STS Don'ts

- Don't go down into a septic tank. Toxic gases are produced naturally by the treatment process that goes on inside of the tank and can kill in minutes. Extreme care should be taken when inspecting a septic tank, even when just looking in.
- Don't do all of your laundry in one day. The amount of liquid entering the system all at once may be too excessive for your system to handle.
- Don't use septic tank additives. These products usually do not help and some may be harmful to your system.
- Don't dump pesticides, herbicides, paints, automobile fluids, household chemicals, antibiotics, or any other toxins into the system, they may kill or disrupt active bacteria.
- Don't use a garbage disposal. They increase the loading of suspended solids, nutrients, and BOD to septic systems, as well as increasing the amount of solids in the tank, thus increasing pumping frequency.
- Don't pave or construct anything over the treatment area, it requires air to function properly. The treatment area should only have grass cover. The grass helps prevent erosion as well as aiding in the transpiration process.
- Don't use fabric softener; this can disrupt the natural bacteria process occurring in the tank. Instead substitute the liquid with fabric softener dryer sheets.

Finalized Mound System

Delaware General Health District

Dedicated to your health

For more information contact the Delaware General Health District

P.O. Box 570

1-3 W. Winter Street

Delaware, OH 43015

740-368-1700

Or visit our website

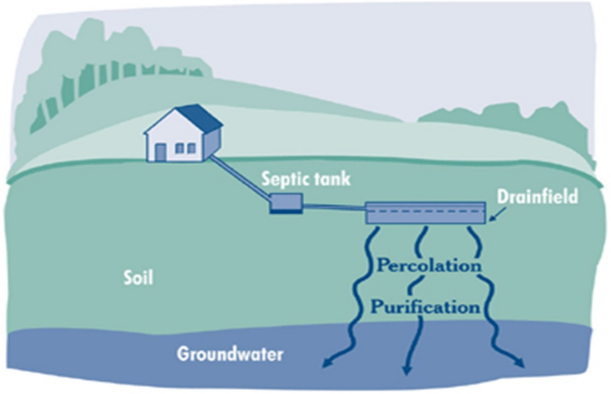
www.delawarehealth.org

Revised May, 2012

Delaware General Health District

Dedicated to your health

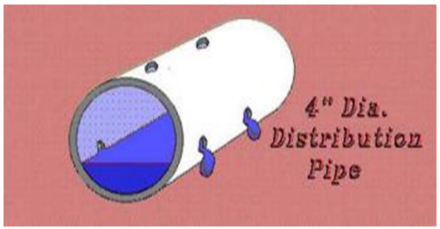
Sewage Treatment Systems



Care and Protection

Care of your Sewage Treatment System

Sewage Treatment Systems, much like an automobile, require periodic inspection and maintenance. Preventative maintenance helps prolong the life of the system and can save the owner money by catching problems before they further develop.



Leachfield Tile

Frequently Asked Questions

Q: Why do some types of systems require a maintenance contract?

A: Certain types of systems may contain one or more mechanical components, including aerators, pumps, and filters, that need routine maintenance to ensure they are functioning properly. The more mechanical components a system has, the more "parts" there are that could break and cause the system to fail. Regular maintenance on these types of systems can catch a problem before it becomes serious.

Q: I am not the original owner. How do I know what type of system I have and where it's located?

A: DGHD has records of systems that date back into the 1950s. You can call our office and a sanitarian will try to locate any records that may exist.

Q: I am adding on to my house, or making another addition or change to my property and was told I need Health District approval. Why?

A: Health District approval is required in these situations to ensure both the current STS is functioning properly and the addition will not adversely affect the existing STS or any area that was set aside as a replacement area. A sanitarian will come out to the property to do an inspection and prepare a letter and packet of information that will be given to the owner.

Drip Distribution Tubing

Frequently Asked Questions

Q: What types of STS are allowed in Delaware County?

A: Under current rules, several types of systems are allowed. These include the "traditional" leachfield type systems, mound systems, and drip irrigation systems. There is no county wide ban on any type of system. The soil conditions on each lot determine what type of system will best serve that particular property.

Q: Are there items that should not be flushed when I have a STS?

A: Yes. Do not flush items such as coffee grinds, dental floss, disposable diapers, kitty litter, cigarette butts, paper towels, feminine hygiene products, condoms, or any fats, greases, or oils. Additionally, do not put toxic chemicals such as paints, thinners, varnishes, or pesticides into your STS. All of these items can disrupt the biological function of your system.

Q: How often should I have my septic tank pumped?

A: Pumping frequency will vary depending on the number of people in the home and the amount of water being used. Routine inspections can help determine if it is time to have your system pumped. Typically, for a family of four, tanks should be pumped every 3 to 5 years.

STS Dos

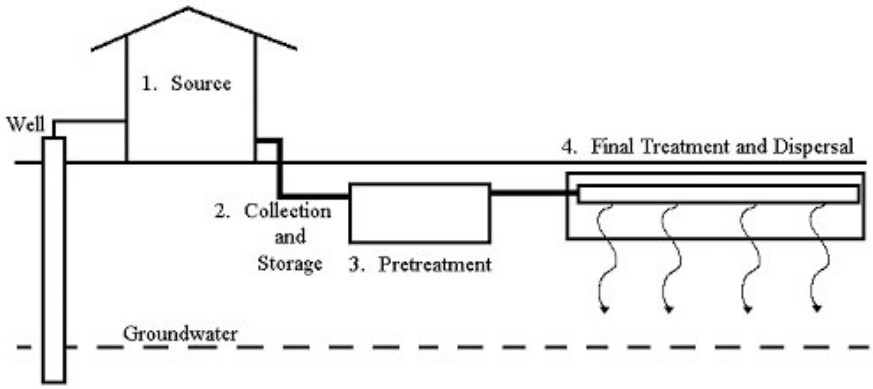
- Do learn the location of your septic system. Keep a to-scale drawing of your septic layout handy for future use.
- Do have your system inspected annually.
- Do have your septic tank pumped out regularly by a registered sewage tank cleaner every 3 to 5 years.
- Do Keep you septic tank cover accessible for inspections and pumping. Install risers if necessary.
- Do call the Health District or a registered sewage installer if you are experiencing problems.
- Do keep a detailed record of all repairs, pumping, inspections, permits issued, or other maintenance activities.
- Do conserve water to avoid over saturation. Be sure to repair any leaky faucets or toilets.
- Do divert all other sources of water away from your treatment areas, like sump pump drains, roof drains, and neighboring run-offs. Grade your landscape accordingly.

Layout of a Drip Distribution System

Ohio Department of Health
Bureau of Environmental Health

Power Outage and Sewage Treatment Systems

Electrical power outages may affect the operation of your home sewage treatment system. Sewage treatment systems operate either by gravity, or involve the use of pumps and valves that require electricity. You will need to determine which type of system serves your home.



Components of an onsite wastewater treatment system.

A gravity collection system feeding into a septic tank and gravity distribution into leaching trenches or the soil absorption area will continue to operate properly and you will be able to continue using your system. You may use buckets of water (from a pond, stream or other similar source) to manually flush the toilet.

If your system contains components that require electricity to operate, the wastewater will collect in the septic tank, treatment unit or dosing tank during the electrical outage and will have to be treated and dispersed when electrical service resumes. Such components include:

1. Aerobic treatment units and recirculating media filters
2. Pump chambers to leaching (soil absorption) trenches
3. Sand filters
4. Dosing or flow equalization tanks
5. Low pressure distribution
6. Subsurface drip distribution

What can you do while the power is out?

- ⇒ Limit water usage to essentials such as toilet flushing and hand washing. Laundry, bathing, showers, and dishwashing should be minimized or eliminated during the power outage. Don't let the water run while brushing teeth, shaving or rinsing dishes. Don't flush the toilet each time it's used for liquid waste.
- ⇒ The septic tank can hold about one-day's supply of waste. Once the tank is filled, additional waste can back up into your home.

- ⇒ Stop all water use if electrical outage is extended or the plumbing begins to drain slowly. Slow-draining plumbing may indicate that the reserve capacity in the tank is exceeded and the system is full.
- ⇒ If the system has a pump, turn off the pump at the control panel. Effluent will continue to build up in the pump chamber until it resumes operation.
- ⇒ **CAUTION:** Do not enter the pump chamber. Gases inside pump chambers are poisonous and the lack of oxygen can be fatal. Always turn off the power supply at the circuit breaker, and unplug all power cords before handling the pump or floats to prevent electric shock. The service or repair of pumps and other electrical equipment must be done by an experienced person.

What should you do once power is restored?

- ⇒ Contact your service provider or a licensed electrician if you are unsure or uncomfortable working with the components. Your service provider will plug in any electrical equipment that was unplugged during the outage. Always be careful when working with electrical components to prevent shock.
- ⇒ If you have an operation manual for your system, refer to the manual for directions on restarting your system.
- ⇒ If your system is demand dosed, (waste is pumped out to a treatment unit or soil as the tank becomes full), the pumping system can be manually operated to disperse the stored wastewater to the soil absorption field (leaching trenches). Manually operating the dosing system may be necessary to avoid overloading your soil absorption system following the first dose after the restoration of power. Your system can be dosed manually by:
    - o When the power is restored, turn the pump 'on' for 2 minutes and 'off' for 4 – 6 hours. You are now "dosing" the right amount of effluent into the drainfield over a given period of time. If there was little water use during the power outage, the pump may automatically turn off during the first manual dosing.
    - o Conserve water and continue the 2-minute pumping every 4 – 6 hours until the pump turns itself off.
- ⇒ If your system is time dosed, allow the system to continue to operate normally until the water level reduced in the system. A pump system with a timer controls the number of times the pump starts and stops. It manages how much effluent (liquid sewage from the septic tank) goes into the soil absorption field (leaching trenches) in a 24-hour time period. Timers make sure that the soil absorption field only gets as much effluent as it was designed to handle. The timer system will eventually take care of itself once the power is restored. If the power has been off for awhile, the timer will be behind. In order to let your timer catch up, continue to conserve water for an additional day or more.
- ⇒ System components that require electricity are usually equipped with a high water alarm. This alarm may sound when the power is restored based on your water usage during the power outage. You can silence the alarm if it has a silence switch option. If the alarm remains activated more than 24 hours, contact your service provider.
- ⇒ If you are unsure about the operation of your system, contact your service provider, system manufacturer, or your local health district for assistance.

Delaware General Health District
P.O. Box 570
1-5 West Winter Street
740-368-1700

HOMEOWNER ONSITE SYSTEM RECORD KEEPING

Permit #: _____
Date Issued: _____
Issued to: _____
Address: _____
Legal Description: _____

Household Information

Number of Bedrooms_____
Number of Bathrooms_____
Number of Residents_____

◯ Garbage Disposal
◯ Dishwasher
◯ Public Water Supply

◯ Water Softener
◯ Well/spring/pond
◯ Hot Tub/Jacuzzi

System Description

Septic Tank Size: Number of Tanks: _____ Gallons: _____
Pump Tank Size: _____
ATU Size: Gallons: _____

◯ Round/Oval
◯ Square/rectangular

◯ One Compartment
◯ Multi-Compartment

◯ Fiberglass
◯ Concrete
◯ Metal
◯ Other: _____

Soil Treatment System Dimensions:

◯ Trenches
◯ Bed
◯ At-Grade
◯ LPP

◯ Mound
◯ Drip Irrigation
◯ Spray System
◯ Surface Discharge Permit # _____

◯ Gravelless
◯ Chamber
◯ Other: _____

Accessories

◯ Septic Tank Effluent Filter
◯ Diversion Valve

◯ Siphon
◯ Pump

◯ Distribution Box
◯ Other: _____

Additional Treatment Components

◯ Biofilter
◯ Constructed Wetland
◯ Intermittent Sand Filter
◯ Other: _____

◯ Disinfection

◯ Lagoon/Pond
◯ Recirculating Sand Filter

Designer:
Firm _____
Address _____
Phone _____

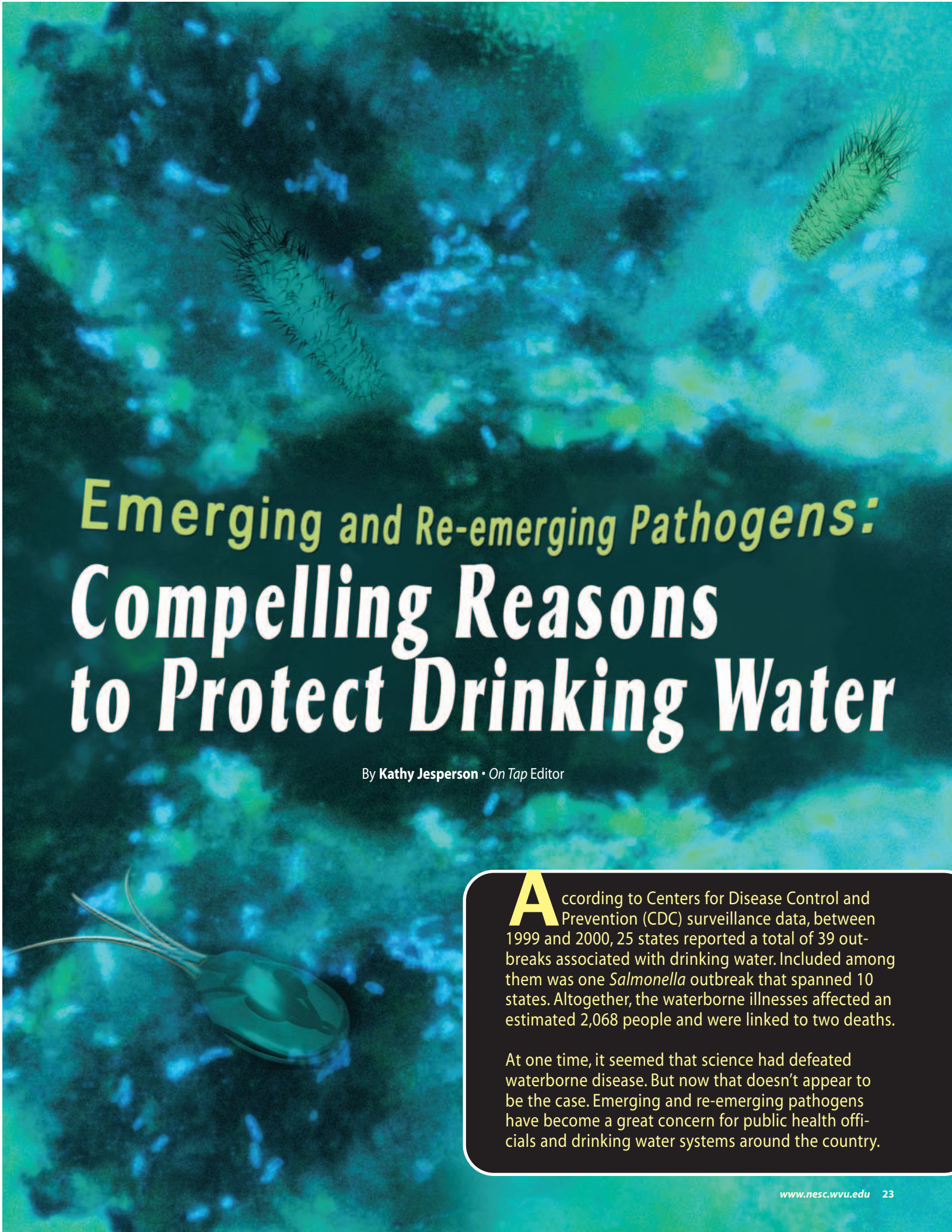
Installer:
Firm _____
Address _____
Phone _____

Pumper:
Firm _____
Address _____
Phone _____

Operation & Maintenance Provider:
Firm _____
Address _____
Phone _____

Maintenance Record

Date	Service Performed	Service Performed By	Cost



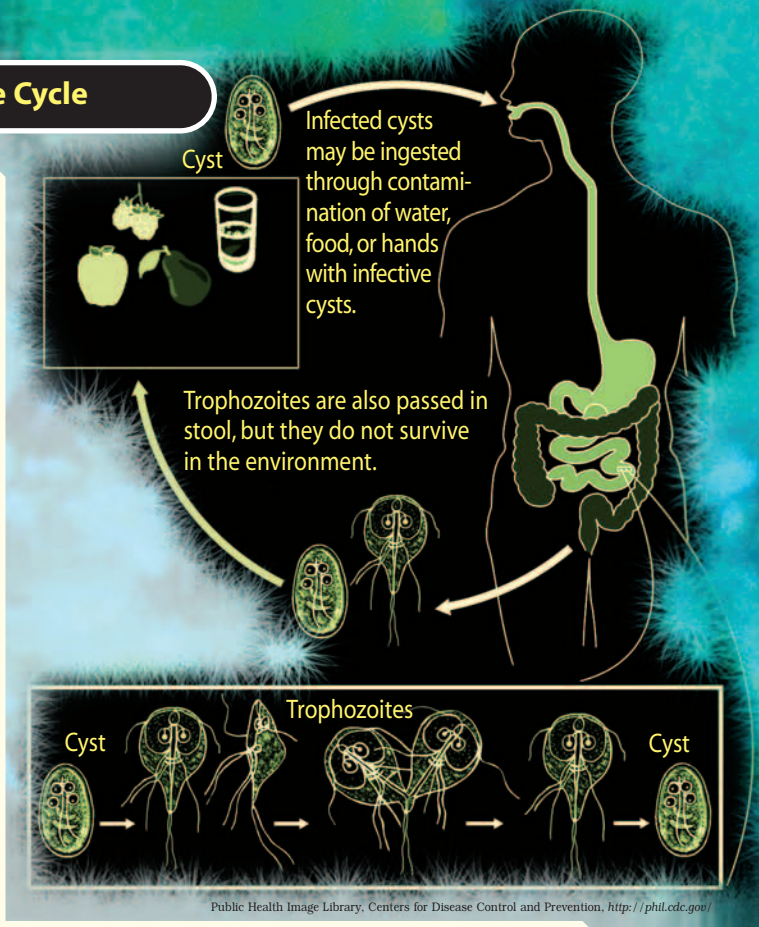
Emerging and Re-emerging Pathogens: Compelling Reasons to Protect Drinking Water

By **Kathy Jesperson** • *On Tap* Editor

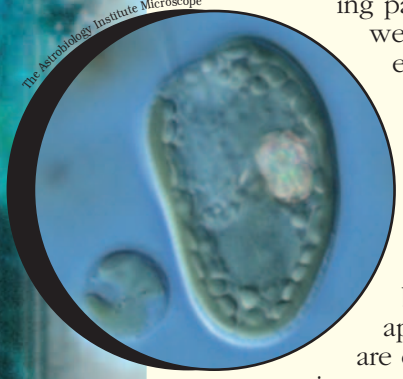
According to Centers for Disease Control and Prevention (CDC) surveillance data, between 1999 and 2000, 25 states reported a total of 39 outbreaks associated with drinking water. Included among them was one *Salmonella* outbreak that spanned 10 states. Altogether, the waterborne illnesses affected an estimated 2,068 people and were linked to two deaths.

At one time, it seemed that science had defeated waterborne disease. But now that doesn't appear to be the case. Emerging and re-emerging pathogens have become a great concern for public health officials and drinking water systems around the country.

Giardiasis • *Giardia intestinalis* • The Cycle



Public Health Image Library, Centers for Disease Control and Prevention, *http://phil.cdc.gov/*



The Astrobiology Institute Microscope

Emerging pathogens are either new to the environment or only recently identified as potential health threats. Re-emerging pathogens are pathogens that we know about but haven't encountered in a while. They cause diseases such as cholera and shigellosis. According to the World Health Organization (WHO), new pathogens show up for many reasons. One of the biggest reasons that they appear is that microorganisms are constantly evolving, adapting, and changing their structure. Another reason is that we've gotten better at detecting the microbes that cause waterborne disease because we have developed new tools and methods to study the organisms and their health effects.

Pathogens Have Greatest Health Impact

Pathogens present the greatest waterborne threat to the public's health because it only takes a small number of microbes to cause illness—especially for people who may have unique health risks, such as those with compromised immune systems, says the U.S. Environmental Protection Agency (EPA).

In addition, emerging pathogens, such as *Cryptosporidium*, *Giardia lamblia*, and Hepatitis E, share the following characteristics:

- They are often resistant to chlorination or other forms of disinfection.
- The pathogens are often resistant to antibiotics or other medical treatment.
- They are often highly infectious.

EPA notes that emerging and re-emerging pathogens include pathogens from fecal sources, such as *Cryptosporidium*, *Campylobacter*, and rotavirus, as well as pathogens that are able to grow in water distribution systems, such as *Legionella*, mycobacteria, and aeromonads.

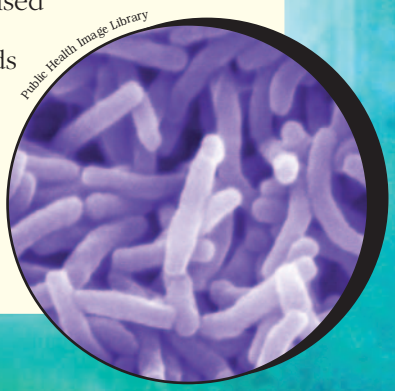
The following list of emerging pathogens was developed from information from the CDC, EPA, the U.S. Geological Survey, the National Institutes of Health, and WHO.

Bacteria

Aeromonas is a bacterium that normally lives in an aquatic environment. *Aeromonas* represent a high percentage of heterotrophic microorganisms in a variety of aquatic systems. Heterotrophic microorganisms are bacteria and other microorganisms that use the organic matter that other organisms synthesize for energy and growth. For this reason, their potential public health threat cannot be ignored. *Aeromonas* have been found in sewage and sewage effluents, surface water, fish ponds, soils, natural mineral springs, stagnant water, chlorinated and unchlorinated drinking water, and fresh waters. They act as primary pathogens and significantly sicken the fish that they invade.

Campylobacterium is a bacterium from the genus *Campylobacter*. Most people who become ill with campylobacteriosis get diarrhea, cramping, abdominal pain, and fever within two to five days after exposure to the organism. The diarrhea may be bloody and can be accompanied by nausea and vomiting. The illness typically lasts one week. Some people who are infected with *Campylobacter* don't have any symptoms at all. In those with compromised immune systems, *Campylobacter* occasionally spreads to the bloodstream and causes a serious life-threatening infection.

Cholera is the illness caused by a bacterium called *Vibria cholerae*.



Public Health Image Library

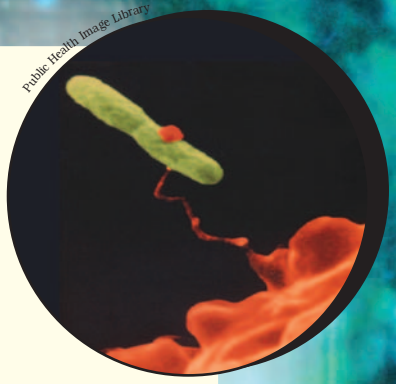
It infects people's intestines, causing diarrhea, vomiting and leg cramps. It seems like every time there are floods, earthquakes or any disasters in developing countries of the world, an outbreak of cholera follows quickly. Infect-ion is acquired primarily by ingesting contaminated water or food; person-to-person transmission is rare. Since 1961, *V. cholerae* has spread from Indonesia through most of Asia into Eastern Europe and Africa, and from North Africa, to the Iberian Peninsula. In 1991, an extensive epidemic began in Peru and spread to neighboring countries in the Western Hemisphere. In 2001, nearly 185,000 cases from 58 countries were reported to WHO.

Cyanobacteria (blue-green algae) are found in ponds, lakes, and reservoirs. They are aquatic and photosynthetic, meaning they live in the water and can manufacture their own food. Cyanobacteria are unicellular bacteria that often grow in colonies large enough to see with the naked eye. They can produce toxins—usually neurotoxins or hepatoxins. There is good evidence that certain hepatoxins promote liver tumors. Currently, most worldwide reports of cyanobaterial toxin poisonings have involved livestock, dogs, and waterfowl. Well-documented cases of effects on humans are relatively few, but there are some reports of dermatitis, eye irritation, and gastrointestinal symptoms.

E.coli O157:H7 is a bacterium that has been associated primarily with undercooked beef and raw milk. But waterborne outbreaks have been reported, including one in Missouri that sickened 243 people and left four dead, and one in Wyoming that sickened at least 50 people.

Helicobacter pylori is a bacterium linked to gastric ulcers. Penn State University (PSU) researchers report that they have found a direct link between the presence of a bacterium in Pennsylvania drinking water and stomach ulcers. The research team tied *Helicobacter pylori* in well water and clinical infection in people drinking from that supply. PSU researchers made the association between water containing *H. pylori* and the infection through tests of private wells supplying drinking water to individual households. Interviews with residents who consumed the water found a significant correlation between presence of the bacterium and cases of stomach ulcers.

Legionella pneumophila is a bacterium that was discovered in 1976 at an American Legion convention in Philadelphia.

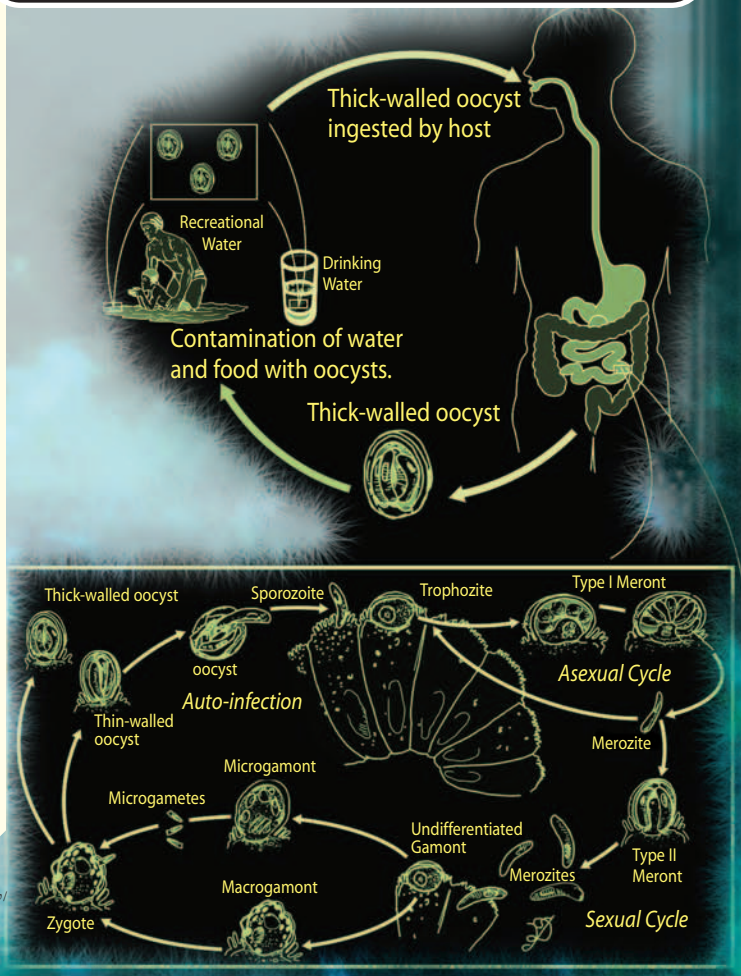


Investigators originally believed that an abandoned cooling tower was its source, but recent research indicates that the *Legionella* might have been introduced through a potable water system. While *Legionella* are relatively resistant to standard water disinfection procedures, research has produced effective ways to control and prevent it in potable water systems, including hyperchlorination, ultraviolet light, and ozonation.

Mycobacterium has been linked to tuberculosis. *M. avium* and *M. intracellulare* complex, long considered a group of organisms that rarely infects humans, is now recognized as one of the leading opportunists associated with AIDS. *M. leprae* causes leprosy, which remains a major disease in the third world. *M. bovis* causes tuberculosis.

Salmonella is a bacterium that causes salmonellosis. Most people infected with *Salmonella* develop diarrhea, fever, and abdominal cramps 12 to 72 hours after infection. The illness usually lasts four to seven

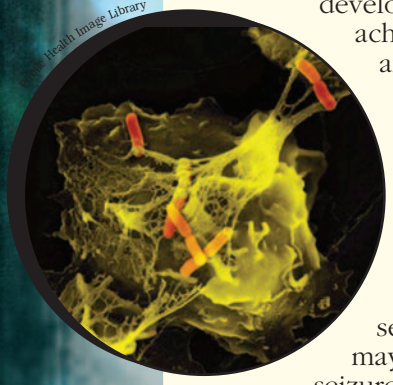
Cryptosporidiosis • *Cryptosporidium* • The Cycle



Public Health Image Library, Centers for Disease Control and Prevention, *http://phil.cdc.gov/*

days, and most people recover without treatment. However, in some people diarrhea may be so severe that the patient needs to be hospitalized. In these patients, the *Salmonella* infection may spread from the intestines to the blood stream and then to other body sites and can cause death unless the person is treated promptly with antibiotics. The elderly, infants, and those with impaired immune systems are more likely to have a severe illness.

Shigellosis is an infectious disease caused by a group of bacteria called *Shigella*. Most who are infected with *Shigella* develop diarrhea, fever, and stomach cramps starting a day or two after they are exposed to the bacterium. The diarrhea is often bloody. Shigellosis usually lasts five to seven days. In some people, especially young children and the elderly, the diarrhea can be so severe that the patient needs to be hospitalized. A severe infection with high fever may also be associated with seizures in children less than two years old. Some people who are infected may have no symptoms at all but may still pass the *Shigella* bacteria to others.



Protozoa

Cryptosporidiosis is a diarrheal disease caused by *Cryptosporidium parvum*—a protozoan that can live in the intestine of humans and animals and can be passed in the stool. Both the disease and the parasite are also known as crypto. An outer shell protects the parasite and allows it to survive outside the body for long periods of time. The shell also makes it very resistant to chlorine disinfection. During the past two decades, crypto has become recognized as one of the most common causes of waterborne disease in humans in the U.S. The parasite is found in every region of the U.S. and throughout the world.

Giardia lamblia is a protozoan that is most frequently the cause of non-bacterial diarrhea in the U.S. Human giardiasis may involve diarrhea within one week of ingestion of the cyst. Cysts are resistant to adverse environmental conditions and are passed in the feces of an infected host, and the next host is infected when it ingests cysts in food or water contaminated with feces. Normally, illness lasts for one to two weeks but there are cases of chronic infections lasting months to years. Chronic cases, both those with defined immune deficiencies and those without, are difficult to treat.

Viruses

Hepatitis E generally affects young adults and usually is not life threatening. The exception is in pregnant women, who have had fatality rates of 15 to 20 percent. According to CDC, virtually all cases of hepatitis E have occurred among travelers returning from developing countries where the disease is endemic and spreads through contaminated drinking water. Nevertheless, tests show that between one and five percent of healthy blood donors in the U.S. have hepatitis E antibodies in their blood.

Rotavirus infects the digestive tract. It is the most common cause of severe diarrhea in infants and young children in the U.S. *Rotavirus* is easily spread by hand-to-mouth contact with stool from an infected person. Most children with *rotavirus* diarrhea recover without medical treatment. Some children, however, become very ill with severe vomiting, diarrhea, and life-threatening loss of fluids.

If you need to report a waterborne disease outbreak, call CDC's Division of Parasitic Diseases, NCID, at (770) 488-7760 or by fax at (770) 488-7761.

For more information, contact: EPA's Safe Drinking Water Hotline at 800-426-4791, visit their Web site www.epa.gov/safewater, *or e-mail them at* hotline-sdwa@epa.gov; *or contact CDC's National Center for Infectious Diseases at* www.cdc.gov/ncidod. *Call the CDC at (888) 232-3228, or send a fax to (888) 232-3299.*

References:

Lee, Sherline H., M.P.H., Deborah A. Levy, Ph.D., Gunther F. Craun, M.P.H., Michael J. Beach, Ph.D., and Rebecca L. Calderon, Ph.D. *Surveillance for Waterborne-Disease Outbreaks–United States, 1999—2000 www.cdc.gov/mmwr/preview/mmwrhtml/ss5108a1.htm*. Accessed on August 27, 2004.

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Pipeline

Fall 1995
Vol. 6, No. 4

NATIONAL SMALL FLOWS CLEARINGHOUSE

Small Community Wastewater Issues Explained to the Public

MAINTAINING YOUR SEPTIC SYSTEM—A GUIDE FOR HOMEOWNERS

Out of sight and out of mind—does this describe your relationship with your septic system? If you are like most homeowners, you probably never give much thought to what happens to what goes down your drain. But if you rely on a septic system to treat and dispose of your household wastewater, what you don't know can hurt you. Proper operation and maintenance of your septic system can have a significant impact on how well it works and how long it lasts, and in most communities, septic system maintenance is the responsibility of the homeowner.

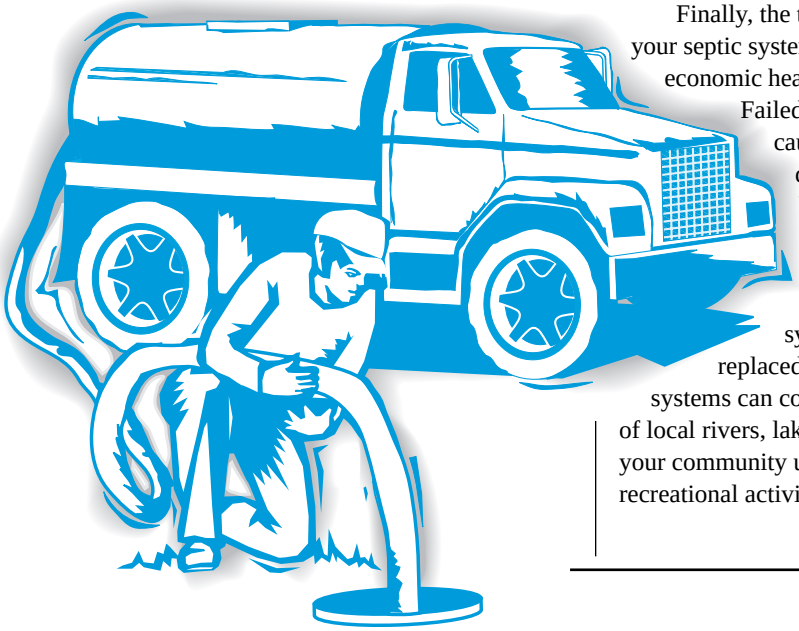
Why Maintain Your System?

There are three main reasons why septic system maintenance is so important. The first reason is money. Failing septic systems are expensive to repair or replace, and poor maintenance is a common cause of early system failures. The minimal amount of preventative maintenance that septic systems require costs very little in comparison. For example, it typically costs from $3,000 to $10,000 to replace a failing septic system with a new one, compared to approximately $50 to $150 to have a septic system inspected, and $150 to $250 to have it pumped.

The second and most important reason to maintain your system is to protect the health of your family, your community, and the environment. When septic systems fail, inadequately treated household wastewater is released into the environment. Any contact with untreated human waste can pose significant health risks, and untreated wastewater from failing septic systems can contaminate nearby wells, groundwater, and drinking water sources.

Chemicals improperly released through a septic system also can pollute local water sources and can contribute to system failures. For this reason it is important for homeowners to educate themselves about what should and should not be disposed of through a septic system.

Finally, the third reason to maintain your septic system is to protect the economic health of your community. Failed septic systems can cause property values to decline. Sometimes building permits cannot be issued or real estate sales can be delayed for these properties until systems are repaired or replaced. Also, failed septic systems can contribute to the pollution of local rivers, lakes, and shorelines that your community uses for commercial or recreational activities.



SEPTIC SYSTEM QUIZ

Can you answer the following questions?

- Where is your septic tank located? (see page 6)
- How often should you have your septic system inspected? (see page 4)
- Does it help to add yeast to your system? (see page 4)
- Do you know the last time your septic tank was pumped? (see page 6)
- How do household cleaners affect your system? (see page 6)
- How can you tell if your septic system has failed? (see page 2)

Even if you think you know the answers to all of these questions, you can probably learn something new about septic system maintenance in this issue of *Pipeline*. For a quick reference, see the list of do's and don'ts for septic system owners on page 5.

Why Many Systems Fail

Improper siting, construction, or design often contribute to septic system failures. But if your septic system has been properly designed, constructed, and installed, then you are the most likely remaining threat to the health and longevity of your septic system. Fortunately, it is easy to learn how to properly operate and maintain a septic system.

This issue of *Pipeline* focuses on educating homeowners about proper septic system operation and maintenance. Some of the topics include groundwater pollution, system inspections, and the use

Continued on page 2

Groundwater Pollution

IS YOUR SEPTIC SYSTEM FAILING?

Septic system owners should be alert to the following warning signs of a failing system:

- Slowly draining sinks and toilets
- Gurgling sounds in the plumbing
- Plumbing backups
- Sewage odors in the house or yard
- Ground wet or mushy underfoot
- Grass growing faster and greener in one particular area of the yard
- Tests showing the presence of bacteria in well water

None of these warning signs can be considered a sure indication that a system has failed, but the appearance of one or more of them should prompt homeowners to have their systems inspected. Septic system failures also can occur without any of these warning signals. For this reason, yearly inspection of your septic system is recommended and even required by some communities.

For more information about septic system inspections, see the article beginning on page 6.

Preventing groundwater pollution from failing septic systems should be a priority for every community. Contamination of the groundwater source can lead to the pollution of local wells, streams, lakes, and ponds—exposing family, friends, and neighbors to waterborne diseases and other serious health risks.

When a septic system fails, inadequately treated domestic waste can reach the groundwater. Bacteria and viruses from human waste can cause dysentery, hepatitis, and typhoid fever. Many serious outbreaks of these diseases have been caused by contaminated drinking water.

Nitrate and phosphate, also found in domestic wastewater, can cause excessive algae growth in lakes and streams called algae blooms. These blooms cause aesthetic problems and impair other aquatic life. Nitrate is also the cause of methemoglobinemia, or blue baby syndrome, a condition that prevents the normal uptake of oxygen in the blood of young babies.

In addition, hazardous household chemicals like paints, varnishes, waste oils, and pesticides pollute the groundwater and should never be disposed of through a septic system. They can also kill the microorganisms in the system that break down the waste.

See the list of do's and don'ts for septic system owners on page 5 for more about what should and should not be disposed of in a septic tank system.

FREE POSTER!

A new poster titled, "*Groundwater Protection Begins at Home,*" is available free from the National Drinking Water Clearinghouse (NDWC). The poster lists sources of hazardous waste in the home and includes guidelines for their safe disposal in an easy-to-read format. The importance of groundwater pollution prevention is also explained. The poster is a great reference source for every home with a septic system.

To order "*Groundwater Protection Begins at Home*," call the NDWC at (800) 624-8301, and order Item #DWBLPE40. A shipping and handling charge will apply.

MAINTAINING YOUR SEPTIC SYSTEM—A GUIDE FOR HOMEOWNERS

Continued from page 1

of additives and cleaners. The issue also includes a handy reference list of important septic system do's and don'ts for homeowners.

You are encouraged to share, copy, or distribute any infomation in *Pipeline* with others in your community. The articles can be reprinted in local newspapers or included in flyers, newsletters, and educational presentations. We ask only that you send us a copy of the reprinted article for our files.

If you have any questions or require further information about any of the topics in this newsletter, please contact the National Small Flows Clearinghouse at (800) 624-8301.

IN THIS ISSUE

HOW TO MAINTAIN YOUR SEPTIC SYSTEM

Septic systems are a very simple way to treat household wastewater and are easy to operate and maintain. Although homeowners must take a more active role in maintaining septic systems, once they learn how their systems work, it is easy for them to appreciate the importance of a few sound operation and maintenance practices.

How Septic Systems Work

There are two main parts to the basic septic system: the septic tank and the drainfield.

The Septic Tank

Household wastewater first flows into the septic tank where it should stay for at least a day. In the tank, heavy solids in the wastewater settle to the bottom forming a layer of sludge, and grease and light solids float to the top forming a layer of scum (*refer to the graphic on this page*).

The sludge and scum remain in the tank where naturally occurring bacteria work to break them down. The bacteria cannot completely break down all of the sludge and scum, however, and this is why septic tanks need to be pumped periodically.

The separated wastewater in the middle layer of the tank is pushed out into the drainfield as more wastewater enters the septic tank from the house. If too much water is flushed into the septic tank in a short period of time, the wastewater flows out of the tank before it has had time to separate. This can happen on days when water use is unusually high (laundry day, for example), or more often if the septic tank is too small for the needs of the household.

The Drainfield

When wastewater leaves a septic tank too soon, solids can be carried with it to the drainfield. Drainfields provide additional treatment for the wastewater by allowing it to trickle from a series of perforated pipes, through a layer of gravel, and down through the soil. The soil acts as a natural filter and contains organisms that help treat the waste. Solids damage the drainfield by clogging the small holes in the drainfield pipes and the surrounding gravel, and excess water strains the system unnecessarily.

How To Care for Your System

Septic system maintenance is often compared to automobile maintenance because only a little effort on a regular basis can save a lot of money and significantly prolong the life of the system.

Sound septic system operation and maintenance practices include conserving water, being careful that nothing harmful is disposed of through the system, and having the system inspected annually and pumped regularly.

By educating everyone in your household about what is and what isn't good for septic systems, they can begin to develop good maintenance habits.

Use Water Wisely

Water conservation is very important for septic systems because continual saturation of the soil in the drainfield can affect the quality of the soil and its ability to naturally remove toxins, bacteria, viruses, and other pollutants from the wastewater.

The most effective way to conserve water around the house is to first take stock of how it is being wasted. Immediately repair any leaking faucets or running toilets, and use washing machines and dishwashers only when full.

In a typical household, most of the water used indoors is used in the bathroom, and there are a lot of little things that can be done to conserve water there.

For example, try to avoid letting water run while washing hands and brushing teeth. Avoid taking long showers and install water-saving features in faucets and shower heads. These devices can reduce water use by up to 50 percent. Low-flush toilets use one to two gallons per flush compared to the three to five gallons used by conventional toilets. Even using a toilet dam or putting a container filled with rocks in the toilet tank can reduce water use by 25 percent (*refer to the graphic on page 4*).

It is also important to avoid overtaxing your system by using a lot of water in a short time period, or by allowing too much outside water to reach the drainfield. Try to space out activities requiring heavy water use (like laundry) over several days. Also, divert roof drains, surface water, and sump pumps away from the drainfield.

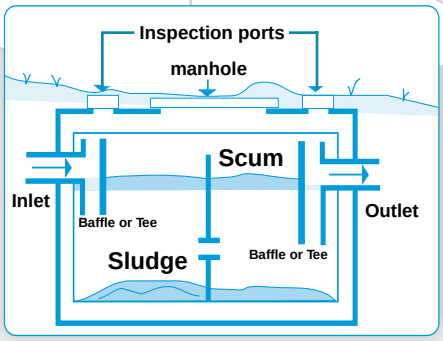
Know What Not To Flush

What you put into your septic system greatly affects its ability to do its job. As a general rule of thumb, do not dispose of anything in your septic system that can just as easily be put in the trash. Remember that your system is not designed to be a garbage disposal, and that solids build up in the septic tank and eventually need to be pumped out.

In the kitchen, avoid washing food scraps, coffee grinds, and other food items down the drain. Grease and cooking oils contribute to the layer of scum in the tank and also should not be put down the drain. Garbage disposals can increase the amount of solids in the tank up to 50 percent and are not recommended for use with septic systems.

The same common-sense approach used in the kitchen should be used in the bathroom. Don't use the toilet to dispose

Continued on page 4



Q&A

Do I need to add anything to my septic system to keep it working properly?

While many products on the market claim to help septic systems work better, the truth is there is no magic potion to cure an ailing system. In fact, most engineers and sanitation professionals believe that commercial septic system additives are, at best, useless, and at worst, potentially harmful to a system.

There are two types of septic system additives: biological (like bacteria, enzymes, and yeast) and chemical. Most biological additives are harmless, but some chemical additives can potentially harm the soil in the drainfield and contaminate the groundwater.

While there hasn't been extensive study on the effectiveness of these products, the general consensus among septic system experts is that septic system additives are unnecessary.

What type of toilet paper is best for septic tanks?

Contrary to popular belief, it is not necessary to sacrifice personal comfort to protect your septic tank. There are many types of toilet paper on the market that are perfectly safe for septic systems.

According to the National Sanitation Foundation (NSF), a nonprofit organization that tests products relating to health and the environment, the thickness and color of toilet tissue does not necessarily affect its biodegradability.

NSF subjects the toilet papers it certifies to rigorous testing, and the brands that pass carry the NSF mark stating that they are safe for use with septic systems. However, there probably are many brands without the NSF mark that are also safe.

HOW TO MAINTAIN YOUR SEPTIC SYSTEM

Continued from page 3

of plastics, paper towels, tampons, disposable diapers, condoms, kitty litter, etc. The only things that should be flushed down the toilet are wastewater and toilet paper. *(For a list of items, see "Do Not Flush" on page 5.)*

Avoid Hazardous Chemicals

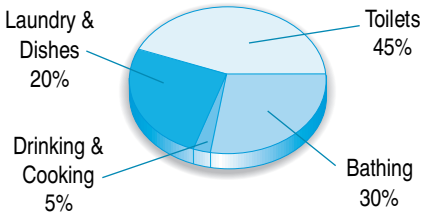
To avoid disrupting or permanently damaging your septic system, do not use it to dispose of hazardous household chemicals. Even small amounts of paints, varnishes, thinners, waste oil, photographic solutions, pesticides, and other organic chemicals can destroy helpful bacteria and the biological digestion taking place within your system. These chemicals also pollute the groundwater.

Some septic system additives that claim to help or clean your system also contain hazardous chemicals and should be avoided. (*See the Q&A on septic system additives at left.*)

Household cleaners, such as bleach, disinfectants, and drain and toilet bowl cleaners should be used in moderation and only in accordance with product labels. Overuse of these products can harm your system. It makes sense to try to keep all toxic and hazardous chemicals out of your septic tank system when possible. (*For more about the use of household cleaners, refer to the article on page 6.*)

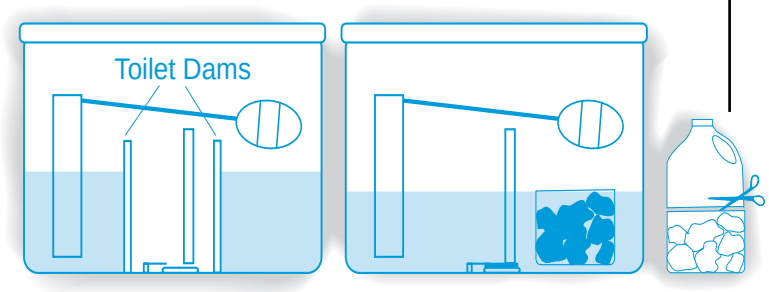
To help prevent groundwater pollution, be sure to dispose of leftover hazardous chemicals by taking them to an approved hazardous waste collection center. For locations and more information, contact your local health department.

Water use around the home



Pump Your Tank Regularly

Pumping your septic tank is probably the single most important thing you can do to protect your system. If the buildup of solids in the tank becomes too high and solids move to the drainfield, this could clog and strain the system to the point where a new drainfield will be needed.



A toilet dam (above left) or a rock filled milk container (above right) can reduce the amount of water flowing out of the toilet by up to 25 percent. (Reproduced with permission from Massachusetts Cooperative Extension)

Inspect Your System Annually

Inspecting your septic system annually is a good way to monitor your system's health. Inspections can reveal problems before they become serious, and by checking the levels of sludge and scum in your tank, you can get a more accurate idea of how often it should be pumped.

For a more detailed discussion of septic system inspections and recommended pumping frequencies and procedures, read the article "Pumping and Inspecting Your System—What To Expect" on page 6.

Protect Your System

Finally, it is important to protect your septic system from potential damage.

Don't plant anything but grass near your septic system—roots from shrubs and trees can cause damage—and don't allow anyone to drive or operate heavy machinery over any part of the system. Also, don't build anything over the drainfield. Grass is the most appropriate cover for the drainfield.

SEPTIC SYSTEM DO's AND DON'Ts

DO's

Do learn the location of your septic tank and drainfield. Keep a sketch of it handy with your maintenance record for service visits.

Do have your septic system inspected annually.

Do have your septic tank pumped out regularly by a licensed contractor. (*See the table on page 6 for estimated pumping frequencies.*)

Do keep your septic tank cover accessible for inspections and pumpings. Install risers if necessary.

Do call a professional whenever you experience problems with your system, or if there are any signs of system failure.

Do keep a detailed record of repairs, pumpings, inspections, permits issued, and other maintenance activities.

Do conserve water to avoid overloading the system. Be sure to repair any leaky faucets or toilets.

Do divert other sources of water, like roof drains, house footing drains, and sump pumps, away from the septic system. Excessive water keeps the soil in the drainfield from naturally cleansing the wastewater.

WARNING

Be sure to exercise appropriate caution when inspecting a septic tank. Never allow anyone to inspect a septic tank alone or go down into a septic tank. Toxic gases are produced by the natural treatment processes in septic tanks and can kill in minutes—even just looking in the tank can be dangerous.

DON'Ts

Don't go down into a septic tank. Toxic gases are produced by the natural treatment processes in septic tanks and can kill in minutes. Extreme care should be taken when inspecting a septic tank, even when just looking in.

Don't allow anyone to drive or park over any part of the system.

Don't plant anything over or near the drainfield except grass. Roots from nearby trees or shrubs may clog and damage the drain lines.

Don't dig in your drainfield or build anything over it, and don't cover the drainfield with a hard surface such as concrete or asphalt. The area over the drainfield should have only a grass cover. The grass will not only prevent erosion, but will help remove excess water.

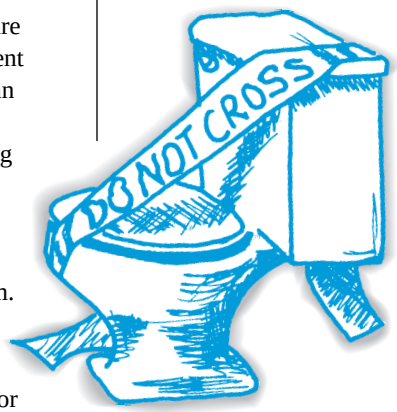
Don't make or allow repairs to your septic system without obtaining the required health department permit. Use professional licensed septic contractors when needed.

Don't use septic tank additives. These products usually do not help and some may even be harmful to your system.

Don't use your toilet as a trash can or poison your septic system and the groundwater by pouring harmful chemicals and cleansers down the drain. Harsh chemicals can kill the beneficial bacteria that treat your wastewater.

Don't use a garbage disposal without checking with your local regulatory agency to make sure that your septic system can accommodate this additional waste.

Don't allow backwash from home water softeners to enter the septic system.



Do not flush

coffee grinds
dental floss
disposable diapers
kitty litter
sanitary napkins
tampons
cigarette butts
condoms
fat, grease, or oil
paper towels

and hazardous chemicals, such as:

paints
varnishes
thinners
waste oils
photographic solutions
pesticides

These items can overtax or destroy the biological digestion taking place within your system.

Pumping and Inspecting Your System—What To Expect

Annual inspections of your septic system are recommended to ensure that it is working properly and to determine when the septic tank should be pumped. By inspecting and pumping your system regularly, you can prevent the high cost of septic system failure.

Inspecting Your System

Although a relatively simple inspection can determine whether or not your septic tank needs to be pumped, you should consider calling your local health department or hiring a professional contractor. A professional can do a thorough inspection of the entire system and check for cracked pipes and the condition of the tees or baffles and other parts of the system.

A thorough septic system inspection will include the following steps:

1. Locating the system—Even a professional may have trouble locating your system if the access to your tank is buried. One way to start looking is to go in your basement and determine the direction the sewer pipe goes out through the wall. Then start probing the soil with a thin metal rod 10 to 15 feet from the foundation. Once your system is found, be sure to keep a map of it on hand to save time on future service visits.

2. Uncovering the manhole and inspection ports—This may entail some digging in your yard. If they are buried, try to make access to the ports easier for future inspections. Install risers (elevated access covers) if necessary.

3. Flushing the toilets—This is done to determine if the plumbing going to the system is working correctly.

4. Measuring the Scum and Sludge Layers—There are two frequently used methods for measuring the sludge and scum layers inside your tank. The contractor may use a hollow clear plastic tube that is pushed through the different layers to the bottom of the tank. When brought back up, the tube retains a sample showing a cross section of the inside of the tank.

The layers can also be measured using a long stick. To measure the scum layer using a stick, a three-inch piece of wood is attached across the end of the stick to form a "foot," and the stick is pushed down through the scum to the liquid layer. When the stick is moved up, the foot meets resistance on the bottom of the scum layer, and the contractor marks the stick at the top of the layer to measure the total thickness. As a general guideline, if the scum layer is within three inches of the bottom of the inlet baffle, the tank should be pumped.

The sludge layer is measured by wrapping cloth around the bottom of the stick and lowering it to the bottom of the tank. This should be done either through a hole in the scum layer or through the baffle or tee, if possible, to avoid getting scum on the cloth. The sludge depth can be estimated by the length of sludge sticking to the cloth. If the sludge depth is equal to one third or more of the liquid depth, the tank should be pumped.

5. Checking the Tank and the Drainfield—The contractor will check the condition of the baffles or tees, the walls of the tank for cracks, and the drainfield for any signs of failure. If your system includes a distribution box, drop box, or pump, the contractor will check these too.

Tank size (gals.)	Household size (number of people) 1	2	3	4	5	6
500	5.8	2.6	1.5	1.0	0.7	0.4
750	9.1	4.2	2.6	1.8	1.3	1.0
900	11.0	5.2	3.3	2.3	1.7	1.3
1000	12.4	5.9	3.7	2.6	2.0	1.5
1250	15.6	7.5	4.8	3.4	2.6	2.0
1500	18.9	9.1	5.9	4.2	3.3	2.6
1750	22.1	10.7	6.9	5.0	3.9	3.1
2000	25.4	12.4	8.0	5.9	4.5	3.7
2250	28.6	14.0	9.1	6.7	5.2	4.2
2500	31.9	15.6	10.2	7.5	5.9	4.8

Estimated septic tank pumping frequencies in years. These figures assume there is no garbage disposal unit in use. (Source: Pennsylvania State University Cooperative Extension Service)

When To Pump

How often your tank needs to be pumped depends on the tank size, the number of people living in your home, and the habits of your particular house-

Continued on next page

How do household cleaners and detergents affect my system?

When used as recommended by the manufacturer, most household cleaning products will not adversely affect the operation of your septic tank. Drain cleaners are an exception, however, and only a small amount of these products can kill the bacteria and temporarily disrupt the operation of the tank.

If you are concerned about the effect of cleaning products on your septic system and the environment, there are some safe alternatives. Penn State University has developed a fact sheet listing alternative cleansers and their uses. The fact sheet is included in the septic system information packet for homeowners, described on page 8.

Inspections from the State Regulations

Septic system inspection regulations vary from one state to the next. Do you know what the laws are in your state?

A new report from the National Small Flows Clearinghouse (NSFC) provides this information in a single 128-page document, *"Inspections from the State Regulations."* It is a compilation of regulations for septic system inspections from the 23 states that have them on the books. This report includes a complete list of state regulatory contacts and references for all 50 states. The cost is $11.35. To order, call NSFC at (800) 624-8301 and request Item #WWPCRG40.

What some communities are doing

To protect public health and the environment, some communities are working to promote septic system maintenance through public education and the formation of septic system maintenance districts.

Septic system maintenance districts are areas in which local governments and health agencies monitor and regulate privately-owned septic systems on a regular basis. In a maintenance district, all residents must comply with the maintenance standards and must help pay for the cost of administration.

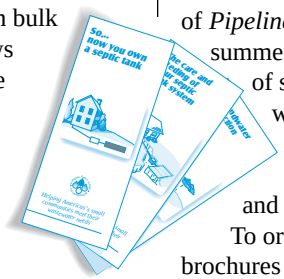
One of the advantages to this type of system is, because detailed records are kept on the condition of the individual systems, communities can identify problem areas and work with homeowners to develop solutions.

Another advantage is the opportunity to educate septic system owners individually about the proper operation and maintenance of their systems. Maintenance districts also make it easier to arrange inspections and pumpings at several houses in a neighborhood at one time, which can save money.

For more information about maintenance districts and other strategies for controlling septic system failures in your community, contact the National Small Flows Clearinghouse's technical assistance department at (800) 624-8301.

Septic system information available in bulk from NSFC

A series of educational materials that explain the operation and maintenance of septic systems are available in bulk from the National Small Flows Clearinghouse (NSFC). These materials are written for homeowners and would be useful for any community education program.



The NSFC's series of three septic system brochures has recently been revised, updated, and reprinted. The brochures include:

- So . . . now you own a septic tank,
- The care and feeding of your septic tank system, and
- Groundwater protection.

This issue and the summer 1995 issue of *Pipeline* are also available in bulk. The summer issue explains the advantages of septic tank systems, how they work, the importance of site evaluations, alternative septic system and drainfield designs, and resources for more information.

To order bulk copies of any of the brochures or either issue of *Pipeline*, please call the NSFC at (800) 624-8301. Up to 10 copies of each item are free except for shipping and handling charges. Orders of 11 or more will be charged a fee to cover printing and shipping.

Pumping and Inspecting Your System—What To Expect

Continued from previous page

hold. Garbage disposals and high-water-use technologies, such as a hot tub or whirlpool, also affect the pumping frequency.

To estimate how often you should have your tank pumped, refer to the table on page 6. This information combined with observations from annual inspections will help you to estimate your individual pumping schedule.

When it's time to pump out your tank, be sure to hire a licensed contractor. He or she will have the appropriate equipment and will dispose of the sludge at an approved treatment site. You can find listings for licensed pumpers and haulers in the yellow pages, or contact your local health department for assistance.

It's a good idea to be present when your tank is being pumped. Make sure the contractor uses the manhole, not the inspection ports, to pump the tank to avoid damaging the baffles or tees. Also make sure all of the material in the tank is removed. It is not necessary to leave anything in the tank to "restart" the biological processes, but it is also not necessary to scrub or disinfect the tank.

CONTACTS

Health Department

Homeowners with questions about regulations or requirements for septic system construction or maintenance should contact their local health department (usually listed in the yellow pages).

National Small Flows Clearinghouse (NSFC)

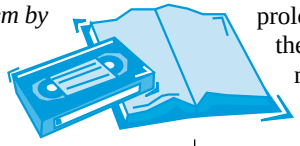
The National Small Flows Clearinghouse (NSFC) located at West Virginia University, is also a good place for homeowners and community officials to contact for more information about septic systems and alternative systems. The NSFC is funded by the U.S. Environmental Protection Agency and offers technical assistance and a variety of free and low-cost products to help small communities with wastewater issues. Some of these NSFC products are listed on page 8.

Extension Service

Many universities have U.S. Department of Agriculture cooperative state extension service offices on campus and field offices in counties and other localities. Part of the mission of these extension services is to provide access to information and assistance to the public, and to help educate the public about federal wastewater policies and requirements. To locate the extension office in your area, contact the U.S. Department of Agriculture at (202) 720-3377, or NSFC at (800) 624-8301, and ask for Crystal Stevens, the contacts and referrals assistant in the technical assistance department.

RESOURCES AVAILABLE FROM NSFC

To order any of the following products, call the National Small Flows Clearinghouse (NSFC) at (800) 624-8301, or write to NSFC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. Be sure to request each item by title and item number. A shipping and handling charge will apply.



New NSFC Guide to Products and Services

The *"National Small Flows Clearinghouse's (NSFC) 1995 Guide to Products and Services"* will be available soon. The updated guide contains complete descriptions of the NSFC's nearly 300 products that range from educational videos and brochures to technical design manuals and case studies of small community and onsite wastewater treatment systems. More than 50 new products are included. However, the new guide will only be mailed to those NSFC customers who have placed product orders in the past year. It will also be available upon request. Please call the NSFC at (800) 624-8301 to reserve your copy.

Septic System Information Packet for Homeowners

This information packet includes a variety of resources that no septic system owner should be without. The packet includes brochures, articles, and other materials on septic system design and the proper care and feeding of a septic system. The price is $5.20. Item #WWPCPE28.

The Care and Feeding of Your Septic Tank

This 16-minute NSFC videotape discusses the basic workings of a conventional septic system and its operation and maintenance. Steps are given that can prolong the life of septic systems, and the idea of centralized septic system management is discussed. The price is $20.00. Item #WWVTPE18/Video.

Septic Systems and Groundwater Protection—A Program Manager's Guide and Reference Book

Designed to provide information to officials responsible for developing state or local septic system management codes, this nontechnical photocopied book provides ideas, alternatives, and real-world examples for implementing a management plan appropriate for your community. The price is $19.25. Item #FMBKMGO3.

Do More With Score Poster

A free poster from the U.S. Environmental Protection Agency (EPA), *"Do More with SCORE: Small Community Outreach and Education Helps Solve Wastewater Problems,"* explains how EPA's small community outreach program can help communities solve their wastewater treatment problems. It lists national and state government agencies, public interest and advocacy groups, educational institutions, small community outreach coordinators and environmental training centers for each state, and EPA's regional and SCORE coordinators in an attractive chart that is suitable for display. Single or multiple copies of the poster are available. Item #WWBLPE03. Shipping and handling charges still apply.

PIPELINE

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NATIONAL SMALL FLOWS CLEARINGHOUSE

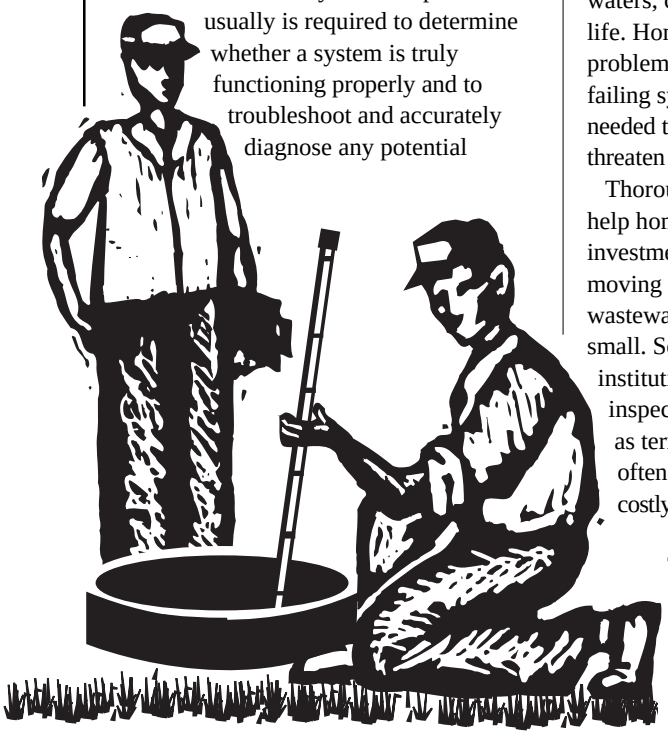
Small Community Wastewater Issues Explained to the Public

INSPECTIONS EQUAL PREVENTATIVE CARE FOR ONSITE SYSTEMS

Most people know that it is important to visit the doctor from time to time if they want to live a long healthy life. Regular checkups can uncover physical problems or unhealthy habits before they lead to serious illnesses, yet many people put off going to the doctor precisely because they are afraid of what they might find out.

Perhaps it's only human nature, therefore, that explains why many homeowners tend to put off having their onsite wastewater treatment systems inspected. Homeowners often don't even know what type of system they have or when it was last serviced. After all, onsite systems usually are buried out of sight, which makes them easy to ignore, especially when they seem to be working.

But ignorance about the condition of onsite systems can be costly for homeowners. Careful examination by a trained professional usually is required to determine whether a system is truly functioning properly and to troubleshoot and accurately diagnose any potential problems in their early stages before they lead to expensive emergencies.



In fact, regular inspections are as important to onsite system health as medical checkups are to human health. Inspections help homeowners determine when and how often systems need maintenance, which is essential for keeping them in good working order. Inspection results also can suggest simple lifestyle changes, such as conserving water, to help homeowners protect and extend the life of their systems.

Protect Your Home and Family

Inspections not only protect systems but also the health of family, neighbors, and entire communities. Malfunctioning onsite systems can contaminate nearby wells and public drinking water sources, and they can pollute local rivers, lakes, and coastal waters, contaminating and killing aquatic life. Homeowners can be held liable for problems and nuisances associated with failing systems. Regular inspections are needed to uncover problems before they threaten public health and the environment.

Thorough onsite system inspections also help homeowners protect their property investments. Imagine the nightmare of moving to a new home only to find that the wastewater system is failing or that it is too small. Some local regulations and lending institutions require that systems be inspected prior to property transfers, just as termite and structural inspections are often required, to help homebuyers avoid costly surprises.

Types of Inspections

Although newly constructed onsite systems also need to be inspected before they are approved for operation, this issue of *Pipeline* focuses specifically on inspections of existing onsite systems already in operation. These inspections sometimes occur independently or as part of a maintenance visit, depending on local regulations, the type of system, the reason for the inspection, and the degree of observation and monitoring necessary.

This issue of *Pipeline* provides an overview for homeowners of what occurs during an inspection visit. Readers are encouraged to reprint the articles in local newspapers or include them in flyers, handouts, newsletters, and educational presentations. Please include the name and phone number of the National Small Flows Clearinghouse (NSFC) on the reprinted information and send us a copy for our files.

If you have any questions about reprinting articles or about any of the topics in this newsletter, please contact the NSFC at (800) 624-8301 or (304) 293-4191.

Why Have Your System Inspected?

- to make sure it is functioning properly,
- to protect the health of your family and neighbors,
- to extend the life of the system,
- to catch and troubleshoot problems in their early stages before they become serious and expensive to correct,
- to protect wells and other local drinking water sources from contamination,
- to protect life in local rivers, lakes, and coastal waters and prevent the need for costly rehabilitation efforts,
- to comply with environmental and health regulations,
- to protect your investment in your home and property, and
- to fulfill legal or lending institution requirements for property transfers.

When should onsite systems be inspected?

Exactly when and how often systems should be inspected depends on local onsite system regulations, the type of system, how it is used, and whether it is located in an environmentally sensitive site or area. Contact your local health department for information concerning requirements for your system. *Refer to the contacts list on page 7 for information on how to reach your local health department.*

Septic Systems

Conventional septic tank/soil absorption systems are the most common type of onsite system serving individual homes in the U.S. It is in homeowners' best interests to have their septic systems inspected regularly, even when local regulations don't require it. Septic systems serving restaurants or other businesses or institutions must be inspected more frequently than residential systems because they usually treat wastewater that is higher in strength and volume.

It is especially important for homeowners to schedule annual inspections for new septic systems and systems that are new to them as users to monitor how quickly the layers of sludge and scum accumulate in the septic tank with normal use. If sludge and scum layers are allowed to become too thick, solid materials may flow from the septic tank into the soil absorption field, clogging the pipes and soil and causing the system to fail. Annual inspections help homeowners estimate more precisely how often they need to have their septic tank pumped out to avoid this problem.

Inspections also can uncover any cracks, flaws, or other problems with systems, and they can help homeowners find out if they are using their systems wisely. For example, inspections can reveal if food scraps or other inappropriate items are being washed down the drain regularly or if too much water is being used, which can overburden systems.

For more information about how septic systems work and proper septic system operation and maintenance, refer to the Summer and Fall 1995 issues of Pipeline *(Items #SFPLNL02 and #SFPLNL03). The price for* Pipeline *back issues is 20 cents each plus shipping and handling. See page 8 for ordering information.*

Other Onsite Systems

Home aerobic treatment units, sand filters, mounds, chlorination units, lagoons, and other alternative or innovative onsite system technologies have different inspection requirements. Some systems must be inspected more frequently or require regular monitoring by specially qualified professionals. (*See "Who inspects onsite systems" on page 3.*) In addition, systems with electrical or mechanical components, such as pumps, timers, control panels, and alarms, need to be inspected and serviced according to manufacturer recommendations.

Regulations may require that some alternative onsite systems be inspected more frequently than conventional septic systems because of their more complex designs and because many alternative systems are located at difficult sites or in environmentally sensitive areas. Some communities have onsite system management programs in place to ensure that systems are regularly monitored, or communities may issue operating permits requiring inspections as a condition for renewal. Home aerobic treatment units usually come with maintenance service contracts that include regular inspections by a local manufacturer representative. Homeowners are sometimes required to renew these contracts after the initial two-year period, but should consider renewing them even if not required to do so.

To learn more about community programs for managing onsite system operation and maintenance, refer to the Spring 1996 issue of Pipeline *(Item #SFPLNL05). For more about home aerobic treatment units and service contracts, refer to the Winter 1996 issue of* Pipeline *(Item #SFPLNL04).*

The National Small Flows Clearinghouse (NSFC) also offers a variety of information about other alternative and innovative onsite wastewater systems. Refer to pages 7 and 8 for information.

Property Transfers

It is not unusual for regulations or lending institutions to require that onsite system inspections be performed within a given time of the sale or transfer of property. This requirement sometimes can be waived if the owner has kept detailed records of past system inspections and maintenance. For their own protection, consumers should insist on a thorough system inspection before purchasing a home, whether or not it is required by local regulations, and once the home is purchased, they should maintain detailed and up-to-date records of all system inspection and service visits.

Major Changes and Repairs

Homeowners often need to have their onsite systems inspected to obtain building permits for constructing home additions or adding new buildings to their property. An inspection determines whether the system will be affected by the new construction and if it will be able to handle any potential changes in the amount or strength of the wastewater from the extra rooms or additional occupants.

Inspections also may be required before making system repairs and other changes to property that can affect the system. Changes in the use of a property, for example, from seasonal to year-round occupancy or from residential to commerical use, also affect onsite systems and inspections often are required before such changes are approved.

Who initiates inspections?

If your community has some type of program in place for managing onsite systems, you may be contacted by a health official or management program employee to schedule an inspection of your system. Otherwise, it usually is up to homeowners to initiate system inspections. Contact your local health department for information about inspections in your area.

Who inspects onsite systems?

Onsite system inspections may be performed by health officials, sanitarians, independent contractors (septic system pumpers and haulers, for example), or people employed by communities, developers, or homeowner associations. Manufacturer representatives are responsible for inspecting and servicing certain systems and components covered by service contracts or warranties. Exactly who should inspect your system depends on the type of system you have, the reason for the inspection, and local onsite system regulations.

Choose the Right Professional

The first step to finding the right person to inspect your system is to contact your local health department. *(Refer to the contact information on page 7.)* Health department officials know about local onsite system regulations, and they may know whether your community schedules regular system inspections. They also will be aware of any special requirements for your particular type of system or property and whether certain licenses, certification, education, or training are required for onsite professionals in your state.

For example, a few states, such as Massachusetts and Pennsylvania, and counties in some states sponsor training programs for onsite system inspectors and maintain lists of the people who have completed these programs. Regulations concerning qualifications for onsite system professionals vary considerably from state to state, and some states have no requirements at all. Local health officials often can help you find qualified people in your area.

It is important to be aware, however, that simply finding a professional with the required qualifications does not guarantee that he or she is the best person for the job. Homeowners should compare estimates, check references, and hire someone who has appropriate experience. It also is a good idea to hire someone who carries adequate insurance and to be alert to any potential conflicts of interest. For example, it is very common for onsite system professionals working in the private sector to perform a variety of different services, so the person who inspects your system also may repair, maintain, and install systems. Homeowners should simply be aware of the potential for a conflict and take the time to check references.

Should you do it yourself?

Do you know what a baffle looks like and how to tell if it is working? Do you know what you should find inside a properly functioning septic tank, or how to test pump switches? If not, you should hire a professional to inspect your system.

Because some state and local regulations do not specify who should inspect systems and how often they should be inspected, some homeowners may be tempted to inspect their systems themselves. Even when this is an option, there are many advantages to hiring a professional to do the job.

Experienced onsite system professionals can identify structural problems with tanks and other components and are able to inspect entire systems, including all plumbing, components, and the soil absorption field. If a system is difficult to locate, professional inspectors will have the know-how and equipment to find the system more easily. After the inspection, they can provide the homeowner with a written report detailing the results, the location of the system, and any maintenance that needs to be performed. These reports are official documents valuable for showing to banks, insurance companies, and prospective homebuyers.

Another reason homeowners should hire professionals are the dangers inherent in performing inspections and maintenance for some systems. Septic tanks, for example, contain gases that can be poisonous, explosive, and potentially fatal, so tanks should not be entered or inspected alone. Systems with electrical components pose a shock hazard and even probing in the backyard with a metal rod (a common method for locating systems) can be dangerous if there are utility lines buried there. Also, the wastewater in the tank may contain disease-causing pathogens.

Professional system inspectors are aware of proper safety practices. They also have specialized equipment that enables them to perform the inspection more safely and cost-effectively than would be possible for most homeowners.

Help Is Available!

If your local health department is unable to help you find a qualified professional onsite system inspector in your area, there are additional resources available:

NSFC's Manufacturers and Consultants Database

Homeowners can call the National Small Flows Clearinghouse (NSFC) and request a customized search of the Manufacturers and Consultants Database to obtain a list of consultants in their area who work with onsite and small community wastewater systems. The search can be narrowed to include only those consultants who have notified the NSFC that they perform onsite system inspections. Homeowners then can contact local consultants to compare prices, check references, and inquire about insurance coverage, certification, and licenses.

Contact the NSFC at (800) 624-8301 or (304) 293-4191 and ask to speak with a technical assistance specialist for more information about the database or to request a search. Please be sure to specify the topic and Item #WWPCCM15 when requesting a search. The price is 15 cents per page.

National Association of Waste Transporters, Inc. (NAWT)

As a professional organization serving onsite system pumpers and haulers, part of NAWT's mission is to advance and increase the professionalism and public image of its industry. NAWT has developed its own training and certification programs for onsite system inspectors and offers the curriculum to states and others. The organization also offers group insurance for independent contractors.

Homeowners who would like information about NAWT members who perform inspections in their area can contact the organization's headquarters in Scandia, Minnesota, at (800) 236-6298.

The Homeower's Role in the Inspection Process

Suppose you contacted your local health department, found the right people to inspect your system, and scheduled an appointment—now is your role in the inspection over? Not if you're smart. Your continued involvement will help ensure that everything goes smoothly and that you benefit as much as possible from the process.

Gather Information

One way homeowners can aid the inspection process and save considerable time and money is to provide the professionals performing the inspection with as much information about the system as possible. An "as-built" drawing of the system or reports from previous inspection or maintenance visits, for example, will help the inspector locate the system and inspect it thoroughly. Other helpful documents include operating manuals or manufacturer information for system components. Gathering this information in advance and having it on-hand at the inspection will help homeowners save time answering the inspectors' questions *(refer to the article below, "Questions Inspectors May Ask")*, and it may save the expense of someone else having to do the research.

These records sometimes can be found with the deed and other documents from the purchase of your home, or there may be some information at your local health department. *(Refer to page 8 for information about the National Small Flows Clearinghouse's new "Homeowner Onsite System Recordkeeping Folder.")*

Be Present

It is important for someone living in the home to be present during the inspection to answer any questions the inspectors have about the habits and lifestyle of the system users and to let the inspectors in the house to examine pipes and flush toilets.

Another good reason for homeowners to be present is to oversee the inspection as an added precaution to ensure that everything is done thoroughly and correctly—for example, that any soil or sod that is removed is replaced neatly *(see the article on page 5 for more information)*.

Ask Questions

Inspections are an excellent opportunity for homeowners to learn about their system and how to best care for it. It is a good idea to follow the inspector to observe and ask questions. Some health officials and other onsite system professionals are very good about taking the time to interact with homeowners to educate them about proper system operation and maintenance. However, like any group of people, different inspectors have different personalities and priorities, and it sometimes will be up to the homeowner to ask for this information.

Questions Inspectors May Ask

A thorough onsite system inspection usually includes a detailed interview of the homeowner or resident concerning the system and household practices that may affect the system. The answers help the inspectors assess the quantity and quality of wastewater flowing into the system at various times of the day and week and other burdens to the system. The interview information also helps inspectors recommend ways residents can change their household habits to protect their systems.

The following are examples of the types of questions homeowners should be prepared to answer:

User Information

- *How many people currently live in the home?*
- *How many bedrooms are there in the home?*
- *Is the home occupied year-round or seasonally?*
- *Is anyone in the home using medications or antibiotics long-term?*
- *How many loads of laundry do you do per day and per week?*
- *Do you do consecutive loads?*
- *Do you use powdered or liquid detergent?*
- *Do you have a garbage disposal?*
- *Do you have a dishwasher?*
- *Do you use a water softener?*
- *How many rolls of toilet paper do you use per week?*

System Information

- *Do you know what type of system you have?*
- *When was the system installed?*
- *Has the tank ever been pumped? If so, when was it last pumped?*
- *Has the system ever been repaired?*
- *Do you know where the septic tank and drainfield are located?*
- *Have pumps ever been serviced?*
- *Has the alarm system ever been repaired?*
- *Has the alarm light ever been on, or has the alarm ever sounded?*
- *Where are the separate circuits for the alarm and pump?*
- *Has sewage ever backed up into the house?*
- *Has sewage ever surfaced on the ground?*
- *Are there any soggy areas in the yard even in dry weather? Any odors?*

Sometimes the inspectors will have additional questions after examining the system. They may suspect that too much

wastewater is flowing into the system at once from excess water use, leaky faucets, or running toilets, or that food scraps or harsh chemicals are being washed down the drain. Or, there may be evidence that inappropriate items, such as diapers, cigarette butts, tampons, or condoms are being disposed of in the system.

Although some of the inspectors' questions may seem intrusive and even a little embarrassing, it is in your best interest to answer them all as openly and as honestly as possible. The inspectors' only motivation is to get an accurate picture of what happens in the system so they can identify and help you avoid any potential problems. Again, think of your inspection visit as if it were a medical checkup—your cooperation can help protect your system's health.

The Inspection Visit

After the inspectors obtain the information that they need from you, they will begin to examine different parts of your system and record what they find. Homeowners should be aware that the goal of an inspection simply is to assess the condition of a system at a particular point in time. It is impractical for inspectors to make any predictions or guarantees about the future performance of the system because it can be affected by too many unforeseeable factors, including the actions of homeowners.

Inspecting the Site

Before examining the system itself, the inspectors may check your property for obvious signs of trouble or system failure. They will look to see that downspouts and drains are pointed away from the system, and they will observe the topography of the site and note any property features, such as pavement, trees, or wells, that may affect the system or be of concern.

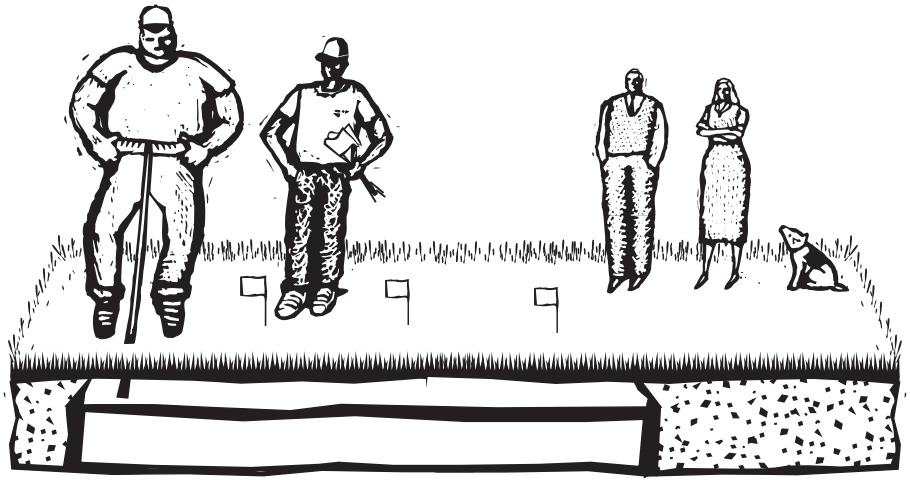
Some warning signs of possible system failure that warrant further investigation include odors and areas of the yard where the ground is wet or mushy or where the vegetation is different or growing more rapidly.

Checking Inside the House

Inspectors also will ask to go inside the house. They will flush the toilets and run a small amount of water down the drains to see if wastewater is backing up or draining slowly, which is a possible sign that the system is clogged. They also may add dye to the system *(see page 6 for more information)*, and they may locate and check the condition of pipes and verify the number of bedrooms and the number and size of water-using appliances and fixtures.

Locating the System

If a map or drawing of the system is not available, the inspector will need to find your system some other way, which often takes considerable time and energy and, in some cases, even adds to the inspection cost. Once the system is located, make sure the inspector sketches a map of its layout and location for future inspections.



Common methods for finding system tanks include estimating their position from the direction of the sewer pipe that leaves the house, probing the ground outside with an insulated metal rod, using a metal detector, or flushing an electronic transmitter/locator device down the toilet. Once the tank is found, the inspectors will search for the rest of the system using the metal rod or metal detector, and they will temporarily place flags in the yard as they locate various features to facilitate sketching a map of the system. The whole process of locating and flagging different parts of the system may take several hours.

The NSFC's "Homeowner Onsite System Recordkeeping Folder" contains more detailed information about locating systems. See page 8 for more details and ordering information.

Uncovering Tank Access Ports

Systems, such as septic systems, that have tanks buried underground should have risers (elevated access covers) that make finding, inspecting, and maintaining them more convenient. If not, inspectors will have to unearth the tank's inspection ports and manhole. Ideally, the digging should be done with care so the inspectors can replace the sod neatly before they leave.

Homeowners should consider installing lockable risers for tanks that are difficult to locate or access to save time and money for future inspection and maintenance visits. If risers are not practical, there are flags and other devices available for marking the location of the tank and other system components.

Inspecting the Tank

After the tank accesses are opened and the covers are set aside, the inspectors will determine the size of the tank and whether it is constructed of concrete, metal, fiberglass, or plastic. They also will note the odor and appearance of the wastewater inside. There should be a layer of scum on top and the wastewater should smell musty, not sour.

Next, the inspectors will check the baffles or tees inside the tank to make sure they are correctly positioned and that there is no damage or plugging. (Adequate baffles and tees can prevent scum and sludge from leaving the septic tank and clogging the drainfield.) If the tank is equipped with effluent filters to help prevent solids from leaving the tank, these filters will be examined as well and may be cleaned if necessary.

The inspectors also will try to determine if the tank is watertight or if it has any cracks or leaks by measuring the level of liquid above or below the inlet and outlet. If the water is too high or if it is constantly flowing out of the tank even when no water is being used in the house, it could mean high groundwater or storm runoff is entering the tank. Low levels in the tank can be a sign that wastewater is leaking out. The tank may need to be pumped and cleaned for leaks to be located. The inspectors also may check the integrity of the pipes and connections to the tank.

If the inspector finds water stains in the tank that show that the level of wastewater has been high in the past, again the cause

Continued on page 6

The Inspection Visit

continued from page 5

may be high groundwater or stormwater, or it may be the result of excess household water use. Leaky faucets, running toilets, and doing loads of laundry consecutively, for example, can discharge large volumes of water into the system, causing hydraulic overloading. Inspectors may need to work with homeowners to discover the root of the problem.

Measuring Scum and Sludge

If an onsite system is working correctly, the wastewater in the tank will separate into three layers—grease and other light materials will float to the top to form a layer of scum, heavier solids will settle to the bottom to form a layer of sludge, and the partially clarified liquid that is left in the middle of the tank flows out for further treatment. However if the layers of scum and sludge in the tank become too thick, solids can be flushed out of the tank along with the liquid and can clog the system. Therefore, one of the most important tasks the inspector will perform is to measure the depth of scum and sludge in the tank.

There are a few common methods that inspectors use to measure the layers in the tank. They sometimes use a hollow clear plastic tube device that when lowered to the bottom of the tank through a hole in the scum layer and brought back up retains a cross-section of the liquid and sludge layers that can be measured. Or, the sludge layer can be measured by wrapping a long stick with a towel or cloth and then lowering it to the bottom of the tank through the baffle, tee, or a hole in the scum layer. The length of the sludge material sticking to the cloth indicates the depth of the sludge layer.

To measure the scum layer, the inspectors may use a long stick with a short piece of wood attached to the bottom to form an "L" or a "foot." When this stick is pushed through the scum and brought back up, the "foot" meets resistance at the bottom of the layer, and the inspectors can then mark the stick at the top of the layer to give them depth of the scum layer.

When the scum and sludge layers in the tank become too thick or get too close to the bottom of the outlet baffle or tee, the tank should be pumped. Exactly how much scum and sludge is too much and how often a tank needs to be pumped depends on several factors, including local health agency regulations or guidelines, the type of system and the biological processes at work, the size of the tank, the number of people in the house and their habits, the type of appliances and fixtures in the home, and the temperature in the tank. Your local health department should be able to give you information concerning what levels in the tank indicate the need for pumping.

How often the tank should be pumped can then be determined from observing the rate of accumulation with regular inspections. Although general pumping frequency guidelines and schedules are available for different types of systems, the best way to protect your individual system is to have it inspected regularly so the most accurate pumping frequency can be determined.

The NSFC offers a variety of information on the maintenance requirements of different onsite systems. Refer to pages 7 and 8 for contacts and product information.

Examining the Distribution Box

If the system includes a distribution box or drop box where all the effluent from the tank flows to be distributed to the different lines in the drainfield, this box also may be located and uncovered for inspection.

Inspectors will check to make sure that the box is level to ensure that the different sections of the drainfield are receiving the intended amount of effluent. They also will note the depth of the wastewater in the box and if there are any solids in it. If the depth of effluent in the box is above the outlets, this may indicate that the drainfield is clogged. Solids in the box may indicate a broken baffle or tee in the tank or that the tank needs to be pumped.

Inspecting Pumps and Siphons

Some onsite systems are designed to use pumps or siphons, which also need to be checked. Pumps are located in tanks, called pump wells, chambers, or vaults, located either outside separate from the treatment tank or in a compartment inside the treatment tank. Pump tanks need to be inspected for damage, corrosion, and watertightness, and are considered enclosed spaces, which makes certain safety precautions necessary. Inspectors also must protect themselves from electric shock when inspecting pumps, as well as from the other hazards inherent with inspecting onsite wastewater systems.

Inspectors will look to see if any grease or solids from the tank are in the pump chamber, and they will manually check the operation of the pump or siphon, testing all level controls, switches, and alarms. They also may take readings from counters and meters on the pump or siphon.

Checking Alarms and Controls

Onsite systems that have mechanical components sometimes have electrical control panels and alarm systems that need to be regularly inspected, tested, and serviced. Complex electrical systems may be checked and serviced by a manufacturer representative as part of the terms of a service contract or warranty.

Inspecting the Drainfield

Once the drainfield is located, the inspectors will examine the site for signs of failure and for certain types of cover, such as trees and shrubs that can clog the drainfield pipes. As they probe the area to determine the layout of the drainfield, they will note the number, length, and width of the trenches, and whether they are lined with sand, gravel, or some other material.

Probing in the drainfield area also gives inspectors clues as to whether the soil underneath is clogged. The texture and color of the adjacent soil is significant—thick black sticky soil may indicate a problem.

Using Dyes and Tracers

Another common method for testing onsite systems is to flush tracers or dyes down the toilet and into the system. Dyes and tracers are often used to locate leaks and to determine whether the drainfield is clogged and if the system is contaminating nearby wells, other drinking water sources, or surface waters.

One drawback to this method is that some dyes are thought to be carcinogenic and may themselves contaminate nearby water sources. Also, dyes sometimes don't become visible for hours or days or may not appear at all, even in systems that are malfunctioning.

Delaware Inspector Shares His Experience

If there is a problem with an onsite wastewater system, Hollis Warren has probably seen it. His family's onsite system business has been serving Kent County, Delaware, since 1960. About five years ago they also began inspecting systems.

"I like doing inspections because you sometimes catch the start of a failing system and save the homeowner money," explains Warren. "Some of the problems we have been finding are baffles missing in the tanks, which can let sludge out into the drainfield, and things that don't belong in the system, such as plastic products and undigested food. We've also found holes in the tanks or around the pipes going into the tank, which can let excess water in, and when we question customers about their water use, we find that most people do all of their wash at one time, thus overloading the system."

Sometimes, Warren explains, the problem is improper maintenance or shoddy work by untrained people in the field.

"We recently inspected an LPP [low pressure pipe] system for a customer and discovered that the pump was installed without a check valve, which was causing problems," explains Warren.

According to Warren, this last example illustrates why homeowners should learn about their systems and be careful to hire trained professionals and not only look at cost when deciding to have work done to their systems.

"There are still people out there who just flush the toilet three times, and if it goes down, pass the system," Warren says. "We in the industry must maintain a high standard and have a good understanding of the systems through education."

What if there is a problem with my system?

Inspections may uncover relatively minor system issues, such as tanks that need to be pumped and baffles that need to be repositioned or replaced, or they may bring attention to plumbing problems, such as leaky fixtures.

However, in the event that an inspection reveals a more serious problem that requires repairing or replacing part of your system, it is important to contact your local health department (or, in some cases, your onsite system management program or homeowners' association) for information and advice. Although inspectors may offer suggestions concerning repairs or different technologies to help your system, you will need to confirm which options are appropriate and allowed in your area.

For example, local health officials can confirm which options are most practical and cost-effective and which alternative treatment technologies are allowed by local regulations. You also need to know if your system must be repaired within a certain time, if you need a permit, and if your water supply needs to be checked for contaminants.

Usually, the most serious problem is a failed system. The exact criteria for system failure varies from place to place depending on local regulations, but it usually indicates that operating the system in its current condition poses a threat to public health or the environment. Depending on the problem and conditions at the site, you may be advised to replace part of your system or to provide additional or alternative treatment. Again, local health officials can help you sort out the most practical solutions for your situation.

Even if an inspection does reveal a problem that needs to be addressed, homeowners should feel reassured that because of the inspection, they know more about their system and how to operate and maintain it properly to avoid more problems in the future. After all, the cost of periodic inspections and pumping is just a fraction of the cost of replacing all or part of a system. Routine inspections and maintenance along with proper operating habits significantly increases the potential that a system will function well for many years.

CONTACTS

Local Health Departments

Homeowners and residents of small communities who want information about onsite system inspections should contact their local health departments for local regulations concerning inspections, how often certain types of systems should be inspected, and who is qualified to perform inspections locally. Health officials also may have records showing the exact location of systems, the frequency of system maintenance, and the results of past inspections. Local health agencies usually are listed in the government section or blue pages of local phone directories.

National Small Flows Clearinghouse (NSFC)

The NSFC offers technical assistance and free and low-cost information and materials on a variety of onsite and small community wastewater issues. Only a few of the NSFC's many resources and services are mentioned in this newsletter. Call the NSFC at (800) 624-8301 or (304) 293-4191 for more information or to request a free catalog.

Extension Service Offices

Many universities have U.S. Department of Agriculture Extension Service offices on campus and in other locations that provide a variety of services and assistance to individuals and small communities. For the phone number of the extension office in your area, check the government pages of your local phone directory, call the NSFC, or call the U.S. Department of Agriculture directly at (202) 720-3377.

RESOURCES AVAILABLE FROM NSFC

To order any of the following products, call the National Small Flows Clearinghouse (NSFC) at (800) 624-8301 or (304) 293-4191, fax (304) 293-3161, e-mail nsfc_orders@estd.wvu.edu, or write NSFC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. Be sure to request each item by number and title. A shipping and handling charge will apply.

Site Evaluation and Inspections

A new NSFC publication, *Site Evaluations and Inspections from the State Regulations*, will be available beginning July 16, 1998. It is a compilation of onsite regulations from different states including information about who may conduct onsite system inspections and when and how often they are required. Contact the NSFC in July for price information. Item #WWBKRG27.

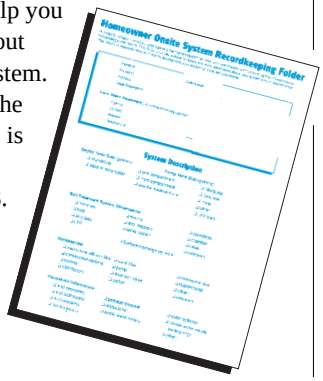
Onsite Wastewater System Operation and Maintenance

This training curriculum offered by the National Environmental Training Center for Small Communities can be used to educate onsite professionals and includes information about inspecting and maintaining systems. The complete package (Item TRTPCD09), which includes a *Trainer's Resource Pack*, *Operator's Manual*, and *Trainer's Guide* is $273. Ordered separately, the *Operator's Manual* (Item #TRPMCD11) is $36, and the *Operator's Manual* and *Trainer's Guide* together (Item #TRTGCD10) are $43.

New Homeowner Recordkeeping Folder and Information Package

The NSFC has developed new products to help homeowners to record and store information about their onsite systems and to learn more about them. The "Homeowner Onsite System Recordkeeping Folder" includes sections for recording permit and local health department information, a checklist for information about different system components and accessories, a place to record household information, a grid for sketching the layout and position of the system, as well as tips for locating the system. The price for the folder is 40 cents. Item #WWBLPE37.

The NSFC's new "Homeowner Septic Tank Information Package" includes the recordkeeping folder described above packed with materials, such as back issues of *Pipeline*, brochures, and fact sheets, designed to help you learn more about your septic system. The price for the entire package is $2. Item #WWPKPE28.



Free NSFC Catalog

The *1997 Guide to Products and Services* lists and describes the many products and services the NSFC offers. The catalog can be downloaded from the NSFC's Web site at www.nsfc.wvu.edu or is available free upon request. Item #WWCAT.

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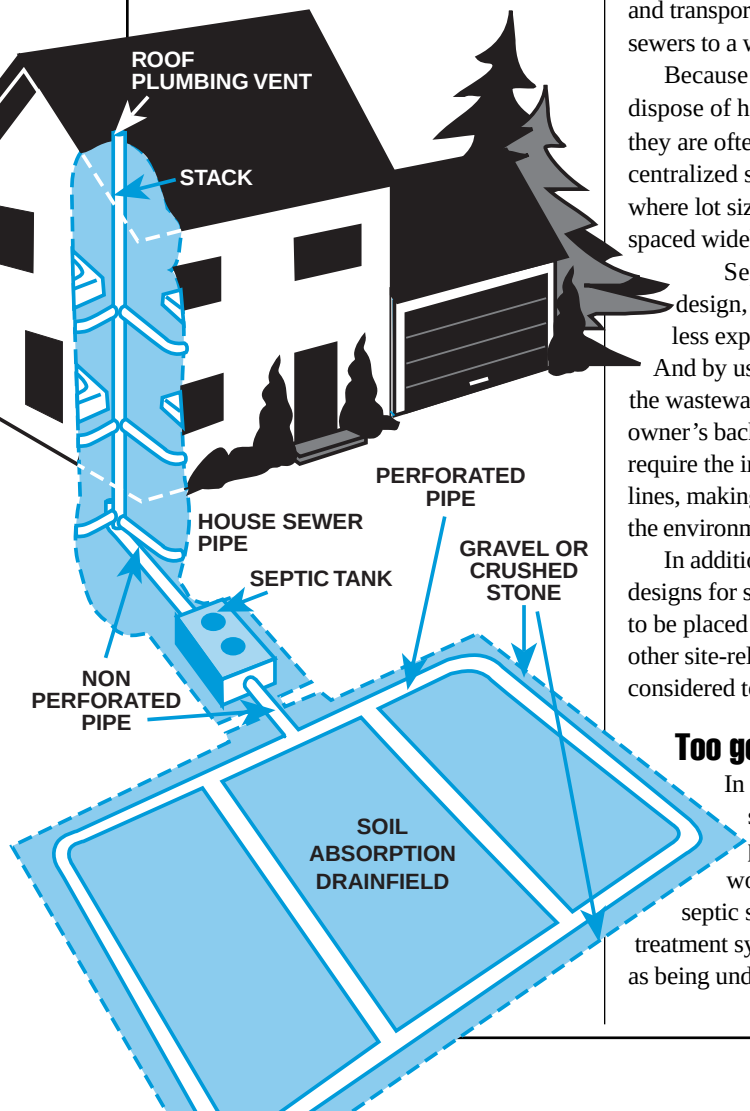
NATIONAL SMALL FLOWS CLEARINGHOUSE

Small Community Wastewater Issues Explained to the Public

Septic Systems—a practical alternative for small communities

Are you the proud owner of a septic system? If so, you're in good company. Nearly one out of every four homes in the U.S. relies on some form of septic system to treat and dispose of household wastewater. When properly designed, installed, and maintained, septic systems can be the most cost-effective and efficient method of wastewater treatment a homeowner can choose.



A septic system is an especially good alternative for homeowners in many small and rural communities. In these communities, the cost per household of installing, maintaining, and operating a conventional sewer system is usually higher because the population is smaller. (A conventional sewer system is the type of centralized wastewater collection and treatment system used by most U.S. communities. Wastewater is collected from individual households and transported through a network of sewers to a wastewater treatment plant.)

Because septic systems treat and dispose of household wastewater onsite, they are often more economical than centralized sewer systems in rural areas where lot sizes are larger and houses are spaced widely apart.

Septic systems are also simple in design, which make them generally less expensive to install and maintain. And by using natural processes to treat the wastewater onsite, usually in a homeowner's backyard, septic systems don't require the installation of miles of sewer lines, making them less disruptive to the environment.

In addition, there are many innovative designs for septic systems that allow them to be placed in areas with shallow soils or other site-related conditions previously considered to be unsuitable.

Too good to be true?

In spite of these facts, septic systems suffer from an image problem. Many people who would be better served by a septic system than a centralized treatment system still think of septic tanks as being undependable, old-fashioned, or as a temporary solution until a conventional sewer system can be built.

ADVANTAGES OF SEPTIC SYSTEMS

- Simple and effective wastewater treatment
- Less disruptive to the environment to install and maintain
- Less expensive to operate than centralized treatment facilities
- Provide wastewater treatment in areas where it would not be available otherwise
- When functioning properly, can help replenish groundwater

Part of the blame for the poor reputation of septic systems can be traced to the popularity of conventional sewer systems in the 1960s and early 1970s, when more government funding was available to install and maintain large, complex systems. Many communities weren't informed about possible alternatives and, therefore, didn't consider more cost-effective or appropriate technologies like septic systems. And engineers, local officials, and community residents sometimes may be easily impressed by more high-tech solutions to problems. Septic systems may be overlooked as a solution in some cases because they are such a simple technology.

Pollution of local groundwater, lakes, and streams due to septic system failures is also responsible for their unpopularity in some communities. The U.S. Environmental Protection Agency (EPA) has identified failing septic systems as a major source of groundwater pollution in some areas. However, most of these failures can be attributed to old systems with poor design,

Continued on page 2

Are septic systems right for my community?

When planning cost-effective wastewater treatment, homeowners and community leaders should work together to identify the needs of residents and other potential users of a system, such as schools, businesses, and industry. It is also important to evaluate factors such as the amount of money available for financing, regulations, and the performance of existing wastewater facilities and any needed repairs, expansion, or replacement.

Communities may decide that using a combination of technologies is the most effective way to fulfill the needs and goals of the entire community. Many small and rural communities use septic systems in less densely populated areas and cluster or community treatment systems where there are more users or smaller lot sizes.

The National Small Flows Clearinghouse (NSFC) offers information and technical assistance for small communities and homeowners planning or installing individual or commmunity wastewater treatment systems. Some of the resources available are listed throughout this newsletter and on page 8. *To order products or to request further assistance, call the NSFC at (800) 624-8301.*

Approximately one out of every four homes in the U.S. uses an onsite system to treat household wastewater.

HOW COMMON ARE SEPTIC TANKS?

According to the 1990 U.S. Census, there are approximately 24.7 million households across the U.S. that use septic tank systems or cesspools (holes or pits for receiving sewage) for wastewater treatment. This figure represents roughly 24 percent of the total households included in the census. Roughly half of the households in Vermont, Maine, New Hampshire, and North Carolina use septic systems or cesspools.

According to a review of local health department information by the National Small Flows Clearinghouse, 94 percent of participating health departments allow or permit the use of septic tank and soil absorption systems. Those that do not allow septic systems have sewer lines available to all residents.

The total volume of waste disposed of through septic systems is over one trillion gallons per year, according to a study conducted by the U.S. Environmental Protection Agency's Office of Technology Assessment, and virtually all of that waste is discharged directly to the subsurface, which affects groundwater quality.

Septic Systems — *continued from page 1*

poor maintenance, poor installation, or inadequate site evaluations before installation.

In the past, a lack of adequate regulations for septic system design, construction, and installation also contributed to septic system failures. With education, most problems with septic systems can be avoided. Education can lead to the proper operation and maintenance of septic systems or the possible rehabilitation of failing systems.

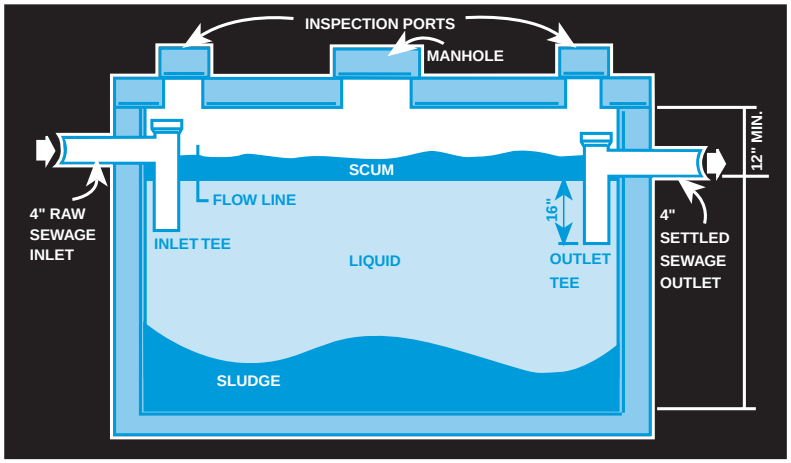
This issue of *Pipeline* presents some basic information about septic tank systems, how they work, and where homeowners and community leaders can find further information and assistance.

The fall issue of *Pipeline* will cover the care and maintenance of septic systems in detail, including important tips for homeowners who want to ensure the success and longevity of their systems.

You are encouraged to share, copy, or distribute any information in *Pipeline* with others in your community. The articles can also be reprinted in local newspapers or included in flyers and newsletters. We only ask that you send us a copy of the reprinted article for our files. *If you have any questions or require further information about any of the topics in this newsletter, please contact the National Small Flows Clearinghouse at (800) 624-8301.*

IN THIS ISSUE

How Septic Systems Work



Septic systems are wastewater treatment systems that collect, treat, and dispose of wastewater generated by homes or businesses. The wastewater is treated onsite, rather than collected and transported to a centralized community wastewater treatment plant. If properly designed, installed, and maintained, a septic tank system can effectively treat household wastewater for up to 20 years or more.

There are several variations of the basic septic system design in use today. While many systems are individually designed or adapted for a specific site, most work using the same basic principles.

A septic system consists of two main parts—a *septic tank* and a *drainfield*, also known as a leachfield, disposal field, or a soil absorption system. The entire system is connected by pipes, and a sewer pipe connects the home or business to the septic system.

The Septic Tank

The main function of the septic tank is to collect household wastewater, which includes water from the toilet, referred to as blackwater, and water from the bathtub, showers, sinks, and laundry, which is known collectively as graywater. The septic tank treats the wastewater naturally by holding it in the tank long enough for solids and liquids to separate.

Treatment begins when the household wastewater flows from the home to the septic tank through the sewer pipe. A baffle (an internal flap) or tee (a T-shaped pipe) at the inlet slows the flow of wastewater going into the tank and directs it downward toward the middle of the tank. The wastewater is then retained for a day or more in the tank to allow the solids in the wastewater to separate from the liquids.

Inside the tank, solids lighter than water—such as greases, oils, and, sometimes, other solid materials like toilet paper—float to the top forming a layer of scum. Solids heavier than water settle at the bottom of the tank forming a layer of sludge. This leaves a middle layer of partially clarified wastewater.

An outlet baffle in the septic tank is positioned to allow only the partially treated liquid waste in the middle layer to flow out of the tank for further treatment.

The layers of scum and sludge remain in the septic tank where bacteria found naturally in the wastewater work to break the solids down. This process takes place anaerobically, or without the presence of oxygen, and gases produced from the decaying solids are vented back through the sewer line and released, usually through a plumbing vent located on the roof of the house. The sludge and scum that cannot be

Continued on page 4

What Homeowners Need To Know About Septic Tank Design

Septic tanks are usually made of precast concrete, fiberglass, or plastic, and come in a variety of shapes and sizes. In order for septic tanks to work properly, they must be watertight and resistant to corrosion—for this reason, metal tanks are not recommended.

Most septic tanks are single-compartment tanks. Tanks with two or more compartments use the same processes to treat the wastewater, but often retain the wastewater in the tank longer allowing for additional settling time for the solids, and thus providing additional treatment before releasing it to the drainfield. Some states recommend or require two or more compartments for septic tanks that hold 1,000 gallons or more, or two or more septic tanks used in series to provide additional treatment.

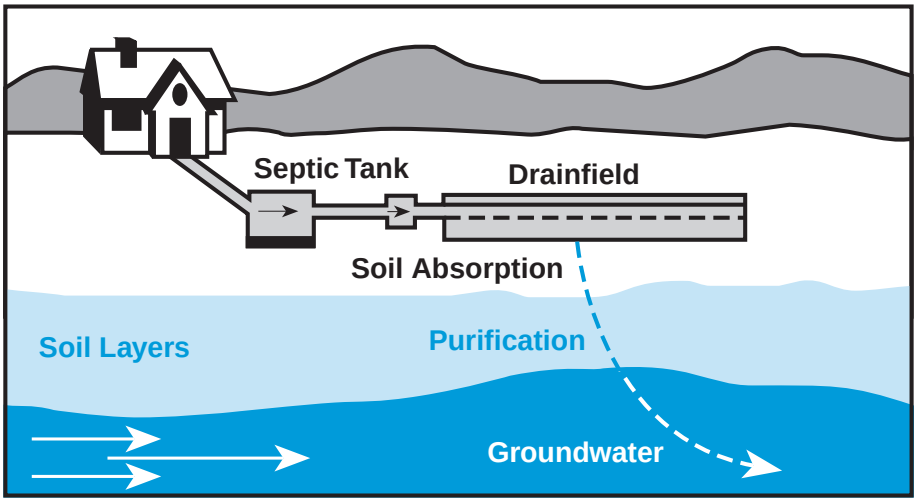
Septic tank filters, screen- or basket-like devices that trap and retain solids, are another way to enhance treatment inside septic tanks. A relatively new technology, septic tank filters are included with some newer septic tank designs, or can be retrofitted to work with older designs. Homeowners should check with their local health departments to see if septic tank filters are required or recommended.

Septic tanks are often rectangular, oval, or round. The overall shape of the septic tank has little to do with its performance, but tank size is a very important factor. Septic tanks must be large enough to accommodate the needs of the household.

The size of a septic tank is usually determined by the number of bedrooms (not bathrooms) in a home. One way to estimate the size of septic tank necessary for an average household would be to multiply 150 gallons per bedroom per day, and then multiply this number by two to allow for two days retention time in the tank. Using this formula, a three-bedroom house would use 450 gallons of water per day, and would require at least a 900-gallon septic tank for two days retention. Standard septic tank sizes include 750; 1,000; 1,200; and 1,500 gallons.

While there are several formulas available for estimating septic tank size, it is most important for homeowners to know the specific regulations for septic tank size and design in their state or area. *For more information on septic system regulations, see the article on page 6.*

How Septic Systems Work—*continued from page 3*



broken down is retained in the tank until the tank is eventually pumped.

After the wastewater is allowed to settle and separate in the septic tank, the partially treated liquid from the middle layer flows through the outlet baffle or tee to the drainfield.

The Drainfield

In a conventional septic system, the wastewater flows by gravity from the septic tank to the drainfield or to a distribution device, which helps to uniformly distribute the wastewater flow in the drainfield. *(For more information on distribution methods, see the article on page 5.)*

The drainfield or soil absorption field provides the final step in the wastewater treatment process. A standard drainfield is a series of trenches or a bed lined with gravel or coarse sand and buried one to three feet below the ground surface. Perforated pipes or drain tiles run through the trenches to distribute the wastewater.

The drainfield treats the wastewater by allowing it to slowly trickle from the pipes out into the gravel and down through the soil. The gravel and soil in a drainfield act as biological filters.

As the wastewater percolates (moves through the soil) to the groundwater below, the filtration process and organisms in the soil work together to remove toxics, bacteria, viruses, and other pollutants from the wastewater. Soil particles, particularly clay, chemically attract and hold sewage nutrients, metals, and disease carrying organisms. This process can effectively treat the wastewater to an acceptable level that will not contaminate the groundwater.

Certain toxics, such as paints, thinners, pesticides, waste oils, and other hazardous chemicals, cannot be treated by the drainfield and should never be disposed of through a septic system. Some of these chemicals also kill the bacteria found in the septic tank, temporarily disrupting the natural treatment process that occurs in the septic tank.

The size of the drainfield is determined by the amount of wastewater flow anticipated and the quality of the soil below. Soil type and the position of the water table also help determine how deep the trenches should be. A thorough site evaluation should be conducted when the septic system is still in the planning stages. Septic system failures are often caused by poorly sited drainfields. *For more information, see the article on site evaluations at left.*

WARNING

Toxic gases, including methane and hydrogen sulfide, are produced by the natural treatment processes in septic tanks. These gases can kill in minutes. Extreme care should be taken when inspecting your tank, even when just looking in. Never enter a septic tank or try to inspect the tank alone. Most communities have licensed septic contractors who can inspect your system periodically. For guidelines on how to safely and properly inspect your system, call your local health department.

A Proper Site Evaluation Is Essential

In a typical site evaluation, a sanitarian, engineer, or other wastewater professional examines the soils, landscape features, and past surveys of the potential site. He or she makes special note of the location of nearby wells, other septic systems, the slope of the land, depth to the groundwater source and to impermeable layers (such as bedrock), natural drainage patterns, and the boundaries of the lot.

An important feature of the site evaluation is a thorough study of the soil. Marking the position of the absorption field, the sanitarian digs an observation pit to examine the soil layers for texture, structure, and color patterns that will give clues about the soil's permeability and potential for seasonal water saturation. Sometimes the sanitarian will conduct a percolation, or "perc," test to measure how quickly the water moves through the soil. In some states, other methods of testing soil permeability may be used.

A good site evaluation defines the limitations of a site. If the soil or other conditions are inappropriate for a conventional drainfield, workable alternatives can be designed using the data collected in the evaluation.

Poorly sited septic systems may fail, causing inadequately treated wastewater to pond on the ground surface or to contaminate the groundwater.

If you are planning to construct a septic tank system, be sure to contact your local health department for more information on site evaluation and permit requirements for your area.

DISTRIBUTION SYSTEMS FOR DRAINFIELDS

Some septic systems require the use of a distribution system to ensure that the flow of wastewater coming from the septic tank is evenly distributed to the different parts of the drainfield. Uneven distribution can overload areas of the drainfield, causing it to fail.

Following are descriptions of some of the most common distribution methods.

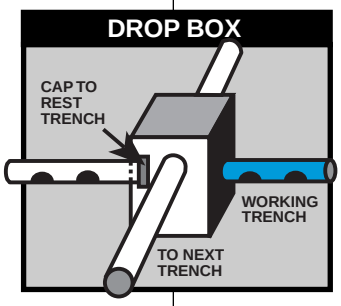
Distribution Box

A distribution box is a tank-like box with as many outlets as there are pipes or lines in the drainfield. The effluent, or partially treated wastewater, from the septic tank flows into the box and through the different outlets to the drainfield. Because the outlets in the box are level with each other, and because this system relies on gravity to work effectively, it is important that the distribution box be level. If the distribution box is not exactly level, the flow to the drainfield will be uneven.

Advantages of this distribution method include easy inspection (the top of the box opens) and the option of capping outlets to give certain drainfield trenches a chance to rest.

Drop Box

A drop box is also a very simple tank-like box designed for effluent distribution. A series of drop boxes can be used for distributing wastewater to drainfields on sloped sites using only gravity.



Inside the drop box, the pipe inlet is higher than the outlets, allowing the wastewater to flow downward to the drainfield trenches. A series of drop boxes can be arranged on the sloped drainfield so that after the highest drainfield trench is saturated with wastewater, the flow continues on to the next drop box and trench below. Drop box outlets can also be capped to control the direction of flow and to give the saturated upper trenches a rest.

Siphons and Pumps

Some septic systems, because of site conditions, soil conditions, or design, cannot rely on gravity alone to efficiently distribute the flow of effluent from the septic tank to the drainfield. Siphons or pumps are sometimes used as a method of distribution with these systems.

Siphons are often used when septic tank effluent must be evenly distributed over a large area; for example, with drainfields using more than 500 feet of pipe. The effluent flows from the siphon to the drainfield in pressurized doses, making uniform distribution easier to achieve. The effluent from the septic tank flows into a dosing tank, then through the siphon to the drainfield. Siphons work using only air, water pressure and gravity—no outside power source is necessary.

Siphons are a relatively low-cost technology that can improve the performance of the drainfield, but because they require approximately two feet between the septic tank outlet and the drainfield, they are unsuitable for some sites and septic system designs. They also require more maintenance than some other methods of distribution.

Electric pumps are also used to deliver controlled amounts or doses of effluent to the drainfield. Dosing can improve the performance of any drainfield by guaranteeing more uniform distribution, but it is especially advantageous for drainfields with shallow or poor soil conditions. However, electric pumps are more expensive to operate than other distribution systems and they require regular maintenance.

Some sites and drainfield designs require the use of electric pumps because the drainfield is higher than the septic tank, making it impossible to rely on gravity for distribution. Mound systems, for example, always require an electric pump to elevate and distribute the effluent flow from the septic tank. *For more information about mound systems and other alternative septic system and drainfield designs, see the article on page 6.*

Q&A

How much do septic systems cost?

The cost of installing and maintaining a septic system varies greatly depending on its location and design. In order to accurately estimate what a septic system will cost, homeowners should contact their local health department for more information about the costs of septic systems in their area.

In most areas in the U.S., conventional septic systems cost from $2,500 to $7,500 to install. While certain site conditions or alternative drainfield designs can make installation more expensive, this is a general range for standard septic tank and soil absorption systems. Alternative septic systems requiring pumps or specially constructed drainfields can be considerably more expensive.

As a general rule of thumb, septic systems are most cost-effective in communities where houses are spaced widely apart, and where connection to a sewer system is not an option. When the cost of operation and maintenance of a centralized treatment plant is factored in, residents in small rural communities may pay many times more per household for a centralized sewer system than residents in more densely populated areas. In certain communities, a centralized sewer system would be so expensive to install and maintain that costs per household could exceed property values.

In order to find the most cost-effective wastewater system for their homes, small community residents should discuss available options with local health department officials, neighbors, and community leaders.

How Regulations Affect Septic System Owners

Homeowners considering installing or upgrading their septic systems need to familiarize themselves with local regulations.

In most areas of the U.S., there are laws regulating the construction of the septic tank itself, the size of the tank, the number of tank compartments required, the construction and design of the drainfield, and maintenance of the system.

These regulations can vary from state to state and county to county. Often, communities have their own practices and standards regarding how and where septic systems may be constructed. Homeowners should contact their local health department for information about local regulations and permit requirements. *See the list of contacts on page 7.*

NSFC Offers Watersheds Information Package—

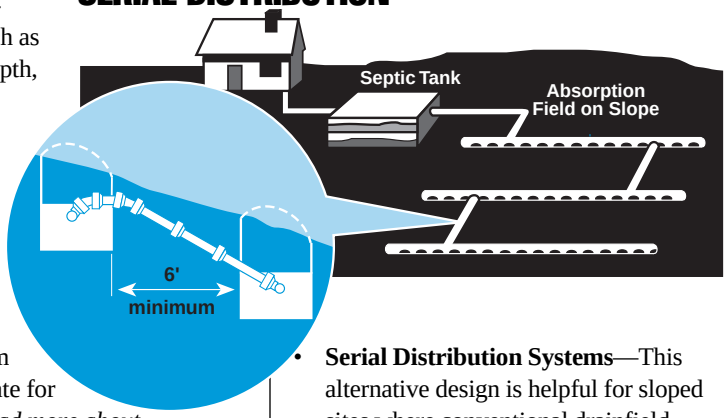
Watershed and groundwater protection have become important concerns for everyone who cares about the environment. Questions often arise about the role of wastewater and wastewater treatment systems in preventing water pollution.

To answer these concerns, The National Small Flows Clearinghouse (NSFC) is offering a new information package, "Wastewater in Watersheds." This helpful package defines what a watershed is, describes the role of septic tanks and other onsite systems in maintaining watershed and groundwater quality, provides examples of successful watershed management projects, and lists additional resources for information.

The cost of the package is $16.40. To obtain a copy, call the NSFC at (800) 624-8301 and ask for Item #WWPCGN57. Please include $2 for shipping and handling.

Alternative septic system designs

Because of the importance of site-related factors, such as soil quality, soil depth, the position of the water table, lot restrictions, and slope of the land, a thorough site evaluation is needed to determine if a conventional septic system design is appropriate for a given site. *(To read more about site evaluations, see the article on page 4.)*



If the evaluation reveals difficult or unsuitable site characteristics, many alternative drainfield designs are available. The following are just a few of the many available alternatives *(be sure to contact your local health department for more information about these alternatives, state regulations, and other options available in your area)*:

- **Low Pressure Pipe (LPP) Systems**—This drainfield design is typically used in areas where the land is rocky, the soil is shallow or tight, or the water table is high. A pump is used to guarantee uniform distribution and to prevent soil saturation.

  LPP system trenches are more shallow and narrow than conventional drainfield trenches, and the drainfield pipes are perforated and made of plastic. Advantages of LPP systems include the relatively low cost of installation for an alternative system and that septic systems can be used effectively with less than perfect site conditions.

- **Serial Distribution Systems**—This alternative design is helpful for sloped sites where conventional drainfield designs are unsuitable. A series of trenches is dug parallel to the slope so that each trench is higher than the next. Starting with the highest, each trench fills with wastewater completely, then overflows through a series of overflow pipes (as illustrated) or drop boxes (instead of a single distribution box). Discharge to each trench can be controlled through the overflow pipes or drop boxes.

- **Mound Systems**—These systems are helpful for sites where the water table is high, or the soil is too shallow or tight to provide adequate treatment.

  The drainfield is located in a man-made mound constructed of materials that will provide adequate treatment. The wastewater trickles through gravel beds or trenches located on top of a bed of sandy soil or fill, which is built on the plowed natural ground surface. With this design, a pump is necessary to

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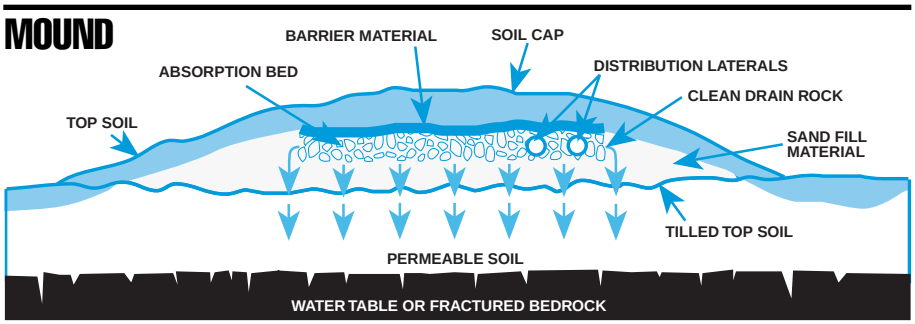

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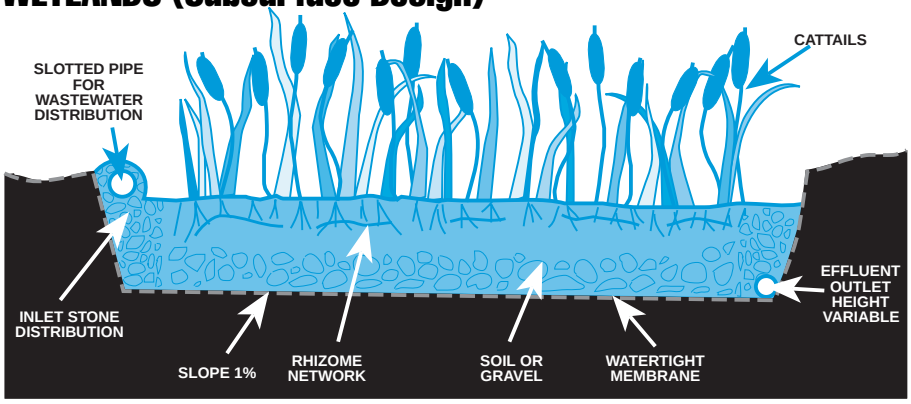
move the wastewater from the septic tank to the drainfield mound.

- **Constructed Wetlands**—These alternative drainfield systems are built to resemble small natural wetlands. Reeds and other aquatic vegetation are planted to provide a natural filtering process. For example, in a subsurface wetland design, a drainfield area is excavated and covered with a synthetic or clay waterproof liner, and then filled with rock, gravel, sand, and soil. Wastewater is treated by both the plants and the soil. Climate is an important consideration in wetland design, because certain plants will not perform well in cold weather. Usually, wastewater treated by wetlands require additional treatment, such as disinfection or discharge to a drainfield. These systems require a lot of land area, but can be a very beautiful use of the land, and are good for sites where the soil is not suitable for adequate absorption.

- **Sand Filters**—A sand filter consists of several layers of sand located under or above ground. The wastewater is pumped evenly, or dosed, over the sand filter, which also contains naturally occuring bacteria that aid the purification process. After this treatment, the wastewater usually needs to be discharged to a drainfield or, less commonly, disinfected before being discharged directly to a body of water. This design is used in areas that require the effluent (treated wastewater) to be very clean before being discharged.

There are several other alternative septic system designs available and successfully being used in small communities throughout the U.S. Some of these include drip and spray irrigation systems, gravelless systems, and contour trenches. Homeowners should contact their local health department for help in determining the most suitable septic system design to fit their needs. The National Small Flows Clearinghouse (NSFC) offers technical assistance and a variety of resources on septic system alternatives. *Refer to page 8 for a partial listing of resources, or contact the NSFC for more information.*

WETLANDS (Subsurface Design)



Fall issue of *Pipeline* to focus on septic system maintenance for homeowners

Everyone who owns a septic system should keep a copy of the next issue of *Pipeline* around the house. *Pipeline*'s fall issue will include all the information you need to properly care for your septic system so that it can serve you, trouble free, for many years to come. Regulations, inspection, pollution prevention, and other important issues for septic system owners will also be covered. If you are not already on our regular mailing list, call the National Small Flows Clearinghouse at (800) 624-8301 to request a free issue or subscription to *Pipeline*.

CONTACTS

Health Department

Homeowners with questions about regulations or location requirements for septic system construction and maintenance should contact their local health department (usually listed in the yellow pages).

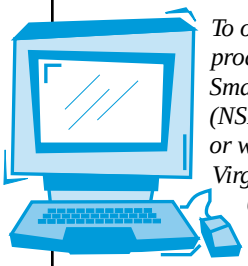
National Small Flows Clearinghouse (NSFC)

The National Small Flows Clearinghouse located at West Virginia University is also a good place for homeowners and community officials to contact for more information about septic systems and alternative systems. The NSFC is funded by the U.S. Environmental Protection Agency and offers technical assistance and a variety of free and low-cost products to help small communities with wastewater issues. Some of these NSFC products are listed on page 8.

Extension Services

Many universities have U.S. Department of Agriculture cooperative state extension service offices on campus and field offices in counties and other localities. Part of the mission of these extension services is to provide access to information and assistance to the public, and to help educate the public about federal wastewater policies and requirements. To locate the extension office in your area, contact the U.S. Department of Agriculture at (202) 720-3377, or NSFC at (800) 624-8301 and ask for Crystal Stevens in the technical assistance department.

RESOURCES AVAILABLE FROM NSFC



To order any of the following products, call the National Small Flows Clearinghouse (NSFC) at (800) 624-8301 or write to NSFC, West Virginia University, P.O. Box 6064, Morgantown, WV 26506-6064. Be sure to request each item by title and item number. Please allow a minimum of $2 shipping and handling charges per order.

Onsite Wastewater Treatment: Septic Tanks
Septic tank functions, design, and geometry are discussed in this semi-technical, 15-page booklet available from the NSFC. Included are tables illustrating typical wastewater flows from commercial, institutional, and recreational services. Septic tank construction, operation, and maintenance are also addressed. The price is $1.20. Item #WWPCDM18.

Small Wastewater Systems: Alternative Systems for Small Communities and Rural Areas
This foldout poster describes 20 different alternative wastewater systems for small communities. It also includes an illustration of a sample community that details where each system would be appropriate. The price is $1. Item #WWBLPE02.

So . . . Now You Own a Septic System
This free brochure describes how homeowners should care for their septic systems. Item #WWBRPE20.

Your Septic System: A Guide for Homeowners
This 11-minute videotape discusses septic system operation and maintenance, covering 10 basic rules for homeowners to follow. The price is $27. Item #WWVTPE16.

Septic Systems—A Guide for Homeowners
Conventional septic systems and how they should be cared for are described in this free brochure. Tips for trouble-free operation are also provided. Item #WWBRPE17.

Septic Systems and the Sanitarian
This 10-minute videotape explains health department inspection procedures for septic tank systems. It also discusses common problems and suggests alternative solutions for the construction of septic tanks. It contains information of interest to homeowners and community officials. The price is $24.50. Item #WWVTGN11.

Septic System Information Packet for Homeowners
This information packet includes a variety of resources that no septic system owner should be without. The packet includes brochures, articles, and other materials on septic system design and the proper care and feeding of a septic system. The price is $3.80. Item #WWPCPE28.

Site Evaluation for Onsite Treatment and Disposal Systems
Critical site and soil characteristics and the use of soil surveys and necessary equipment are discussed in this semi-technical report on site evaluation. Price is $4.95. Item #WWBLDM12.

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Know what to do after a Sewage Back-up

"To improve and protect the health of all Ohioians"

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Columbus, Ohio 43215

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How to Clean up After Sewage Backup –

Heavy storms, blockages, breakdowns in sewer pipes or septic tanks, or a flooded leach field can cause sewage to back up into basement floor drains. Children and pets should be kept out of the flooded area until it has been properly cleaned and disinfected.

- Always protect yourself and wear boots and gloves during removal and cleanup.
- Wash contaminated surfaces and objects with warm soapy water and disinfect with a bleach/water solution (one cap of chlorine bleach to one gallon of water).
- Either dispose or properly wash and disinfect toys, clothing, and other contaminated objects.
- Wash your hands with soap and water when you finish or between breaks.

How to Prevent Disease after a Sewage Backup –

Sewage has the potential of carrying disease causing pathogens that cause diarrhea and other diseases such as, Hepatitis, Salmonella, Cholera, and Giardia.

- Avoid skin contact with sewage, especially cuts and sores.
- Keep dry by wearing boots and gloves. If your skin becomes contaminated, wash with warm and soapy water.
- Keep children and pets out of the area until it has been properly cleaned and disinfected.
- Do not eat anything that has been exposed to sewer water.
- Keep contaminated objects away from mucous membranes (mouth, eyes, and nose).

Think Safety During Clean up –

Safety must always be considered during the clean up process. Wet surfaces can be slippery. Cleaning solutions can be hazardous or fatal if abused.

- Read and follow directions on bleach.
- Never mix cleaning products.
- Do not use ammonia.
- Ventilate area if possible.

This publication was financed in part through a grant from the Ohio Environmental Protection Agency and the United States Environmental Protection Agency, under the provisions of Section 319(h) of the Clean Water Act.

7/01

Ohio Department of Health
Bureau of Environmental Health

Know Your Septic Tank

"To improve and protect the health of all Ohioans"

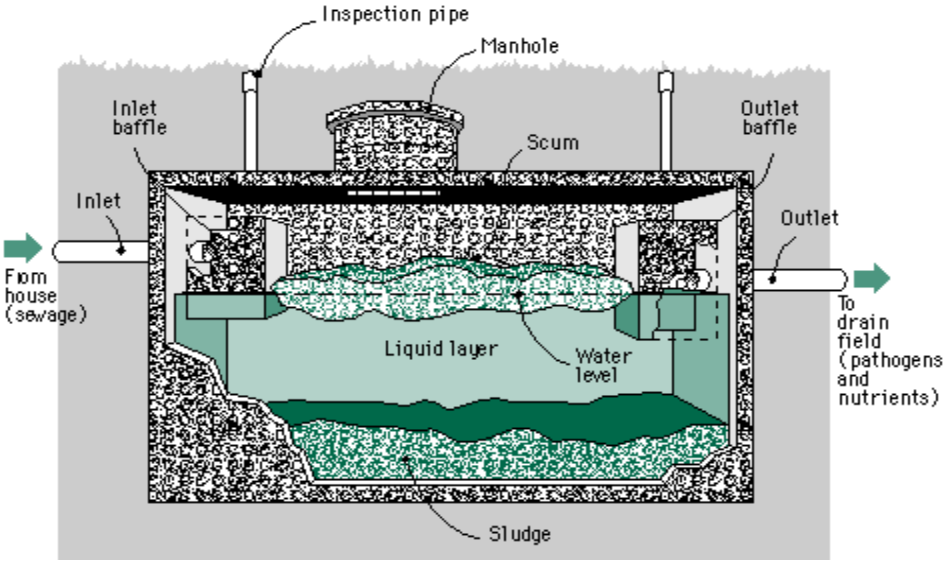
246 North High Street
Columbus, Ohio 43215

www.odh.ohio.gov
614-466-1390

Most households that are not served by public sewers depend on a household sewage system to collect and treat wastewater. Your septic tank is the primary treatment device that collects and settles wastewater from your home. Your household sewage system represents a significant investment that you will want to protect. Failed sewage systems are costly to replace and proper ongoing maintenance can extend their life. Preventive maintenance will not only protect your investment, but will also protect the environment and the public health.

What is preventive maintenance? An example is changing the oil in your car. Industry recommends that every 3–5 thousand miles that you have the oil changed. This removes the build-up of sediments that can decrease the performance of the engine. Another example is pumping your septic tank. The chart on the back of this fact sheet is the industry recommended pumping frequency rate. Pumping the septic tank removes the build-up of sediments that reduces the performance of the tank that would lead to failure of the absorption field.

- The septic tank holds the wastewater in the tank long enough for solids and liquids to separate. The wastewater forms three layers inside the tank. Sediments lighter than water (such as greases and oils) float to the top forming a layer of scum. Sediments heavier than water settle at the bottom of the tank forming a layer of sludge. This leaves a middle layer of partially clarified wastewater.



- The layers of sludge and scum remain in the septic tank where bacteria found naturally in the wastewater work to break the solids down. The sludge and scum that cannot be broken down are retained in the tank until the tank is pumped.

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An Equal Opportunity Employer/Provider

Maintain accurate maintenance records. These records will be helpful if problems occur, and will be valuable to the next owner of the home. The following chart can assist in establishing a good maintenance program.

Date	Nature of Work (Tank Pumped, Inspection, Repairs)	Contractor Name	Cost

- Inspect or have your septic tank inspected once each year. Ensure that the buildup of sludge and scum does not limit the ability to settle solids. Check to ensure the baffles or tees are in good condition. If the tank has an effluent filter, have it checked and cleaned if needed. Check for root intrusion or evidence of ground or surface water entering the tank.

- Your local health department may assist you with your annual inspection.

Many septic tank owners believe that if they haven't had any problems, they don't need to have their septic tanks pumped. If the solids are not removed, eventually they will flow out of the tank damaging the rest of the system. The following chart can be used as a guide to assist you as to when to have your tank pumped.

Tank Size	Number of People Living in House							
(GAL)	1	2	3	4	5	6	7	8
750	9.1	4.2	2.6	1.8	1.3	1	0.7	0.6
1000	12.4	5.9	3.7	2.6	2	1.5	1.2	1
1250	15.6	7.5	4.8	3.4	2.6	2	1.7	1.4
1500	18.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8
1750	22.1	10.7	6.9	5	3.9	3.1	2.6	2.2
2000	25.4	12.4	8	5.9	4.5	3.7	3.1	2.6
2500	31.9	15.6	10.2	7.5	5.9	4.8	4	4
Pumping Frequency in Years								OSU Extension AEX-740-98

- Always use a registered septage hauler approved by your local health department.

- More frequent pumping is necessary if a garbage disposal is used.

- Biological and chemical additives are not necessary, may cause harm to the system, and do not eliminate the need for pumping the septic tank.

Protect Your Investment

Delaware General Health District
P.O. Box 570
1-5 West Winter Street
740-368-1700

Use the following area to create a sketch of your sewage treatment system location for future reference.