

SEPTIC SENSE, SCENTS, CENTS



Supreme Insights to the Fearless Flush

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There are at least three guarantees in life. Most of us know the first two, death and taxes. Often we overlook the third item: poop. Every living thing excretes waste. How we handle it can have significant impacts on our quality of life.

Despite the popular belief that municipal sewer systems are the preferred method of disposing of human waste, there are events – system failures, the practice of bypassing treatment because of storm events – that allow improperly treated sewage to enter and contaminate our waterways.

A well-placed and properly functioning septic system is an effective method of treatment and disposal. If you own one, congratulations, you are a sewer manager. Its operation and maintenance are your duty and your system's successful operation will require an educated, hands-on approach.

Follow the three supreme insights presented here — septic sense, scents and cents — and you can transcend to the realm of the fearless flush.



ACKNOWLEDGEMENTS

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1 SEPTIC SENSE – WHAT IT IS, HOW IT WORKS

The septic system is a very common, cost effective and safe technique for handling human sewage.

Septic systems can take many forms. Some have bells and whistles that alert you to problems, others create hills in your backyard, and some are silent and hidden from view. Regardless of the type of system, you and the

users of your system need to understand how it works and how to properly operate and maintain it. Understanding your system will help you avoid health hazards, expensive repairs or replacement, and major inconvenience.

A septic system is used to treat wastewater from a home or business not served by a community collection system. Check with your health department or local wastewater utility to find out the type of system that serves your location. Even if you are not using a septic system, these guidelines will help your sewer system, too.

KEEP A NATURAL BALANCE



A common myth is that septic tank additives will break down the sludge in your tank so that it never needs to be pumped. This is false. Septic tank additives are unnecessary since you contain everything needed to inoculate your septic tank with bacteria. Instead of spending money on expensive additives that are little more than dried bacteria, take yourself and your spouse out to dinner and come home.

If the additive claims to contain the bacteria you need to augment your septic tank's bacterial load remember that milk carton you left out on the counter a while back. After leaving the half-full carton

on the counter all day, it was bulging. In fact, it was teeming with bacteria that had generated on their own when the conditions were suitable. If your septic tank could handle more bacteria, it would make them. Adding a little container of this or that is not going to help shift the balance of bacteria in your tank. If your septic system professional says you have a sick tank, have the tank pumped and start again.

In Washington state, makers of septic tank additives are required to prove the products do not harm the environment. They are not, however, required to prove they are effective.

THE SEPTIC TANK

A typical septic tank is a buried watertight container made of concrete, fiberglass or polyethylene that is designed to pre-treat domestic wastewater. It clarifies wastewater by holding the water long enough to allow the solids to settle out (sludge), be reduced by bacterial action, or float to the surface (scum). The clarified wastewater is pushed along into the drainfield for further treatment every time new wastewater enters the tank.

If a septic tank isn't watertight, water can leak into and out of the system. Water leaking in overloads the system and causes it to work harder than it is designed to. Usually, water entering the system from the environment causes hydraulic overloading, taxing the system beyond its capabilities, causing inadequate treatment and sometimes surfacing liquid. Water leaking out of the septic tank is also a significant health hazard because the leaking effluent has not been properly treated.

Baffles within the septic tank direct the flow of the wastewater and help to keep sludge and scum from traveling into the drainfield area. All tanks should have accessible covers for checking the condition of the baffles and for pumping both compartments of the tank.

Solids that accumulate in the bottom of the tank as sludge need to be removed through periodic pumping just as lighter materials that form a scum layer need to be removed. Commercial septic tank additives will not eliminate the need for periodic clean-out.

GETTING PUMPED

If the bottom of the scum layer is within 3 inches of the bottom of the outlet baffle, or the top of the sludge layer is within 12 inches of the outlet baffle, your tank needs to be pumped. Whether or not the pumper determines the tank should be pumped, sludge and scum levels should be noted in your operation and maintenance records. This information will help you decide how often pumping is necessary.

The contents of the tank should be pumped through the main lids only, not through the baffles. Everything should be removed out of every compartment; 'starter' is not needed to reactivate the tank.

The pumped tank also should be rinsed with water so that you can see the physical condition of the tank. At the end of the inspection the pumper should refill your tank with water. This will keep it from raising up if the groundwater level is high. If you have a below-ground swimming pool, you know that it could pop out of the ground if you emptied it completely. Obviously, if your septic tank is a holding tank, do not refill it.

In the service report, the pumper should note whether the tank is in good condition or damaged. Any repairs made by the pumper during this visit should be recorded. If the pumper recommends repair but cannot perform this service, note the recommendation and hire someone to make the repairs as soon as possible.

THE DRAINFIELD

Your drainfield takes the clarified effluent from the septic tank. It further treats this effluent in the soils below gravel-lined trenches and then disposes of it in the surrounding soils and groundwater. Various mechanisms and bacteria within the soil treat the effluent.

Keep all vehicles and heavy equipment from using your drainfield and entire septic system as a parking lot or storage area. Not only can soil be squeezed together such that it restricts wastewater moving through it but also pipes and other components can crack and shift under the weight. Protect your septic system by building barriers to vehicle traffic.

The clogging mat, or 'biomat' as it is sometimes called, is an important element of your septic system that builds naturally under your drainlines. The mat is a complex formation of microorganisms that provide some treatment, effectively slow the

movement of liquid into the soil, and can help keep the soil beneath it from becoming saturated.

Unsaturated soils below your drainfield trenches allow wastewater to slowly pass downward through the soil with sufficient time for the soil bacteria and natural die-off to remove all pathogens of human health concern.

If the soils beneath your drainfield are saturated, they will not be able to properly

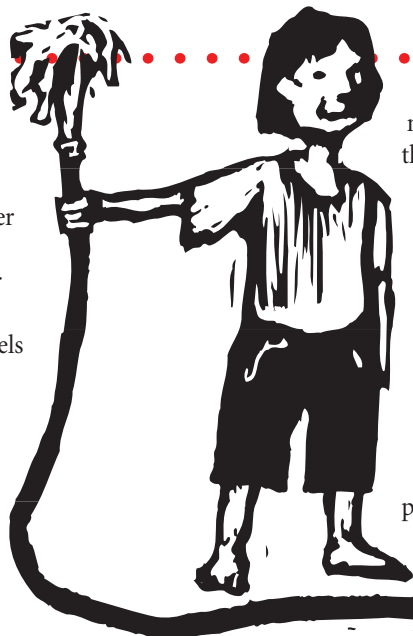
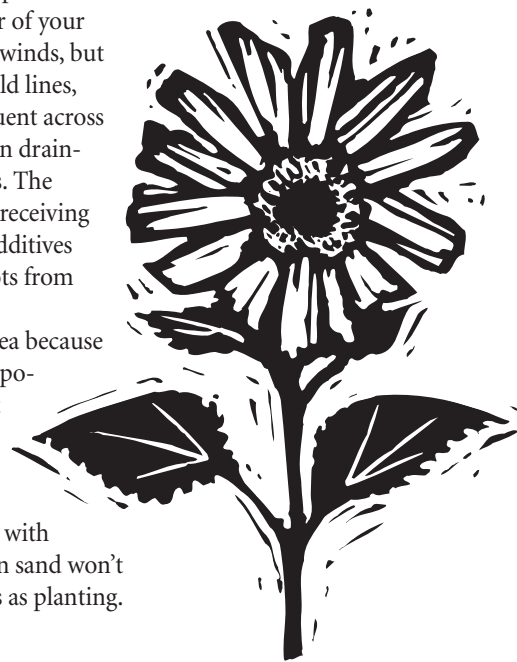
handle and treat the effluent being distributed by your drainfield pipes. In essence, you will not be sure that the wastewater will be free of disease-causing organisms or other nutrients harmful to the environment. Effluent distributed into the soil eventually ends up in shallow perched water tables that feed lakes, rivers, streams and other surface water bodies.

A simple drainfield relies on gravity to distribute the clarified effluent over the soils. Every time water enters the septic tank, water leaves the septic tank for the drainfield. Therefore, in a gravity system the drainfield gets liquid whenever we use water in the house. Make sure your drainfield isn't overloaded by excess water drained by roof tops, hot tubs or anything else under your control. Keep any irrigation system at least 10 feet from the edge of your septic system.

Try to maximize the exposure of your drainfield to sunlight and wind currents to improve its performance. Surrounding the perimeter of your drainfield with tall trees not only blocks winds, but their roots could also invade the drainfield lines, interfering with uniform delivery of effluent across the area. Tree roots are often a problem in drainfield lines and septic system components. The roots can plug up or divert sewage from receiving proper treatment. There are no magic additives recommended to routinely clear tree roots from the lines or your tank.

Planting is good for your septic area because plants increase oxygen exchange and evaporation in your drainfield area. You might choose to plant a lawn, shallow-rooted native ground covers or shallow-rooted perennials for a beautiful cutting flower garden. Covering your septic area with plastics, bark, gravel or patio blocks set in sand won't give your septic system the same benefits as planting.

Septic tanks can be made with one or two compartments.





THE RESERVE AREA

The reserve area is a site on your property suitable for a new septic system if your current system fails. Treat this area with care just as you do your septic system. This area is not a parking lot, great place for a basketball court or hot tub and definitely not the location for your house addition. Your reserve area should be clearly designated on your “as-built” drawing and preserved for future on-site sewage system installation.

ADVANCED SYSTEMS

Many of the properties left for development or system repair do not have the proper soil or site conditions to ensure proper sewage treatment and disposal without the aid of additional technology. These more advanced systems are often referred to as alternative systems.

It seems strange to call them alternative, because they are the mainstays of septic system installation throughout the Pacific Northwest. These alternative systems can rely on pumps, timers and imported soil to overcome property limitations.

Don’t think of these advanced systems as a hindrance or plague; they have been installed so that you can use your property without causing harm to yourself or the rest of your community.

PRESSURE SYSTEMS

By pressurizing a drainfield, you can make sure effluent is being distributed evenly over the available soil, creating optimal unsaturated flow conditions without a biomat.

MOUND SYSTEMS

If it looks like an elephant was buried, you have a mound system. Mound systems are used where the water table is fairly high and proper effluent treatment could not take place below ground. It is important to keep the sides of your mound sloped as designed. Resist the temptation to straighten them up and fill it in a bit. That could cause premature failure of your system.

HOW DOES YOUR CURRENT TOILET PAPER MEASURE UP?

Take a square of your current paper and other papers you are considering using and put them in jars of water. The paper that falls apart first and stays suspended in the jar should be your last choice for use in your household.

PRETREATMENT COMPONENTS

Sand filters, aerobic treatment units (ATUs) and packed bed filters are devices used as intermediary steps to reduce the harmful disease-causing pathogens and nutrients in effluent prior to final treatment and disposal in your drainfield. The Glendon BioFilter is a similar pretreatment device with a drainfield component as a integral part of the treatment system.

DRIP SYSTEMS

Drip systems can be used to overcome some site limitations by placing highly treated or highly filtered effluent very close to the soil surface. What is especially nice about drip systems is that they can easily be meandered around obstacles in their path.



THE SEPTIC SCENT – HOW AND WHY SYSTEMS FAIL

It’s time to suspect a system failure not only when the odor assaults your senses, but when its contents come back to haunt you: between your toes

in the shower, the flush that won’t go away, sewage surfacing in your front yard... But by then, the damage may already be done. There are many reasons why a septic system fails. There are two golden rules that will help to insure its long life and successful operation: conservation and maintenance.

As you increase your awareness and limit your water use, you will reduce the amount of effluent your system has to dispose of. When you have your system inspected and pumped as needed, you can lessen the chance of failure.

There are physical reasons why a system fails to do its job: improper siting in soils unsuitable for treatment, inaccessible tanks for maintenance and pumping, parking lot and paved drainfields, tree roots and defective components. And, there are subtle causes that will impact the health of your septic system – everyday living practices throughout your



THE BATHROOM

TOILET PAPERS

Did you know that the quantity and quality of toilet paper you use could affect your septic system? When toilet paper breaks down it turns into its components, cellulose and lignin. If the toilet paper dissolves in your tank, it can travel into the drainfield and block the soil spaces needed for effluent treatment.

By using toilet paper that is more durable, the paper will float to the top of the tank and add to the scum layer. The scum layer, like the rest of the septic tank contents, can quickly and efficiently be removed by septic tank pumping as needed. The more toilet paper you use, the more quickly your scum layers will build.

TO FLUSH OR NOT TO FLUSH

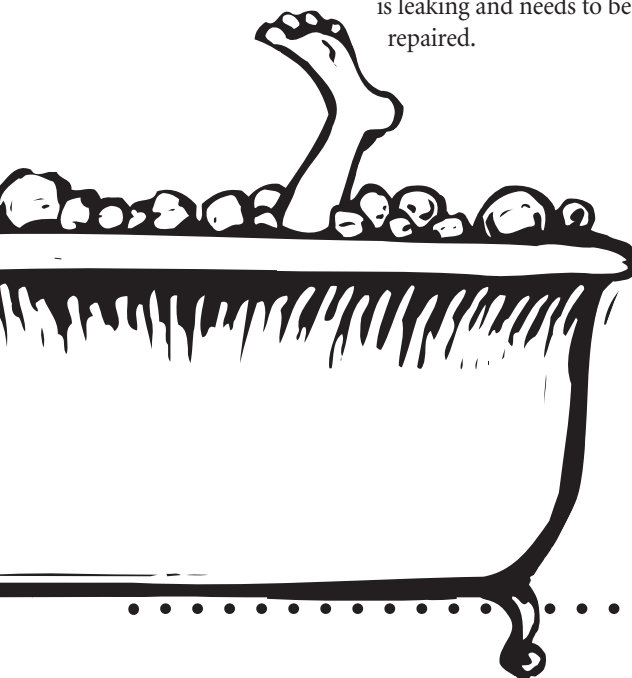
What shouldn't you flush down your toilet? Dental floss, tampons, cotton swabs, paper towels, hair or other bathroom items that clog and potentially damage septic components if they get trapped.

LOW-FLOW TOILETS

Do you know how many gallons of water your toilet uses to clean the bowl? Most older homes have toilets with 5- to 6-gallon reservoirs while newer low-flow toilets use 1.6 gallons of water or less per flush. If you have problems with your septic system being inundated with household water, consider lowering the toilet tank reservoir if you don't already have a low-flow model.

TOILET AND TAP LEAKS

Check to make sure your toilet's reservoir is not leaking into the bowl. Add five drops of liquid food coloring into the reservoir before bed. The next morning if the dye is in the bowl, the reservoir is leaking and needs to be repaired.



A water bottle or commercially available kit is suitable for reducing the amount of water in the reservoir so that each flush does not contain as much water. Bricks have often been recommended to help displace the extra water but know that they can chip and break down over time, causing mechanical damage to your toilet and drainlines.

A small drip from your faucet adds gallons of unnecessary water into your system on a daily basis. To see how much your leak is adding to your water usage, place a cup under the drip for 10 minutes. Multiply the amount of water in the cup by 144 (the number of 10 minute intervals in 24 hours). This is the total amount of clean water traveling to your septic system from this tiny little leak each day.

If you have never gotten out of the habit of leaving the water on while you are brushing your teeth, figure out how much clean water you let escape during that daily task.



FAUCET AERATORS AND LOW-FLOW SHOWERHEADS

Faucet aerators also can help reduce the volume of water entering your septic system for treatment and disposal. Low-flow showerheads or showerhead aerators are also available to reduce the volume of water.



SOAPS

The type of soap you use in your bathroom can add to your septic tank's scum level. Liquid hand soaps contain oils to make them flow and glide across your hands.

To see how much grease and oil your soaps, shampoo, conditioner and bath accoutrements add to your scum layer, take and dissolve the quantity you normally use on a daily basis in a quart jar with warm water. Let the mixture sit and watch as the products separate. This experiment is best left for at least 24 hours.

Some oils and greases are hidden in products while sun tanning and oiling lotions clearly have ingredients that can add to your scum layer. Your system is expecting some amount of greases and oils from products, but not the quantity generated by a sunbathing party or daily use by your entire family. If your septic tank pumper is concerned about your quickly accumulating scum layer, please work with someone to reduce the flow of floatable materials into your tank or be prepared for more frequent inspection and pumping.



THE LAUNDRY ROOM

We have talked about cleaning your body, now let's talk about your clothes. There are many important choices you can make regarding your laundry detergent.

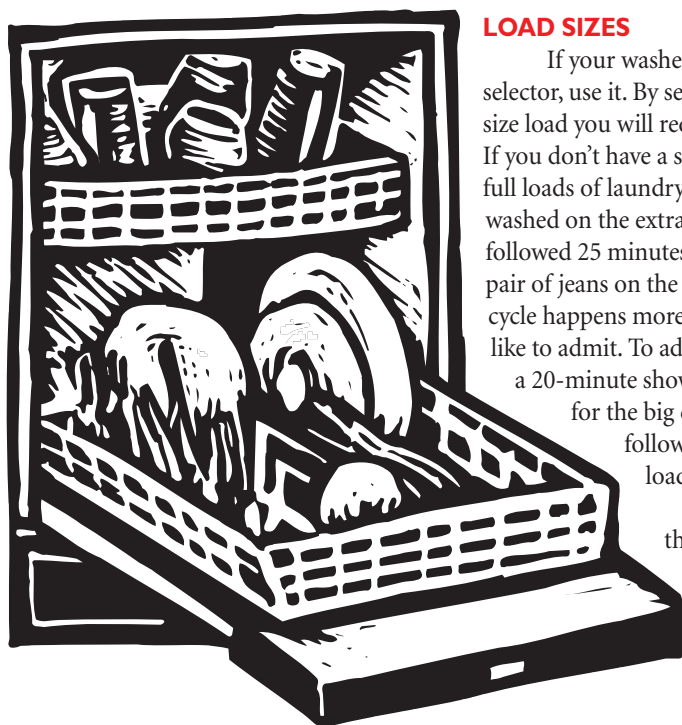
LAUNDRY DETERGENTS

First is the all-important decision — liquid or powder. Choose liquid. If you have ever found white spots on your dark laundry, you wish you had used liquid. Even if you don't see spots, many septic tank pumpers report large cakes of powdered detergent in tanks.

Often homeowners report that their washing machine overflows and then they find the drain line is caked with detergent. One homeowner had a 15-foot long tube of detergent removed when her system finally shut down completely. The homeowner had been using a "bargain" detergent that she acquired in large tubs. It is environmentally sound to purchase large quantities of items; it cuts down on packaging costs. However, the detergent she was using contained a lot of fillers to make buyers believe they received a lot more for their money.

In detergent purchases, less is more. The smaller the jug that does more loads of laundry, the better. "Concentrated" or "ultra" are words commonly used to describe these detergents. Using more of a concentrated detergent does not improve its cleaning capability, so use only the manufacturer's recommended quantity.

Don't forget to check the label of the detergent you select. Is it phosphate-free? Phosphates are one of the nutrients that cause plants to grow, including algae in our waterways.



LOAD SIZES

If your washer has a load-size selector, use it. By selecting the proper size load you will reduce water waste. If you don't have a selector, run only full loads of laundry. The one sweater washed on the extra-large load cycle followed 25 minutes later by a single pair of jeans on the extra-large load cycle happens more than we would like to admit. To add insult to injury, a 20-minute shower to get ready for the big date frequently follows these two wash loads.

Doing all of the household laundry in one day might seem like a time

saver, but it could be an expensive nightmare. Recall that water pushes through your septic tank every time water enters it. One of the important aspects of your septic tank is to hold wastewater for sufficient time to allow it to separate. Doing load after load does not allow your septic tank time to hold the water. If you are not on a dosed or timed system, you could be flooding your drainfield without sufficient recovery time. In the long run, your laundry practices could be short-circuiting your system. Try to spread water usage throughout the week and over a day.

If you are in the market for a new washer, check out the low-flow models. Dealers and consumer groups can help you learn about new water-saving models.

THE UTILITY ROOM

Does someone in your house use your utility sink to clean out paint rollers and flush automotive parts? Oil-based paints and solvents should not be allowed to enter your septic system. Latex paint brush and roller cleanup waste should be minimized. Excess paints and stains should be taken to the local household hazardous waste collection point. Remember, your septic system is a living collection of organisms prepared to handle waste from your body, not your autobody.

THE KITCHEN

There are many opportunities to improve septic system performance through your kitchen practices.

GARBAGE DISPOSALS

The first thing most septic system users learn to avoid is the garbage disposal. It might seem like a handy household appliance that every kitchen should have, but in essence it could be draining your bank account.

A garbage disposal grinds up kitchen scraps, suspends them in water, and sends the water to the septic tank. The disposal takes a lot of water to move the scraps down the drain. Once in the septic tank, some of the materials break down by bacterial action, but most of the grindings will have to be pumped out of the tank. Using a garbage disposal frequently could dramatically increase the accumulation of sludge in your septic tank, causing you to have it pumped more often.

Composting is a better way to recycle your kitchen scraps. For information about building your own worm bin or compost unit, contact your local cooperative extension office.



WASHING DISHES

One of the most important things to know is that you should not wash greases and oils down the kitchen sink, regardless of the amount of hot water you run after your deposit. Scrape your dishes and wipe out frying pans instead of sending the grease down the drain. Grease solvent drain cleaners can harm your septic system and might also cause groundwater contamination if the solvents are not trapped in the septic tank.

Running full dishwasher loads is best to get your money's worth on the soap and the most out of your septic system. Again, there are the questions of powder or liquid and phosphate-laden or phosphate-free. The same logic applies as with laundry detergents.

The best news for people without dishwashers, especially for teenagers with this chore, is that doing full tubs of dishes is much more economical water-wise than doing the dishes after each meal or snack. Regardless of when dishwashing takes place, the water should not be left running throughout the procedure. Of course, parental decisions prevail with regard to dish duty.

HOUSEHOLD CLEANERS

Now that we have gotten into the bacteria in the septic tank, let's talk about cleaners you use around your house. For the most part, if you are not a compulsive Mr. or Mrs. Clean, your septic system bacteria should respond quickly after your cleaning session. Of course, some cleaning products are less toxic to your system than others. Labels can help key you into the potential toxicity of various products.

The words 'Danger' or 'Poison' on a label indicate that the product is highly hazardous. The label description of 'Warning' indicates the product is moderately hazardous. 'Caution' means the product is slightly hazardous. 'Non-toxic' or 'Septic Safe' are terms that are not defined, created by advertisers to sell products. Regardless of the type of product you are using, use it in the quantities listed on the label instructions.



HOT TUBS

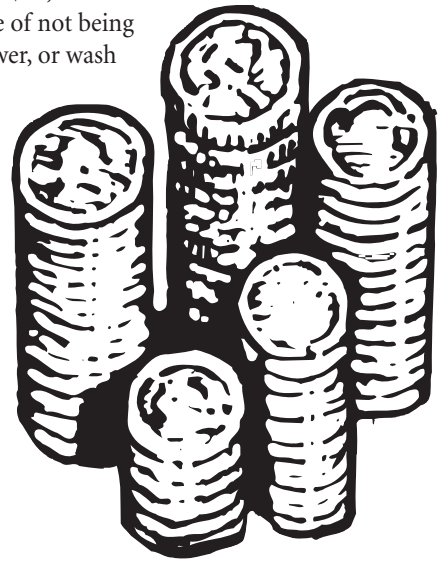
Hot tubs are a wonderful way to get away from it all and relax. Emptying your hot tub into your septic system will provide you with one of the most stressful events in your life. Your septic system was not designed to handle the quantity of water from your hot tub. If you try it, you risk stirring the solids in your tank and pushing them out into the drain-field, causing it to fail. Even if you could keep from disturbing the layers in your septic tank, you would be overloading your system with all of that water at once.

THE CENTS OF SEPTICS – THE COSTS OF REPAIR AND REPLACEMENT

Routine maintenance is much cheaper than emergency maintenance or repairs — and much, much cheaper than total system replacement.

Over time, septic systems require all sorts of fixes. Maintenance might cost you, on average, \$200 per year. Simple repairs might be less than \$100 while a new tank is probably less than \$1,000. Based on a statewide survey, a replacement system will probably cost between \$2,000 and \$21,000.

Factor in the inconvenience of not being able to flush the toilet, take a shower, or wash your dishes. While maintenance can typically be accomplished all season long, repair or replacement might only be performed during the dry summer months.

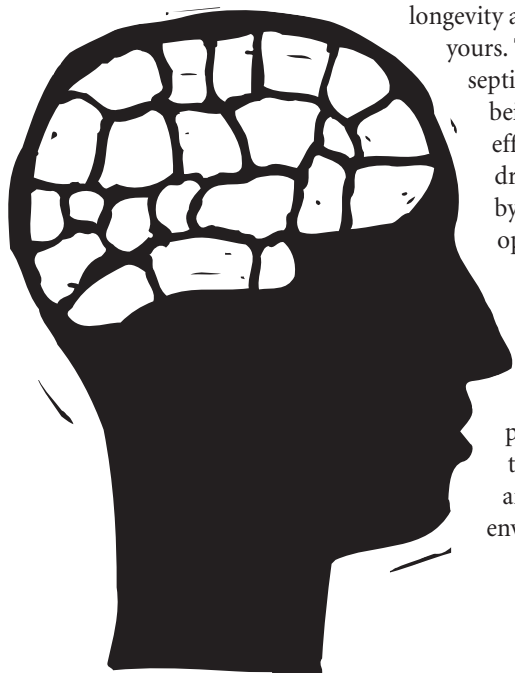


FINAL THOUGHTS

Now that you've gained the three supreme insights for fearless flushing, remember: your septic system is part of your daily life. Use your septic sense. Be kind. If you overuse or neglect your system, it will suffer and so will you. Feed your system as you would yourself — small, regular and well-balanced meals.

Proper operation, maintenance, and monitoring of your system will increase its longevity and good health — along with yours. Think about it. The effluent your septic tank disposes of is continually being recycled. How quickly the effluent goes from wastewater to drinking water is in part controlled by how well you oversee its operation.

An ounce of maintenance can prevent the headache of a cure, especially when it comes to septic systems. By practicing even a couple of the tips provided here, you are on the way to a healthier system and a healthier environment.



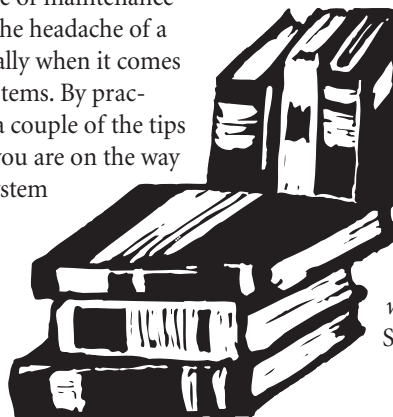
RELATED INFORMATION

This information was originally published and distributed by Washington Sea Grant.

Five homeowners' manuals designed to take the mystery out of the maintenance and monitoring of your septic system were developed by the Washington Sea Grant in conjunction with the Frank Family Foundation and the Puget Sound Water Quality Action Team. These manuals—Pressure Distribution, Gravity, Mound, Sand Filter, and Proprietary Device—are available to the public. The

manuals also cover operation of a septic system during heavy rainfall periods, electrical outages, and in connection with a recreational vehicle (or RV). Also available are brochures on landscaping, pumping, and siting your septic system.

To order these and other pieces, call Washington Sea Grant Publications at 206.543.0733 or visit the Web site at www.wsg.washington.edu/pubs/publications.html. For more information, contact Washington Sea Grant at 206.543.6600 or www.wsg.washington.edu and click on "Septic Sense".



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