

Drainfield Rehabilitation

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The septic system, once thought of as a temporary solution for the treatment of domestic wastewater, is still the best choice for homes or residences and small communities where it would be cost-prohibitive to access public sewer systems. In the U.S., these onsite systems collect, treat, and release about four billion gallons of wastewater per day from an estimated 26 million homes.

Current interest in the impact of these systems on groundwater and surface water quality has increased interest in optimizing the systems' performance. It is now accepted that these onsite systems are not just temporary installations that will eventually be replaced by centralized sewers, but are a permanent part of the wastewater infrastructure.

Septic systems are typically simple in design, which makes them generally less expensive to install and maintain. And by using natural processes to treat the wastewater onsite, usually in a homeowner's backyard, septic systems don't require the installation of miles of sewer lines, making them less expensive and less disruptive to the environment. In addition, there are many innovative designs for septic systems that allow them to be placed in areas with shallow soils or other site-related conditions previously considered to be unsuitable for onsite treatment and dispersal.

Although the septic tank settles out most of the heavier solids and breaks down almost half of the suspended solids from household wastewater, the effluent still has a high amount of biodegradable organic materials, along with a high bacterial content that may include pathogens. Therefore, septic tank effluent is not suitable for direct discharge into surface waters or onto

land surfaces. Further treatment is needed to remove these harmful pathogens. The most common way to do this and dispose of the partially treated wastewater is through subsurface soil absorption through the drainfield.

Septic systems were never intended for lifetime use without maintenance. Neglecting maintenance of system components only leads to failures. When properly designed, installed, and maintained, septic systems have a minimum life expectancy of 20 to 30 years.


The U.S. Environmental Protection Agency (EPA) *Onsite Wastewater Treatment Systems Manual* (2002) defines system failure as "a condition where performance requirements are not met." Typically, failures are declared when wastewater is observed on the surface of the ground or is backing up into the household plumbing.

When a septic system fails, it can pollute nearby water resources and endanger public health. Children are

most susceptible to these health problems because they very often come into contact with the contaminated areas. There's really not all that much that is going to go wrong with the septic tank itself as long as it is watertight and pumped on a regular basis. However, what usually fails is the soil absorption system.

The soil absorption system, or drainfield, is an arrangement of perforated pipes or chambers buried underground that channel the pre-treated wastewater—the liquid discharge (effluent) from the septic tank—out over a large area of the soil. The effluent then moves slowly down through the soil to become naturally purified before returning to the aquifer. The drainfield acts as a natural filter for effluent by absorbing the organic materials, reducing or removing bacteria and viruses, and removing some nutrients.

The most obvious sign of drainfield failure is surfacing effluent. If the soils can no longer accept the effluent being delivered, the effluent will either



Below and above right: Repairing a failed septic system may require constructing a new drainfield.