SEPTIC SYSTEM OWNER'S MANUAL

A Water Systems Council Publication

Disclaimer

This manual is provided for informational purposes only to assist homeowners in understanding septic systems, the possible components of their system, and general maintenance practices. It is not a substitute for professional design, installation, inspection, or repair guidance.

Septic system requirements, codes, and regulations vary by state and local jurisdiction. This manual may not reflect all local or state requirements applicable to your property. Homeowners are responsible for complying with all applicable laws, regulations, and permitting requirements and should consult licensed professionals and local authorities before making modifications, performing repairs, or installing any septic system components.

The publisher and authors assume no liability for any loss, damage, or injury arising from the use of this manual.

CONTENTS

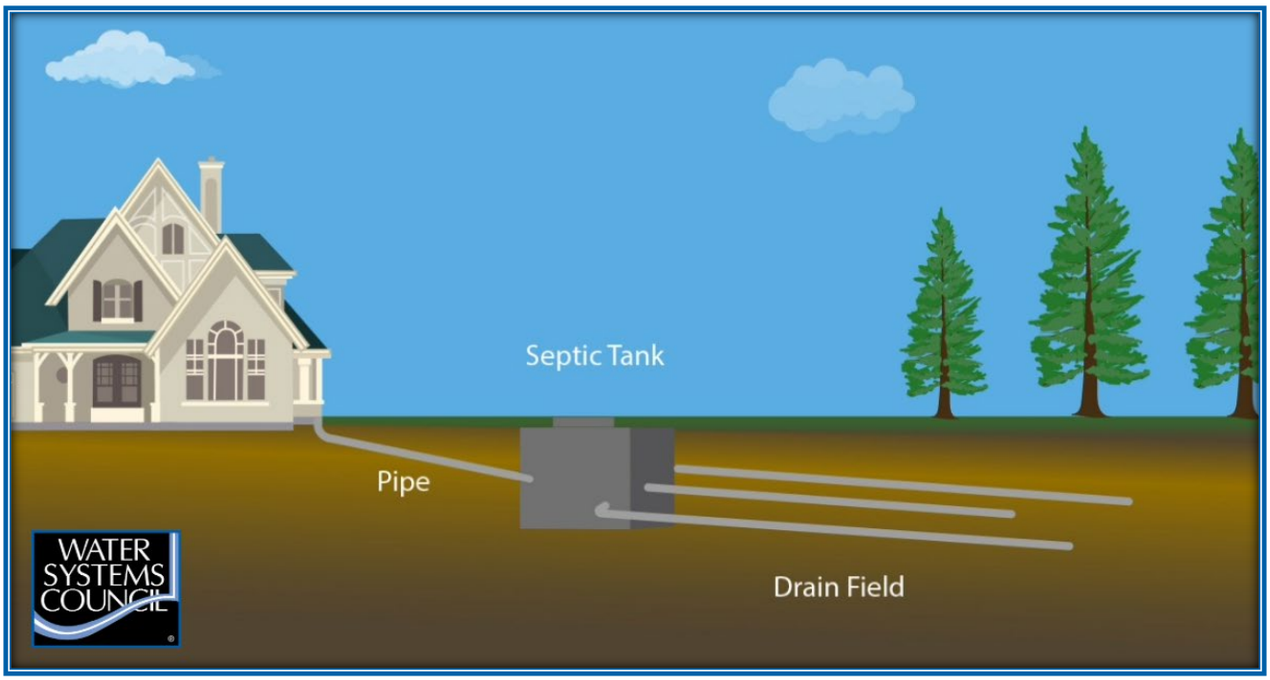
Your Septic System

As a homeowner with both a private well and an onsite wastewater treatment system (septic system), proper care and routine maintenance are essential to protecting your drinking water, your property, and the long-term performance of both systems. Septic systems treat and disperse household wastewater on your property, typically returning treated water to the soil where natural processes continue the treatment before it reaches groundwater. Groundwater often supplies private wells; therefore, the way your septic system is operated and maintained can directly influence the quality of your drinking water.

While system designs may vary depending on site conditions and local regulations, all septic systems work toward the same goal: reducing contaminants in wastewater before it returns to the environment. When properly designed, installed, and maintained, septic systems can function reliably for decades. However, neglect, overuse, or improper maintenance can lead to system failure, costly repairs, environmental damage, and potential contamination of nearby water sources.

This manual is designed to help you identify system components, recognize warning signs, follow best practices for everyday use, and establish a maintenance routine that protects your investment while safeguarding your family's drinking water supply.

Sample Septic System



This image is intended to represent some of the components that can be included in a conventional septic system and is not intended as an installation guide. Check local codes for actual requirements and restrictions.

Septic System Details

Septic System Permit Information

Issued to: _____

Date Issued: _____

Address: _____

Legal Description: _____

Installed by: _____

Phone: _____

Septic System Description

Septic Tank Manufacturer: _____

System Size (Designed Flow Rate (gpd) or Bedroom Count): _____

Volume of Septic Tank (gal): _____

Dosing Tank or Pump Compartment Capacity (gal): _____

Is there a Pretreatment Device: _____ Brand: _____

Septic System Accessories (e.g., tank risers and lids for easy access, effluent filters to protect the drain field, alarms to prevent backups, etc.):

Dispersal Method (e.g., trenches/drain fields, mound, drip systems, discharge, etc.):

Dispersal Dimensions: _____

Additional Information: _____

Septic System Details

Septic System Location

Use this space to create a simple map of your property. Sketch the location of your home, septic system components, water well, and other structures. Note approximate distances between your well, septic system, neighboring systems, and property lines. Refer to this drawing before planning any construction, excavation, or landscaping.

Maintenance Log

Septic System Service Providers

Name: _____
Address: _____
Phone: _____

Name: _____
Address: _____
Phone: _____

Septic System Maintenance Log

Date	Work Performed	Company	Cost

How Septic Systems Work

A septic system treats household wastewater onsite using natural biological processes, soil filtration, and in some cases pumps or additional treatment components. Water from sinks, toilets, showers, and household appliances flows out of the home and into the septic system, where it is treated and safely returned to the environment.

Septic systems are commonly used in areas where municipal sewer service is unavailable. When properly designed and installed, they provide an effective way to treat wastewater while protecting groundwater, nearby wells, and surface water.

Although septic system designs can vary, most operate through a series of treatment steps that separate solids, treat wastewater, and safely disperse the treated water back into the soil.

Primary Treatment: The Septic Tank

Most residential septic systems begin with a **septic tank**, a watertight container typically made of concrete, fiberglass, or high-density polyethylene (HDPE). Wastewater enters the tank and is held long enough for the contents to separate into layers:

- ✓ **Sludge** - heavier solids settle to the bottom
- ✓ **Scum** - fats, oils, and grease float to the top
- ✓ **Effluent** - the partially treated liquid remains in the middle

Naturally occurring bacteria in the tank begin breaking down organic waste. While this process reduces the number of solids, some materials cannot be fully decomposed and remain in the tank. The liquid effluent flows out of the septic tank into the next stage of treatment. In some systems, wastewater may pass through additional treatment units before reaching the soil.

Secondary Treatment and Dispersal

After leaving the septic tank, the partially treated wastewater moves to a soil treatment area where it is filtered and dispersed. In many homes, this area is known as a **drain field**, or **soil absorption field**, which typically consists of perforated pipes placed in gravel-filled trenches or beds. Effluent slowly disperses through the pipes and into the surrounding soil.

As the wastewater percolates through the soil, naturally occurring microbes filter and remove harmful bacteria, nutrients, viruses, and other contaminants. This final treatment step is critical to protecting groundwater and nearby drinking water wells. The soil acts as a natural filter, completing the treatment process before the water returns to the natural water cycle. Healthy soil conditions, proper system design, and a well-maintained septic tank are essential for this process to work effectively.

Types of Septic Systems

The type of septic system installed on a property depends largely on soil type, available space, slope, and local regulations. While the treatment goal remains the same, different system designs are used to accommodate specific site conditions, with conventional systems being the most common and alternative systems used when additional treatment or specialized designs are needed. The following are the main types of residential septic systems:

- ✓ **Conventional Septic System -** This is the most common type of residential septic system. Wastewater flows from the home into a septic tank where solids settle and liquids flow by gravity into a drain field consisting of perforated pipes in gravel or stone trenches. The soil provides the final stage of treatment.
- ✓ **Chamber System -** A chamber system is a gravel-less alternative to the traditional drain field. Large plastic chambers create open space in the soil that allows wastewater to disperse and be treated without the need for gravel trenches.
- ✓ **Aerobic Treatment Unit (ATU) -** Aerobic systems introduce oxygen into the wastewater to promote the growth of beneficial bacteria that break down waste more efficiently. These systems provide a higher level of treatment and are often used where soil conditions are less suitable for conventional systems.
- ✓ **Mound System -** Mound systems are used where natural soil conditions are unsuitable for a traditional drain field due to shallow soil, high groundwater, or bedrock. Wastewater is pumped into a raised mound of sand and soil that provides the necessary depth for treatment.
- ✓ **Drip Distribution System -** Drip distribution systems use small flexible tubing to slowly distribute wastewater across a wide area near the soil surface. These systems are often used on sites with limited space or uneven terrain.
- ✓ **Recirculating Sand Filter System -** This system uses a contained sand filter to provide additional treatment before wastewater is discharged to a soil absorption area.

Additional systems may include Constructed Wetland, Evapotranspiration, and Cluster or Community systems, which are the least common and typically used only in specific situations dictated by site conditions or local requirements.

Location of Your Septic System

The location of your septic system plays an important role in protecting your drinking water, groundwater, and the long-term performance of the system. Before a system is installed, a site evaluation is conducted to determine the most appropriate design for your property. Factors that influence the type and placement of a septic system include:

- ✓ **Soil type and absorption capacity** - Determines how wastewater will naturally treat in the soil.
- ✓ **Property size and available land area** - Ensures enough space for the septic tank, drain field, and reserve area.
- ✓ **Land slope and drainage conditions** - Affects wastewater flow and system efficiency.
- ✓ **Depth to groundwater or bedrock** - Prevents contamination of drinking water sources.
- ✓ **Local climate and rainfall patterns** - Impacts system performance and drainage.

Septic systems must be installed at safe separation distances from drinking water wells, surface water, buildings, and property boundaries to reduce the risk of contamination and system damage. Installing a septic system too close to a well or water body increases the chance that bacteria, nutrients, or other contaminants could enter the drinking water supply.

Location Guidance

The U.S. Environmental Protection Agency (EPA) recommends the following minimum setbacks:

- ✓ Maintain at least 50 feet between a drinking water well and any septic system component, including the septic tank and drain field.
- ✓ Install the septic system downhill from the well whenever site conditions allow, so wastewater flows away from the drinking water source.

On older properties, or on smaller or constrained properties where septic systems may have been installed under special permits, systems may not meet current setback requirements. If your system does not meet today's recommended minimum safety distances, it is especially important to test your well water twice each year for bacteria and once each year for nitrate to help ensure your drinking water remains safe.

Regulations and Local Requirements

Septic systems are carefully regulated by state and local health or environmental agencies to protect both public health and local water resources. These rules exist to make sure that wastewater is safely treated and does not contaminate wells, rivers, or nearby properties.

Regulations usually cover several important areas:

- ✓ **System design and installation:** Rules specify how your septic system should be built, including the size of the tank and drain field, and the materials that can be used. This ensures the system works effectively for your property's specific soil, slope, and climate conditions.
- ✓ **Minimum distances:** Septic systems must be installed a safe distance from drinking water wells, property lines, buildings, and water bodies. These setback requirements help prevent contamination of drinking water and protect neighboring properties.
- ✓ **Permits and inspections:** Most local agencies require a permit before installing or repairing a septic system. Inspections may also be required during installation or after repairs to make sure everything meets safety and construction standards.
- ✓ **Approved system types and construction standards:** Certain types of septic systems may be approved or restricted depending on your property's conditions. Regulations ensure the system is built to last and will treat wastewater safely.

As a homeowner, it is important to know that local regulations do not just apply when installing a new system, they can also affect repairs, upgrades, or changes to your property. For example, if you plan to build an addition, install a pool, or modify landscaping near your septic system, you may need approval from your local environmental health department.

Knowing exactly where your septic tank, drain field, and reserve area are located is vital. This knowledge makes routine maintenance easier, helps in emergencies, and ensures any future property improvements will not interfere with your system.

For questions about setbacks, approved system types, permits, or inspections, contact your local environmental health department or permitting authority.

Septic System Maintenance

Routine maintenance is essential to keep your septic system operating safely and efficiently, thus avoiding costly repairs or system failure. A well-maintained septic system protects groundwater, nearby wells, and surface water while extending the life of both the septic tank and the drain field.

Regular inspections and timely pumping prevent solids from building up in the tank and flowing into the drain field, where they can clog soil and pipes. Once a drain field is damaged, repairs can be expensive and may require system replacement.

Recommended Maintenance Schedule

It is recommended that a licensed septic service professional inspect your entire system every 1 to 2 years to identify leaks, blockages, or early signs of failure. In addition, the septic tank should be pumped every 3 to 5 years, or more frequently for larger households, homes with high water use, or systems with smaller tank capacities, to prevent solids from accumulating and damaging the drain field.

The frequency at which your septic tank needs to be pumped depends on several factors:

- ✓ The number of people living in the home.
- ✓ The amount of wastewater generated daily.
- ✓ The volume of solids entering the tank (including food waste and non-flushable items).
- ✓ The total capacity of the septic tank.
- ✓ Homes with garbage disposals, regular visitors, or higher-than-average water use generally require more frequent pumping.

State and Local Requirements

Some states or localities may have regulations requiring more frequent inspections, testing, or pumping than the general recommendations listed here. Always check with your local health or environmental agency to ensure your system meets these rules and to avoid potential violations.

Maintenance Records

Keep a detailed record of all septic system inspections, pumping dates, repairs, and service provider information. Use the *Maintenance Log* located on page 7 of this manual to document this information and keep everything in one convenient place.

Maintaining accurate, centralized records helps septic professionals diagnose issues quickly, ensures maintenance is performed on schedule, and provides a clear history of system care. These records protect your investment and can be especially valuable when selling your home or planning future repairs or upgrades.

Protecting Your Septic System

Your daily habits have a direct impact on the performance and lifespan of your septic system. Everything that goes down a drain, toilet, or garbage disposal flows into the septic tank, where it must be treated naturally. Unlike municipal sewer systems, septic systems are not designed to handle trash, chemicals, or excessive water use. Protecting your system starts with understanding what it can and cannot process.

When unsuitable materials enter the system, they can disrupt biological treatment, increase solid buildup, clog pipes, damage the drain field, and lead to system failure. These materials do not break down properly in the tank, contribute to excessive sludge accumulation, and may harm the beneficial bacteria that are essential for proper wastewater treatment. Many of these failures are preventable through simple, responsible use.

The following items should never be flushed or poured down drains:

- ✓ Grease, fats, or oils
- ✓ Feminine hygiene products
- ✓ Disposable diapers or wipes (including products labeled “flushable”)
- ✓ Paper towels or tissues
- ✓ Kitty litter or coffee grounds
- ✓ Dental floss or hair
- ✓ Household chemicals or medications
- ✓ Paint, thinners, varnish, pesticides, or waste oil

Drain Field Protection

The drain field is a critical part of the treatment process and must remain open, uncompacted, and undisturbed to function properly. Wastewater leaving the septic tank relies on healthy, aerated soil to complete the natural treatment process. Compacted soil and excess water reduce the drain field’s ability to treat wastewater effectively, which can lead to system failure or groundwater contamination.

To protect your drain field:

- ✓ Do not drive or park vehicles or heavy equipment over the drain field.
- ✓ Do not plant trees or large shrubs in or near the drain field, as roots can damage pipes.
- ✓ Do not cover the area with patios, decks, concrete, or asphalt.
- ✓ Keep gutters, downspouts, and surface runoff directed away from the drain field.

Protecting Your Septic System

The table on this page provides a quick reference for everyday actions that help protect your septic system and avoid common causes of failure. These guidelines are based on how septic systems are designed to treat wastewater and the limits of what they can safely handle.

Following these guidelines and the recommendations from your septic professional reduces the risk of backups, odors, drain field failure, and contamination of nearby wells and surface water. Refer to this table regularly and share it with everyone in the household to help ensure your septic system operates safely and efficiently for years to come.

DO'S	DON'TS
Use water efficiently throughout the home	Flush wipes, diapers, or hygiene products (even "flushable" ones)
Repair leaking faucets and running toilets promptly	Pour grease, fats, or oils down drains
Spread laundry loads over several days	Overload the system with back-to-back laundry or heavy water use
Use high-efficiency toilets, washers, and fixtures	Use the toilet or sink as a trash can
Keep records using the maintenance log in this manual	Ignore inspection or pumping schedules
Know the location of your tank and drain field	Drive, park, or place heavy equipment over the drain field
Direct gutters and surface water away from the drain field	Allow surface water to pond over the drain field
Use septic-safe, mild cleaning products	Use excessive bleach, antibacterial cleaners, or drain openers
Pump the septic tank as recommended	Delay pumping until problems occur
Protect soil over the drain field	Plant trees or large shrubs near the drain field

Protecting Your Septic System in Emergencies

Disasters such as floods, hurricanes, earthquakes, or landslides can damage your septic system, even if your home appears unaffected. Knowing how to act before, during, and after an event helps prevent backups, contamination, and costly repairs.

Before a Disaster

Preparing your system ahead of time can reduce risks. Keep your septic tank at least half full to prevent it from floating or collapsing during flooding. Seal manholes and inspection ports to stop excess water from entering. If your system uses electricity, turn off pumps at the circuit box and make sure all electrical connections are waterproof to prevent damage or shock.

During a Disaster

During an emergency, limit water use. Only flush when necessary and reduce showers, laundry, and dishwashing. Standing water may be contaminated with sewage, which can threaten nearby water wells, including yours! Stay safe by avoiding contact with floodwaters and do not touch electrical components or operate your system in unsafe conditions.

After a Disaster

Floodwaters can carry sewage and other contaminants. **Do not drink your well water until testing confirms it is safe.** Instead, use bottled or treated water. Avoid contact with electrical devices until dry, and do not pump the septic tank more than halfway. Partially emptied tanks can float or shift in wet soil. Continue conserving water and flush only essential waste or use a temporary toilet until your system is checked.

Contact a Professional

Have a licensed septic professional inspect your system as soon as possible. They can safely assess the tank, pumps, and drain field, and make repairs to prevent long-term problems. Use the *Septic System Resources* on page 16 of this manual to help find a list of septic professionals in your area.

Recover and Plan Ahead

After repairs, clean and disinfect areas that may have been exposed to contaminated water, wash hands thoroughly, and launder clothing that came into contact with floodwater. Document damage and repairs for insurance and local authorities. For long-term protection, consider elevating electrical components or installing barriers if flooding is a recurring risk; and keep a written emergency plan for your septic system.

Septic System Resources

The following organizations provide trusted information, technical assistance, lists of septic system professionals, and support for homeowners with septic systems and private wells. These resources can help you better understand system care and maintenance, as well as available assistance programs.

National Association of Wastewater Technicians (NAWT)
Website: www.nawt.org

National Onsite Wastewater Recycling Association (NOWRA)
Website: www.nowra.org

Water Well Trust (WWT)
Phone: 833-539-8200
Website: www.waterwelltrust.org

Water Systems Council (WSC)
Phone: 202-625-4387
Website: www.watersystemscouncil.org

wellcare® Hotline
Phone: 888-395-1033
Website: www.wellcarehotline.org

U.S. Environmental Protection Agency (EPA)
Website: www.epa.gov/septic

You can also reach out to your local Environmental Health Department and Septic Service Professionals for guidance.

Additional Resources

wellcare® HOTLINE
A Water Systems Council Program
888-395-1033

The wellcare® Hotline is a free, national hotline that can answer your septic and water well system questions. Contact the wellcare® Hotline Monday through Friday at 888-395-1033 or visit wellcarehotline.org.

wellcare® Well Owners Network
A Water Systems Council Program

The wellcare® Well Owners Network provides consumers nationwide that are served by septic and water well systems with education and information regarding proper construction and maintenance. Sign up at wellcarehotline.org/well-owners-network.

waterwell trust

The Water Well Trust offers septic system grants and loans through their programs to qualifying homeowners. For more information and to request an application waterwelltrust.org/apply or call 833-539-8200.

The Water Systems Council would like to thank the Water Well Trust for providing the front cover image for this manual.

Notes

Important Records

Water Systems Council
1101 30th Street N.W., Suite 500
Washington, D.C. 20007

Phone: 202-625-4387

www.watersystemscouncil.org

© 2026 Water Systems Council