

Many factors contribute to drainfield malfunction. In many instances, the factors affecting drainfield system performance are independent of the drainfield media installed at the site, so it is critically important to be able to differentiate between a media-related and non-media-related malfunction. Use these guidelines to assist in troubleshooting your next malfunctioning system.

INVESTIGATION PARTICIPANTS, ROLES, AND RESPONSIBILITIES

Regulator	May need to approve the remedy for the site; may be required because system is subject to a notice of violation.
Owner/occupant	Provides essential information on water use habits (e.g., laundry, in-home day care), access for plumbing inspection (e.g., leaky fixtures, non-wastewater discharges), input on problems, and number of occupants in home.
Pumper	Measures scum and sludge and pumps the tank, d-box and drainfield.
Installer	Excavates the d-box and drainfield media, and possibly leaking parts of the tank, piping connections, or risers.
Soil scientist Engineer/designer	Investigates the soil texture and limiting conditions (e.g., depth to water table, bedrock, etc.) for consistency with the design; assists with solution.

DRAINFIELD MALFUNCTION INVESTIGATION BASIC PRINCIPLES

Owner usage habits	Understand system use by speaking with the owner. The owner use often causes malfunction, such as in-home daycare operation, devoting a single day for laundry, and living with leaking fixtures.
System design	Check the design calculations and effluent loading rate to verify accuracy and consistency with the built system.
Plumbing	Leaky plumbing fixtures can be identified by having the owner turn off all fixtures and inspecting the tank inlet for continued flow.
System siting	If located at a topographic low point, within a zone where roof stormwater runoff, or vertically coincident with seasonally standing water, the hydraulic performance of the drainfield may be compromised.
Vegetation	Deep-rooted vegetation or vegetation with an affinity for water may be indicators of root intrusion. Stressed vegetation at the ground surface may indicate saturated soil or shallow groundwater.
Tank inspection	Excessive scum and sludge decrease effluent storage volume, reducing hydraulic residence time. Sludge can block flow through inlet and outlet tees. A leaky tank can allow groundwater to flow into and overload the system.
Distribution box inspection	Excessive solids indicate the septic tank is not adequately separating solids and liquid, sending solids to drainfield. Mis-alignment can change outlet pipe invert elevations, under- or over-loading trenches.
Drainfield inspection	Solids in the drainfield media reduce hydraulic capacity by clogging the soil pore matrix. Excavate the biomat/soil interface and inspect the contact and underlying soil for staining and discoloration (grey to black). If not discolored, the soil pore matrix may be clogged. Check that the drainfield media has not collapsed due to excessive load. Compare the soil texture from the soil characterization with the texture determined in the field to verify proper system size.

DRAINFIELD MALFUNCTION REMEDIES

The best remedy for the site typically begins by considering some combination of site-specific conditions, type of drainfield media, homeowner usage habits, and other key factors. Note that remedies must adhere to any state and local regulatory requirements.

Improper siting	Relocate to a higher topographic position or elevate the system. Do not collocate the drainfield with surface water discharge and infiltration, such as roof drains, basement sump pump discharge, the lawn sprinkler system, and overland precipitation flow.
Clogged infiltrative surface	If clogging resulted from solids, grease, oil, or similar substances, affected areas may not be repairable and may require replacement or expansion. Avoid the discharge of deleterious substances, such as petrochemicals, harsh cleaners, poisons, and grease.
Incorrect soil characterization	Expanding the system to account for the actual site soil texture will allow for adequate capacity for effluent dispersal and treatment.
Malfunctioning septic tank	Pump the tank regularly, repair sources of leaking groundwater, and keep the effluent filter clean to allow for discharge to the drainfield. Verify that the piping and distribution box systems allow evenly distributed flow into the tank and drainfield.
Hydraulic overload	Repair leaky plumbing fixtures. Coach owners to alter water use habits, such that they spread wastewater discharges over time. Separate sump pump and water softener back wash discharges from the onsite wastewater treatment system. Repair or replace a leaky septic tank. Re-align d-boxes to balance flow to trenches.
Old system/excessive biomat	Remediate the drainfield through the installation of an aerobic bacterial generator to reduce biomat accumulation and allow the hydraulic capacity of the system to be restored.