# Honest Information About Your Septic System – YOU Make the Decision!

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**What A Septic System Is:**

The term septic tank is an abbreviation for septic sanitation system. The purpose of the septic system is to cleanse and purify human and household wastewater and return the purified water back to our usable groundwater. This is done by utilizing an underground system which is usually made up of a temporary holding compartment (tank) and a drainfield filtering system (absorption area).

Because the tank will contain a great deal of disease causing organisms (pathogens) it must be watertight. These pathogens mainly come from human feces. It is important that these pathogens do not escape into the surrounding soil. Therefore, most tanks are made from concrete, steel or fiberglass material. The tank is where most of the solid waste is treated by enzymes and bacteria. The effluent leaving the tank is mostly liquid and is further treated by the action of the absorption area. The effluent seeps into the soil beneath the drainfield where the enzymes, bacteria, and many other microorganisms within the soil purify the liquid. This liquid eventually reaches an aquifer as clean water fit for human consumption.

As you can see, the septic sanitation system is an excellent way of treating wastewater in rural areas. Large multi-million dollar treatment plants are very expensive to build and operate. They also consume a tremendous amount of our natural resources for energy. These plants use many different types of technology in treating the solid wastes. Consider yourself lucky if you are the owner of a septic system. You are getting the benefit of waste treatment for a fraction of the cost city resident's pay monthly for their waste treatment.

**How A Septic System Works:**

The average person uses between 100 and 300 gallons of water per day for drinking, cooking, washing, and toilet flushing. Wastewater enters the septic system from toilets, sinks, tubs, and other house drains.

This wastewater flows by gravity from the house to the septic tank. The effluent entering the tank is about 99% water and 1% solids. Of these solids, 80% are organic and the remaining 20% are inorganic. The heavily polluted wastewater from the toilet produces most of the organic solids (feces, toilet paper, and urine). Other organic solids come from detergents, pieces of food, and any other non-chemical source. Water softeners, bleaches, paint residue, household cleaners, and other chemical sources make up the inorganic solids.

The purpose of the tank is to slow down the flow of water throughout the system, long enough for the solids to settle. As the wastewater enters the tank, its movement is brought to a standstill. This allows the solid materials to settle to the bottom of the tank where enzymes and bacteria immediately start to digest them. The process begins with the enzymes, which liquefy the organic solids. Once liquefied, bacteria can do their job by absorbing the liquid. In this process of digestion, methane and other gases are produced as a by-product. These gases rise to the top of the tank carrying along fine particles. The gases are released through the vent pipe attached to the tank. The fine particles, along with oils and grease form a scum layer at the top of the tanfpk. This is another excellent breeding ground for enzymes and bacteria, which also actively digest these organic materials. Enzymes, bacteria, and other microorganisms can only digest organic solids. The inorganic solids together with the other by-products of the digestion process fall to the bottom of the tank to form a sludge layer. This process will continue day after day as long as there is organic food for the enzymes and bacteria to feed on and the conditions within the tank are suitable for their continued life. During this time billions upon billions of microorganisms will multiply (bacteria double approximately every 20 minutes).

As this process continues over the life of the tank the sludge layer will keep building up. As this layer builds the tank capacity is decreased by the volume of the sludge layer. This sludge layer must be removed on a periodic basis so that the tank can operate correctly. If the sludge is not removed, it can build to the point where it will block the outlet pipe and the system will eventually fail. The other important element of this process is the enzyme/bacteria action within the septic tank. As mentioned earlier, proper tank conditions must be maintained for them to keep multiplying. Everyday household cleaners, drain openers, chlorine bleaches, mouthwashes, etc. kill off enzymes and bacteria. If the enzyme/bacteria action is reduced below a proper level the solids and sludge will build up and cause system failure. So at the time of pumping the tank(s) and we find the bacteria level LOW we recommend that you rejuvenate this bacteria on a monthly basis with an additive. Contact us for more information on this.

Now that the enzymes and bacteria in the tank have done their work of converting the solids to liquid the next process can start. The liquefied effluent now looks like dirty water. This discharge water flows out of the tank and into the filtration system (drainfield). If you have a pressurized system (at-grade, mound, in-ground pressure) a pump in the pumping chamber then pumps waste water into filtration area.

The liquid flows through the drainpipe system, and then percolates into the gravel base. From there it is absorbed into the surrounding soil. As the effluent passes through the soil it is purified by the many microorganisms within the soil. The

enzymes, bacteria, fungi, and the rest of the microscopic creatures of the soil purify the effluent and make it harmless to man and beast. Some of these soil organisms can actually produce antibiotics like penicillin, which will destroy pathogens and viruses. They also convert the effluent into nutrients that plants can use for food. The water within the effluent is purified through this process and eventually reaches the groundwater reserves for future use. The distance the discharge water must percolate through the soil to purify it is based on the type of soil. Course sand is bad because it allows the water to pass too freely. Clay is bad because the water can no percolate quickly enough. Therefore, the location of the drainfield is very important for a properly operating septic system. Almost all septic systems are pre-approved by using percolation tests to determine if the soil will handle the amount of discharge water anticipated for the household.

Although the septic system process appears to be very complex, it really is very simple. It is based on the very nature of how dead organic materials is broken down in the environment everyday. Dead plant material, dead animal waste, and human produced garbage in landfills are all decomposed by these microscopic creatures. Many of these are the same enzymes and bacteria that are present in your very own septic system. In nature, there are even some specialized microorganisms that actually feed on toxic material. They have been found in oil spill areas, toxic waste dumps, etc. Septic systems can work on this simple and natural process forever if they are properly installed, maintained, and cared for. It is when these systems are abused or highly concentrated that they can cause problems to the environment!

**Helpful Advice To Keep Your Septic System Working Efficiently:**

(1) The water absorption of the drainfield area is the backbone of the septic system. The better the drainfield absorption, the better the overall system will work. Therefore, the following suggestions have to do with the reduction of water in this area:

Water conservation is one of the easiest things you can do to reduce the amount of water going to the absorption area.

- Wash full loads of laundry and dishes instead of several small loads.
- Water saving showerheads, faucet aerators, new toilet float valves, toilet tank space-occupiers, or low-flow toilets are very helpful. Today, we find new washing machines on the market that also save of water usage.
- Repair all leaking faucets quickly.
- Avoid leaving the water running when shaving, brushing teeth, rinsing food or dishes, etc.
- Put a pitcher of drinking water in the refrigerator. This will reduce the amount of water running to reach the desired temperature when getting a glass of drinking water.

Make sure that non-polluted water such as the roof downspouts, house footing drain tiles, sump pumps and any other non-polluted water does not go into the septic tank. These water sources should also be directed away from the drainfield area.

Be sure the ground surface above the drainfield is graded so that natural rainwater runs off the drainfield area as much as possible. The drainfield should be located in a sunny place so that maximum evaporation can take place. Be aware of building shadows and shade from nearby trees.

NO heavy equipment should be used above the drainfield, and no buildings should be built above this area because soil compression may occur and drainpipes could break. This is also true when we have a nice snowfall that we are able to make use of our snowmobiles. We would never want to use our mound as a "jump" for these recreation vehicles! Driving and packing down the snow down over any drain fields reduces the amount of insulation that the snow actually provides to the drain field and should be avoided.

Trees and shrubs should not be grown above the drainfield area because their roots could cause blockage and other damage to the drainpipes. Lawn grasses are the only things that should be grown above this area.

Solids from the septic tank should not be allowed into the drainfield area because they will clog the drainpipes or reduce the ability of the soil to absorb water.

(2) The septic tank is the support for the whole system. Without the septic tank the whole drainfield area would fail in a very short period of time. The action within the tank is what allows the drainfield to work. The cleaner the effluent entering the drainfield, the better the drainfield will work. Following are a number of suggestions to keep this process working without any interruptions:

- The tank must be the proper size for the waste treatment at hand. A small tank used for a two-bedroom house occupied by three people will not support the waste generated by six people. Therefore, the tank capacity must match the intended use. Oversized tanks are an advantage because they allow the solids to settle and liquefy over a longer period of time.

- The tank is where solids are liquefied. Therefore, the enzyme/bacteria action must be maintained in the tank so that the solids are liquefied in the normal time period. The more action within the tank the faster the solids will liquefy. The more solids liquefied the cleaner the effluent will be entering the drainfield. Care should be taken to maintain a proper living environment for these microorganisms.
- The use of a garbage disposal will add extra solids to your septic tank. If you use one make sure the tank capacity can handle this extra waste. You are probably better off not using the garbage disposal and should throw the waste in with your other solid wastes or have a composting pile.
- Remember, sludge build up decreases the tank capacity. The sludge layer should never be allowed to reach the level of the outlet pipe. A regular pumping of the tank will allow you to renew the life of your tank. This will also give you the opportunity to inspect the tank for any structural problem. The idea is to prevent any harm to the drainfield, which is caused by sludge entering it and clogging the absorption capabilities.

(3) Your septic system is a big investment. The payback on this investment comes from operating a very effective waste treatment system over a long period of time at a small annual operating cost. Treat your system with care and you will see the benefits of your efforts. But if you don't treat it with care, you will eventually have problems. If the problems continue and the system fails it could mean another big investment to replace the system.

(4) If you have a newer septic system you most likely have a filter on the outflow side of tank that will need to be pulled and serviced on a regular basis. We recommend *at least* 2 cleanings per year; ideally every 3 months to keep this filter from plugging up and causing back-ups. Feel free to call our office if you would like to be put on a scheduled cleaning list for this service.

**Myths And False Facts About Septic Systems:**

Over the years septic tanks have been one of the most misunderstood and misconstrued pieces of equipment. Everyone seems to have an opinion about how to care for your septic system. Worse yet, some septic tank owners don't know or care about their own systems. Now that you know about your system and how it works, we will try to clarify some of the myths that have followed septic tanks. We will also warn you about some of the false facts about septic tank additives.

- Some people believe that putting yeast or a dead rabbit into their septic tanks adds bacteria to the tank and therefore, would prevent problems. Actually, yeast does not produce bacteria, but it does help by breaking down starches within the tank. However, starches make up only a small percentage of the waste in your tank. Therefore, it takes more than yeast to break down the five types of waste (Proteins, Fibers, Greases, Pectins, and Starches) found in the normal septic tank. Enzymes are specific. For example, Cellulase, an enzyme that liquefies fibers (toilet paper), will only liquefy fibers. It has no effect on proteins. Therefore, a protein-liquefying enzyme called Protease must be present to attack the protein-base wastes. Bacteria are different than enzymes. The fact is, there are many different types of bacteria. Some need oxygen to survive and are called aerobic bacteria. Others are actually killed by the presence of oxygen. These bacteria are called anaerobic bacteria. There are good bacteria and there are bad bacteria. Throwing yeast or a dead rabbit into the tank will add some forms of bacteria (good and bad), but certainly not enough of the good bacteria to materially help your tank. The solids added by the dead rabbit reduce the capacity of your tank and the bacteria from the rabbit are not worth the effort. In conclusion then, yeast is helpful to some extent, but the dead rabbit is not.

- People have also believed that putting lime or baking soda in their tanks is helpful. This is true in certain situations because most enzymes and bacteria grow best in a non-acidic environment. By adding lime or baking soda, in the proper amounts, the pH level is brought to a neutral condition. On the other hand, too much lime and baking soda can also be harmful. Acids should never be added to a septic tank.

- Some people brag about not having their septic pumped in 20 years, like they deserve a pat on the back or a medal of honor! When all conditions are perfect this can happen, but it is a VERY rare occurrence. Some people win lotteries too! Don't take someone else's good fortune as your own. Care for your septic system properly.

- The worst septic tank misjustice that we see today are the phony products being sold by telemarketers making wild claims about "never having to pump your septic tank again." In every industry you will get bad apples. Bad apples in the septic tank additive business are very common because it is so easy to play on the cost of a pump out. Don't be fooled by these false claims. You now know that proper care, including high levels of enzymes and bacteria along with regular pumping, is the way to go. Some products actually do more damage than good. Other low quality products are of limited benefit. It is a shame when a septic system fails, adding to the groundwater and environmental problems. What will

hurt more is the cost of repairing your septic system after spending money on useless products, not to mention the many headaches a failed system will bring you in odor and mess. However, there are some top quality products that add positive benefits to your system. Look for products that add the natural process of your system. In the long run, these will cost much less than the phony ones. Feel free to call our office for more information on enzyme/bacteria additives.

**Helpful Hints In Caring For Your Septic System:**

A failing system is not like your car when it is low on oil. No red light will come on to warn you. There are a few signs (such as septic odors, effluent and standing water above the drainfield, and sluggish toilet flushing), that will warn you of future problems. However, the best way to avoid problems is to properly care for your system from day one. The U.S. Department of Health, Education and Welfare – Public Health Division states: "A septic tank system will serve a home satisfactorily only if it is properly designed, installed, and adequately maintained. Even a good system which does not have proper care and attention may become a nuisance and a burdensome expense. Remember, a septic tank – solid absorption system which does not function properly, frequently becomes a neighborhood health hazard. To obtain satisfactory service, the homeowner must know something about the design, operation and maintenance of his own septic tank system." Proper care means a regular pumping schedule and high levels of enzyme/bacteria action within the septic tank system! Following are some suggestions for proper care of your system:

- You should have your septic tank pumped out on a regular basis. The tank should be pumped out every one to three years depending on the capacity, use of the tank and history of the system. When the septic tank is pumped out it should be checked for any structural damage which may cause the tank and/or system to fail.
- Toxic hazardous chemicals should NEVER be poured down the drains or flushed down the toilet. Chemicals such as paints, varnishes, pesticides, solvents, and caustic drain openers can kill off the enzymes and bacteria within the system and also could contaminate the groundwater.
- Non-biodegradable materials such as cat box litter, disposable diapers, sanitary napkins or tampons, and coffee grounds are not attacked by enzymes and bacteria. Therefore, these inorganic materials will decrease the capacity of the tank and should not be flushed into tank or must be removed regularly by pumping.
- Every effort must be made to avoid letting large amounts of grease or oils into the tank. Grease is one of the hardest organic materials to be broken down by enzymes. Grease and oils also will combine with soap and laundry detergents to form a scum that is very hard to break down and liquefy.
- If possible, don't use garbage disposals because they add extra solids to the tank. These large solids along with other solid wastes such as cigarette butts, paper towels, etc. should be disposed of in the garbage.
- Limit, as much as possible, any personal care products that kill enzymes or bacteria. Mouthwash is a good example of this. You have probably heard the commercial stating that the mouthwash kills germs that cause bad breath. Well, if it kills bad germs (bacteria) that cause bad breath, then it will also kill the good enzymes and bacteria that make your septic tank work. A suggestions is: baking soda mixed with water works fine as a mouthwash. Baking soda does not kill enzymes or bacteria.
- The same is true of household products such as chlorine bleaches. Chlorine is one of the best killers of enzymes and bacteria. These types of products should be kept to a minimum or even avoided and alternative products should be used.
- When we experience VERY cold winters in Wisconsin with no snow covering it is recommended to cover your septic tank cover(s) with LOOSE hay/straw or a tarp. Some have even gone to the extent of covering their whole drainfield with straw/hay to provide insulation. When we do not have a snow covering, we do not have our natural insulation for systems and it can cause freeze-ups within the system.

Proper care is the most important thing you can do for your septic system! If done consistently you should avoid any major problems with your system.

**Conclusion:**

All of us at KUETTEL'S SEPTIC SERVICE hope this information has given you a better understanding of your septic system and how to care for it properly. When you really sit down and think about it, the cost of proper care is much cheaper than the cost of fixing avoidable problems. We wish you the very best with your system and we sincerely appreciate the time and effort you have taken to become better educated about your system. Remember, you are in control of your septic system and how efficiently it treats the wastewater you generate daily. We hope you care enough about your system and the environment to use your authority and control wisely!