

Overview of Onsite Sewage Treatment and Disposal Systems

Bureau of Environmental Health

Division of Disease Control and Health Protection

Florida Department of Health

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What is an OSTDS?



- Onsite sewage treatment and disposal system
- Includes septic systems (septic tank and drainfield) but also includes systems capable of greater treatment

Septic Systems and “Advanced” Systems

Septic tanks provides basic treatment

- Removal of solids and fats, oils and greases

“Advanced” systems provide greater treatment

- Removal of degradable organic material
- Removal of nutrients

EPA/625/R-00/008
February 2002

Onsite Wastewater Treatment Systems Manual

Office of Water
Office of Research and Development
U.S. Environmental Protection Agency

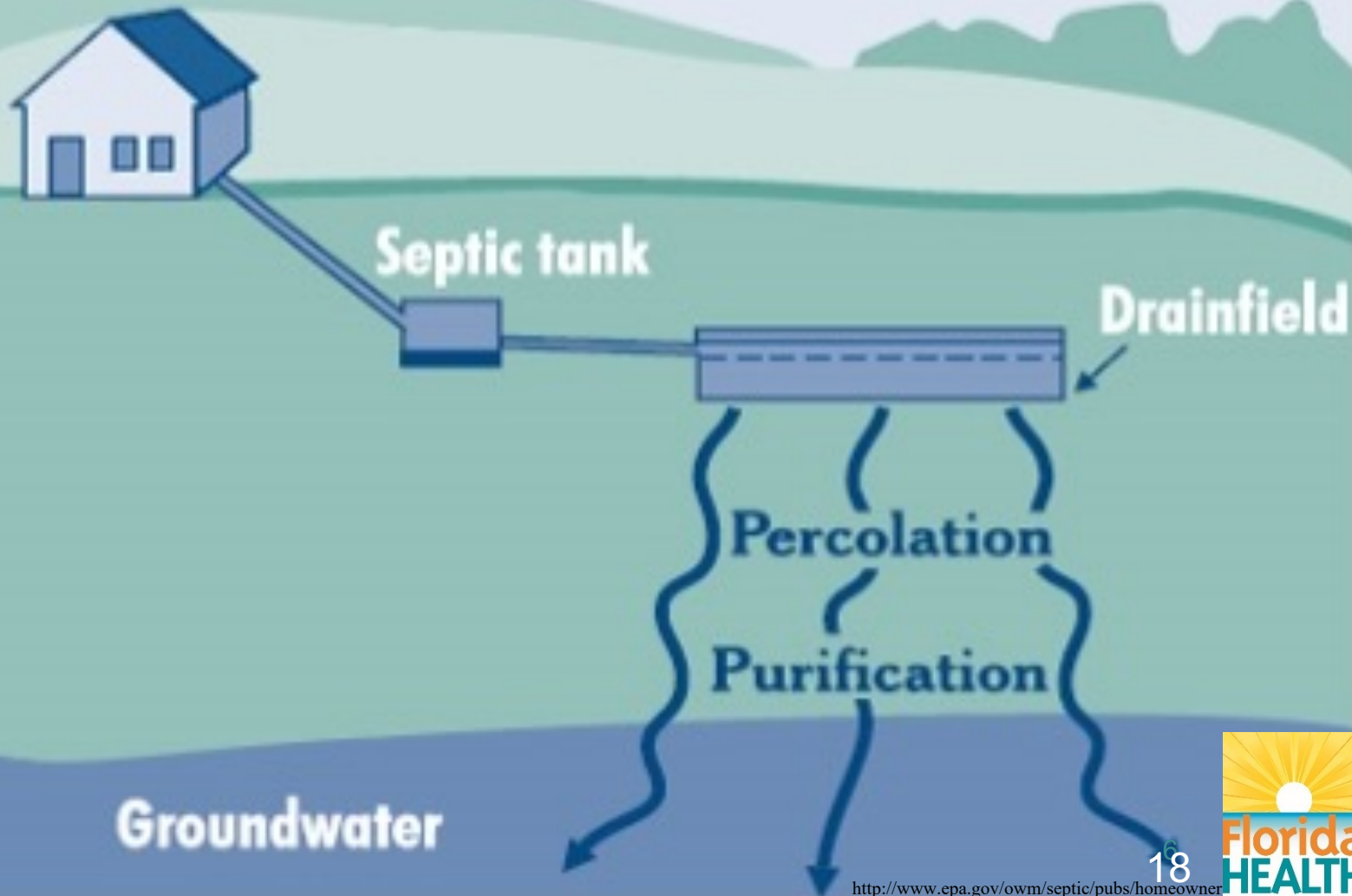
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- OSTDS are recognized as low-cost and long-term approaches to wastewater treatment
- Are effective and protective when properly designed, installed, operated, and maintained

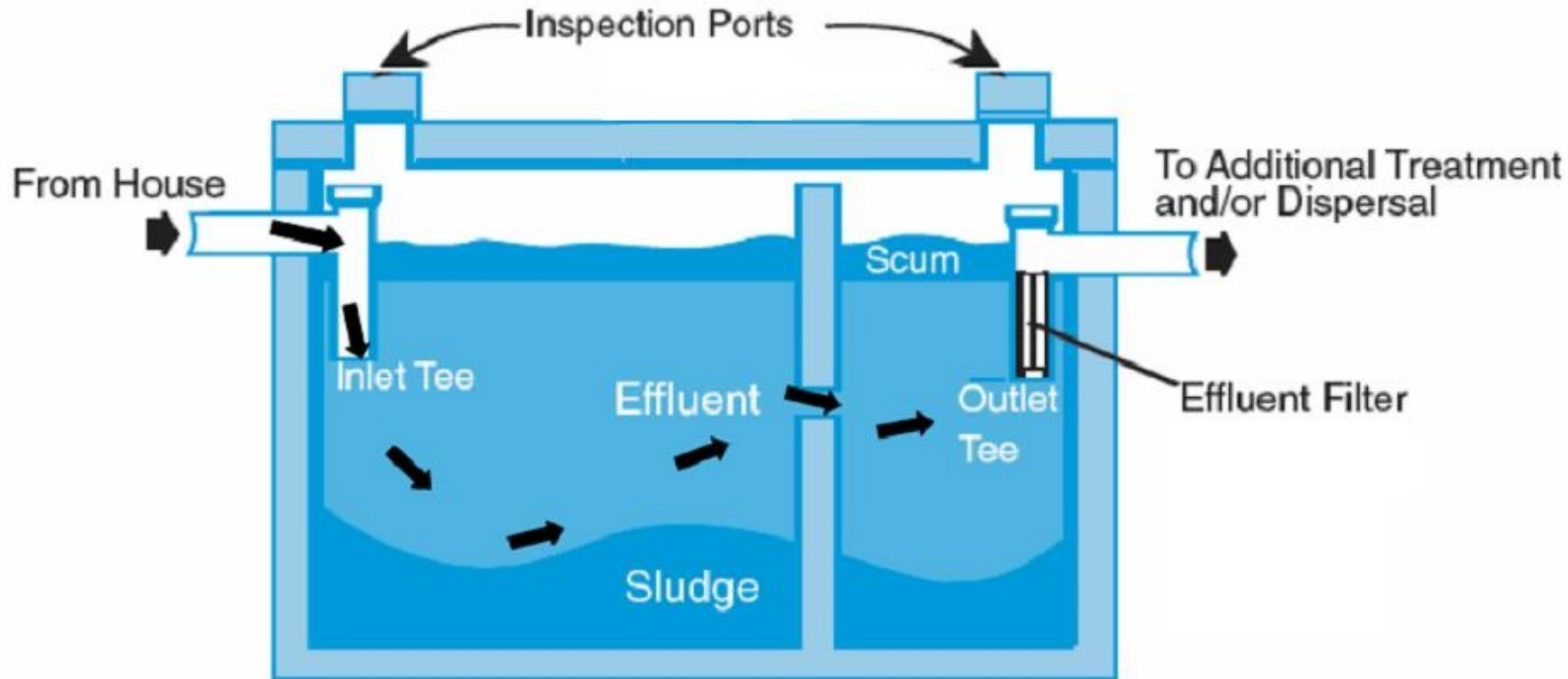
Modern OSTDS in Florida protect Public Health and the Environment

- About 2.4 million OSTDS serve a third of the state
- OSTDS are effective alternative to central sewer
 - Less environmentally disruptive in some areas
 - Less than 40% of OSTDS in environmentally sensitive areas
- Construction standards and setback distances protective
 - Primarily protect public from waterborne illness
 - More than 90% of drinking water in FL comes from groundwater
 - The drainfield further breaks down viruses/pathogens from septic tank; can reduce nitrogen by 10-50%
- Florida can and does establish policies for additional protection of sensitive environmental areas

Septic Tank and Drainfield (A Conventional OSTDS)



How Do Septic Tanks Work?



Multi-compartment Septic Tank

- Modern septic tanks are water tight
- Collect solids and consume a third to half of biodegradable material (carbonaceous biochemical oxygen demand after 5 days[CBOD5])

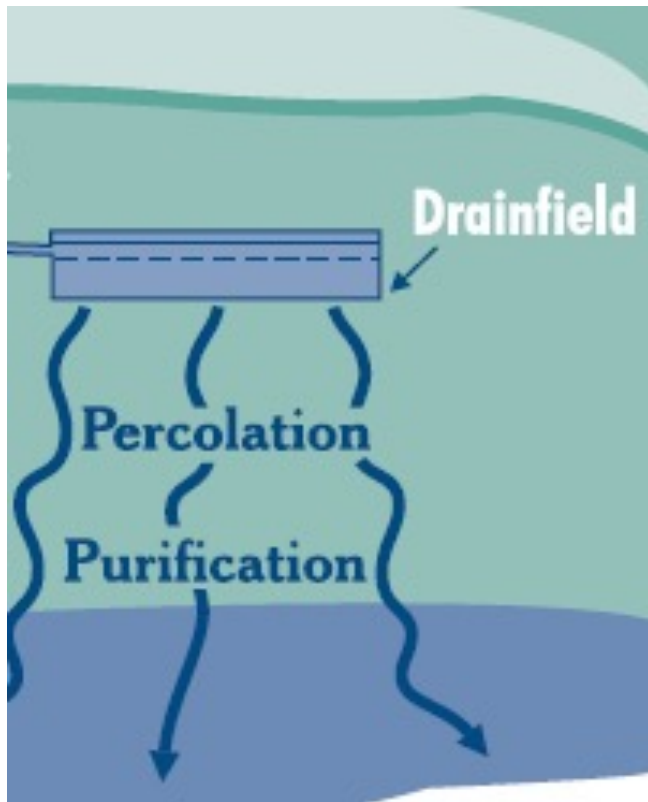
How Does a Drainfield Work?

- Liquid that comes from septic tank drains into soil
- Soil/Air/Water combination:
 - Removes/filters pathogens, suspended solids in the area above groundwater
 - Converts ammonia to nitrate (removes 10-50% of nitrogen)



Modern Drainfield Design Protects the Environment

Separation to wet season water table important for treatment



6 inch between top of drainfield and ground surface

Drainfield thickness (12 inch for gravel)

2 feet between bottom of drainfield and wet season water table required to provide air and soil treatment

Mound As Alternative Drainfield

A system can be elevated (Mound system) to protect environment

- Wet season water table too high
- Prohibited soils (e.g., rock) exist

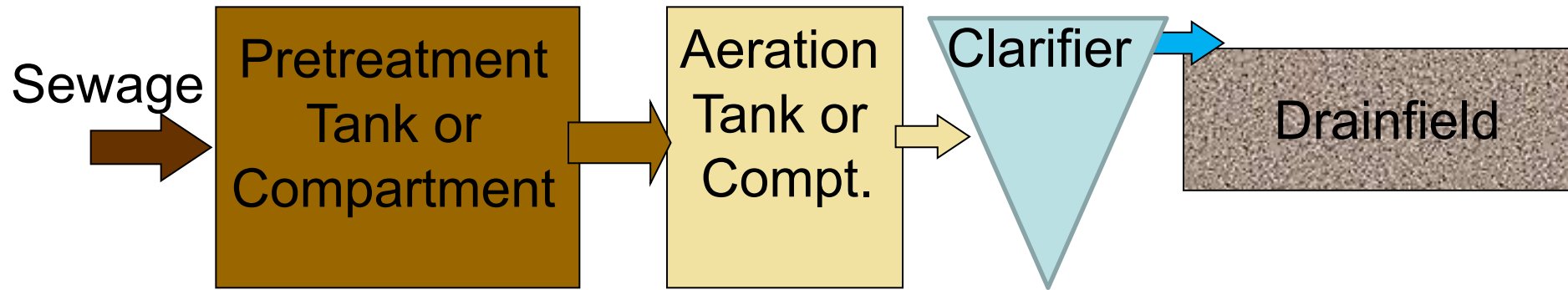


Options for Nutrient Reduction

To limit OSTDS-contribution of nutrients (in general or for specific areas)

- Lower the number of OSTDS
 - Sewer
 - County ordinances (lot size, setback)
 - Existing statute density-limitations
(Sections 381.0065(4)(a)-(g), Florida Statutes)
- Require higher treatment by OSTDS

Aerobic Treatment Unit (ATU)



ATU certification based on certain performance standard

All ATUs certified to meet standard NSF 40; some are also certified to meet a 50% nitrogen-reduction standard (NSF 245)

Performance-Based Treatment System (PBTS)

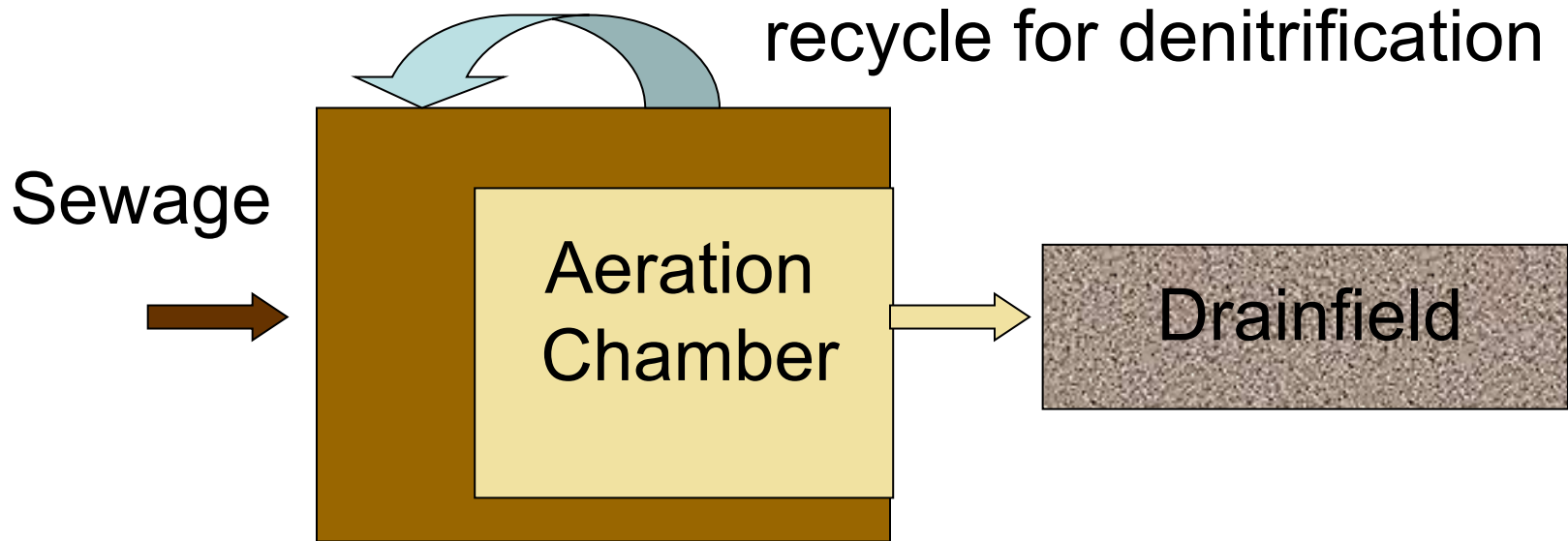
Specialized onsite sewage treatment and disposal system

In many cases, includes an ATU

Designed and certified by professional engineer to achieve specific and measurable established *performance standards* for:

- Carbonaceous biochemical oxygen demand,
- Total suspended solids,
- Total nitrogen,
- Total phosphorus,
- Fecal coliforms

PBTS Based on Nitrogen-Reducing ATU



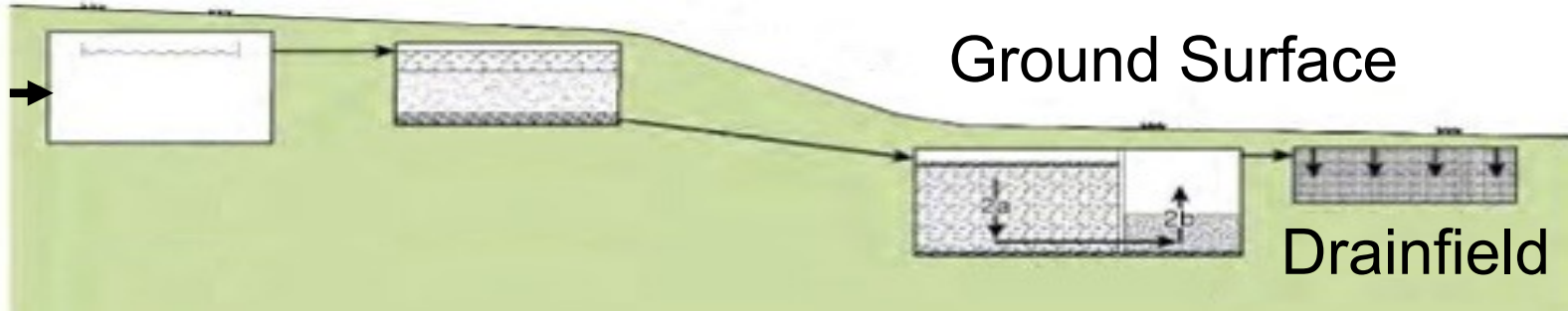
- One example of a nitrogen-reducing ATU
- Field evaluations show about 50% nitrogen reduction
- More complex technologies with higher treatment effectiveness are becoming available

Two-Stage Nitrogen Reduction Process Example

In-tank Nitrogen Reduction Biofilter - PBTS

Wastewater

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Septic Tank
Pretreatment

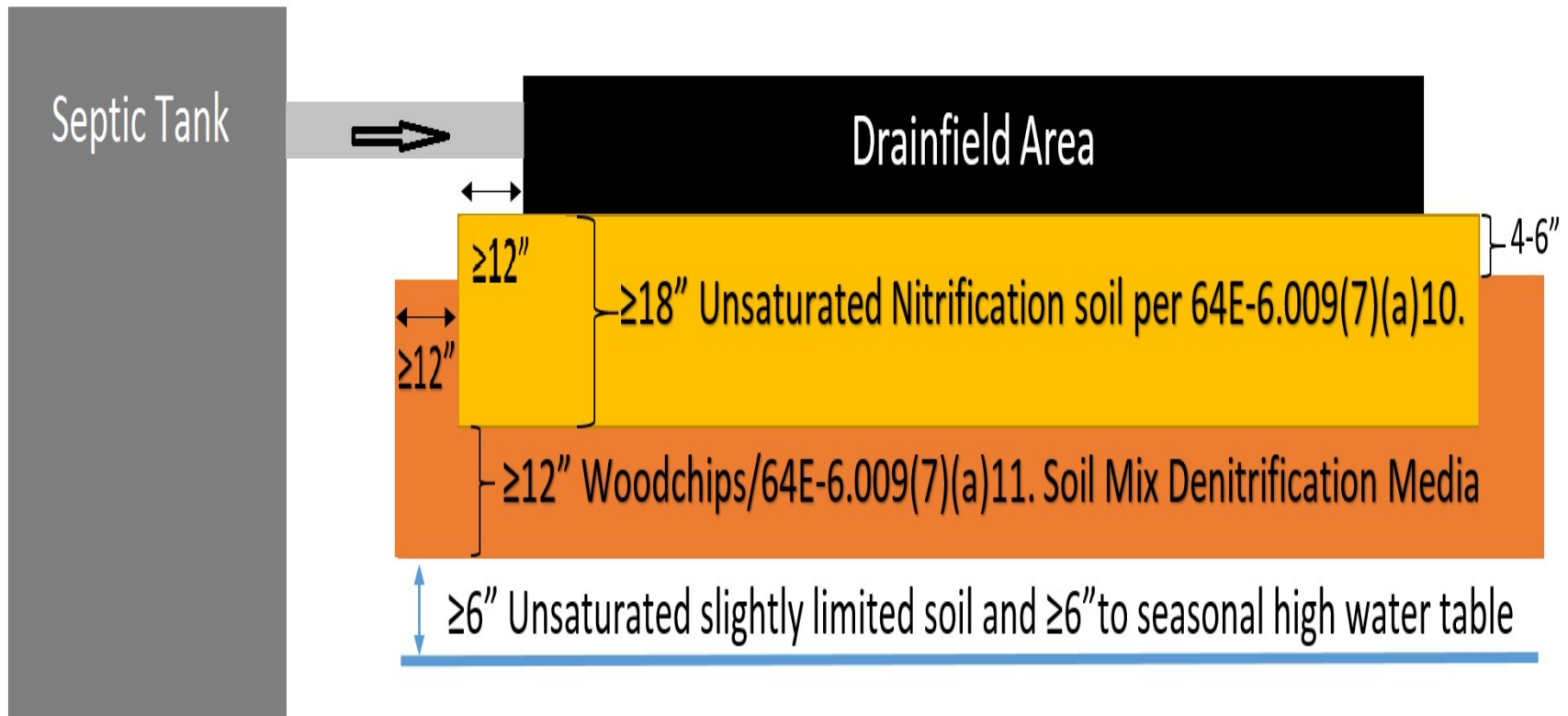
Stage 1 Biofilter
Nitrification

Stage 2 Biofilter
Denitrification

Drainfield

Note: In flat landscapes may need a single pump.

In-ground Nitrogen-Reducing Biofilter



A nitrate-reducing layer below drainfield; material reacts with nitrate

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