



Georgia Department of Public Health Environmental Health

Background and Use of Onsite Wastewater Treatment Systems in Georgia

Background

On-site sewage management systems are designed and used to dispose of domestic sewage, the sewage generated by individual households and small businesses, in land areas where public sewage collection and disposal is not available. Onsite sewage management systems are commonly called individual sewage management systems, septic tank systems or septic tanks.

The typical onsite sewage management system consists of a primary treatment tank and an absorption trench designed to disperse wastewater into the soil for secondary treatment. A two-compartment septic tank with an effluent filter on the outlet provides primary treatment. The septic tank serves as a settling basin for suspended solids and a holding tank to allow for microbial decomposition of organic materials in the wastewater. Secondary treatment is achieved by dispersing wastewater through an absorption field consisting of subsurface absorption trenches filled with a medium to provide structural support, void space and soil surface for additional microbial treatment as the wastewater moves through the soil.

Regulatory Authority

Historically the regulation of onsite sewage management systems was a function of the county boards of health. Legislation adopted in 1997 reconfigured this regulatory framework. The primary change was to centralize the regulatory authority at the state level. The Department of Public Health, the Official Code of Georgia Annotated 31-2-7, was granted authority to adopt statewide rules and regulations for onsite sewage management systems and approve alternative and experimental onsite sewage management systems prior to use in the state.

The county boards of health, under O.C.G.A. 31-3-5, are limited to regulate in six specific areas:

1. Specifying locations where onsite sewage management systems can be used.
2. Specifying minimum lot sizes for onsite sewage management system use.
3. Specifying the types of residences, facilities and buildings that may be served by onsite sewage management systems.
4. Issuing permits for the installation of systems.
5. Inspecting systems upon the completion of installation.
6. Provide for the ongoing maintenance of such systems, except for non-mechanical residential sewage management systems.

Although permitting and enforcement are carried out through the county board of health, the regulations for the permitting and use of such systems are assigned to the Department of Public Health.

Longevity of Sewage Management Systems

Until recently, onsite sewage management systems were considered an interim means of providing sewage disposal and not a permanent part of the wastewater disposal infrastructure. The United States Environmental Protection Agency (USEPA) estimates 25% of the U.S. homes and 40% of new home development are served by onsite sewage management systems. In Georgia, there are approximately 1.5 million onsite sewage management systems. Many of these onsite systems are over 30 years old. Since onsite sewage management systems are being utilized as a long-term means of providing sewage disposal, these systems should be required to meet the same public health and environmental goals as public central sewer in a community water plan.

The longevity of the typical septic tank system depends on a number of factors. Factors affecting short-term system performance are the soil conditions on the site and the installation practices. A critical factor is the ability of the surrounding soil to accept and treat the additional hydraulic load from the system, in addition to precipitation, and dispose of the wastewater without creating a health hazard. Soil conditions vary widely in their suitability for sewage disposal system use, and the size and location of systems are based on soil suitability. The size of the onsite sewage management systems should be sufficient to provide an infrastructure to achieve long-term system performance. The Department Rules and Regulations for Onsite Sewage Management Systems, Chapter 290-5-26, establish system permitting and inspection requirements.

Long-term system performance depends on the volume and pattern of use, the size of the system, the development rate of the biomat and system maintenance. The consensus of research is that onsite sewage management systems progressively fail over time. As wastewater from the home enters the septic tank, effluent is displaced from the septic tank and enters the absorption trench. The effluent disperses across the trench bottom as it is absorbed into the soil surface. Over time suspended solids and bacteria develop at the trench bottom soil interface creating a biomat. The biomat develops progressively along the trench bottom and up the trench sidewall. As the biomat develops, the effluent dispersal into the soil slows down. When the rate of wastewater generated by the home is greater than the dispersal rate to the soil, a failure occurs through a wastewater backup into the home or a surface discharge of effluent. With proper use and maintenance a typical septic tank system is designed to last 20 or more years.

Best Management Practices

The management of onsite sewage management systems must consist of a comprehensive set of procedures and practices that include the planning, siting, design, installation, operation, maintenance and monitoring of each system. The Department's Manual for Onsite Sewage Management Systems establishes site suitability parameters, design criteria, installation and operational requirements for onsite sewage management systems.

The planning, monitoring, and maintenance of on-site sewage management systems are delegated to the local county board of health and local governing authority. The first step of a management plan is to develop a means for system inventory. Local county health departments typically maintain paper records of system installations within their county. There is a need for a statewide computerized database of septic tank system installations, locations, repairs and maintenance information. Most county health departments have recently adopted the state wide database and tracking system which assists the state and county in cataloging these systems and is instrumental in determining future septic needs and provide a means of tracking system performance and maintenance.

Planning

Planning should include establishing which areas within the county can be served by on-site sewage management systems and minimum lot sizes based on soil suitability for such systems. Department regulations establish soil suitability parameters for on-site sewage disposal. Land areas with generally suitable soils and site conditions with low environmental sensitivity may be served by conventional septic tank systems. Local county boards of health and local county governments should evaluate the soil conditions within their county as part of land use planning to determine which areas are conducive to development with on-site sewage disposal.

The local county board of health is required to adopt minimum lot sizes where onsite sewage management systems are used. The Department minimum lot size recommendations for typical three and four bedroom single family residential housing is ½ acre with public water and 1 acre with individual well water supply. Larger square foot homes, homes with additional amenities such as circular drives, pools and out buildings will require larger lot sizes. Lots with marginally suitable soil conditions may also require a large lot size to minimize environmental impact. Based on Department regulations, each lot shall have sufficient land area with suitable soil conditions for the installation and complete replacement of the on-site sewage management system.

Land areas within a county may have limiting soil conditions, such as slow permeability, shallow soils with limited treatment capability or high groundwater. If these conditions exist and are subject to development with on-site sewage disposal, an advanced treatment system is often necessary. Advanced treatment systems are performance based mechanical systems develop to provide a greater degree of primary treatment from that achieved through a conventional septic tank. The advanced treatment system improves the wastewater quality prior to discharge to the soil. These types of systems are approved based on the system's ability to meet certain performance parameters. Land areas with an environmentally sensitive receiving environment, such as a watershed of a municipal drinking water reservoir or other protected groundwater or surface waters of the state, may require site specific system performance requirements and larger lot sizes. In order to ensure advanced treatment system performance, system maintenance and monitoring are essential.

Central on-site sewage treatment is an option being considered by developers. The wastewater from several houses or buildings is collected and treated through a single on-

site sewage management system. These types of systems are typically regulated through the Department of Natural Resources, Environmental Protection Division.

Maintenance

The level of maintenance required is subject to the complexity of the on-site sewage management system proposed and the environmental sensitivity of the receiving environment. New technology continues to be developed to overcome site limitations. Under current regulation, the responsibility for system maintenance is delegated to the homeowner. Legislation prohibits county health departments from mandating maintenance for conventional septic tank systems serving residential housing. For these systems, homeowner education is the key to long-term system performance. The Department has developed educational material for distribution to homeowners, including a new DVD on the care and use of a septic tank system.

The typical maintenance required for a conventional septic tank system is the periodic pumping of the septic tank to remove the accumulation of settled solids, which reduces the effectiveness of solids decomposition due to a decrease in retention time. Pumping should be done every three to five years but may vary due to household usage. The number of bedrooms of the home and the expected peak daily use determines the size of the septic tank. Average size three and four bedroom homes require a 1000 gallon septic tank. Larger homes and homes provided with a garbage disposal should increase the size of their septic tank to provide greater retention time. A minimum 1500 gallon septic tank is required for three and four bedroom homes with a garbage disposal.

Advanced treatment systems designed to overcome site limitations require a higher degree of monitoring and maintenance. The long-term success of these systems depends on consistent maintenance of the system. Improperly performing systems will lead to a failing system and cause surface and groundwater pollution. The homeowner should be required to obtain a maintenance contract with yearly monitoring when these types of systems are used.

For any onsite sewage management system, system maintenance is essential for long-term performance. This maintenance is primarily the removal of accumulated solids, called septage, from the primary treatment tank. Many wastewater treatment plants are refusing to accept septic tank waste for final disposal. Local county governments need to address septage disposal as a part of a community wastewater management plan.

Summary

On-site sewage management systems can be an economical and environmentally safe alternative for sewage disposal if; the soil conditions are suitable; the system is properly designed and installed; and the system is properly used and maintained. Local county boards of health and local county governments need to establish which areas within the county are suitable for on-site sewage disposal based on soil conditions and the sensitivity of the receiving environment. The county board of health must establish lot sizes sufficient for an adequately sized onsite sewage management system and the complete replacement of the system. A database to track system installations and maintenance is needed at the state and county level. County boards of health and local

county governments must address system maintenance to achieve long-term system performance.

For additional information visit the Georgia Department of Public Health's Website:
dph.georgia.gov/environmental-health/onsite-sewage