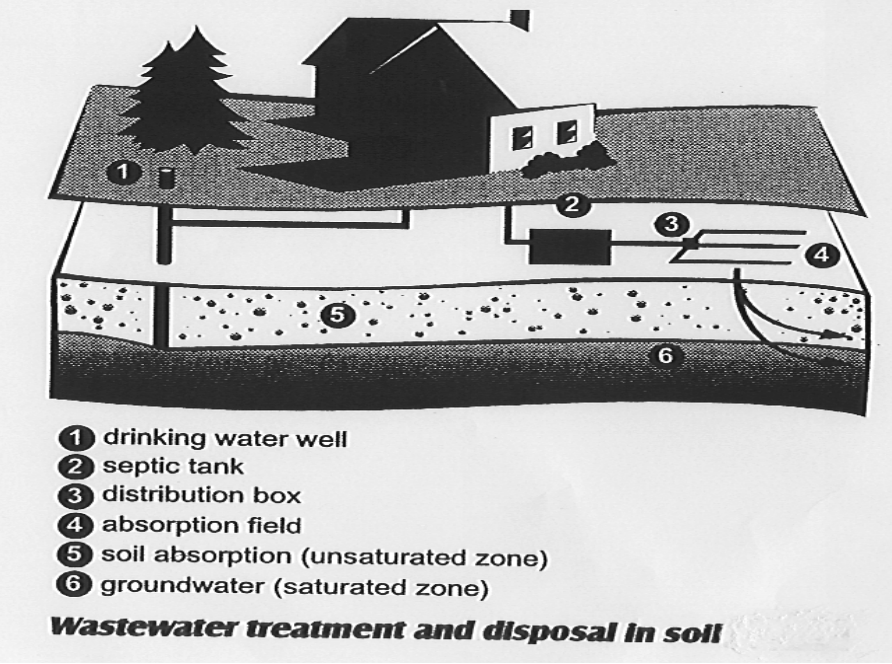
GEORGIA DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION

A HOMEOWNER'S GUIDE

TO

ON-SITE SEWAGE MANAGEMENT SYSTEMS



March 12, 2002

WHAT IS AN ON-SITE SEWAGE MANAGEMENT SYSTEM

An on-site sewage management system is a wastewater treatment system designed to use the soil to treat the wastewater generated by a home, business or other building intended for human occupancy or congregation. These types of systems are utilized in areas where central public sewage treatment is not available. The system is "on-site" because the sewage treatment and disposal is accomplished entirely on your property. One of the major differences between owning an on site system and a public sewer system is that the on site system must be maintained by the homeowner.

The most common on-site sewage management system is the septic tank system. The system typically consists of two major components: a primary treatment tank and an absorption field. The most common type of primary treatment tank is a septic tank. The septic tank may be made of concrete, fiberglass, or plastic. All septic tanks have inlet and outlet tees. Septic tanks installed prior to February 20, 2000 consist of a single compartment. Septic tanks installed after February 20, 2000 are required to have two compartments and an effluent filter. All septic tanks approved for use with on site sewage management systems are reviewed and approved by the Georgia Department of Human Resources.

The number of bedrooms determines the size of the septic tank serving a single family residence. The minimum size septic tank approved for use in the State of Georgia is a 1000 gallon tank, which will serve a 3 or 4 bedroom house. Homes with garbage disposals are required to increase the size of the septic tank by 50%. The primary purpose of the septic tank is to separate the solids from the liquid in order to facilitate the breakdown of the solids by microorganisms naturally present in the wastewater. The solids, known as sludge, collect in the bottom of the tank. This sludge must be pumped out periodically in order for the system to operate properly.

Keeping the solids out of the soil absorption field prevents soil clogging and helps insure the ability of the soil to effectively treat the wastewater. An effluent filter on the outlet of the septic tank is used to protect the absorption field from solids exiting the septic tank. As solids accumulate in the septic tank, the effluent filter may become clogged. This is an indication that it is time to have the solids pumped out of the septic tank and clean the filter.

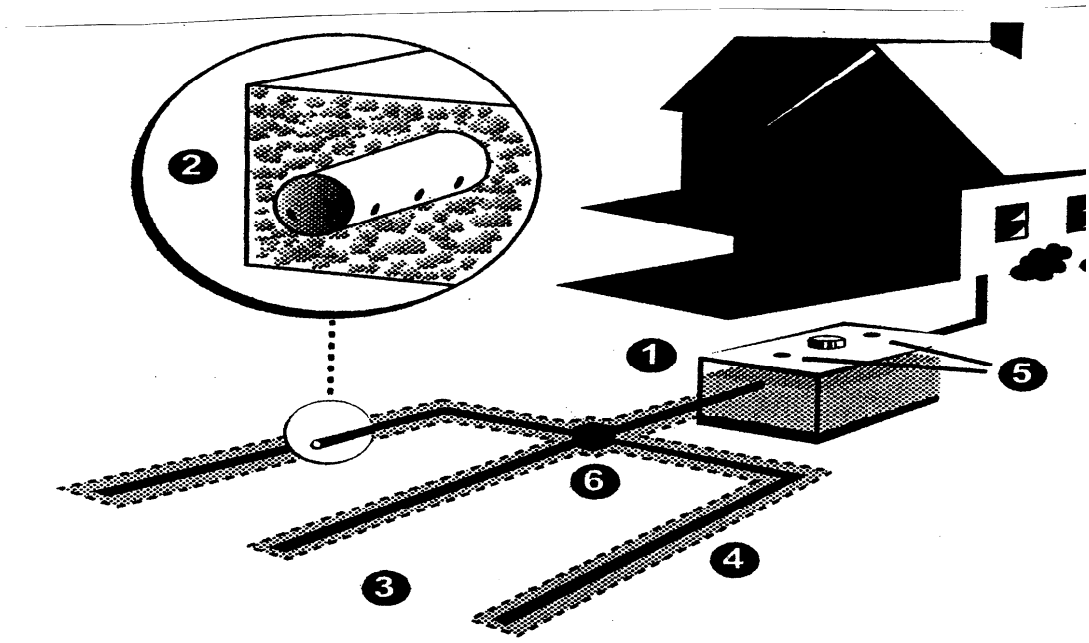
The wastewater effluent coming out of the septic tank may contain disease causing microorganisms and pollutants. The soil acts as a natural filter and treats the wastewater effluent through physical, biological and chemical processes. Harmful bacteria, viruses, and pollutants are treated as the wastewater effluent moves down through the soil before it reaches the groundwater table. The absorption field must be located in an area of unsaturated soil in order to facilitate this process. For this reason, a soil analysis is required on all property served by an on site sewage management system.

The typical septic tank system is a gravity flow system where the wastewater flows down into the system. The wastewater effluent is passed on to the absorption field through a connecting solid pipe. There are three primary absorption field design methods: level field, distribution box and serial distribution. On level topography, the level field method may be utilized. Absorption lines are installed level and interconnected to form a continuous absorption field. The distribution box method may be used on level or sloping topography. The wastewater enters a distribution box where the flow is equally distributed to two or more absorption lines of equal length. On sloping topography, the serial distribution method may be used. When this method is used, level absorption lines shall run parallel with the ground contours. The solid line from the septic tank enters the uppermost absorption line. Adjacent absorption lines are successively connected by means of overflow sewers to form an absorption field.

In some instances, the wastewater effluent may need to be pumped up hill to an absorption field. The wastewater effluent from the septic tank will enter a separate dosing tank. A pump approved for wastewater effluent is placed in the dosing tank in order to transport the wastewater effluent to the absorption field. The dosing tank should have a reserve capacity equal to the peak daily water usage from the home. Peak daily water usage is based on 150 gallons per bedroom. For a three bedroom house this would be a reserve capacity of 450 gallons, and 600 gallons for a four bedroom house. In the event of a

power outage or pump failure the storage capacity of the dosing tank will allow temporary use of home's on site sewage management system. An audible high water alarm is required in the dosing tank to notify the homeowner in the event of a pump failure.

The absorption field may be constructed of gravel or other approved aggregate, chamber, gravelless pipe, drip irrigation or other approved alternative product. The type of absorption field is usually determined by the soil conditions present on the site. For single family residences, the number of bedrooms and the soil percolation rate determines the size of the absorption field. A list of approved alternative absorption field products may be obtained from the Department. All on site sewage management systems are permitted and inspected by the local county health department for compliance with the Georgia Department of Human Resources Rules and Regulations for On Site Sewage Management Systems, Chapter 290-5-26.



1. septic tank
2. 4" perforated pipe
3. absorption field
4. crushed rock or gravel lined trench
5. inspection ports
6. distribution box

Typical Septic System **Fig. 1**

OPERATION AND MAINTENANCE

With proper use and maintenance your on site sewage management system will serve your family for many years. All homeowners should obtain a copy of the on site sewage management system inspection report from the local county health department. The inspection report will show the type and location of the on site sewage management system. Any maintenance or repair to an on site sewage management system must be performed by a septage removal and disposal company or septic tank contractor certified by the Department of Human Resources.

Proper Use:

Direct all wastewater from the home into the septic tank. This includes all sink, bath, shower, washing machine, toilet and dishwasher wastewater. Any of these wastewaters can contain disease causing organisms and pollutants. The department does allow separate black water and gray water systems for water reuse. All gray water must be disposed of in an on site sewage management system.

- Practice water conservation to avoid overloading the on site sewage system. Repair dripping faucets and leaking toilets. Run dishwashers when full. Do not do all your laundry in one day. Space out the washing machine use over the week. Replace old fixtures with water saving fixtures.

- Do not direct water from gutter downspouts, sump pumps or subsurface drains into the septic tank. The on site sewage management system is designed based on an estimated daily water use. Excess water directed into the septic tank will cause a hydraulic failure.

- Use commercial bathroom cleaners and anti-bacterial soaps in moderation. Treatment in the septic tank depends on natural bacteria. The Department does not recommend the use of septic tank additives. These products are not necessary for proper system operation.

- Do not plant trees or bushes on top of the absorption line. Root intrusion may damage and block the absorption line.

- Landscape the site to allow surface water to drain off of the absorption field area. Divert roof drains from the absorption field area. Standing water over the absorption field will cause soil saturation and potential system failure.

- Do not park or drive over the septic tank or absorption field. This can damage the septic tank and absorption field. Soil compaction can occur reducing the ability of the soil to absorb the wastewater from the system.

- Do not pour grease, oil, paint or other chemical products down the drain. Do not put non-biodegradable items such as cigarette butts, feminine hygiene products, condoms, disposable diapers or other similar solid waste into the septic tank.

When to Pump the Septic Tank

A properly designed septic tank system will have a septic tank with sufficient volume to accumulate solids for several years. Over time the solids accumulate and begin to fill up the septic tank. If these solids are not periodically pumped out, suspended solid particles may begin to flow into the absorption field. These solids will eventually clog the absorption field and may require the installation of a new absorption field. Newer septic tank systems are required to have an effluent filter located on the outlet of the septic tank. The purpose of this filter is to protect the absorption field by trapping suspended solids. If the septic tank is not pumped out periodically, the effluent filter may become clogged causing wastewater to back up into the house.

A specific determination of when it's time to pump a septic tank can be made by having the depth of the solids and level of scum buildup checked periodically. New septic tanks have an access port over the inlet and outlet tees to facilitate the cleaning of the effluent filter and pumping of the tank. Two factors primarily affect the pumping frequency required. The first factor is the holding capacity of the septic tank. The more people using a system, the faster the solids build up, and the more frequently the tank will have to be pumped. A larger capacity system provides better treatment and requires less pumping. The standard three or four bedroom house has a 1000 gallon septic tank.

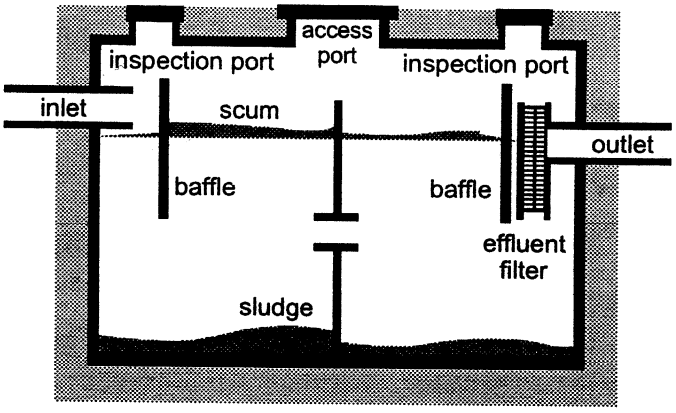
The second factor is the amount of solids in the wastewater. If you have a garbage disposal, you will have to pump out your septic tank more frequently. The use of a garbage disposal may increase the amount of solids in a septic tank by as much as 50%. Pouring grease or other non-biodegradable types of solid waste drown the drain will add to the accumulation of solids. Homes with garbage disposals are required to increase the size of their septic tank by 50%. A three or four bedroom house with a garbage disposal is required to have a 1500 gallon septic tank.

The recommended pumping frequency for pumping out septic tanks can be estimated based on assuming a wastewater retention time of 24 hours and assuming that 50% of the solids are digested by bacterial action in the tank. The following table can be used as a guide for average home water usage without a garbage disposal.

Estimated Septic Tank Pumping Frequency
(year round residences)

Household Size (Number of People)

Tank Size (gal)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1000	12 years	5.9 years	3.7 years	2.6 years	2.0 years	1.7 years	1.2 years	1.0 years	0.8 years	0.7 years
1500	19 years	9.1 years	5.9 years	4.2 years	3.3 years	2.6 years	2.1 years	1.8 years	1.5 years	1.3 years
2000	25 years	12 years	8.0 years	5.9 years	4.5 years	3.7 years	3.1 years	2.6 years	2.2 years	2.3 years
2500	32 years	16 years	10 years	7.5 years	5.9 years	4.8 years	4.0 years	4.0 years	3.0 years	2.6 years



Cross-section of a two-compartment septic tank
Fig. 2

A certified septage removal and disposal contractor must pump the septic tank out. Access to the septic tank shall be through the access ports in the tank or by removal of the tank lids. Holes should not be made into the septic tank. The contractor is required to completely remove the contents of the septic tank. The contractor should check the inlet and outlet tees for damage. Damaged inlet and outlet tees should be replaced. The inlet and outlet tees direct the wastewater to the bottom of the tank and prevent solids from exiting the tank to the absorption field. If an effluent filter is present, the filter shall be cleaned and reinstalled. The excavated soil removed to expose the access ports of the septic tank shall be replaced. The contractor is required to give the homeowner written documentation of the condition of the septic tank and the work performed. Homeowners should keep all maintenance records. Many lending institutions require an existing system evaluation for loan closings, which includes documentation of maintenance performed.

The State Office of Environmental Health does not recommend the use of septic tank additives. Commercial septic tank additives do not eliminate the need for periodic pumping and may be harmful to the absorption field. You should not need biological or chemical additives for successful restart or continuous operation of your septic tank system. You should not wash or disinfect the septic tank after pumping.

Signs of a Malfunctioning Septic Tank System

1. Slow drains or sewage backing up into the house: The cause could be a blockage in the plumbing line to the septic tank, blockage to inlet and outlet tees within the septic tank or a clogged filter if present. If the problem only occurs during rainy weather, the problem could be related to surface water drainage or water standing on top of the absorption field area. If the septic tank system is old, the absorption line may be clogged. If the system has a pump, pump failure could be the cause.
2. Surfacing of septic tank effluent on the ground surface: The cause may be related to a poor soil absorption rate, soil clogging in the absorption line, or water usage. If the problem is noticeable only after rainy weather, the problem could be related to surface water drainage or a high seasonal groundwater table.
3. Smell of sewage odor: The cause of sewage odors may be natural gases that occur in the septic tank that are vented from the plumbing system through the roof of the house. Odors may be noticeable in the area of the vent pipe. Odors near the septic tank could indicate a cracked inlet or outlet plumbing pipe. Odors in the absorption field area could indicate a surfacing of wastewater effluent.

Any repair work performed on an on site sewage management system requires a repair permit from the county health department. The county environmental health specialist can assist homeowners with an evaluation of the system to determine repair options. A certified septic tank contractor should perform any repair work. A list of approved contractors can be obtained from the local county health department or the Environmental Health Section, Georgia Department of Human Resources at 404-657-6534.

ADVANCED SEWAGE TREATMENT SYSTEMS

Not all property in the State of Georgia is suitable for a typical septic tank system. In areas where the soil is not capable of treating domestic wastewater, an advanced sewage treatment system may be utilized as part of an on site sewage management system. Advanced treatment systems facilitate treatment of the wastewater before application to the soil absorption field. Information on advanced treatment systems approved for use may be obtained from the local county health department or the Georgia Department of Human Resources, Environmental Health Section.

Aerobic Treatment Units: Aerobic treatment units are stand alone advanced sewage treatment systems, providing wastewater treatment prior to disposal in the subsurface absorption field. Aerobic treatment units (ATUs) provide aerobic biodegradation or decomposition of wastewater constituents by bringing the wastewater into contact with air mechanically. ATUs come in different configurations and sizes, and

incorporate a variety of approaches, including air pumps, air injectors, lift pumps and biological-contact surfaces.

Bio-Peat Systems: The typical bio-peat system consists of a septic tank, a dosing tank with effluent pump, pretreatment modules containing specialized biofibrous peat, and a soil absorption field. The septic tank wastewater effluent is pumped to and equally distributed through the biofilter modules. As the wastewater effluent passes through the peat a combination of physical, chemical and biological treatment occurs. The wastewater effluent exits the bottom of the modules into the absorption field.

Information on maintaining advanced treatment systems should be obtained from the manufacturer. In some instances a service contract is required.

References

Georgia Department of Human Resources. 2001. "Manual for On Site Sewage Management Systems."Environmental Health Section, Atlanta, Georgia.

National Small Flows Clearinghouse, "The care and feeding of your septic tank system." West Virginia University, Morgantown, West Virginia.

National Small Flows Clearinghouse, "So now you own a septic system." West Virginia University, Morgantown, West Virginia.

U.S. Environmental Protection Agency, 1999. "Septic Tank – Soil Absorption Systems." Office of Water Operations, Washington, District of Columbia.

ON SITE SEWAGE MANAGEMENT SYSTEM
MAINTENANCE RECORD

Location Address:_____

Subdivision Name and Lot/Block: _____

Date	**Contractor and Work Performed**

Observations/Notes:_____

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