



NAWWT

National Association of Wastewater Technicians

Choosing the Right Technology

MATCHING SITES & SYSTEMS

The Variables

RULES

- ▶ Flow
 - ▶ Volume
 - ▶ Strength
- ▶ Soils
- ▶ Available area

Technology:
Who
What
Care

Issues for System Application

- ▶ Users
- ▶ The Site

Users

- ▶ High strength
- ▶ Hard to treat
- ▶ Peak flows



The Site

- ▶ The Soils
 - ▶ Saturated
 - ▶ Rock
 - ▶ Restrictions
- ▶ The Neighborhood
- ▶ The Density



Tough Neighborhoods

- ❑ High Density
- ❑ Shallow Aquifers/ Unconfined Aquifers
- ❑ Groundwater Recharge Areas
- ❑ Fresh water
- ❑ Salt water



EPA Water Quality Programs

7

- ❑ Onsite Wastewater Treatment Systems
 - ❑ Non-point source of pollution
- ❑ Total Maximum Daily Loads {TMDL}
- ❑ Coastal Zone Management Program



High Density

□ Lot Sizes

□ Low risk +2 sites

□ Medium risk 1 site

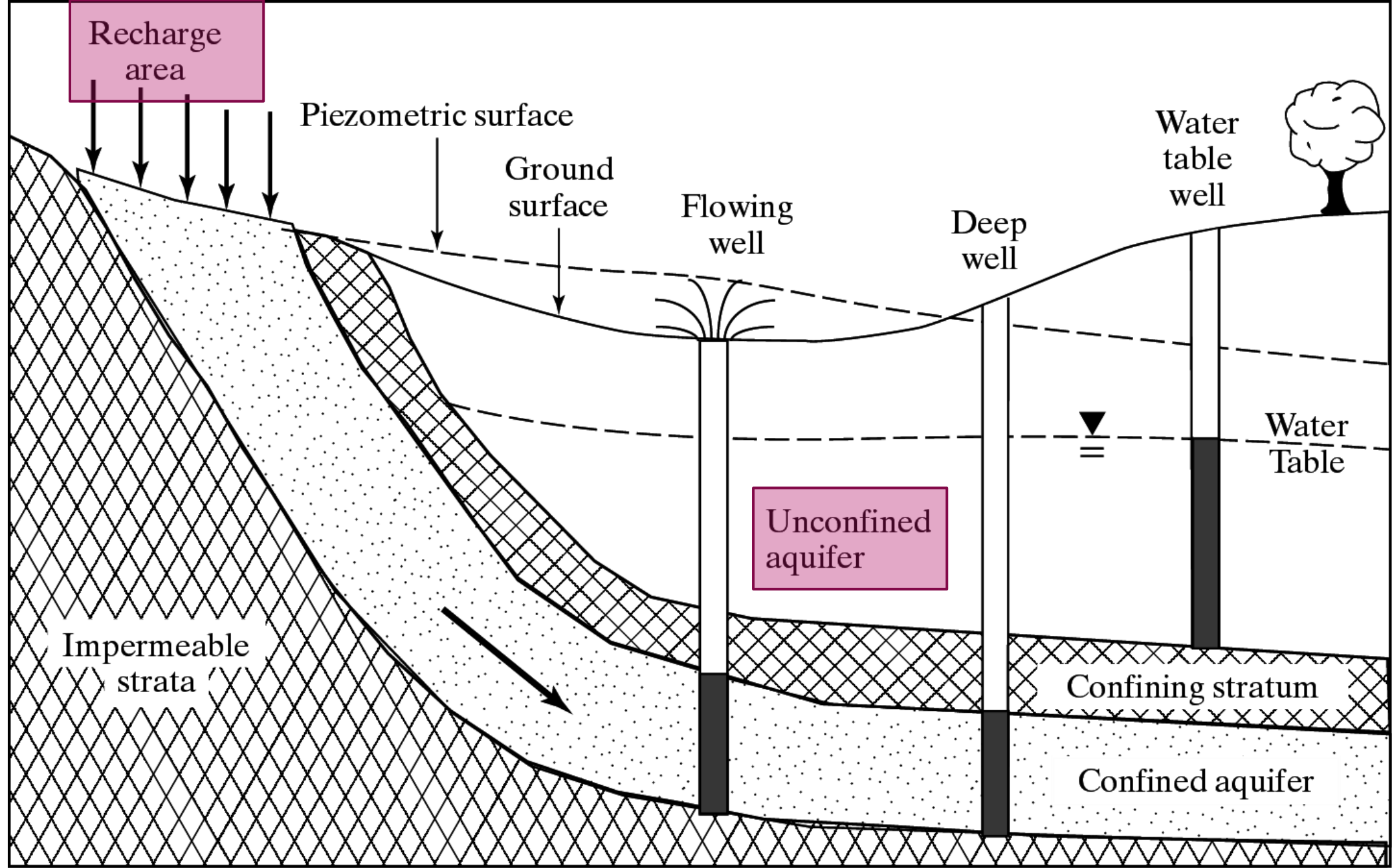
□ High risk < 1 site

□ Increased Nitrogen loading

□ Potential cross connections

Ground water

- ❑ Shallow aquifers
- ❑ Unconfined aquifers
- ❑ Increased Nitrogen loading



Surface water

▶ Freshwater

- Increased Phosphorus loading
- Increased organic loading



▶ Saltwater

- ▶ Nitrogen [TMDL]



The Technologies

- ▶ Conventional
- ▶ Additional treatment
 - ▶ ATU [MBR]
 - ▶ RBC
 - ▶ Media filters
 - ▶ Wetlands
- ▶ Gray water Technologies

Legacy Systems

Cluster technology

System Management

- ▶ People choose easy and Easy creates problems
- ▶ Without **Care** technology is a Problem
- ▶ Without **Oversight** Care does not happen
- ▶ Without sampling **Performance** is ?

Operating Permits

System Care

- ▶ Complete system O&M
 - ▶ Flow
 - ▶ Thoughtful standards related to RISK
- ▶ Effective Solids Management

System Oversight

- ▶ Funding sources to update Systems
- ▶ Effective management program
- ▶ System performance reporting
 - ▶ All Systems
 - ▶ For the life of the System

System Performance

- ▶ Tracking performance
- ▶ Effective enforcement

Effective Funding

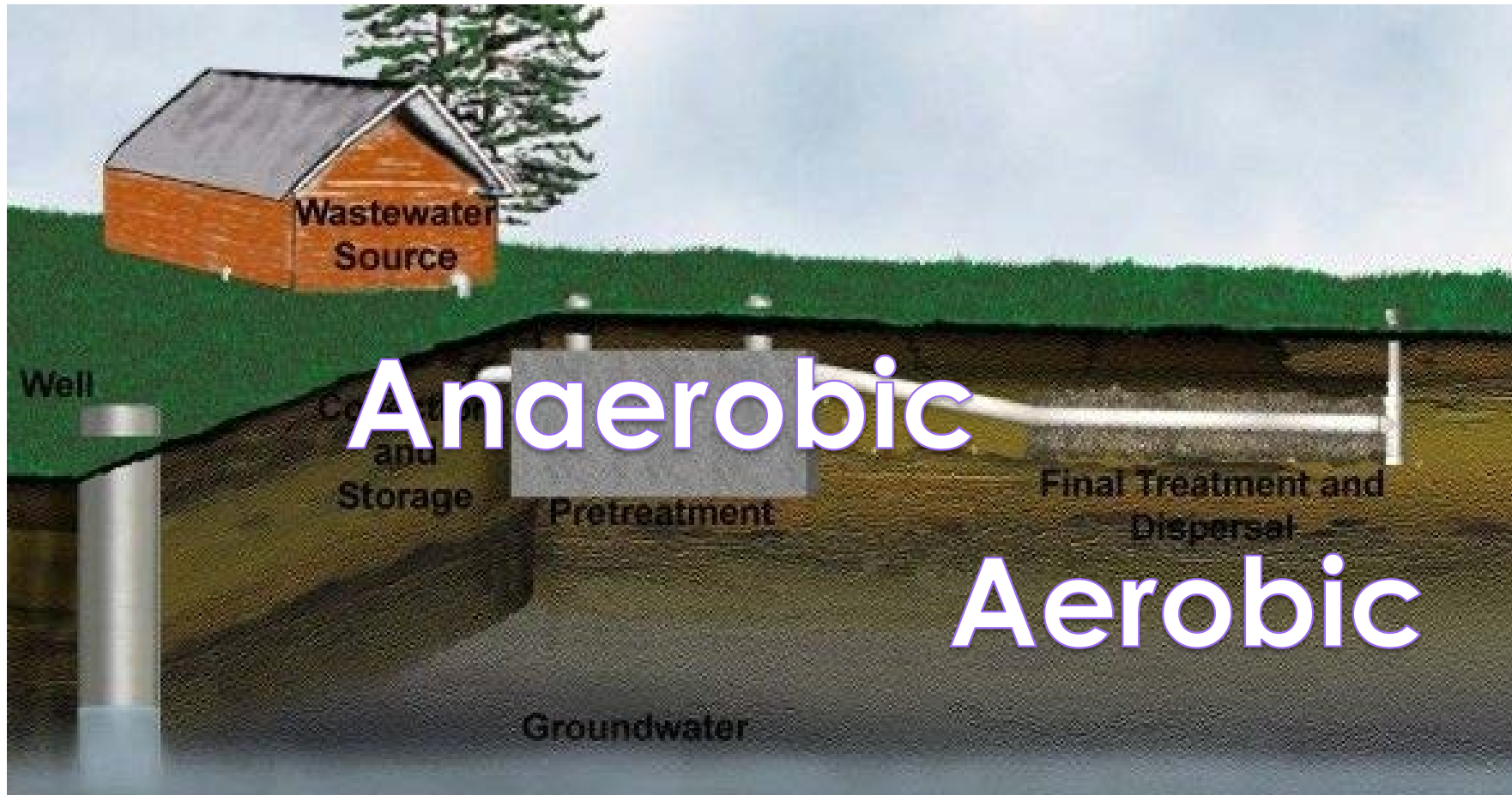
Management Business Development

Legacy Systems

- ▶ Obsolete Systems
- ▶ What is in the ground but Not RIGHT



Conventional Systems



Making them work

- ▶ Normal waste
- ▶ Watertight tanks
- ▶ Required Area & Separation
- ▶ Management:
 - ▶ Tank access & cleaning

Soil Treatment Areas



Where they FIT

▶ Strengths

▶ Low Power

▶ Weaknesses

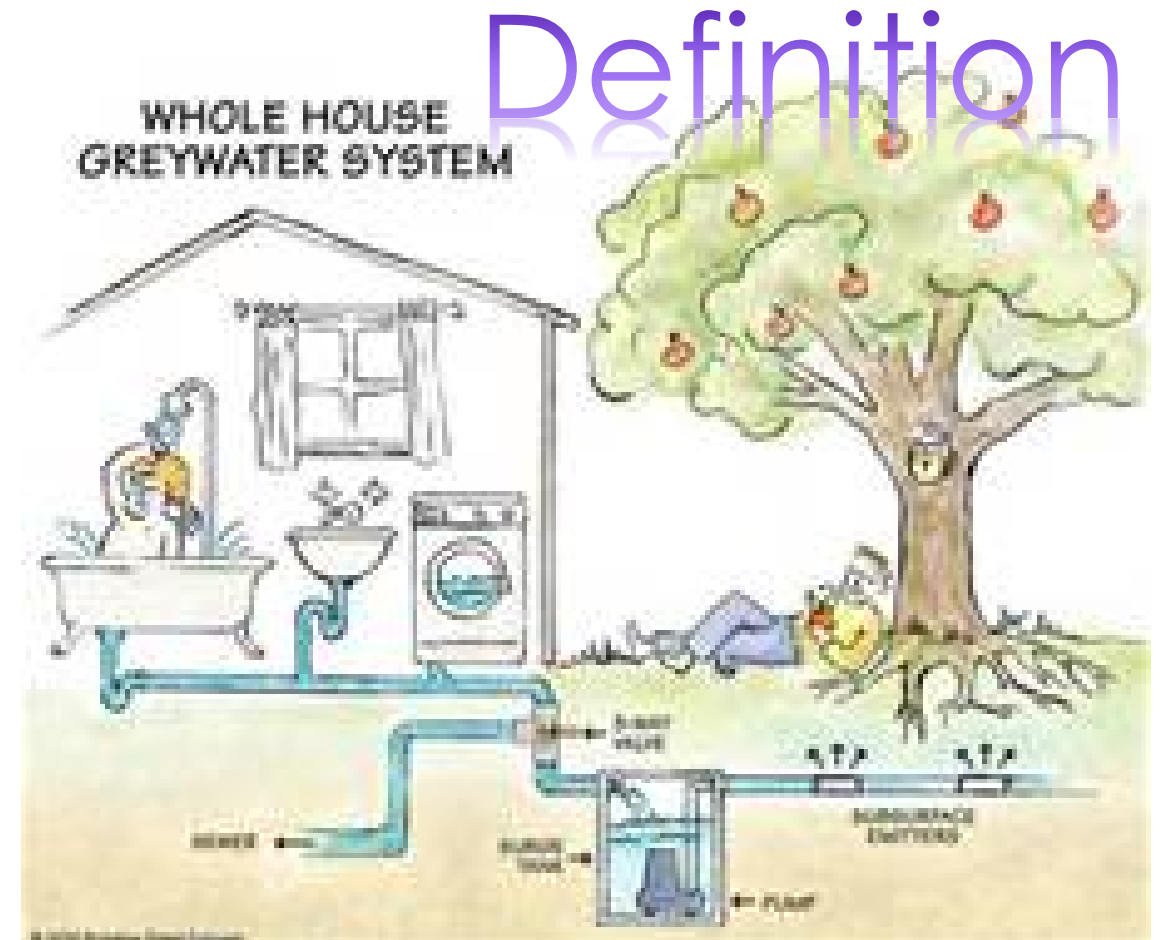
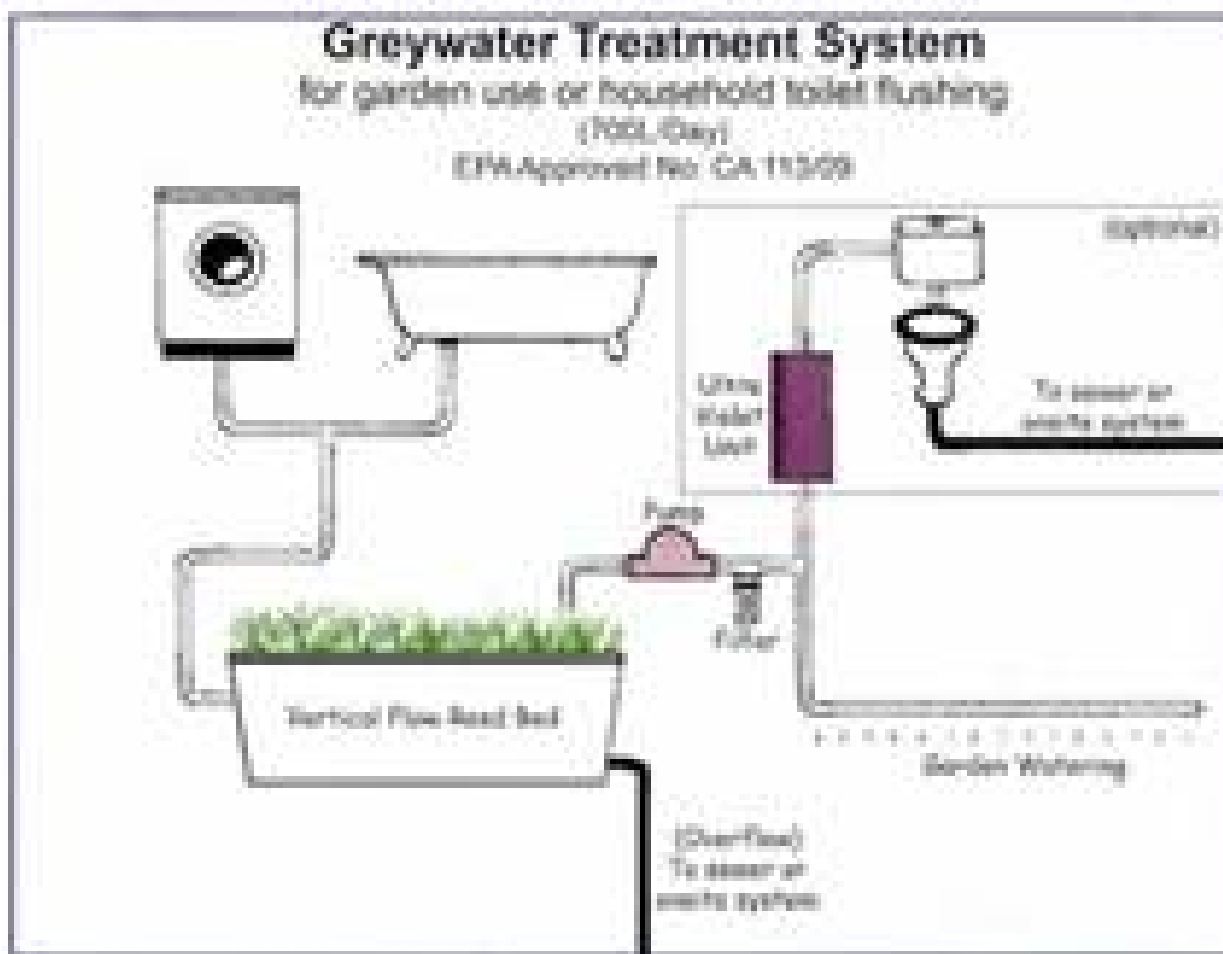
▶ Tough waste

▶ Nutrients

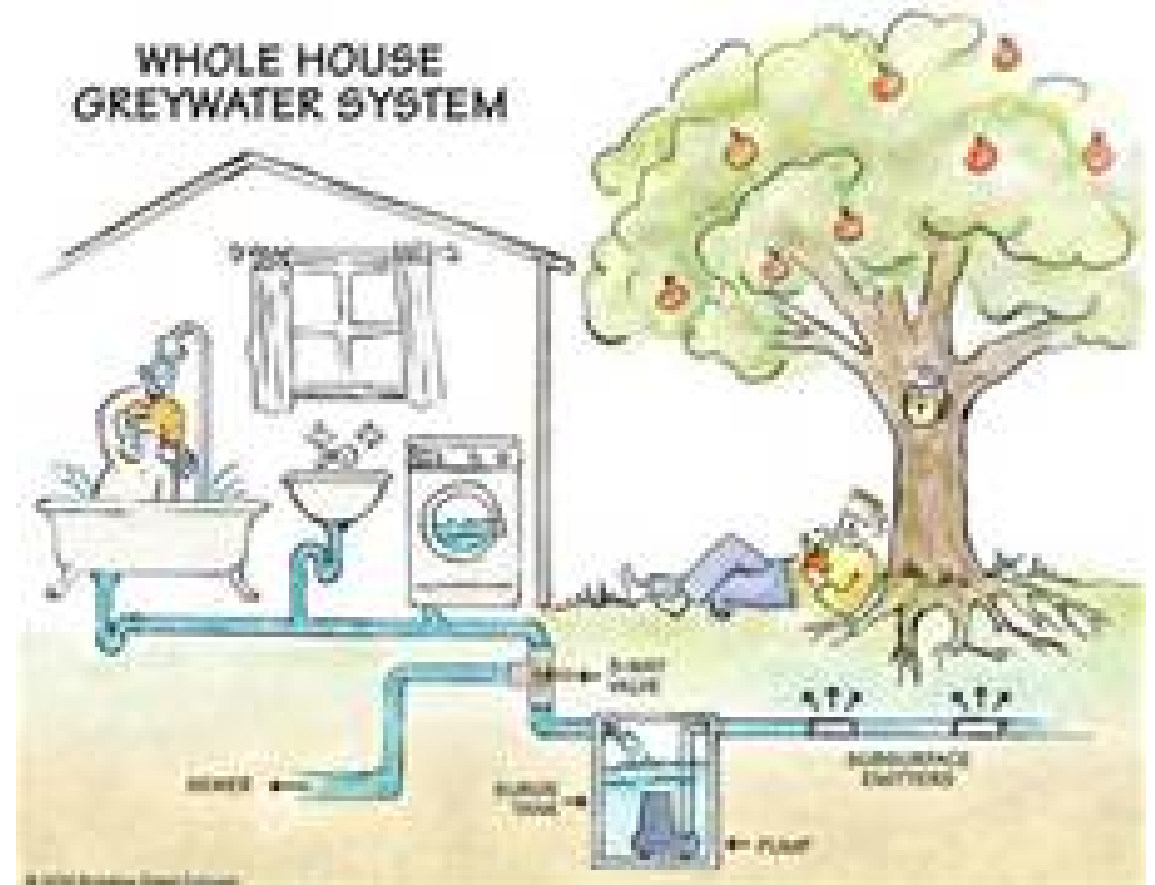
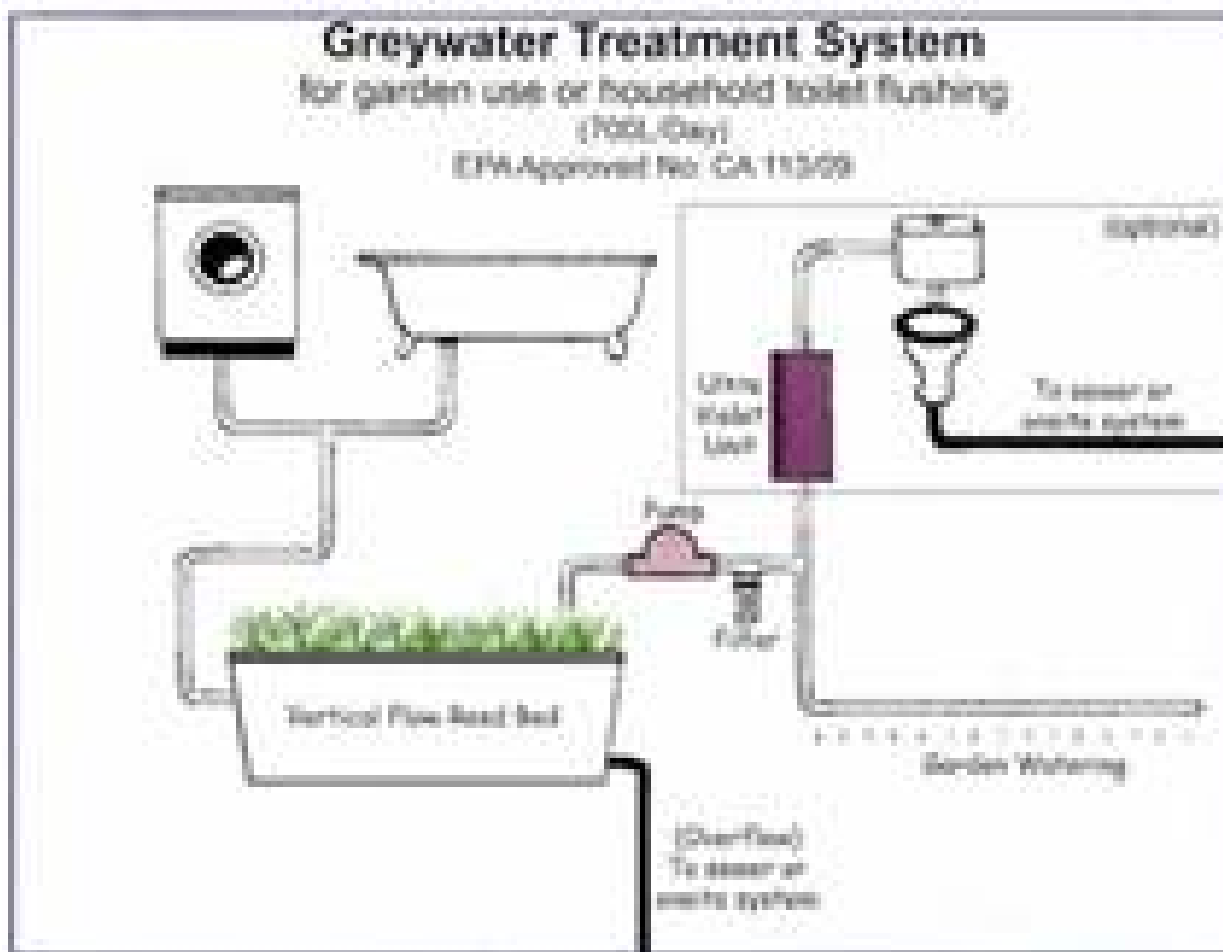
▶ Size & Soil

Graywater Technology

"Shower to Flower"



Graywater Technology



Where they FIT

▶ Strengths

▶ Reuse

▶ Sustainability

▶ Weaknesses

▶ Unclear definitions

▶ Current Science

▶ RISK

Additional treatment

▶ Concerns

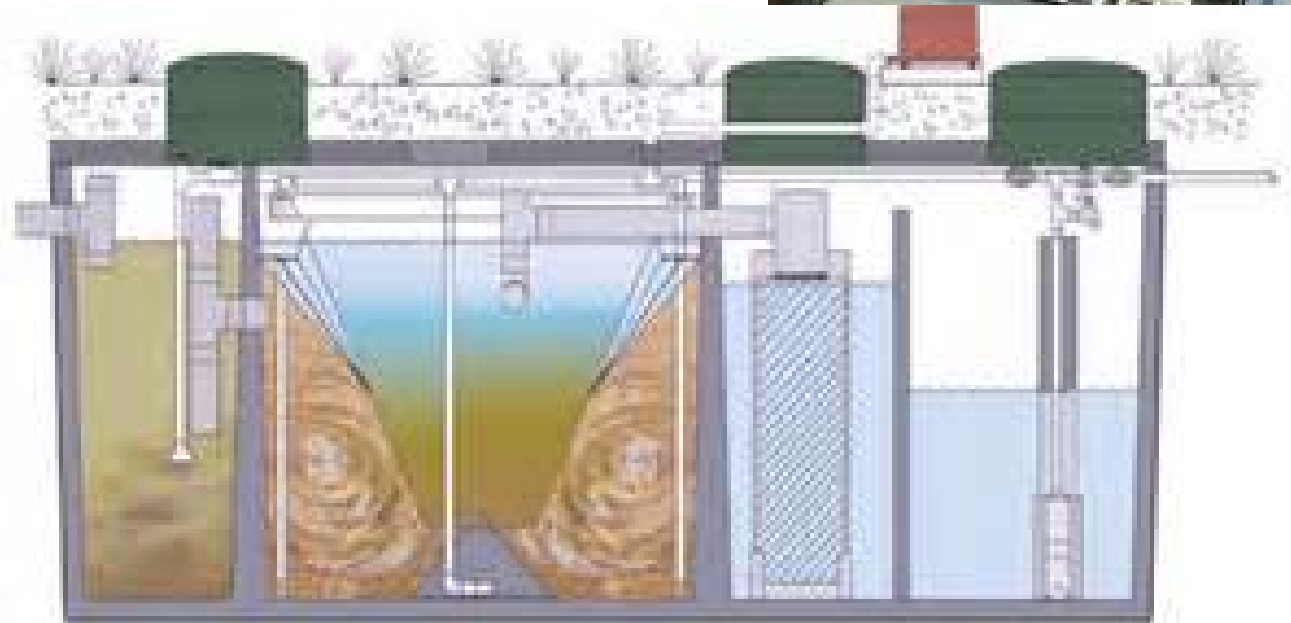
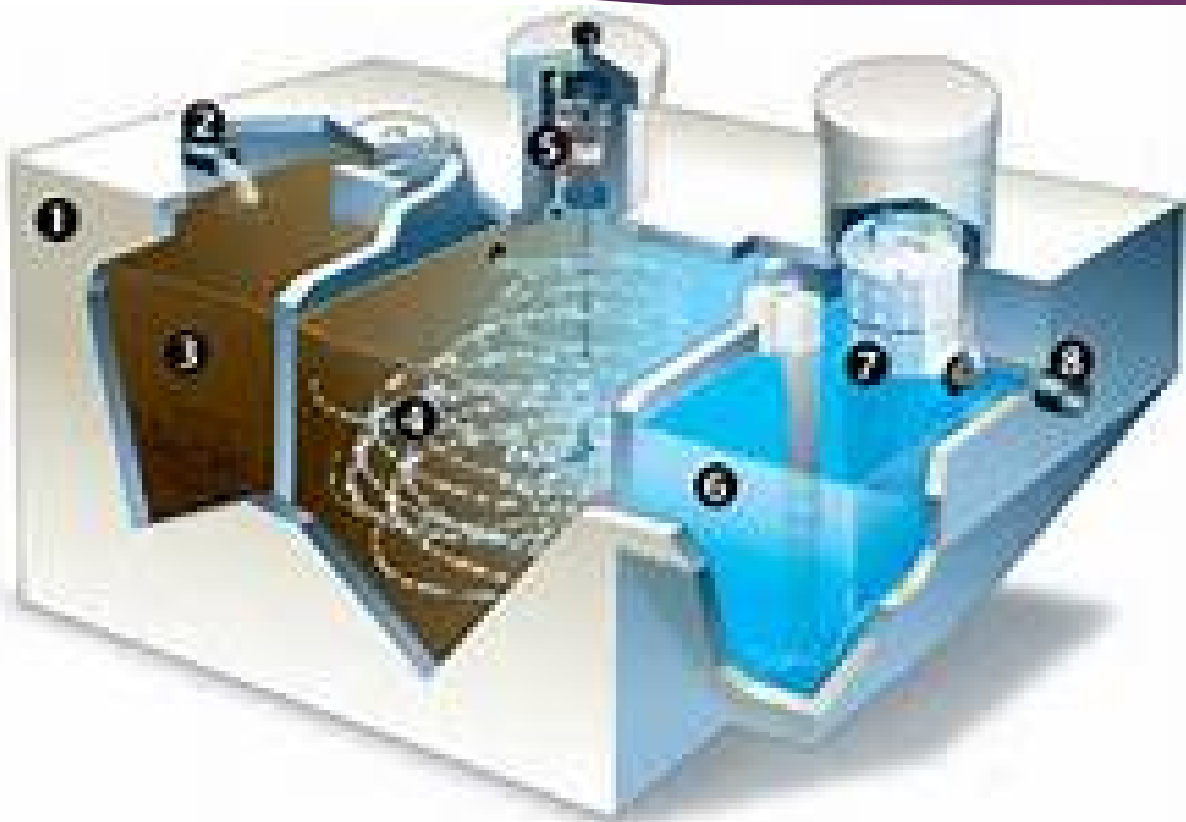
- ▶ Organic loading
- ▶ Pathogen removal
- ▶ Nutrients

▶ System Benefits

- ▶ Acceptance
 - ▶ Smaller size
- ▶ Separation reduction
- ▶ Neighborhood concerns

Cost: Power & Care

Aerobic Treatment Systems



Making them work

- ▶ Normal waste to HSW
- ▶ Watertight tanks
- ▶ Air delivery system
- ▶ Required Area & Separation
- ▶ Management:
 - ▶ Tank access & cleaning
 - ▶ Performance testing

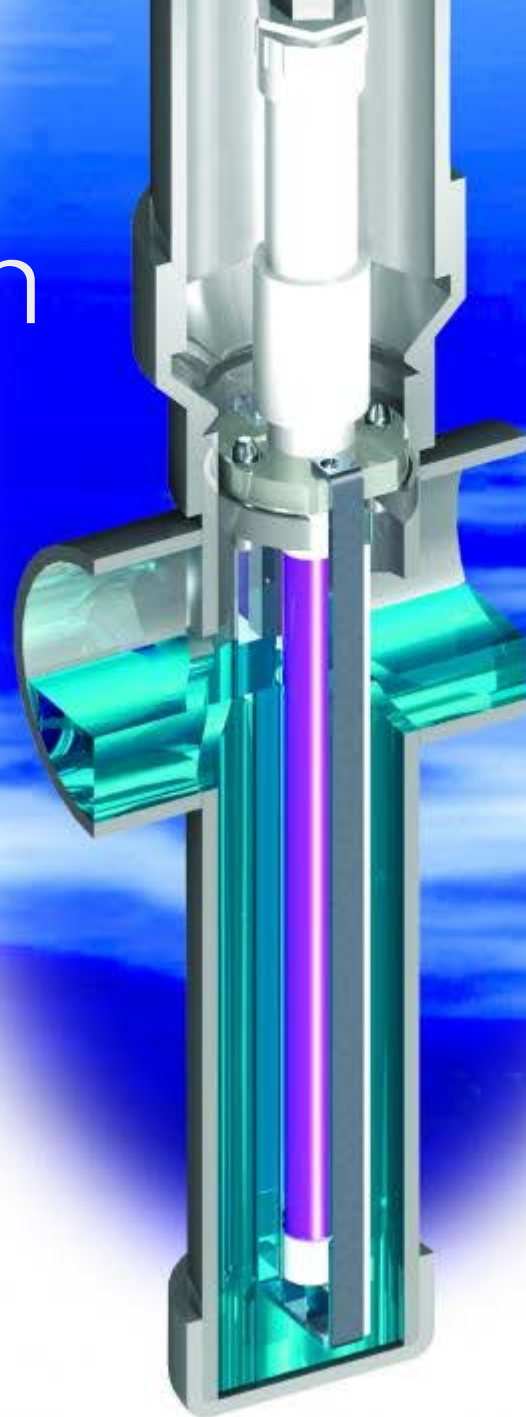
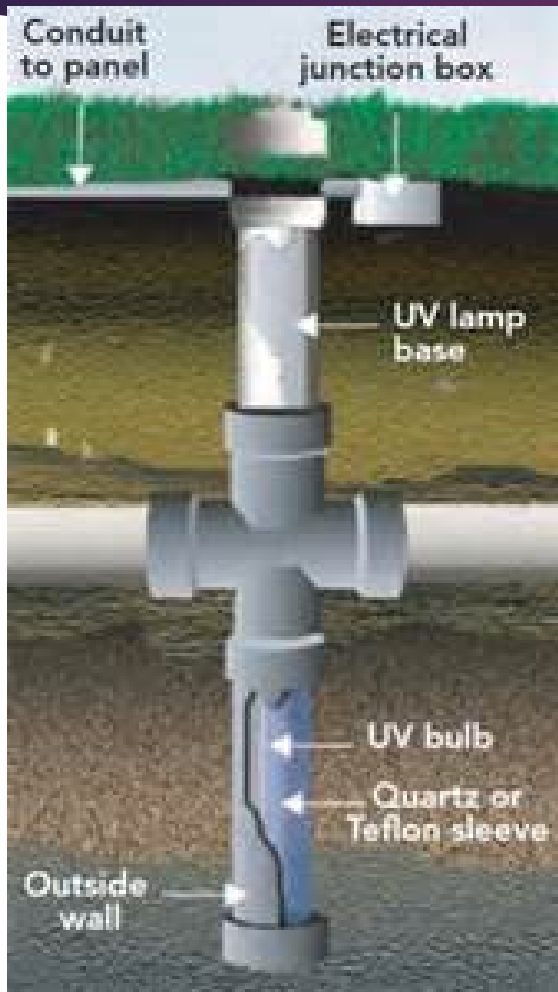
Allows the use
of Disinfection

ATU

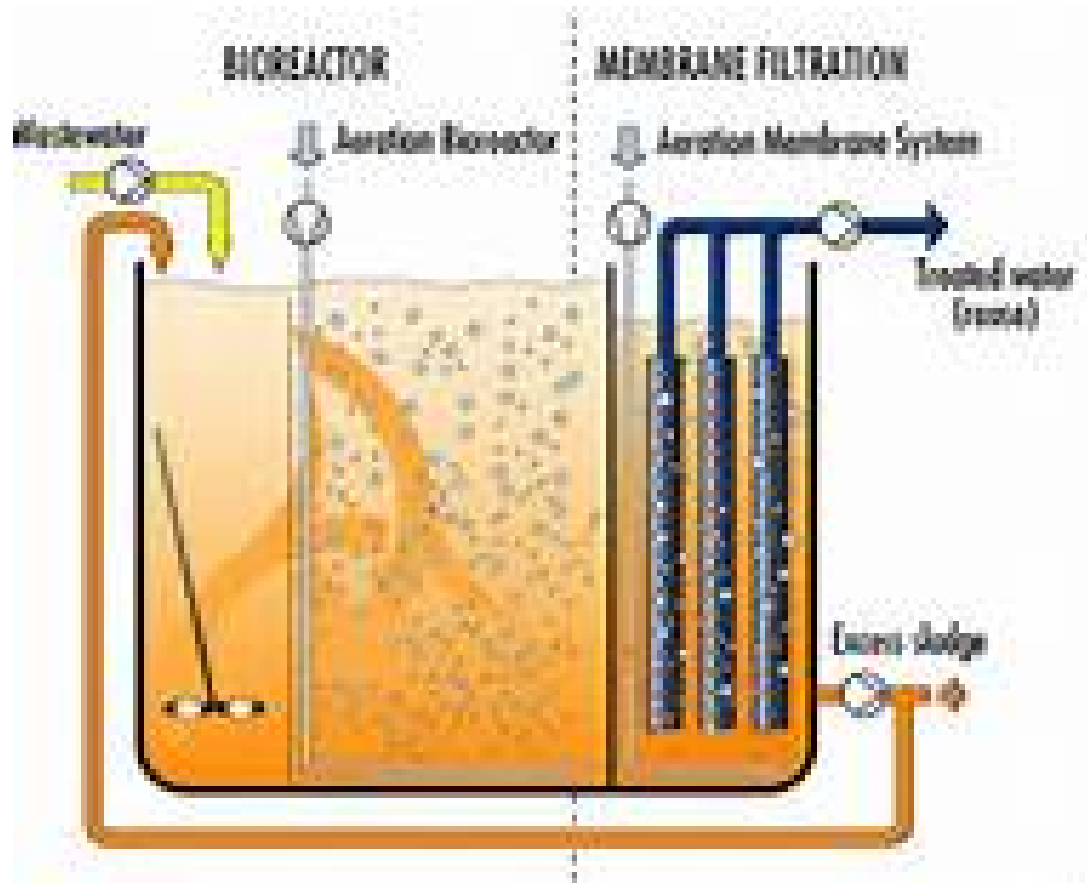
- ▶ Aerobic treatment Units
- ▶ Aerobic treatment
- ▶ BOD₅: 25 mg/L
- ▶ TSS: 25 mg/L



UV Disinfection



Membrane Bio Reactor



Where they FIT

▶ Strengths

- ▶ Footprint
 - ▶ Upgrading
- ▶ Adjustability
- ▶ HSW

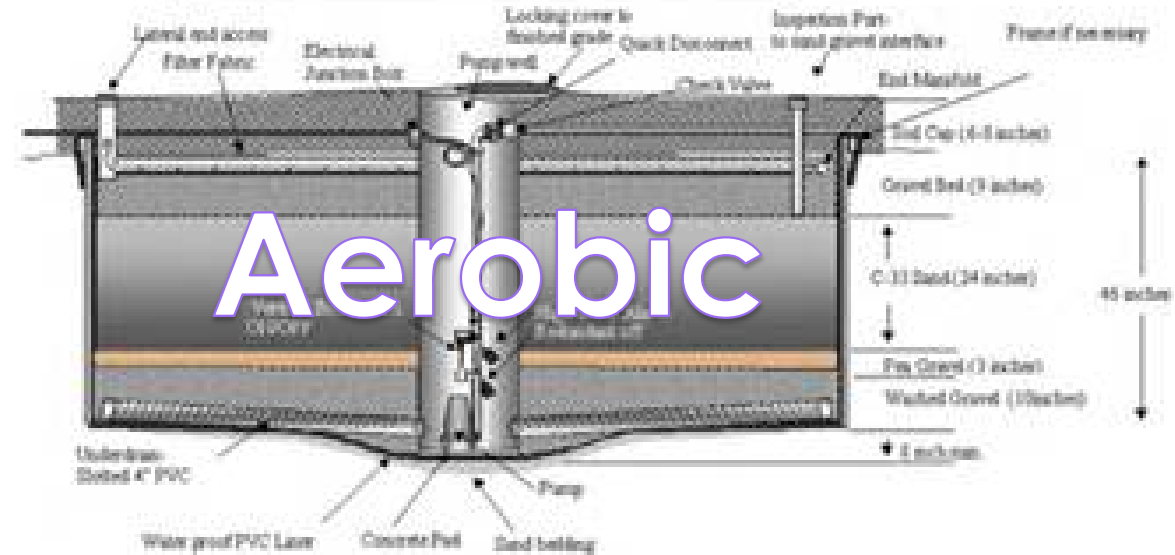
▶ Weaknesses

- ▶ Power req
- ▶ Ability to Break

Media Filters



Intermittent Sand Filter Cross Section



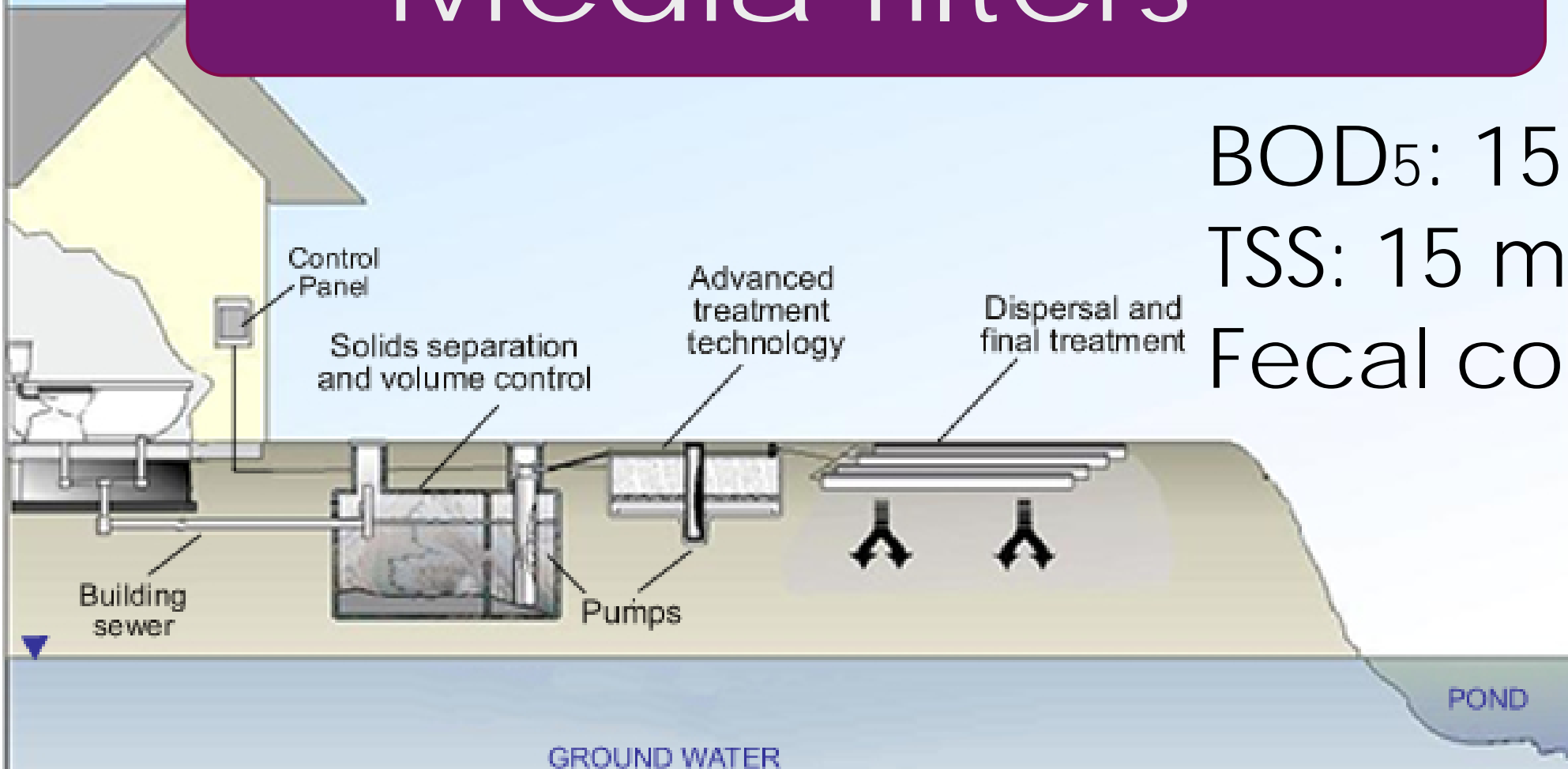
Making them work

- ▶ Normal waste
- ▶ Watertight tanks
- ▶ Effluent distribution
- ▶ Media & Recirculation
- ▶ Required Area & Separation
- ▶ Management:
 - ▶ Tank access & cleaning
 - ▶ Media access & service
 - ▶ Performance testing

SPF: May meet
Disinfection

RMF: Allows the use
of Disinfection

Media filters



BOD₅: 15 mg/L
TSS: 15 mg/L
Fecal coliform~

Constructed Wetlands



Making them work

- ▶ Normal waste
- ▶ Watertight tanks
- ▶ Effluent distribution
- ▶ Media & Recirculation
- ▶ Required Area & Separation
- ▶ Management:
 - ▶ Tank access & cleaning
 - ▶ Media access & service
 - ▶ Performance testing

Sewage Gardening

Where they FIT

▶ Strengths

- ▶ Passive Technology
- ▶ Flex loading
- ▶ SPMF Bacteria
- ▶ RMF Nitrogen

▶ Weaknesses

- ▶ Footprint
- ▶ Parts
- ▶ Media selection

Issues for System Application

- ▶ Users
- ▶ The Site

Comparison

▶ Users

▶ Organic

▶ Peak flow

▶ Sites

Cluster Technologies

- ▶ System sizing
- ▶ System siting
- ▶ Management



Cluster Choices



▶ Shared well

- ▶ Individual Clusters
- ▶ Collection Systems
 - ▶ Conventional Sewer
 - ▶ Solids Handling
 - ▶ Septic tank to Collection



Cluster Keys

- ▶ Flow determination
- ▶ Flexibility
- ▶ Soil identification
- ▶ Care
 - ▶ Serviceability
- ▶ Communication



The Costs

- ▶ Buildable
 - ▶ Usable lot
 - ▶ Desirable location
 - ▶ Environmental Protection
- ▶ System
 - ▶ System Access
 - ▶ System distribution
 - ▶ System Care
 - ▶ System Reporting



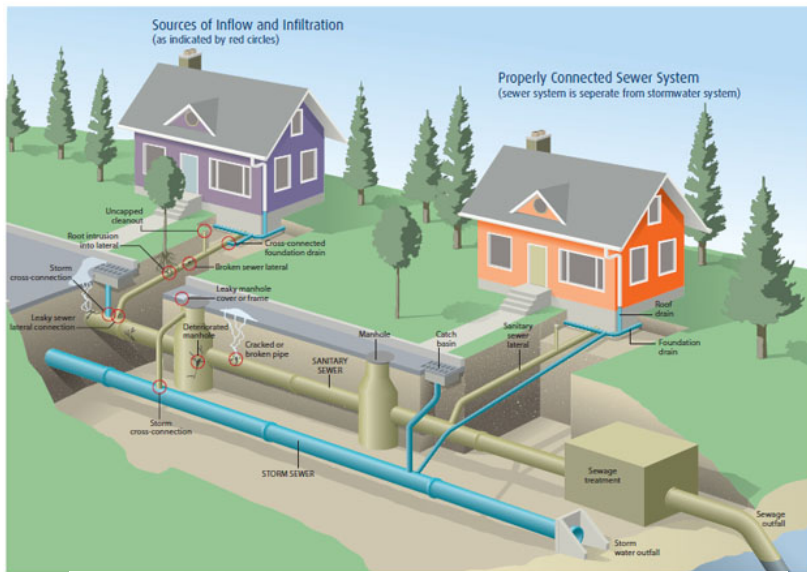
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Questions

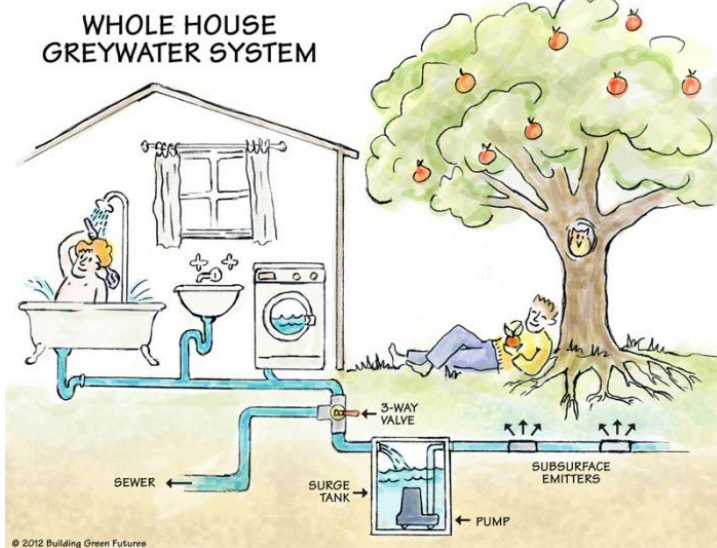
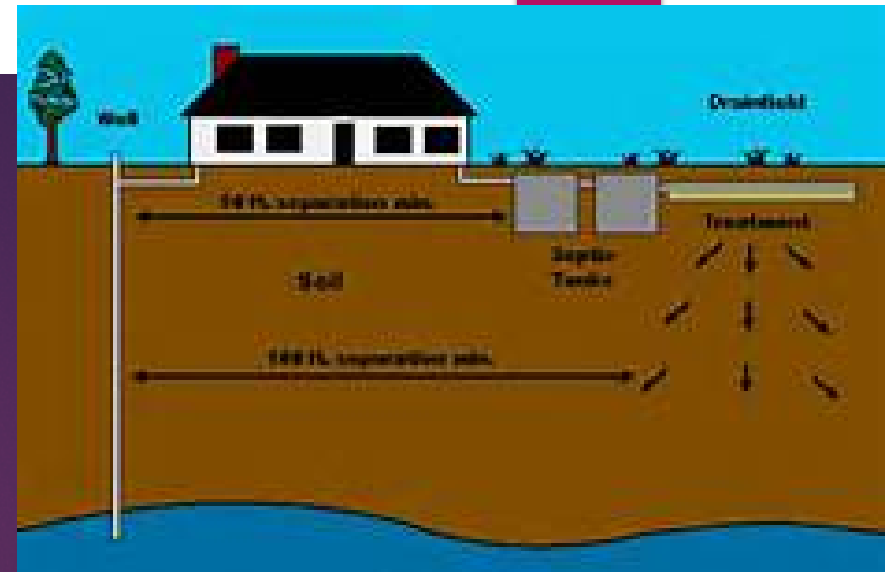
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Municipal OSTP

Graywater What water?



► Wastewater Philosophy

The RULES

Septic System Rules:

Please put **NOTHING**

in the pot, except toilet paper.

No kleenex, feminine products
or hair combings- use the basket.

THANKS!

PAPER TOWELS
SANITARY PRODUCTS
TISSUES & WIPES
KITCHENS & PUPPIES

