

ROZGA e-Guide to Septic and Mound Systems



ROZGA Plumbing and Heating Corp
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tstair@rozgacorp.com

Summary

Septic systems and Mound systems are required for any building not served by municipal sewer. Both are temporary systems that require understanding and maintenance to extend their longevity.

By understanding the information in this guide you will be able to extend the life of your system as long as possible and minimize the potential for sewer backups in your home.



About the Author

Rozga Plumbing and Heating Corp

An award winning Plumbing and Heating Company, Rozga has been the choice of homeowners, business owners, municipalities and even other plumbing companies since 1981.

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The Basics

POWTS (Privately Owned Wastewater Treatment Systems) refers to all types of septic systems, mound systems, holding tanks, etc. For the purpose of this e-Guide, the word 'POWTS' will be referring to any of these type of systems. They all do the same thing; remove, treat, and dispose of the wastewater from a building that isn't served by municipal sewer.

This guide will discuss each individually, however, when discussing general topics we will refer to all of them as POWTS.



What Determines If a Mound or Conventional Septic is Required ?

All POWTS in Wisconsin are regulated by the state plumbing code: Department of Safety and Professional Services 383. Counties are the local regulators of the state plumbing code for POWTS. It all starts with a soil test. A certified soil tester digs test pits in your yard to determine site and soil suitability for POWTS, and the results of the soil test determine whether your lot is suitable for a mound, a conventional (in-ground) system or neither.

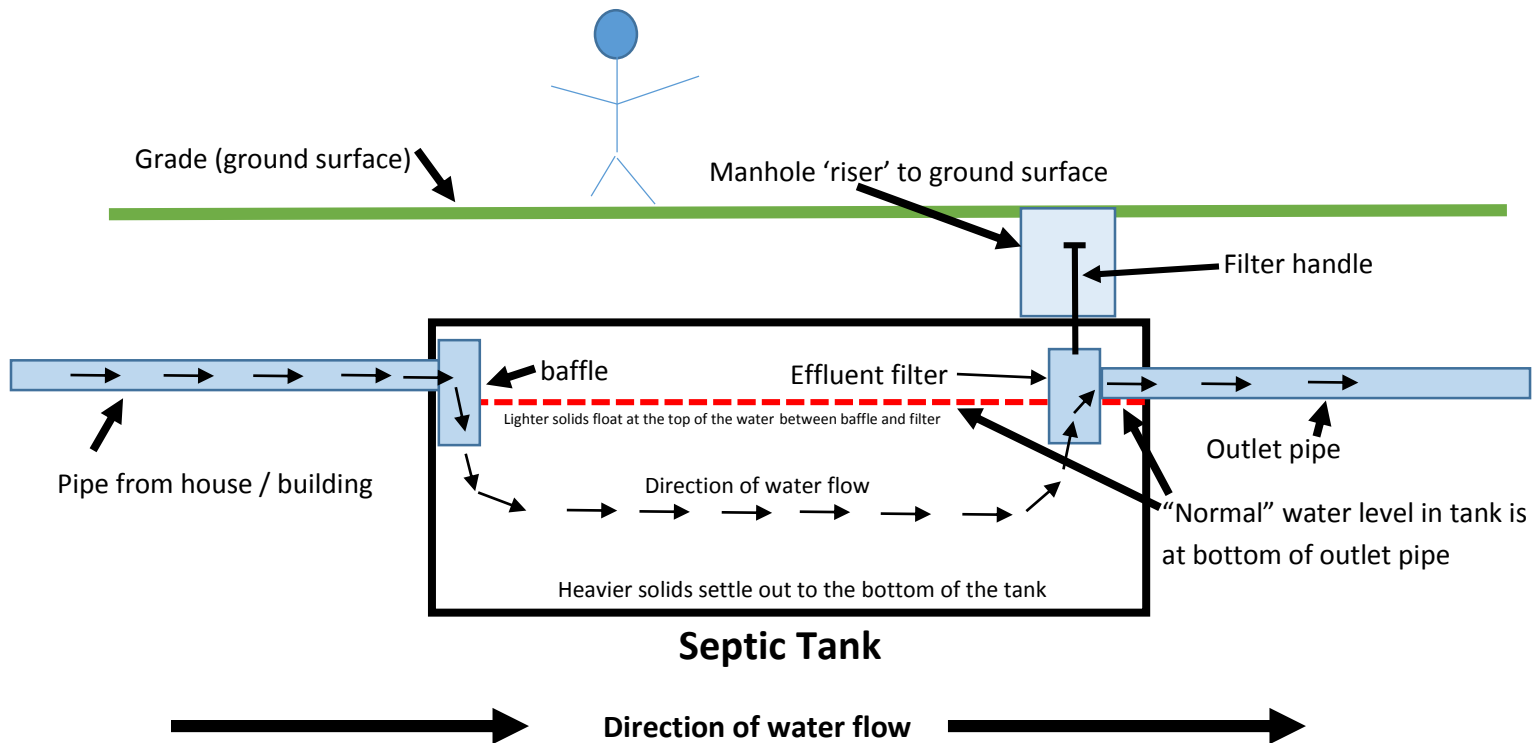
The soil tester is looking for many different factors; soil, slope, setbacks, depth to limiting factor, etc. The main determining factor of whether you will need a mound or conventional (in-ground) system is the depth to the limiting factor. Limiting factors include: High groundwater, bedrock, and slowly permeable soil (i.e. clay). In most instances, the system elevation (bottom of) the system being installed in your yard has to be 36 inches above the limiting factor pursuant to the Wisconsin State code.

So here's the answer: if the soil tester finds the limiting factor seven feet down below grade (ground surface) , depending on the soil, your system could be installed four feet deep below grade and still be three feet above the limiting factor.

However, if the soil tester determines the limiting factor is only two feet below the surface, then how do we design and install a system one foot above the ground? By installing one foot of coarse washed sand on the ground surface, and then building a system on top of that. The one foot of sand plus the two feet of suitable soil achieves the 3 feet of vertical separation required between the system elevation (bottom of system) and the limiting factor two feet below the ground surface. The system built on top of that foot of sand is covered over by top soil and planted with grass seed - this is the mound system.

How do these systems work?

All systems start with the wastewater flowing from the house/building into an underground septic tank. This tank is used to separate heavier solids which sink to the bottom, and lighter solids which float to the top. The relatively 'cleaner' / treated water flows out of the tank.



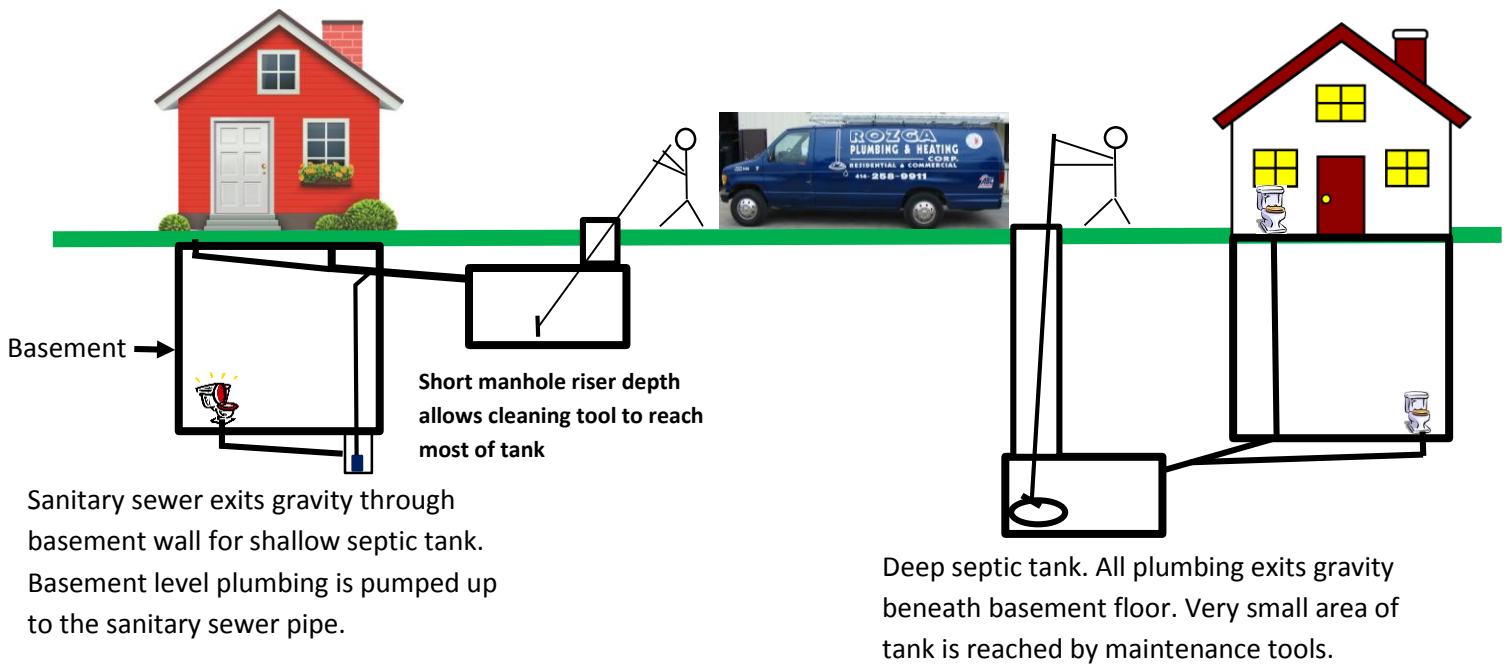
Some IMPORTANT Septic Tank BASICS:

1. **NEVER ENTER A SEPTIC TANK FOR ANY REASON!**
 - a. Septic tanks not only have dangerous gasses, those gasses deplete oxygen. So whether or not you smell and gasses within the tank, the likelihood is high that the oxygen level in a septic tank is not safe to breathe in. Entry into a septic tank should only be accomplished by those persons trained for proper confined space entry. **DO NOT ENTER A SEPTIC TANK FOR ANY REASON.**
2. **Know where your septic tank cover is.**
 - a. It is very important to know where your septic tank cover(s) are. Older tanks typically have one cover, newer septic tanks have at least two manhole covers. By manhole covers we are referring to round covers 24 inches in diameter-not a 4 inch diameter pipe.
3. **If the covers are exposed they must be locked.**
 - a. It is actually best if the covers are not buried, that they be above grade for easy access in case of emergencies. However, if the covers are above grade, they must be locked to prevent unauthorized (children) access into the tanks. (See # 1 above).

Important Septic Tank Information

Unlike municipal sewers which are deep and come out under the basement floor, with POWTS you want your septic tank (and thus your sanitary sewer pipe to be relatively shallow. The goal is to have your septic tank within two to two and one-half feet (i.e. 24 to 30 inches) below grade max. The main reason for this is maintenance. The shallower the tank, the easier it is to properly maintain it. If you were to come out under a basement floor with sewer to a septic tank, and the tank was 8 to 9 feet below the ground surface, two things would happen. First, there are manufacturers of septic tanks whose tanks are not even designed to structurally withstand that type of depth. You would have a potential that your tank could collapse based on the weight of backfill material above the tank.

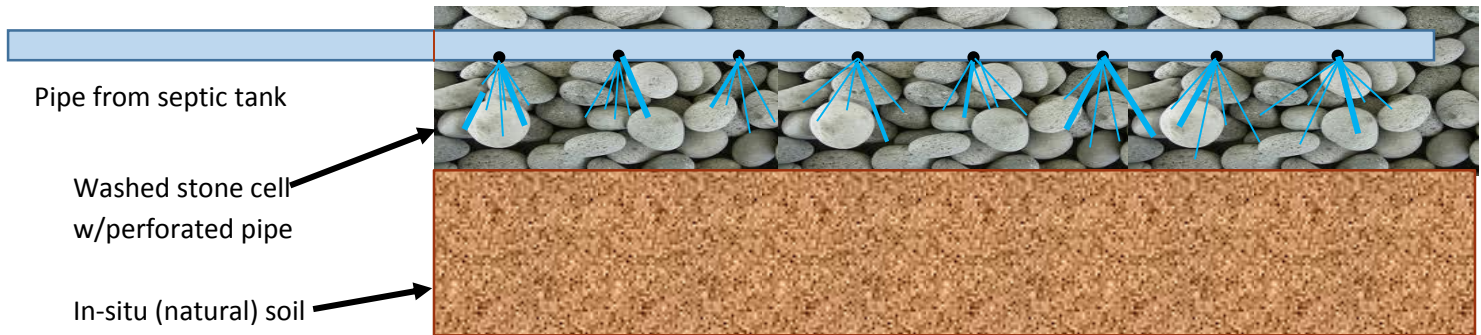
Secondly, maintenance becomes very difficult when a tank is deeper than the 30 inch recommended depth.



Once the water leaves the Septic Tank, where does it go?

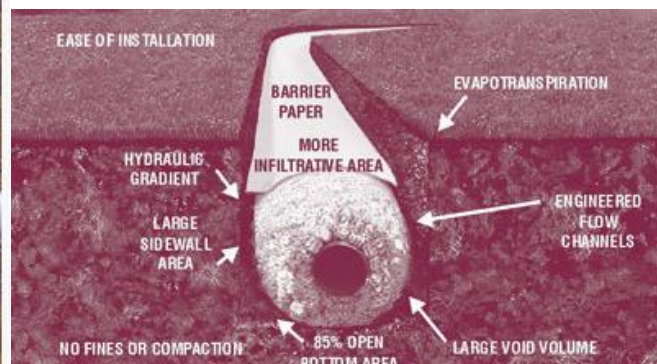
In a conventional (underground) septic system, the water would flow from the septic tank to an underground distribution cell (or 'seepage bed'). Many distribution cells are constructed of clean washed stone and perforated pipe. The water flows through the perforated pipe, then filters through the stone, and then down into the soil. Remember from earlier, the water will now have at least three feet of suitable soil to filter through.

Grade (ground surface)



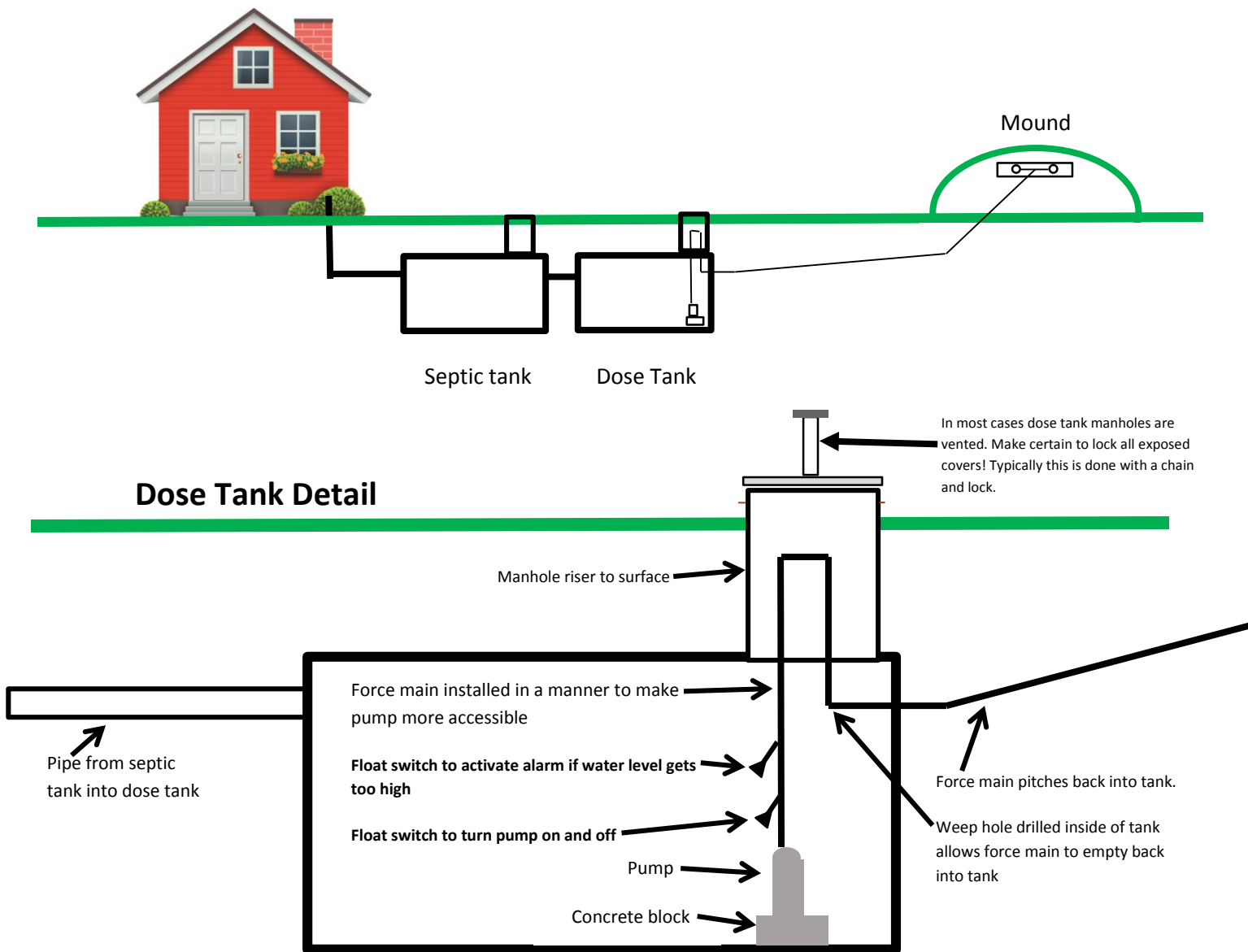
Conventional in-ground system – The water is flowing gravity out of a four inch diameter pipe

There are other types of distribution cell media that are used in place of the stone. In some cases large chambers are used, and others have netting filled with “packing peanut” type media to filter the water. Each has their own pro’s and cons. Stone and pipe has been a staple media for many years with good results.



Mound System

In a mound system, the water leaves the septic tank and flows into another tank that has a pump in it, a 'dose' or 'pump tank'. The water is pumped under pressure into the mound. The mound is a pressurized system. The distribution pipes in a mound system are much smaller diameter than used in a conventional system. The pipes also have smaller holes for the water to spray out of. The idea behind the mound system being pressurized is that it increases the potential for equal distribution over the entire square footage of the distribution cell within the mound.



How to Locate a Mound on a Site

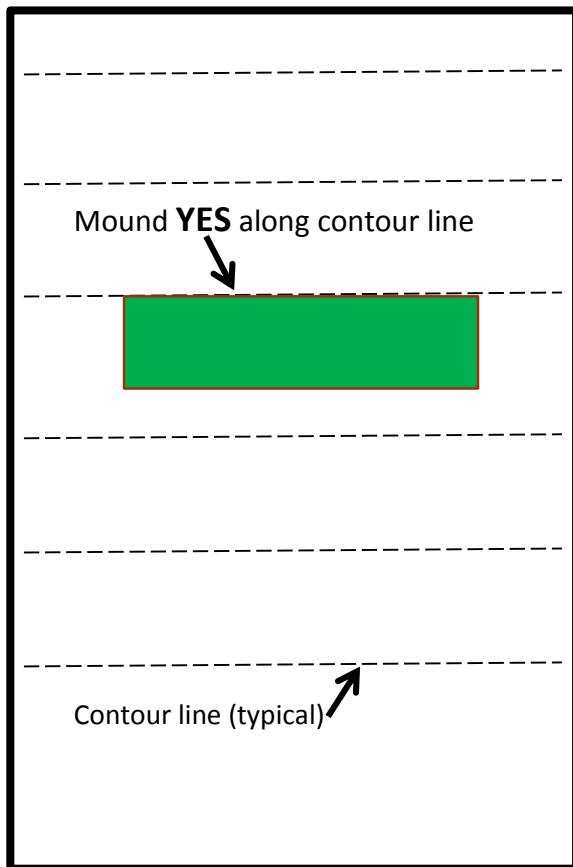
The soil tester will determine the location of any system. Regulations require a system be installed between at least three soil borings that the soil tester deemed suitable for a system.

In the case of mound systems, mounds must be built only on natural ground that has not been disturbed in any way. Soil must not be stripped, filled, nor compacted in any way within the footprint of the mound and for an area 15 feet downslope of the mound. This means no vehicular traffic in the area of mound installation.

Also, the long dimension of the mound must be installed along existing contour lines. This means (as an example), if you were standing at the top of a hill and I was standing at the bottom of a the hill, a mound would have to run lengthwise left to right between us, not up and down the hill. A contour line is an imaginary line on which every point on the line is the same elevation.

Top of Hill "A"

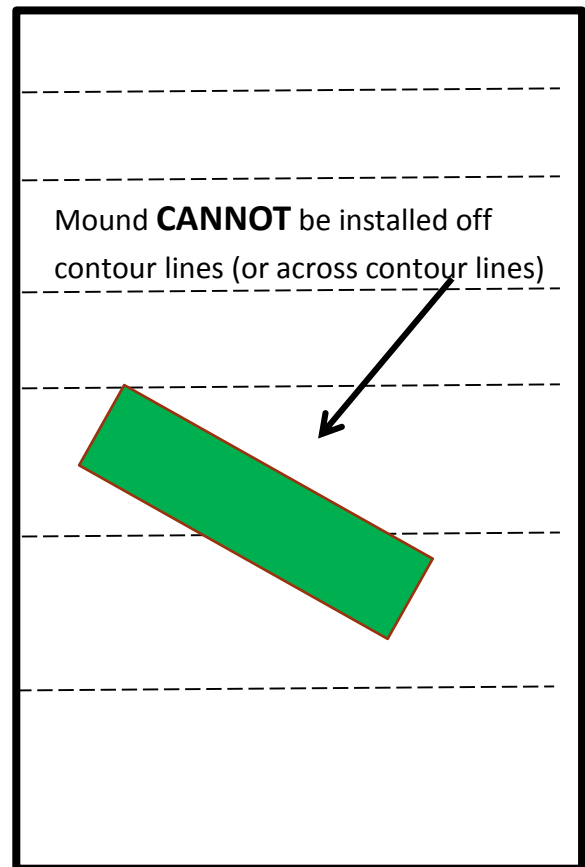
YES



Bottom of Hill "A"

Top of Hill "B"

NO



Bottom of Hill "B"

Setbacks to consider

The following setback minimums must be maintained when siting a POWTS (mound or septic) on a residential lot:

POWTS distribution cell or mound to well or body of water (lake): 50 feet

Pressurized force main to well: 25 feet

Gravity sewer pipe to well: 8 feet

POWTS to lot line: 5 feet

POWTS Distribution cell or mound to building (including decks): 10 feet

POWTS to swimming pool: 15 feet

The Do's and Don'ts of a system:

How to Properly Maintain a Septic System or Mound System for Optimum Longevity

All POWTS (*'Septic and Mound Systems'*) are temporary systems and most will eventually fail. Think of them as a large filter built in your yard.

The 'average' life of a POWTS in Wisconsin is approximately twenty years. Systems can fail much faster, and some last much longer. The following listed are items that will help achieve as long of a life as possible for the system and minimize potential for backups:

1. **Do not flush "wipes" down a toilet or down the drain.** Do not flush: dusting wipes, baby wipes, cleaning wipes, personal wipes, etc. These relatively newer products claim to be 'septic safe' but in reality are not and cause many service calls.
2. **Do not pour grease down the drain.** Some grease will get into the system, and that is understandable. However, do not knowingly pour pans of grease into the system. Grease will cause a system to fail very fast.

3. **Do not use a garbage disposal.** A garbage disposal will grind grease out of most foods. See # 2 above, grease is bad for systems. Garbage disposals also grind the food into small particles. Many of these particles do not settle out in the septic tank, and float out to the distribution cell and cause it to clog faster. One study showed that garbage disposal use will add 30 percent more solids to a system.
4. **Have the system inspected once per year.** It is important that a professional look closely at the system once per year. In many cases small problems (if any) can be addressed before they become larger more expensive problems. The inspector will check the level in the tank, the condition of the baffles and filter, and determine the level of solids in the tank.
5. **Don't use additives in the system.** Even the DNR has a brochure warning of the use of additives in a system. Some additives do nothing, others actually harm the system and the environment.
6. **Practice water conservation.** Use water efficiently. Think of every gallon of water you use as 15 miles being put on a car engine. Eventually, that 'engine' is going to blow. Don't flood out or hydraulically overload your system. If possible, space laundry out throughout the week. Make sure you don't have dripping faucets or leaking (running) toilets. Excess water in a system will cause premature failure.
7. **Don't flush items that could clog the system.** Cigarette butts, hair, cleaning wipes, condoms, feminine hygiene products, etc. should not be flushed into a POWTS.

Advanced Pretreatment

Aerobic systems

The typical, average POWTS as described above are considered “anaerobic” systems. This means very little oxygen is present within the system. The bacteria in a system with very little oxygen do very little to breakdown the solids. An anaerobic septic tank is primarily a large settling chamber.

Some systems add aerobic pretreatment, a method of adding a lot of oxygen to the treatment process. Aerobic digestion is one of the processes used in municipal treatment plants to breakdown solids. Aerobic pretreatment is a tank with special media, or surfaces and a blower. This tank is placed between the septic tank and dose tank, or in place of the septic tank. As the blower adds a lot of oxygen into the water, different more robust bacteria grow within the tank. The special tank has media or surfaces for the aerobic bacteria to thrive on (and not be washed out of the tank).

When an aerobic system is operating properly, the water coming out of the tank should be clear and odorless. Aerobically pretreated water will look and smell like tap water. Because so many of the solids ARE removed in an aerobic process, in Wisconsin many systems are granted size reduction when approved, aerobic pretreatment is added.

Don't be fooled by inexpensive 'widgets' that CLAIM to be aerobic systems but are merely a small blower with a hose to be dropped into your septic tank. This seems aerobic because the bubbles would in a literal context be considered aerobic by virtue of having air in them. However, these widgets are not sized for proper air movement, nor do they provide proper media square footage on which aerobic bacteria would grow and thrive. Their price and claims make them very appealing. Make sure to check with your ROZGA POWTS professional to determine which pretreatment device would actually be beneficial for your system.

Advanced Pretreatment

Ultraviolet Disinfection

In some instances after an aerobic tank, an ultraviolet light will be used as an additional method of pretreatment. An ultraviolet light (typically used in municipal wastewater AND water treatment plants) is used to “kill” or inactivate bacteria and viruses.