tank contains very low levels of oxygen. Hydrogen sulfide, methane, carbon dioxide and other life-threatening gases are also present.

Be alert for unsanitary conditions such as surface effluent or sewage backups into buildings, events which risk serious viral and bacterial hazards and present personal sanitation hazards.

If you think there are dangerous conditions, such as an unsafe tank cover, tank collapse, or a home-made septic tank or cesspool (which are at increased risk of sudden collapse) such areas should be roped off and clearly marked as dangerous to prevent access until proper evaluation and repairs can be made.

Manhole Covers

The manhole in the cover of the septic tank is the large entrance (20" -24") through which the tank should be cleaned. The manhole may be buried below ground level, but should be close to the ground surface for easy access. It may be raised from the cover of the tank with concrete or plastic risers for easier access. It is usually located in at either end of the tank; older tanks may have the larger cover over the inlet end of the tank. Newer tanks should have a cover terminating above grade over the outlet end of the tank to accommodate the servicing of a filter located inside the tank. however, some manufacturers locate it closer to the inlet end of the tank. There may be more than one manhole, in which case they are usually located at the ends of the tank. Covers may be concrete, plastic, fiberglass, or steel. Insulation may be added in cold climates. Unless you are a service professional, never remove the manhole cover! It is heavy and creates a large, dangerous opening.

Dangerous Overwhelming Gases

When treating sewage, the tank contains very low levels of oxygen. Hydrogen sulfide, methane, carbon dioxide and other life-threatening gases are also present. The sewage treatment process uses many beneficial microorganisms, like bacteria, in the treatment process. However, the tank also contains harmful bacteria, viruses, and disease causing organisms. Liquid and solid contents of the septic system are capable of causing infectious diseases. Decomposing wastes in the septic tank produce toxic gases (such as methane) which can kill a human in a matter of minutes.

- Do not lean over or stick your head into the septic tank to examine its interior - you could fall in to the tank or become overcome by gases and fall into the tank, an event which is likely to be fatal.
 - Never go into a septic tank to retrieve someone who has fallen in and was overcome by toxic gases without a self-contained breathing apparatus (SCBA). Call for emergency services immediately and put a fan at the top of the tank to blow in fresh air.
 - Do not light a flame at or near the tank - methane gas is explosive. Do not smoke near septic tank openings.
 - Never use electrical lights, appliances, or tools in or close to water or wet ground near the septic tank or drainfield. This can result in electrical shock or explosion.
 - Contact a plumber or other qualified person if you smell 'sewer gases'. They can identify the source and correct it immediately. If the gas is very strong, evacuate the building until the problem is corrected and the gases are removed.
- Never go down into a septic tank or any other wastewater tank. Professionals who work on onsite wastewater treatment systems are specially trained and wear special equipment and gear for that purpose, including self-contained breathing apparatus.

Wastewater is unsanitary

Be alert for unsanitary conditions such as surface effluent or sewage backups into buildings, events which risk serious viral and bacterial hazards and which indoors may require professional cleaning. Be alert for personal sanitation hazards when working around septic systems, such as open cuts or failure to wash properly after coming into contact with any part of a working onsite sewage system.

Rope off and mark dangerous sites

- If you think there are dangerous conditions, such as an unsafe tank cover, tank collapse, or a home-made septic tank or cesspool (which are at increased risk of sudden collapse), such areas should be roped off and clearly marked as dangerous to prevent access until proper evaluation and repairs can be made.
- Old steel tanks, thin, rusting steel or rotting homemade wood tank covers, site-built tanks and cesspools, and recently - pumped tanks are at particular risk of collapse, with the chance of becoming buried. Beware of

abandoned systems which may not have been filled in. Signs of collapse include depressions or “soil subsidence” anywhere on or around the property. Any suspect area should be roped-off and absolutely no one should walk over or even close to such a spot until it has been investigated by a professional. Don’t assume that an old house which is now connected to the public sewer didn’t previously have an onsite wastewater treatment system.

The news reflects the dangers

"A seven-year-old Portsmouth girl fell into a hole when a septic cover failed. The same thing happened to a 3-year-old boy in Topsfield, Massachusetts. And a 3-year-old Taunton boy died last May after falling into four feet of sewage."

"The 2-year-old fell into an abandoned septic tank. His mother witnessed the event and was able to grab his outstretched hand and pull him to safety, as dirt and stones continued to fall onto his face. Weeks later, a second cesspool collapsed in the same yard, but fortunately no one was hurt."

"The 5-year-old twins knew something was wrong when the earth swallowed the baby. The adults knew something was wrong when the twins started screaming. Two-year-old Isiaha Gatwood had stepped into the opening to a septic tank, dropping into 4 feet of effluent."

"As they arrived in the yard, the young girl stepped on a septic tank cover that was flush with the ground. She probably didn’t even realize the danger when ..."

“I was standing there...watching and stuff. Then I heard a creaking or something. And then I see Angelina almost falling into the septic tank. And the lid flipping over.”

Troubleshooting Septic Tank / Drain field Systems

Problems that sometimes occur include sluggish drainage, contaminated drinking water, wastewater surfacing in the yard, odors, or pipes freezing.

- Sluggish or no drainage from fixtures, or backup of wastewater into the house may be caused by: improperly designed and/or installed system; improper plumbing in the house; blockage in house plumbing; improper appliance operation; excess water entering the system; improper elevations in wastewater system; pump failure or improper operation if system is not a gravity flow; blockage in wastewater line between house and septic tank; blockage in septic tank; blockage in line from septic tank to drain field; blockage in distribution box, drop box or pipe; or blockage at the drain field/soil treatment interface where wastewater enters soil.

- Contaminated drinking or surface water may be caused by: inappropriate or improperly designed and/or installed wastewater treatment system; system too close to water supply well; direct flow of wastewater to surface or groundwater; improper well construction; broken water supply pipe; broken wastewater lines; leaking septic tank; or a source other than owner’s system.

- Sewage odors indoors may be due to: improper plumbing and venting in house; traps not filled with water; wastewater back up into house; wastewater surfacing in yard; or unsealed wastewater ejector sump pump. treatment and disposal. The most common onsite system used is a septic tank in combination with a traditional drain field. A properly designed, installed and maintained system should operate for 20 to 40 years or more, treating wastewater to minimize the negative impact on groundwater, surface water and human health.