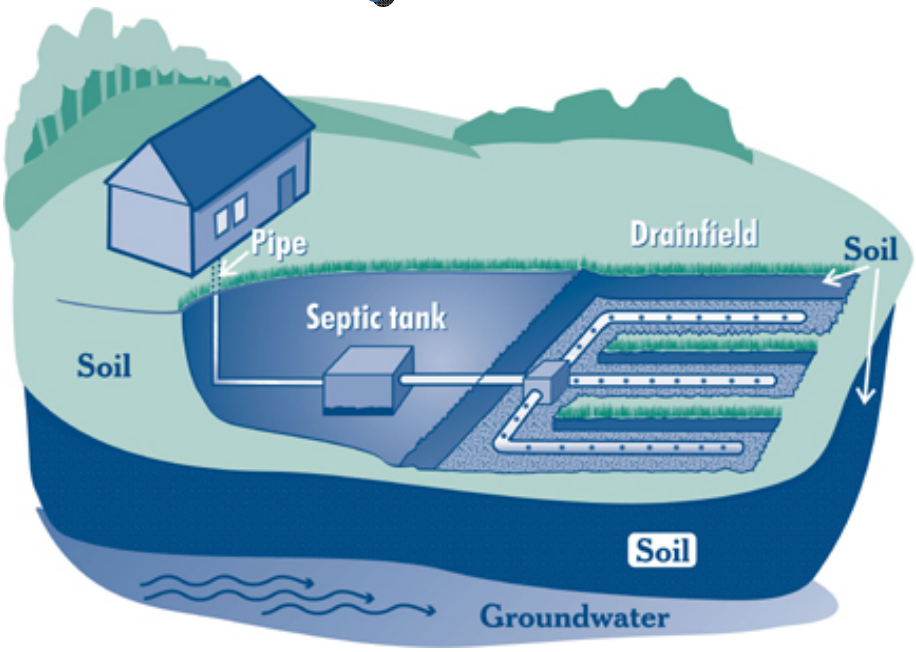
A Kentucky Homeowner's Guide to Septic Systems



Notice and Acknowledgements

This document was originally reviewed and published in accordance with U.S. Environmental Protection Agency policy. Mention of profit-making organizations, trade names, or commercial products does not constitute endorsement or recommendation for use.

Copies of the original document can be obtained from:

U.S. EPA Publications Clearinghouse
P.O. Box 42419
Cincinnati, OH 45241

Telephone: 800-490-9198
Fax: 513-489-8695

Office of Water
U.S. Environmental Protection Agency

The original document was modified and reviewed for use in the state of Kentucky by the Kentucky Onsite Wastewater Association, Inc., the Kentucky Division of Water, and the Kentucky Cabinet for Health Services.

"This work was funded in part by a grant from the U.S. Environmental Protection Agency under §319(h) of the Clean Water Act through the Kentucky Division of Water to Kentucky Onsite Wastewater Association (Grant # C9994861-01)."

Bluegrass Community & Technical College

Kentucky UNBRIDLED SPIRIT

NRCS Natural Resources Conservation Service

EPA United States Environmental Protection Agency
"...to protect human health and to safeguard the natural environment..."

401 KAR 5:037 requires owners of on-site sewage disposal systems to have a groundwater protection plan for their on-site system. Owners of on-site sewage disposal systems may meet the regulatory requirements by reading this information and using the recordkeeping system located at the back of this guide.

A Kentucky Homeowner's Guide to Septic Systems

What's Inside

Our Mission Statement

"Through education and communication, to elevate the onsite wastewater industry and thereby protect human health, preserve the environment, and improve the quality of life for onsite professionals."

Your Septic System is your responsibility!

Did you know that as a homeowner you are responsible for maintaining your septic system? Did you know that maintaining your septic system protects your investment in your home? Did you know that you should periodically inspect your system and, if necessary, pump out your septic tank?

If properly designed, constructed and maintained, your septic system can provide long-term, effective treatment of household wastewater. However, if your septic system is not maintained, you may need to replace it, costing you thousands of dollars. A malfunctioning system can contaminate groundwater, a source of drinking water. Don't forget - If you sell your home, your septic system must be in good working order.

Top Four Things You can Do to Protect Your Septic System

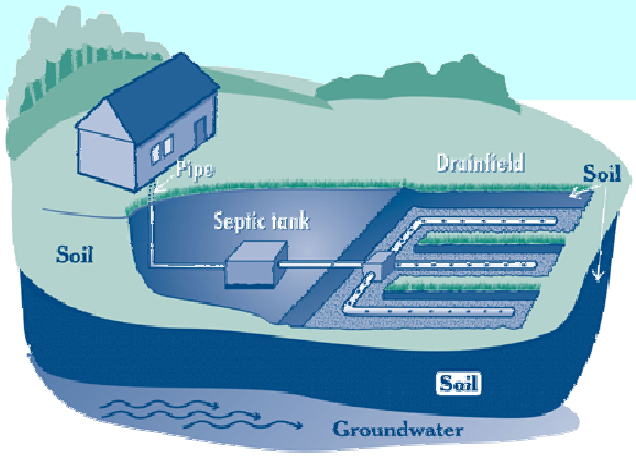
1. **Inspect your system (every year) and pump your tank as necessary (generally every 3 to 5 years).**
2. **Use water efficiently.**
3. **Don't dispose of household hazardous wastes in sinks or toilets.**
4. **Care for your drainfield.**

This homeowner's guide will help you care for your onsite wastewater disposal system. It will help you understand how your system works and what steps you can take, to ensure your system will function properly. To learn more, consult the resources listed at the back of this booklet. A checklist is also included at the end of the booklet to assist you in keeping track of your septic system maintenance.

How does it work?

Components

A typical septic system has four main components: a pipe from the home, a septic tank, distribution box, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it reaches groundwater.



Typical onsite wastewater treatment system

Septic system aliases:

- **On-lot system**
- **Onsite system**
- **Individual sewage disposal system**
- **Onsite sewage disposal system**
- **Onsite wastewater treatment system**

Sewer Line

All of your household wastewater exits your home through a pipe to the septic tank. This pipe is called your sewer line.

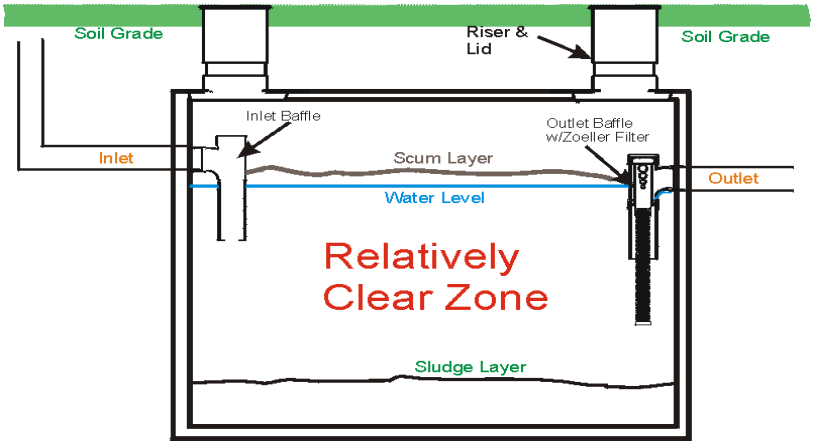
Septic tank

The septic tank is a buried, watertight container typically made of concrete, fiberglass, or polyethylene. It retains the wastewater long enough to allow solids to settle to the bottom (forming sludge) and oil and grease to float to the surface (as scum). In the septic tank partial decomposition of the waste material occurs.

Baffles and/or a T-shaped outlet in the septic tank prevent the sludge and scum from leaving the tank and traveling into the drainfield area. Screens or filters are also recommended to keep solids from entering the drainfield. To function properly, the screens must be removed and cleaned on a regular basis.

Kentucky regulations require new tanks to have a riser with lid at ground surface to allow easy location, inspection, and pumping. This access must be secured, to prevent access by non-authorized persons.

Typical single-compartment septic tank with ground-level inspection risers and screen

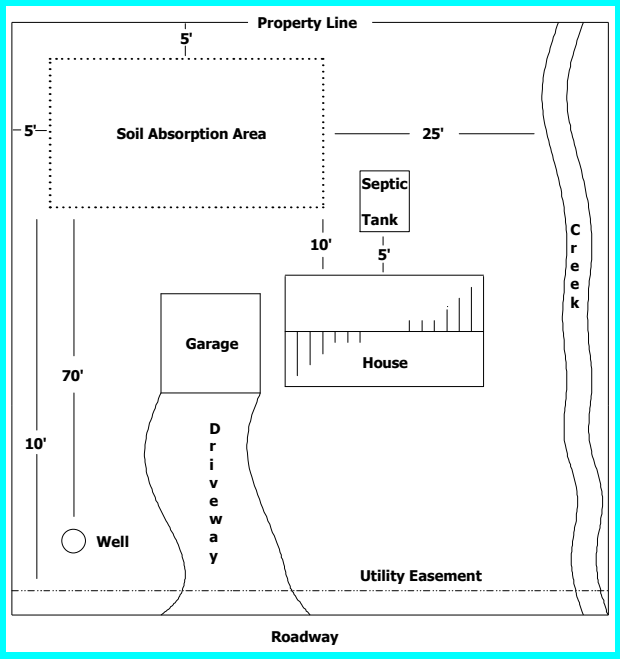


Tip

To prevent buildup in the tank, sludge and floating scum may need to be removed by pumping the septic tank. Regular annual inspections and pumping when necessary (generally every 3 to 5 years) will keep your septic system in good working order.

Finding Your System

Your septic tank and drainfield area(s) should be clearly designated on the "as-built" drawing for your system. (An "as-built" drawing is a line drawing that accurately portrays the system on your property and is usually filed with your local Health Department office.) You might also see lids or manhole covers for your septic tank. Older tanks are often hard to find because there are no visible parts. If your septic tank has no risers visible, contact an inspector or service professional to help you locate your septic system.



Drainfield

The clarified wastewater exits the septic tank and is discharged into the drainfield for further treatment by the soil. The partially treated wastewater is pushed along into the drainfield for further treatment every time new wastewater enters the tank.

If the drainfield is overloaded with too much liquid, it will flood, causing sewage to flow to the ground surface or create backups in plumbing fixtures. This situation prevents treatment of the wastewater. This means you cannot flush your toilet.

A reserve drainfield area is required by the state of Kentucky. A reserve drainfield is an area on your property suitable for installation of a new drainfield system if your current drainfield fails. Treat this area with the same care as your present septic system.

Soil

The wastewater effluent flows to the drainfield, where it percolates into the soil. The soil provides the final treatment where the removal of harmful bacteria, viruses, and nutrients occurs. Suitable soil is necessary for successful wastewater treatment.

Alternative systems

Many areas in Kentucky do not have suitable conditions for typical or conventional septic systems. An alternative treatment system may be available for your site. Alternative septic systems use new technology to improve treatment processes and may need special care and maintenance. Some alternative systems use sand, gravel, peat, or plastic media instead of soil to promote wastewater treatment. Some systems may include aerators, disinfection devices, float switches, pumps, and other electrical or mechanical components. Inspection schedules for alternative systems can vary. Check with your local county health department or installer for more information on operation and maintenance needs if you have an alternative system. Not all Kentucky counties have been approved for the installation of alternative systems, so check with your local county Health Department before purchasing a building site.

Why should I maintain my septic system?

When septic systems are properly designed, constructed, and maintained, they effectively reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater. However, septic systems require regular maintenance or they can fail. Septic systems need to be monitored to ensure that they work properly throughout their service life.

Saving money

A key reason to maintain your septic system is to save money! Failing septic systems are expensive to repair or replace, and poor maintenance is often the culprit. Having your septic system inspected regularly is a bargain when you consider the cost of replacing the entire system, which may cost thousands of dollars. Your septic tank may need to be pumped (generally every 3 to 5 years), depending on water usage in the home and the size of the system. An unusable septic system or one in disrepair will lower your property value and could pose a legal liability.

Protecting health and the environment

Other good reasons for safe treatment of sewage include preventing the spread of infection and disease and protecting water resources. Typical pollutants in household wastewater are nitrogen, phosphorus, bacteria, and viruses, some of which can cause illnesses. If a septic system is working properly, it will effectively remove these pollutants.

With 1/4 of U.S. homes using septic systems, more than 4 billion gallons of wastewater per day is dispersed below the ground's surface. Inadequately treated sewage from septic systems can be a cause of groundwater contamination. It poses a significant threat to drinking water and human health because it can contaminate drinking water wells and cause diseases and infections in people and animals. Improperly treated sewage that contaminates nearby surface waters also increases the chance of swimmers contracting a variety of infectious diseases. These range from eye and ear infections to acute gastrointestinal illness and diseases like hepatitis. So, take care of your system.

How do I maintain my septic system?

Inspect annually and pump as needed

You should have your septic system inspected at least every year by a professional. You should also have your tank pumped as necessary (generally every 3 to 5 years). Systems with electrical float switches, pumps, or mechanical components need to be inspected as well. Your service provider should inspect for leaks and look at the scum and sludge layers in your septic tank. If the bottom of the scum layer is within 6 inches of the bottom of the outlet tee or the top of the sludge layer is within 12 inches of the bottom of the outlet tee, your tank needs to be pumped. Remember to note the sludge and scum levels determined by your service provider in your operation and maintenance records. This information will help you decide how often pumping is necessary. (See the checklist included at the end of the booklet.)

What Does an Inspection Include?

- **Locating the system.**
- **Uncovering access holes.**
- **Flushing the toilets.**
- **Checking for signs of backup.**
- **Measuring the scum and sludge layers.**
- **Identifying any leaks.**
- **Inspecting mechanical components.**
- **Recommendation on pumping the tank if necessary.**
- **Filter Service**

Four major factors influence the frequency of pumping: the number of people in your household, the amount of wastewater generated (based on the number of people in the household and the amount of water used), septic tank size, and the volume of solids in the wastewater. (Solids are increased by using a garbage disposal.)

Some makers of septic tank additives claim their products breakdown the sludge in septic tanks so the tank never needs to be pumped. Not everyone agrees on the

effectiveness of additives. In fact, septic tanks already contain the microbes needed for effective treatment and some additives may actually hamper treatment. Periodic pumping may be a better way to ensure septic systems work properly and provide many years of service.

The service professional should note any repairs completed and whether the tank is in good condition. Have the professional make repairs as soon as possible.

Use water efficiently

Average indoor water use in the typical single-family home is almost 70 gallons per person per day. Leaky toilets can waste as much as 200 gallons each day. The more water a household conserves, the less wastewater enters the septic system. Efficient water use can improve the operation of the septic system and reduce the risk of failure.

High-efficiency toilets

Toilet use accounts for 25 to 30 percent of household water use. Do you know how many gallons of water your toilet uses to empty the bowl? Older homes often have toilets with 3.5 to 5 gallon reservoirs, while newer high-efficiency toilets use 1.6 gallons of water or less per flush. If you have problems with your septic system being flooded with household water, consider reducing the volume of water in the toilet tank if you do not have a high-efficiency model. Plastic containers (such as ½ gallon plastic milk jugs) can be filled with small rocks and placed in a toilet tank to reduce the amount of water used per flush. (Be sure that the plastic containers do not interfere with the flushing mechanisms or the flow of water.) You'll save about ½ gallon of water per flush! You might also consider replacing your existing toilet with a high-efficiency model to achieve even more water savings.

Use Water Efficiently!

- **Install high-efficiency showerheads.**
- **Fill the bathtub with only as much water as you need.**
- **Turn off faucets while shaving or brushing your teeth.**
- **Run the dishwasher and clothes washer only when they're full.**
- **Use toilets to flush degradable waste only (not kitty litter, diapers, or other trash).**
- **Make sure all faucets are completely turned off when not in use.**
- **Maintain your plumbing to eliminate leaks.**
- **Install aerators in the faucets in your kitchen and bathroom.**
- **Replace old dishwashers, toilets, and clothes washers with new, high-efficiency models.**

For more information on water conservation, please visit: www.epa.gov/owm/water-efficiency/index.htm

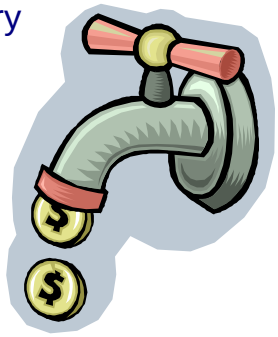
Faucet aerators and high-efficiency showerheads

Faucet aerators help reduce water use and the volume of water entering your septic system. High-efficiency showerheads, shower flow restrictors, and reducing time in the shower also decrease water use.

Water fixtures

Check to make sure your toilet's reservoir (tank) isn't leaking into the bowl. Add five drops of liquid food coloring to the tank before going to bed. If the dye is in the bowl the next morning, the tank is leaking and repairs are needed.

A small drip from a faucet adds many gallons of unnecessary water to your system every day. To see how much a leak adds to your water usage, place a cup under the drip for 10 minutes. Multiply the amount of water in the cup by 144 (the number of minutes in 24 hours, divided by 10). This is the total amount of clean water traveling to your septic system each day from that little leak.



Watch your drains

What goes down the drain can have a major impact on how well your septic system works.

Waste disposal

What should you <u>not</u> flush down your toilet? Dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, and other kitchen and bathroom items that can clog and potentially damage septic system components if they become trapped. Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can destroy the biological treatment occurring within the system or might contaminate surface waters and groundwater. If your service professional is concerned about quickly accumulating scum layers, reduce the flow of floatable materials like fats, oils, and grease into your tank or be prepared to pay for more frequent inspections and pumping.

Washing machines

By selecting proper load size, you'll reduce water waste. Washing small loads of laundry on the large-load cycle wastes precious water and energy. If you can't select load size, run only full loads of laundry.

While doing all the household laundry in one day may seem like a time-saver, it could be harmful to your septic system. Doing load after load does not allow your septic tank time to adequately treat wastes. You could be flooding your drainfield without allowing sufficient recovery time. Try to spread water usage throughout the week. A new Energy Star rated clothes washer uses 35% less energy and 50% less water than a standard model.

Care for your drainfield

Your drainfield is an important part of your septic system. Here are a few things you should do to maintain it:

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs may clog and damage the drainfield.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield with excessive water slows down or stops treatment processes and can cause plumbing fixtures to back-up.

What can make my system fail?

FAILURE SYMPTOMS

When partially treated wastewater flows to the ground surface, you likely have a system failure. However, by the time you can smell a foul odor or see a problem the damage may already be done. The most obvious septic system failures are easy to spot. Check for pooling water or muddy soil around your septic system or in your basement. Notice whether your toilet or sink backs up when you flush or do laundry. You might also notice strips of bright green grass over the drainfield. Septic systems also fail when partially treated wastewater comes into contact with

groundwater. This type of failure is not easy to detect, but it can result in the pollution of wells, nearby streams, or other bodies of water. Check with a septic system professional and the local county health department if you suspect such a failure, and remember to have your septic system inspected annually by an onsite wastewater professional.

FAILURE CAUSES

Water Use

If the amount of wastewater entering the system is more than the system can handle, the wastewater backs up into the house or yard and creates a health hazard.

You can reduce the amount of wastewater your system must treat by limiting your water use. You can reduce the chance of system failure by having a regular service inspection.

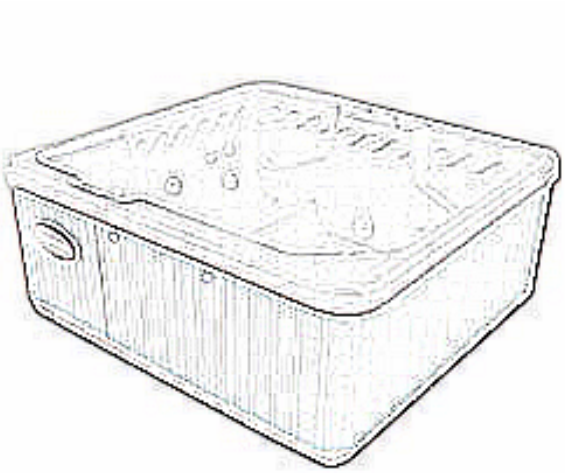
Household toxics

Does someone in your house use the utility sink to clean out paint rollers or flush toxic cleaners? Paints, solvents, and large volumes of toxic cleaners should not enter your septic system. Paint cleanup waste should be minimized. Squeeze all excess paint and stain from brushes and rollers on several layers of newspaper before rinsing. Leftover paints and wood stains should be taken to your local household hazardous waste collection center. Remember that your septic system contains a living collection of organisms that digest and treat waste.

Household cleaners

For the most part, your septic system's bacteria should recover quickly after small amounts of household cleaning products have entered the system. Of course, some cleaning products are less toxic to your system than others. Labels can help key you into the potential toxicity of various products. The word "Danger" or "Poison" on a label indicates that the product is highly hazardous. The word "Warning" means the product is moderately hazardous. The word "Caution" means the product is slightly hazardous. ("Nontoxic" and "Septic Safe" are marketing terms and may not be accurate representations of effects on septic systems.) Regardless of the type of product, use it only in the amounts shown on the label instructions and minimize the amount discharged into your septic system.

Hot tubs



Hot tubs are a great way to relax. Unfortunately, septic systems are not designed to handle large quantities of water from your hot tub. Emptying hot tub water into your septic system stirs the solids in the tank and pushes them out into the drainfield, causing it to clog and fail. Draining your hot tub into a septic system or over the drainfield can overload the system. Instead, drain cooled hot tub water onto turf or landscaped areas well away from the septic tank and drainfield, and in accordance with local regulations. Use the same caution when draining your swimming pool.

Water purification systems

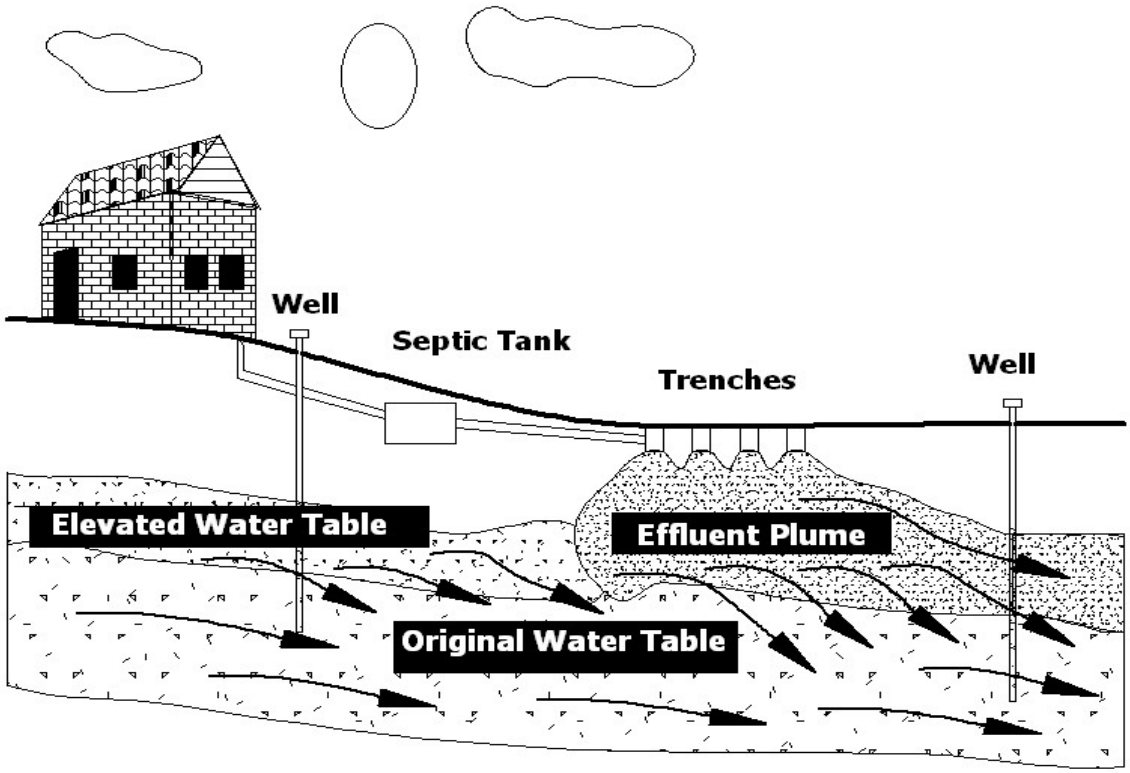
Some freshwater purification systems, including salt and chemical water softeners, unnecessarily pump water into the septic system. This can contribute hundreds of gallons of water to the septic tank, causing agitation of solids and excess flow to the drainfield. Check with your licensed plumbing professional about alternative routing for such freshwater treatment systems.

Garbage disposals

New systems must be sized properly if a garbage disposal is used. Never put items such as eggshells, coffee grounds, or meat products (including bones) in a garbage disposal. Eliminating the use of a garbage disposal can reduce the amount of solids entering the septic tank and possibly clogging the drainfield. A garbage disposal grinds up kitchen scraps, suspends them in water, and sends the mixture to the septic tank. Once in the septic tank, some of the materials are broken down by bacterial action, but most of the grindings have to be pumped out of the tank. Using a garbage disposal frequently can significantly increase the accumulation of sludge and scum in your septic tank, resulting in the need for more frequent inspections and, likely, more frequent pumping.

Improper design or installation

Some soils provide excellent wastewater treatment; others don't. For this reason, the drainfield design of a septic system is based on the results of soil analysis performed during the site evaluation. Homeowners and system designers sometimes underestimate the significance of good soils or believe soils can handle any volume of wastewater applied to them. Many failures can be attributed to having an undersized drainfield or high seasonal groundwater table. Another design failure involves undersized septic tanks that allow solids to clog the drainfield and result in system failure.



If a septic tank is not watertight, water can leak **into** the tank and the overload taxes the system beyond its capabilities. This situation can cause inadequate treatment of wastewater, and sometimes sewage will flow up to the ground surface. Water leaking **out** of the septic tank is a significant health hazard because the leaking wastewater has not yet completed the treatment process.

Even when systems are properly designed, failures due to poor installation practices can occur. If the drainfield is not properly leveled, wastewater can overload the system. Heavy equipment can damage the drainfield prior to, during, and after installation, leading to soil compaction and reduction of the wastewater infiltration rate. If surface drainage isn't diverted away from the field, it can flow into and saturate the drainfield.

Septic Systems: "Do or Don't"

(adapted from the National Small Flows Clearinghouse)

DO

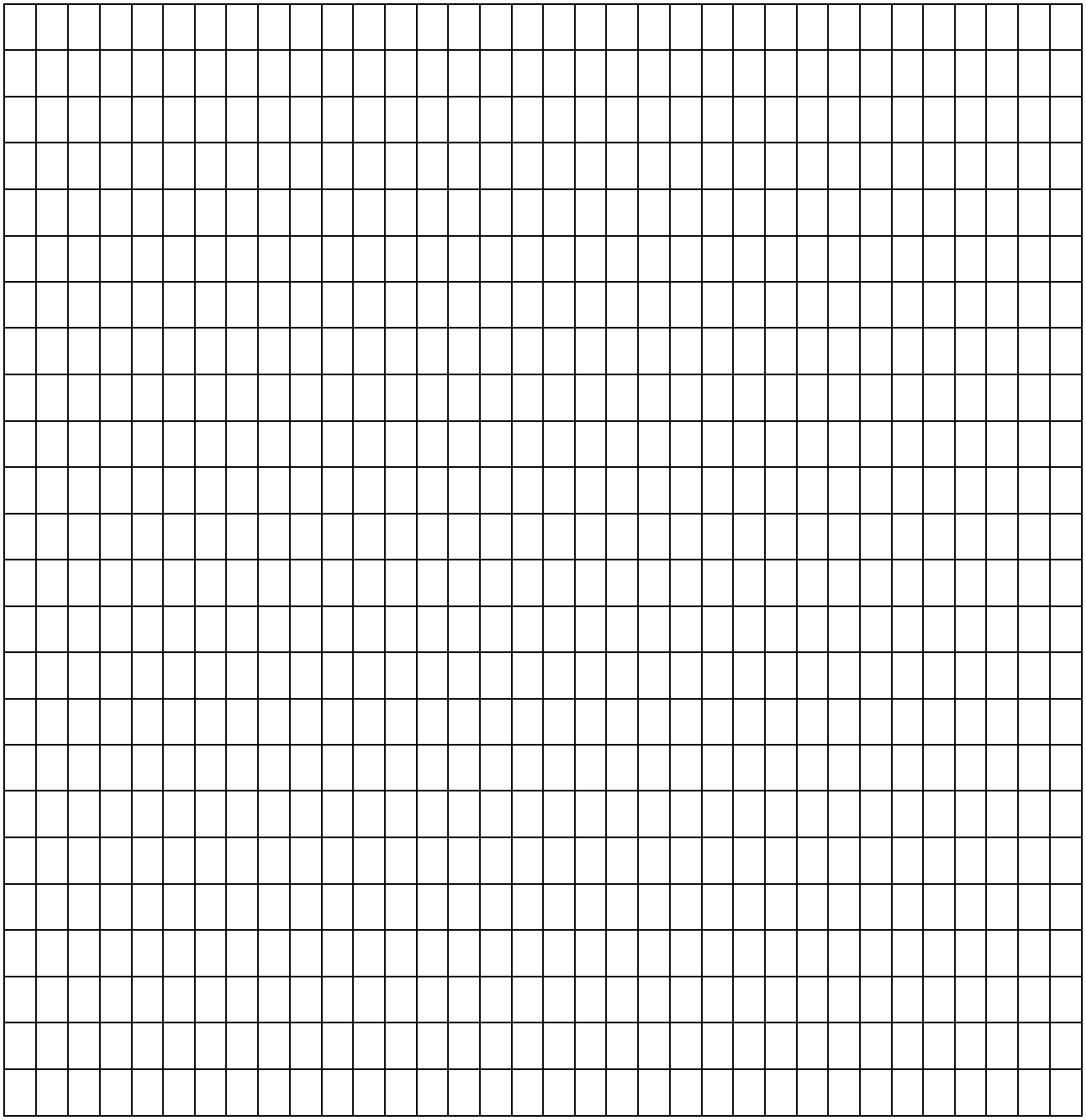
- **DO** check with your local county health department or onsite professional to make sure that your septic system can handle a garbage disposal.
- **DO** use water efficiently to avoid overloading the septic system. Repair leaky faucets or toilets. Avoid long showers, using washing machines and dishwashers for small or partial loads, or letting the water run while brushing your teeth, etc. Use high-efficiency fixtures.
- **DO** direct downspouts, gutters, foundations, and surface waters away from your septic system.
- **DO** use commercial cleaners and detergents in moderation. Try cleaning toilets, sinks, showers, and tubs with a mild detergent or baking soda.
- **DO** check with your local county health department or onsite professional before allowing water softener backwash to enter your septic tank.
- **DO** keep records of repairs, pumping, inspections, permits issued, and other system maintenance.
- **DO** learn the location of your septic system. Keep a sketch of it with your maintenance record.
- **DO** have your septic system inspected annually and pumped as necessary by a licensed onsite professional.
- **DO** plant only grass over and near your septic system. Roots from trees or shrubs may clog and damage the drainfield.

DON'T

- **DON'T** put dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, paints, pesticides, or other hazardous chemicals into your system. Your septic system is not a trashcan.
- **DON'T** use caustic drain openers for a clogged drain. Instead, use boiling water or a drain snake to open clogs.
- **DON'T** drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- **DON'T** dig into your drainfield or build anything over it.
- **DON'T** make or allow repairs to be made to your septic system without first contacting your local county health department inspector.

MY SEPTIC SYSTEM

Sketch the location of your home, septic tank and all components, water supply, driveway, and other landscape features. Alternatively, you may obtain a sketch from your onsite professional or local health department.



SYSTEM INFORMATION

PERMIT INFORMATION:

Permit #:_____ Date Issued:_____

Issued to:_____

Address: _____

SYSTEM DESCRIPTION:

Septic Tank Size (Gallons): _____ Pump Tank Size (Gallons):_____

Drainfield Type: • Trenches • Bed • Mound • LPP • At-Grade
• Leaching • Chambers • Other: _____

Drainfield Dimensions: _____

Components: • Effluent Filter • Diversion Valve • Siphon • Pump
• Distribution Box • Other: _____

IMPORTANT CONTACTS:

Installer:
Name: _____ Telephone:_____

Address:_____

Designer/Engineer:
Name: _____ Telephone:_____

Address:_____

Service Professional/Pumper/Operation & Maintenance Provider:
Name: _____ Telephone:_____

Address:_____

Local Health Department:
Name: _____ Telephone:_____

Address:_____

INSPECTION & MAINTENANCE RECORD

Use this sheet to record inspections, maintenance, or repairs to your septic system.

Date of Service:	Description of Service:	Service Provider:

NOTES

To obtain copies of this document, contact:

Kentucky Onsite Wastewater Association, Inc.
P.O. Box 253
Springfield, KY 40069

Or visit us at our website: www.kentuckyonsite.org

Onsite Wastewater Resources…

Kentucky Cabinet for Health Services
Department for Public Health
Environmental Management Branch

http://chs.ky.gov/publichealth/index-environmental_programs.htm

Kentucky Natural Resources and Environmental Protection Cabinet
Department for Environmental Protection
Division of Water

http://www.water.ky.gov

Kentucky Onsite Wastewater Association, Inc. (KOWA)

www.kentuckyonsite.org

EPA Onsite/Decentralized Management Homepage

www.epa.gov/owm/onsite

National Small Flows Clearinghouse

www.nesc.wvu.edu

Rural Community Assistance Program

www.rcap.org

National Onsite Wastewater Recycling Association, Inc.

www.nowra.org

Septic Yellow Pages

www.septicyellowpages.com

National Association of Wastewater Transporters (NAWT)

www.nawt.org