

# Alabama Home \*A\*Syst

Home Assessment System

**Why be concerned?** The water that we use every day is recycled back into the environment. This is called wastewater, and it is important that this water be treated or cleaned after we use it. Before the 19<sup>th</sup> century, wastewater was usually dumped into streams or streets. This way of disposing wastewater polluted water supplies and spread diseases. We now use two main methods to treat wastewater. In a public sewer system, your wastewater travels through underground pipes and sewers to a wastewater treatment plant where water is treated. After treatment, this water is released back into the environment to a nearby water source, such as a stream, lake, or river.

If you are not connected to a sewer system, then your home probably uses a septic system to treat your wastewater. If you have a septic system, it is your responsibility to take care of the system so that it works properly. Keeping your system working properly helps to prevent water pollution, protects your health, and keeps your system in good working condition.

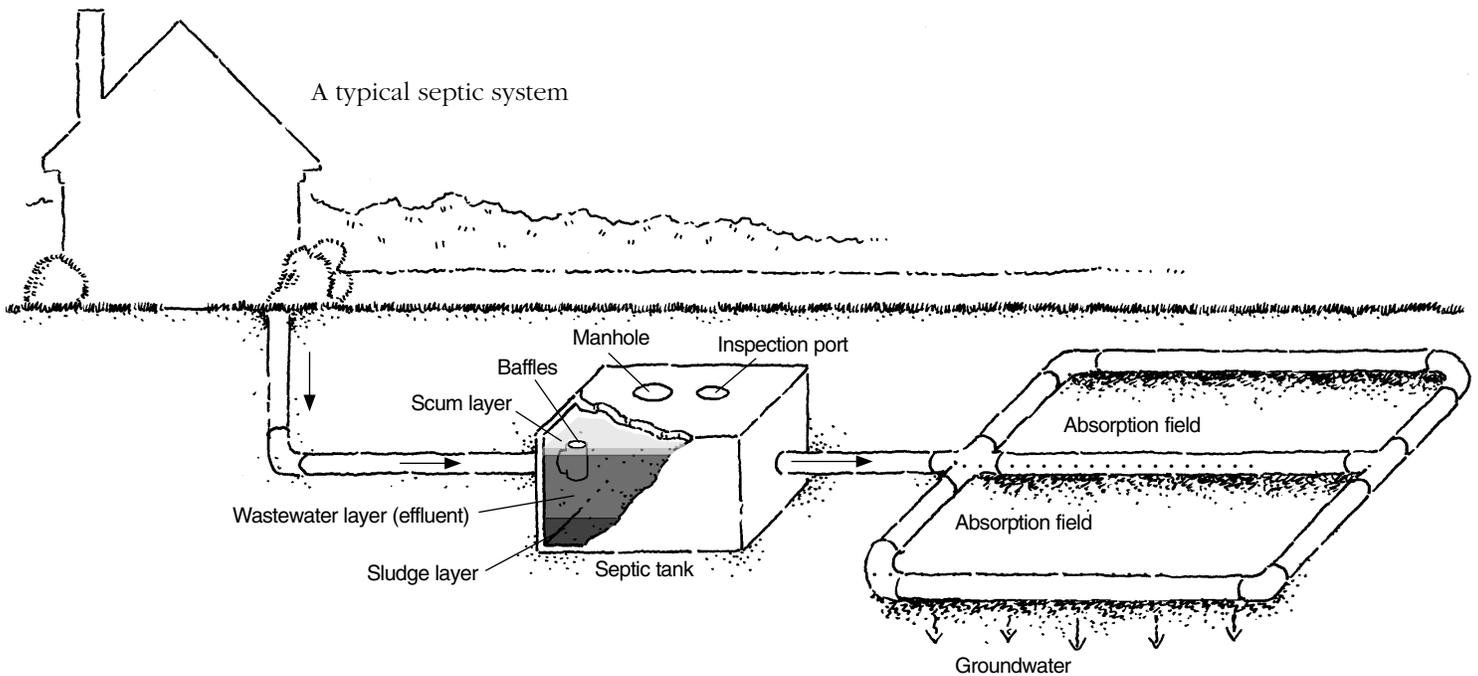
# Household Wastewater: Septic Systems

CRD-81



## How to Use Alabama Home\*A\*Syst

Alabama Home\*A\*Syst is a program you can use to help you protect the health and safety of your home environment. In this series of booklets are do-it-yourself checklists (self-assessments) to help you find out if you have a healthy home. Answer yes or no to the statements on these checklists. After the assessments, there is some information about each statement. Alabama Home\*A\*Syst is a voluntary and confidential program that is designed to help provide you with useful information so you can take the correct actions around your home. If you need more help with any topic, there is a list of phone numbers and Web sites at the end of each publication.



## What is a septic system?

If your home is not connected to a community sewer system, you probably have a septic system buried in your yard. Septic systems use the soil to help treat wastewater from the home. Household wastewater is any water that goes down the drain from sinks, toilets, washing machines, bathtubs, or dishwashers. The wastewater usually contains soap, bodily wastes, and food. Almost 50 percent of Alabamians use septic systems for their household wastewater. Septic systems are the most common home wastewater treatment systems in farm or country homes.

If your septic system was put in correctly and you have taken care of it properly, it can work well for many years. However, poorly working septic systems can contaminate surface water and underground well water. Household wastewater can contain bacteria, viruses, household chemicals, and nutrients from food wastes. Septic systems help to clean up this wastewater. Otherwise, these contaminants can cause waterborne diseases or chemical contamination of water supplies.

Understanding how the septic system works will help you avoid common problems that affect these home wastewater treatment systems. A failed septic system is not only a health hazard, but can cost thousands of dollars to fix.

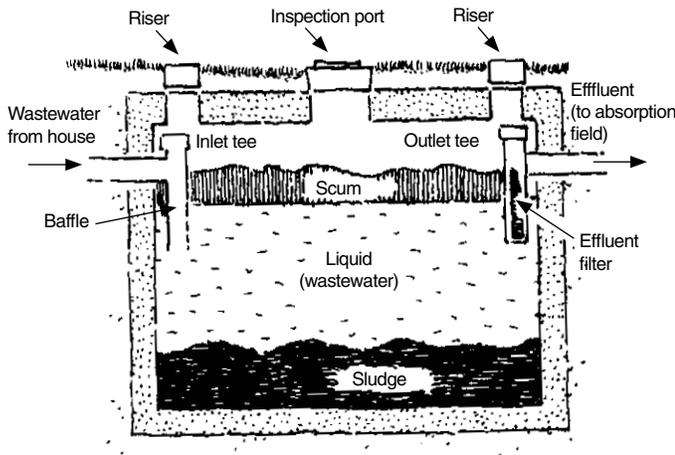
## How does a septic system work?

Although there are many types of septic systems in use, most consist of two main parts:

1. a watertight concrete box called a **septic tank**
2. an **absorption field** (or **drainfield**) that carries the waste away from the tank and into the soil by a system of buried perforated pipes

**The septic tank.** Household wastes, such as soapy water from kitchen and bathrooms, washing machines, food disposal units, and human waste, flow through the plumbing system to the septic tank. This is a water-tight container (usually made of concrete) buried underground outside of the house. The purpose of the septic tank is to temporarily hold the wastewater and separate out the solids from the liquids.

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



Three layers form in the septic tank:

- The **sludge** layer, which contains solid materials that settle to the bottom of the tank. In this layer, naturally occurring bacteria change organic matter into gases and liquids.
- The **liquid** layer, which contains materials such as detergents and smaller solid materials. This wastewater layer will eventually drain to the drainfield.
- The **scum** layer, which contains lighter particles, such as grease and soap, that float to the top of the septic tank.

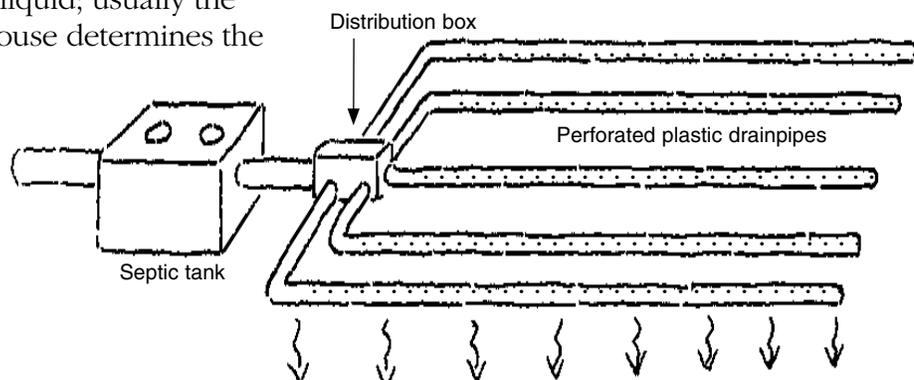
Some of the sludge layer and scum are broken down by anaerobic bacteria (bacteria that work without oxygen) into liquids. These liquids will then flow into the drainfield. The tank should be large enough to hold at least 2 days of wastewater to allow time for the solid materials to separate from the liquid. Septic tanks typically hold about 1,000 gallons of liquid; usually the number of bedrooms in a house determines the size needed.

The tank has **baffles** that allow only the liquid between the sludge and the scum layer to pass from the tank to the absorption field, or drainfield. The fluid leaving the tank is called **effluent**. Small amounts of suspended and dissolved matter not completely broken down may also be transported in the effluent to the absorption field. A serious problem arises when solids are allowed to build up in the tank and reduce the amount of wastewater the tank can hold. An **inspection port** on the septic tank can allow you to check the level of sludge or scum buildup.

Also, too much sludge or scum can clog the drainfield lines or saturate the soil, preventing the natural processing of the wastewater through the soil layers. **Effluent filters** on the outlet between the tank and the absorption field can filter out some of this material. Be sure these filters are changed regularly. **Risers** with lids on the ground surface make it easier to find and pump out septic tanks.

**The absorption field.** The typical soil absorption system, or drainfield, is connected to the septic tank by a buried pipe. This pipe connects to a distribution box and then to tile or perforated plastic drainpipes, which are buried in underground trenches (usually two to five trenches) surrounded by rock or gravel. The septic tank effluent or liquid flows from the septic tank out into the soil through these perforated pipes. This sewage effluent is a cloudy liquid that still contains many disease causing organisms and environmental pollutants.

Picture of absorption field/drainfield



The real treatment of the wastewater happens in the soil beneath the drain pipes.

The soil serves as a natural filter for the wastewater. Microorganisms in the soil and natural chemical processes help break down waste material left in the effluent water, including bacteria that can cause diseases. The soil also traps many other chemicals, such as phosphorus and some forms of nitrogen.

**The best soils for a septic system.** It is important to place the septic tank and absorption field on your property according to health department recommendations. Contact your county health department for state and local regulations. To work properly, the site should be large enough and have soils that can adequately absorb and filter the wastewater. The topography (features of the land, such as direction, shape, and steepness of slope) of the lot is also important. The best soils are ones that contain the right amount of sand, fine soil, and clay particles. A slightly sloping land with a deep water table and at least 10 feet to bedrock is best. If soils have too much sand, wastewater moves too fast and can contaminate groundwater. Too much clay in the soil will prevent the proper flow of water and the system will not work.

You should get a copy of a **soil survey** report from your county Extension office or your area Natural Resources Conservation Service office. Your county health department can help you get your site's suitability tested for a septic system absorption field. Tests such as **percolation tests** will measure the rate of water movement into soils. **Soil borings** can show the depth of the water table underground. Only professionals should make these tests. All of these factors together determine the best site for a septic system on your land.



## Where should a septic system be located?

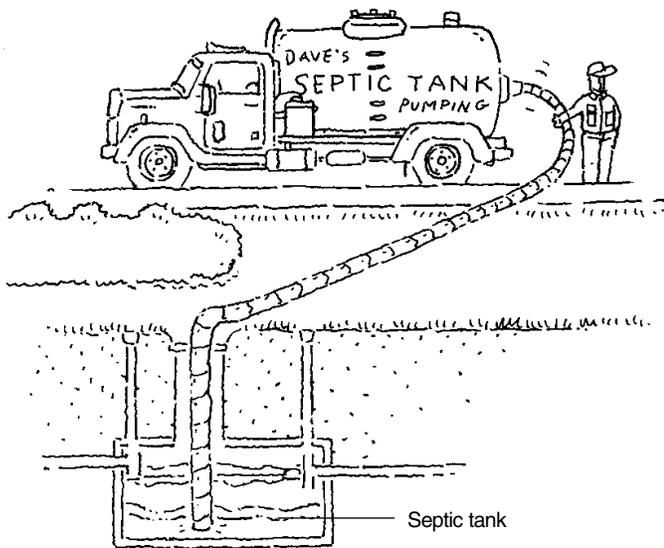
Septic systems should be located downhill and at least 100 feet away from drinking water wells and 50 feet from streams or other waterways. The area over the absorption field should be free of trees because tree roots can plug the drainfield lines. Driveways or paved surfaces should not be placed over the absorption field. Do not drive vehicles or farm equipment over the septic system because these can compact the soil surface and damage drain lines. Drains from roofs should not empty out over the absorption field. Grass is the best groundcover over field lines.

### Important: Alabama laws

- **Alabama state law requires homeowners to get a permit from the local health department before putting in a new system or before repairing an existing system.**
- **Alabama state law requires septic tank installers and pumpers to be licensed by the Alabama Onsite Wastewater Board.**

### How to take care of your septic system.

The best way to take care of your septic system is to prevent problems before they happen. Once installed, there is very little that can be done to correct problems due to poor design or location. Make sure you consider the environment around your home before putting in new systems or moving a system to a new place on your property.



The following can cause problems in a septic system:

- The septic tank and absorption lines are too close to pollution sources
- The soil has poor drainage or it is unsuitable for a septic system
- The water table is close to the surface of the land

A septic system should last at least 20 to 30 years if you take care of it properly. If you do not take care of your septic system, it could cost you thousands of dollars to fix. Some of the practices listed below may help you in taking care of your septic system.

**Inspect and pump out the septic tank regularly.** Because some of the solids always remain in the septic tank, it is necessary, even under normal use, to pump it out every 3 to 5 years. This is the most important thing you can do to keep your system working properly. If you use a garbage disposal this can cause an even larger amount of solids in the septic tank. Use a licensed septic tank contractor to inspect your septic system every 3 years (every year if you use a garbage grinder) and have it pumped out starting with the third or fourth year after it is installed.

### **Protect the ground above the drainfield.**

The area over the absorption field should be free of trees because tree roots can plug the drainfield lines. Driveways or paved surfaces should not be placed over the absorption field. Do not drive vehicles or farm equipment over the septic system because these can compact the soil surface and damage drain lines. Drains from roofs should not empty out over the absorption field. Grass is the best groundcover over field lines.

**Reduce solid wastes.** A septic system will work best if you use it only to dispose of wastewater. Do not use it as a trash can; try to reduce the amount of solid materials you put down the drain. To prevent your system from being overloaded, do not put anything except wastewater, human wastes, and toilet tissue into your septic system.

### **Do not flush**

paper towels	cigarette butts
diapers	condoms
tampons	cat litter
sanitary napkins	coffee grounds
baby wipes	grease or fat

These solid materials can build up and clog the tank because they do not break down easily.

**Reduce food wastes.** Take care not to put food wastes, such as grease, fats, and oils, down the kitchen drain. These fats solidify and can clog up the septic tank system. They should be thrown out in the trash.

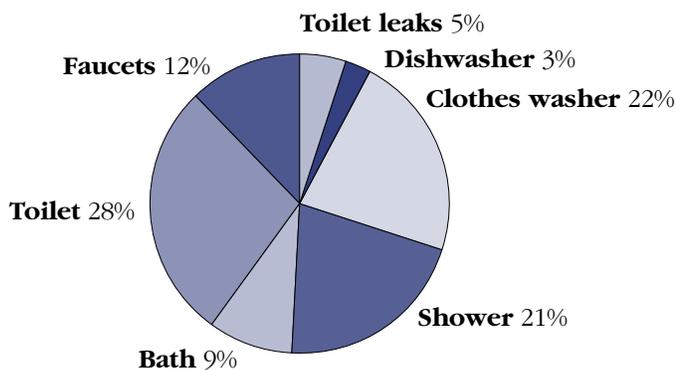
If you have a garbage disposal, try to limit its use. Solid food material can overload the septic system, and it is often recommended that food disposal systems not be installed with septic tanks. If you do have a disposal, grind the food waste into fine particles. You may need to pump your system more frequently. A larger size septic tank is recommended for use with a garbage disposal system. **Note: Instead of disposing of food down the drain, consider composting these wastes (except fats).**

**Never** put these chemicals down the drain:

- Paints
- Oven cleaners
- Pesticides
- Paint thinners
- Drain cleaners
- Acids

**Do not put household chemicals down the drain.** Because wastewater is treated in a septic system by naturally occurring bacteria in the septic tank and microorganisms in the soil, other chemicals added to the system can kill the bacteria involved in this process. Only use detergents and preferably liquid laundry soap if you have a septic system. Never pour paints, oven cleaners, pesticides, paint thinners, acids, or petroleum products down the drain. Not only would these interfere with the proper functioning of the system, they can also contribute to groundwater contamination.

**Conserve water.** Because a septic system only has a certain capacity, you should also limit the volume of water you put down the drain. A typical person only uses about ½ gallon of water daily for drinking purposes—baths, showers, and washing machines use the most water in a household. According to the U.S. Environmental Protection Agency, the average American uses almost 70 gallons of water every day inside the home.



Average water use inside the home.

Be careful about how much water you use and how much goes down the drain. Repair leaky faucets and toilets and only run washing machines and dishwashers when full. Long showers use a lot of water. Consider using low-flow showerheads, aerators on faucets, and low-flow toilets. Especially try to conserve water during periods of high rainfall because the soil can become saturated and the absorption lines will not function as efficiently. It is possible to put a backflow valve at the outlet pipe if the soil over the absorption field becomes soggy from heavy rains. This valve will prevent backup from the drainfield into the plumbing lines.

Fix problems with your septic system as soon as possible. Sewage backup is not only offensive, but it can be a health risk, particularly for children and pets. It also provides an excellent breeding place for mosquitoes and other disease carrying insects.

The following might be signs of trouble:

- Wet spots or standing water above the absorption field
- Bad odors or fly and mosquito problems over the absorption field
- Lush growth of water-loving plants over the absorption field
- Sewage backups from the drainfield onto the ground surface or household plumbing that doesn't drain properly

When these conditions exist, have your local health department environmentalist or septic system professional help you find out the best way to fix the problem. It is important to spend the time and money to keep your system working properly to best protect your family's health.

# Household Wastewater: Septic Systems

## A Self-Assessment

Fill out this self-assessment (a do-it-yourself checklist) to help you find out about your home septic system. For each statement check **yes** or **no**. If you answer **yes**, you are doing the best actions to take care of your septic system. If you answer **no**, this does not necessarily mean that your septic system has a problem, but you may need to make some changes to avoid future trouble. For each statement or question, more help is given under "Actions and Recommendations." For even more information, there is a list of helpful phone numbers and Web sites at the end of this chapter under "For More Information."

**Yes**    **No**

- \_\_\_\_\_ \_\_\_\_\_ **1.** I know where my septic system is placed in my yard, and it is in a good location.
- \_\_\_\_\_ \_\_\_\_\_ **2.** My septic system is inspected every year to check for build up of solids in the tank. The drainfield is also inspected for signs of problems.
- \_\_\_\_\_ \_\_\_\_\_ **3.** I use a licensed septic tank cleaner to pump out my septic tank every 3 to 5 years of normal use.
- \_\_\_\_\_ \_\_\_\_\_ **4.** Surface water and roof drains are diverted away from the septic tank and drainfield.

- \_\_\_\_\_ \_\_\_\_\_ **5.** I do not overload the septic tank with kitchen grease or other solids.
- \_\_\_\_\_ \_\_\_\_\_ **6.** My septic system has a backflow valve between the tank and drainfield.
- \_\_\_\_\_ \_\_\_\_\_ **7.** An effluent filter is installed at the septic tank effluent outlet; it is checked and cleaned regularly.
- \_\_\_\_\_ \_\_\_\_\_ **8.** I never put lye, acids, insecticides, petroleum products, paint thinner, or other harmful chemicals into the septic system.
- \_\_\_\_\_ \_\_\_\_\_ **9.** The area over the drainfield is protected from traffic, tree roots, and excess overland water flow, and I follow recommended maintenance practices.
- \_\_\_\_\_ \_\_\_\_\_ **10.** I am careful about conserving water in my household.



## Actions and Recommendations

- 1. Check the location of the septic tank.** Your septic system should be located downhill and at least 100 feet away from drinking water wells and 50 feet from streams or other waterways.
- 2. Make routine inspections of the septic tank.** You or a professional can check out the septic tank at least once a year to make sure it is working properly. Check the sludge or solid buildup and make sure that effluent or liquid is moving freely through the outlet pipe to the drainfield. Having your septic system inspected by a professional regularly can save you thousands of dollars in the long run.
- 3. Have your septic tank pumped every 3 to 5 years by a professional.** This will help keep your system running efficiently. You may want to have it pumped out more regularly if you use a garbage disposal or often have extra guests in your home. Pumping your septic tank every few years is probably the most important thing you can do to protect your system. Keep the septic tank area in your yard easily accessible for pumper trucks.
- 4. Keep the area over the drainfield clear of surface water.** Do not allow water from roofs, paved surfaces, or rain to collect on top of the drainfield. Soil that is saturated from surface water will not treat wastewater efficiently.
- 5. Do not put kitchen grease or other solid materials down the drain.** Some solid materials can clog the tank with extra sludge and prevent it from functioning regularly. To prevent your system from being overloaded, do not put anything except wastewater, human wastes, and toilet tissue into your septic system. Only flush toilet tissue through the commode.
- 6. Install a backflow device.** This valve can prevent backup from the drainfield into the plumbing lines should the soil become saturated from heavy rains.
- 7. Install an effluent filter.** This filter prevents solids from moving with wastewater through the septic tank effluent pipe to the absorption field. It should be cleaned and inspected regularly. These can and have caused many problems with backups if they are not checked and cleaned regularly, maybe even monthly.
- 8. Do not place harmful chemicals down the drain.** Harmful chemicals, such as pesticides, paint thinners, acids, or petroleum products, should not be poured down the drain because these chemicals interfere with the proper functioning of the system and can also contaminate the groundwater. The soil has microorganisms that help treat wastewater and these chemicals may kill these beneficial bacteria in the soil.
- 9. Protect the area over the drainfield.** The area over the absorption field should be free of trees, shrubs, driveways, or paved surfaces. Roots from trees and shrubs can interfere with drainage from the pipes. Driving vehicles over the drainfield can damage the field lines and compact the soil. Covering the area with paved surfaces prevents release of water vapor from the drainfield. Grass is a good cover and will reduce the chance of erosion.
- 10. Conserve water.** Since your septic system has a limited capacity, conserve water to keep it from overflowing. Water-conserving practices should especially be followed if family size increases. Leaky faucets and toilets should be fixed to keep from overloading the septic system. Laundry and other major water uses can be spread throughout the week or these could be handled by a separate tank and drainfield.

## Action Checklist

### How Am I Doing?

Check over the assessment and make note of changes you might make to keep your septic system working efficiently. It is important to have a regular action plan for maintaining and protecting your household septic system. Left unattended, wastewater disposal problems can develop to the point that the only option is to relocate the drainfield (usually septic tanks don't need to be moved). Even if suitable sites are available on your property, this solution is expensive and disruptive to family living. Maintaining your septic system protects your environment, your investment in your home, and, most of all, your family's health.

Pick at least one action you can do to take care of your household wastewater. Some actions may not cost a lot of money. For example, make it a family practice to never flush household chemicals down the drain. After filling out the self-assessment, make a note of your no answers. These might be situations where you need to make changes in how you are maintaining your septic system.

Use the following chart to record regular maintenance information about your septic system. The permit information can be obtained from your county health department if you do not have these records. If you ever sell your home, these records can be valuable.

### Septic System Maintenance Record

Permit number \_\_\_\_\_ Date installed \_\_\_\_\_

Tank size \_\_\_\_\_ gallons Amount of field lines \_\_\_\_\_ feet

Date	Work Description/Cost	Name of Installer/Pumper	Telephone



### Take Action!

At this point you should be more aware of the actions you can take to protect your septic system. The following are some action steps you can take to extend the life of the system and avoid health and environmental pollution risks.

## Tips for Maintaining Your Septic System

- Pump your tank out regularly—at least every 3 to 5 years
- Have your system inspected every 1 to 3 years
- Do not flush anything but wastewater and toilet tissue down toilets
- Do not put chemicals down the drain: pesticides, paints, drain cleaners, solvents, etc.
- Limit use of your garbage disposal
- Keep automobiles and other heavy equipment off the septic system area
- Conserve your water use to reduce water entering your septic system
- Do not plant trees within 10 feet of the drainfield
- Install new systems downhill and at least 100 feet from a well
- Cover the area over the septic system with grass or other suitable vegetative cover.
- Don't allow other surface water to collect over the drainfield: standing puddles of water, water from roof drains, or any other water that doesn't need to be treated by the septic system

## References

*Home\*A\*Syst: An Environmental Assessment Guide for the Home*. NRAES-87. Northeast Regional Agricultural Engineering Service, New York, 1997.

Hairston, J., Stribling, L., and John Beck. *Understanding Septic System Design and Construction*. Alabama Cooperative Extension System, 2001. ANR-790. (section 3.2.2)

*A Homeowner's Guide to Septic Systems*. EPA Publication 832-B-02-005, 2002.  
[http://www.epa.gov/npdes/pubs/homeowner\\_guide\\_long\\_customize.pdf](http://www.epa.gov/npdes/pubs/homeowner_guide_long_customize.pdf).

Pagan, T. and J. Atiles. *Protecting Your Water and Septic System*. The Georgia HOME\*A\*SYST Program. University of Georgia: Bulletin No. HACE-E-47, 2001.

Smith, G. *Tennessee Farm\*A\*Syst: Assessing Your Septic System*. University of Tennessee Agricultural Extension Service. SP484I.

Hoover, M. *Soil Facts: Septic Systems and Their Maintenance*. North Carolina Agricultural Extension Service. AB-439-13.

*57 Ways to Protect Your Home Environment*. North Central Regional Extension Publication 583, University of Illinois at Urbana-Champaign, 1996.

The Soap and Detergent Association. *Septic Tank Systems and Household Cleaning Products*. New York, NY: The Soap and Detergent Association, 1997.

National Small Flows Clearinghouse. *So...Now You Own a Septic Tank*. Morgantown, WV: West Virginia University Department of Technology Education. Item # WWBRPE20.

## For More Information

**A note about Web site information:** If you do not have a computer, contact your local public or college library. Most libraries provide free use of computers connected to the Internet.

Look in your local telephone book for septic system contractors.

### Alabama Cooperative Extension System

- The Alabama Cooperative Extension System provides many resources on its Web site:  
[www.aces.edu](http://www.aces.edu)
- Have a question about septic systems? Check out the Alabama Cooperative Extension System's water quality Web site:  
[www.aces.edu/waterquality](http://www.aces.edu/waterquality)

Click on Publications, Waste and Wastewater Management, Household Waste and Wastewater for publications on septic systems.

Click on FAQs (Frequently Asked Questions) for answers to your septic system questions.

For additional information, call your county Extension agent.

## Alabama Department of Environmental Management

(334) 271-7700

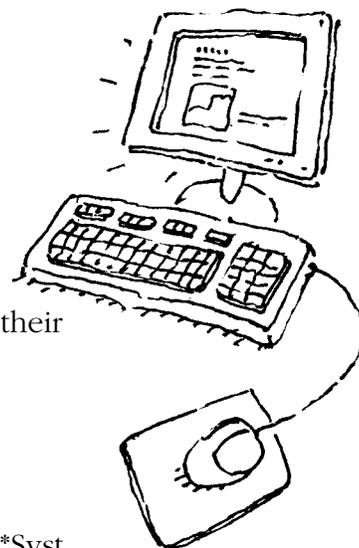
<http://www.adem.state.al.us/>

## U.S. Environmental Protection Agency

<http://www.epa.gov/owm/septic>

The EPA's Office of Wastewater Management (OWM) Septic Systems Web site helps homeowners understand the function and maintenance of their septic system. The following publications are available online:

- Homeowner's Guide to Septic Systems
- Homeowner Septic System Checklist



## Home\*A\*Syst National Office

Alabama Home\*A\*Syst is a partner with the national Farm\*A\*Syst/Home\*A\*Syst program, an environmental education package designed to help farmers and homeowners evaluate pollution and health risks around their property. The Home\*A\*Syst handbook has more information about this and other environmental risk topics.

(608) 262-0024

<http://www.uwex.edu/homeasyst/>

## Alabama Department of Public Health

Septic system information: (334) 206-5373

Look up the listing of your county health department in your local telephone book.

<http://www.adph.org/>

- Listing of all county health departments
- Environmental/Onsite Sewage; Division of Community Environmental Protection: septic system requirements for installation and approval

## Youth Education

Alabama Water Quality Curriculum, grades 4-12

A curriculum about water quality developed for youth; it includes information about Alabama.

<http://www.aces.edu/crd/wqc.html>

## The National Small Flows Clearinghouse (NSFC)

West Virginia University

P.O. Box 6064

Morgantown, WV 26506-6064

(800) 624-8301

[www.nsfrc.wvu.edu](http://www.nsfrc.wvu.edu)

The National Small Flows Clearinghouse (NSFC) provides information about innovative, low-cost wastewater treatments for small communities. NSFC helps homeowners, renters, citizens' groups, government officials, and others.

The following publications on septic system design and maintenance are available:

*Your Septic System: A Reference Guide for Homeowners*, WWBRPE17

*The Care and Feeding of Your Septic Tank System*, WWBRPE18

*So...Now You Own a Septic Tank*, WWBRPE20

*Preventing Pollution Through Efficient Water Use*, WWBRPE26



*Your Experts for Life*

CRD-81

---

**Laura B. Booth**, *Extension Associate*, Alabama Cooperative Extension System, Auburn University.

---

Special thanks to all who helped with the technical review of the materials and who provided editorial assistance, especially Dr. James E. Hairston, Extension water quality scientist, professor, agronomy and soils at Auburn University, staff at Alabama Department of Environmental Management and James L. Lindsay, student at Auburn University.

---

This project was funded by the Alabama Department of Environmental Management through a Clean Water Act Section 319(h) nonpoint source grant provided by the U.S. Environmental Protection Agency-Region IV.

---

We would like to acknowledge the staff of the National Farm\*A\*Syst/Home\*A\*Syst Program who developed the original materials at the University of Wisconsin-Extension. This national program has been supported by the USDA Cooperative State Research, Education, and Extension Service (CSREES), the USDA Natural Resources Conservation Service (NRCS), and the U.S. Environmental Protection Agency (EPA). The national office provides guidelines and educational support to each state for the development of Farm\*A\*Syst/Home\*A\*Syst programs.

---

Acknowledgements also to A. Ray Cavender, retired Associate Director and Jesse C. LaPrade, Extension Environmental Specialist, both with Alabama Cooperative Extension System, Auburn University for preparing original draft materials.

---

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

---

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

---

Issued in furtherance of Cooperative Extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, and other related acts, in cooperation with the U.S. Department of Agriculture. The Alabama Cooperative Extension System (Alabama A&M University and Auburn University) offers educational programs, materials, and equal opportunity employment to all people without regard to race, color, national origin, religion, sex, age, veteran status, or disability.

5M, **New March 2005**, CRD-81

© 2005 by the Alabama Cooperative Extension System. All rights reserved.