Operation and Maintenance

A to Z

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This work was supported by the National Decentralized Water Resources Capacity Development Project (NDWRCDP) with funding provided by the U.S. Environmental Protection Agency through a Cooperative Agreement (WPA No. X-830851-01-0) with Water Environment Research Foundation (WERF) in Alexandria, Virginia. These materials have not been reviewed by the U.S. Environmental Protection Agency, NDWRCDP, or WERF. The contents of these materials do not necessarily reflect the views and policies of the NDWRCDP, WERF, or the U.S. Environmental Protection Agency, nor does the mention of trade names or commercial products constitute their endorsement or recommendation for use.

Introduction

- Handouts
  - Manual
  - Presentations
  - List of Forms
  - Evaluation
- Exam

Goals

- What is Management - definitions?
- Why is it important?
- How do you set the Standards?
- How often should maintenance happen?

These are Important

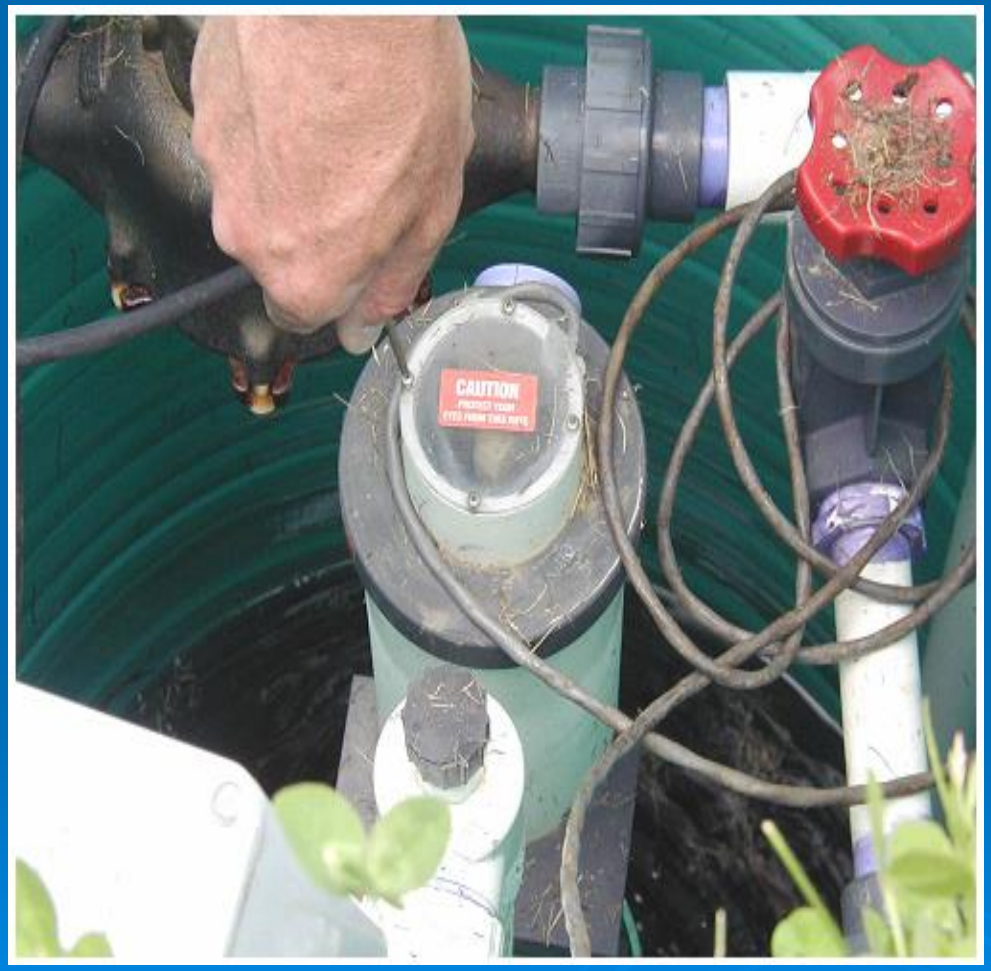
- Communication
  - Service provider
  - Facility owner
  - Permitting authority
- Service Contracts
  - What is included
  - What is extra
- Costs

Definition of Terms

- Management describes all of the steps necessary to conduct operation and maintenance.
- Activities defined as a component of a System Management Program

  - Service
  - Acceptable
  - Unacceptable
  - Inspection
  - Operation
  - Maintenance
  - Monitoring
  - Contract
  - Reporting
  - Repair
  - Replacement
  - Upgrade
  - Troubleshooting
  - Mitigation
  - Compensation
  - System Management

Service



- The action of performing activities such as, but not limited to, inspection, assessment, and maintenance of system components.

Acceptable

- Condition where a component is performing it's intended purpose. Considered to be in an operable state.

Unacceptable

- Condition where components are not operational.
  - Defined by regulations
- Indicates the need for:
  - Maintenance
  - Upgrade
  - Repair
  - Further investigation

Inspection

- The process of identifying the current status of a system for reporting purposes.
- The starting point- Your first visit

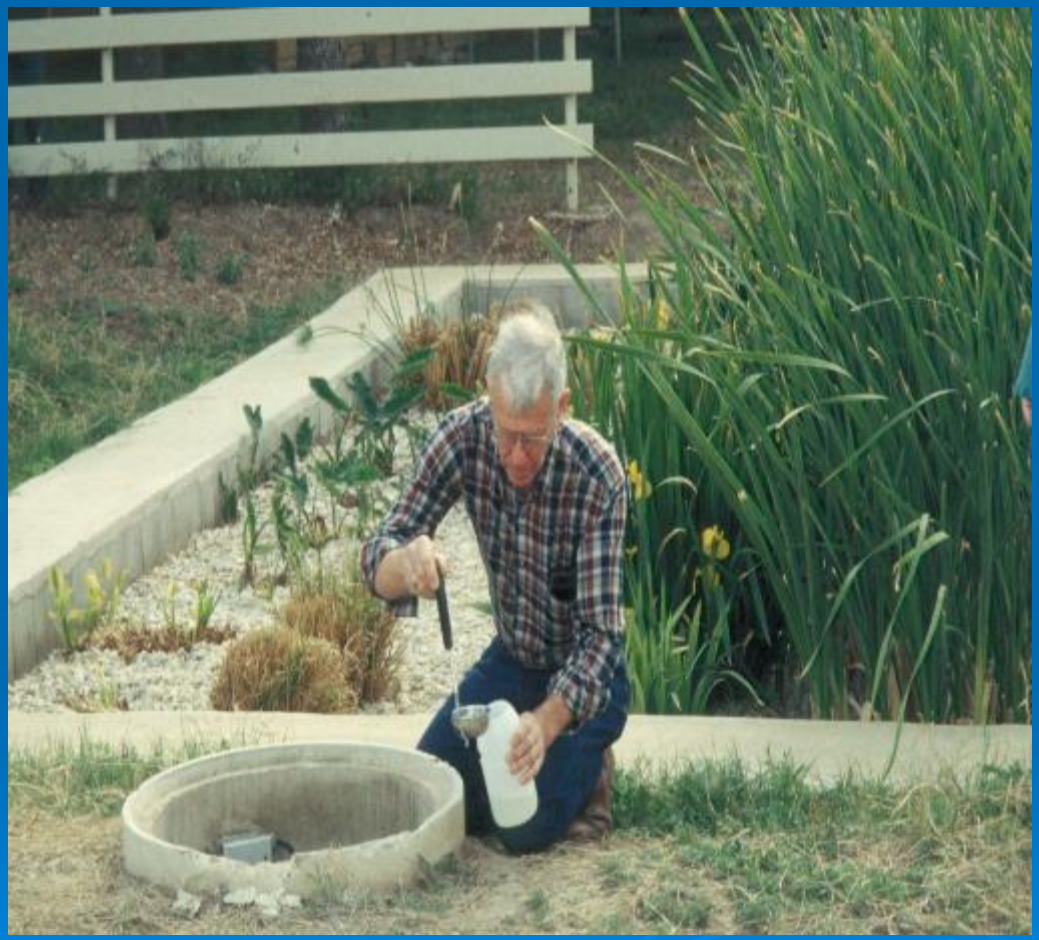
Operation

- The action of assessing the performance of the systems
  - Evaluating each component

Maintenance

- The action of performing routine planned activities.
- Taking care of the individual components of a system
  - Clean
  - Replace
  - Empty

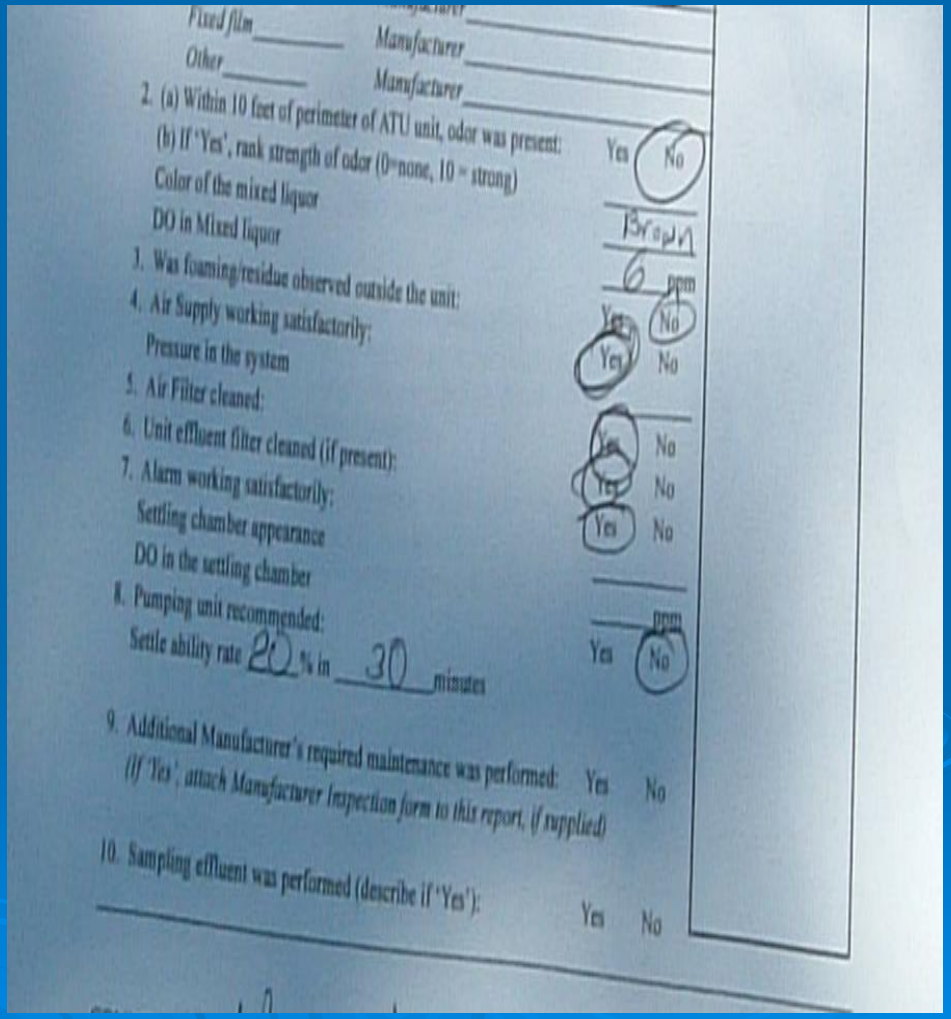
Monitoring



- The action of verifying performance requirements for the regulatory authority
  - Sampling
  - Analysis
  - Measuring

Reporting

- Is the action of submitting a detailed report of operation and maintenance activities performed on a system.
- Who gets the reports
  - System owner
  - Regulatory Authority
  - File copies
- Timely Fashion



Fixed film _____ Manufacturer _____

Other _____ Manufacturer _____

2. (a) Within 10 feet of perimeter of ATU unit, odor was present: Yes No

(b) If 'Yes', rank strength of odor (0=none, 10 = strong)

Color of the mixed liquor

DO in Mixed liquor 6 ppm

3. Was foaming/residue observed outside the unit: Yes No

4. Air Supply working satisfactorily: Yes No

Pressure in the system

5. Air Filter cleaned: Yes No

6. Unit effluent filter cleaned (if present): Yes No

7. Alarm working satisfactorily: Yes No

Settling chamber appearance

DO in the settling chamber

8. Pumping unit recommended: Yes No

Settle ability rate 20 % in 30 minutes

9. Additional Manufacturer's required maintenance was performed: Yes No

(If 'Yes', attach Manufacturer Inspection form to this report, if supplied)

10. Sampling effluent was performed (describe if 'Yes'): Yes No

Repair

- Is the action of fixing or replacing substandard or damaged components.
  - Required repairs
  - Recommended repairs
  - Upgrades

Replacement

- The process of exchanging a component with an equivalent component (like for like).
- Replacing components that are designed to wear out over time.

Upgrade

- The action of creating a better system by addition of a component or increasing the effectiveness of the component.
- Making the system better

Troubleshooting

- The act of locating and eliminating sources of trouble.
  - Looking at entire system to identify problem
- It is not included in maintenance, monitoring or operation.

Mitigation

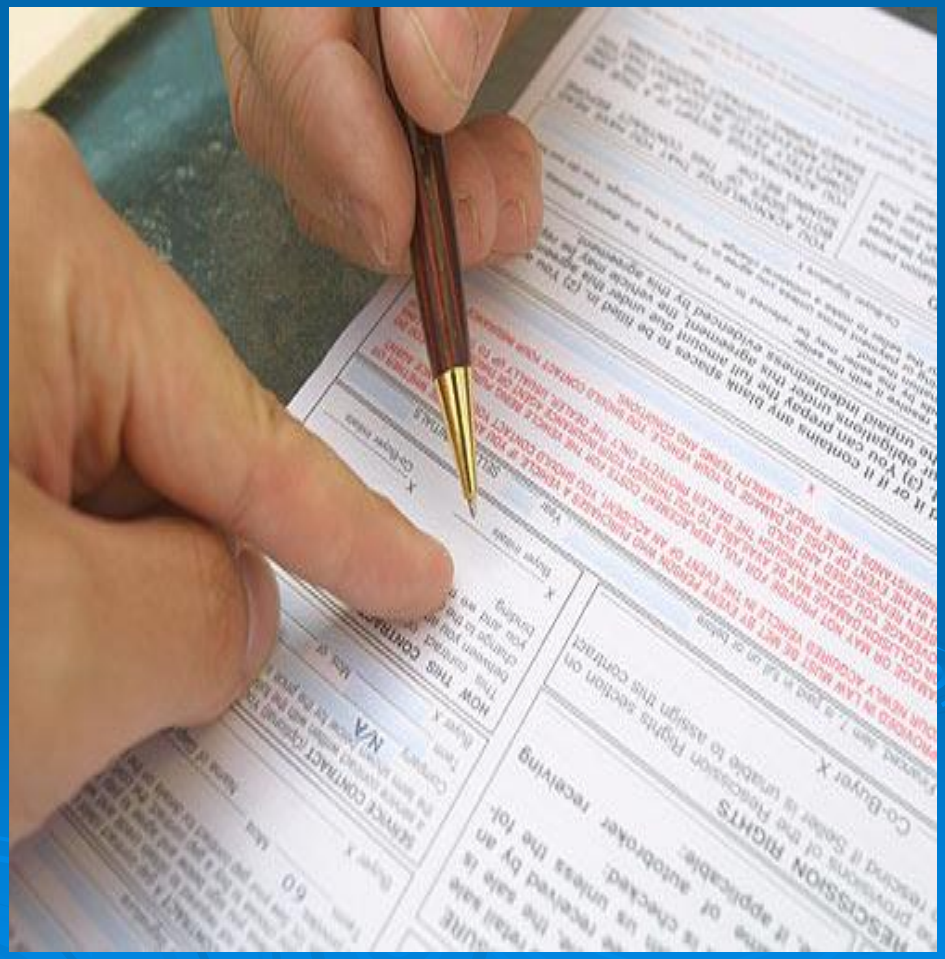
- Is the act of fixing a system that is not performing properly.
  - Evaluation of all components
  - Determine the reason(s) for non performance

Compensation

- Is the action of being paid a fair price for a proper service.
- Need clear contract

Service Contract

- Is the official written relationship between the facility owner and service provider.
- Clearly define:
  - What you do
  - When you do it
  - How you do it
  - Cost of your service



Management (System)

- Management is a term describing all of the steps necessary to conduct operational services, including maintenance, monitoring and compensation.

Role of Management

- Management describes all of the steps necessary to conduct operation and maintenance.
- Provides framework for maintaining the onsite wastewater treatment infrastructure.

What is the O&M Service Provider Program?

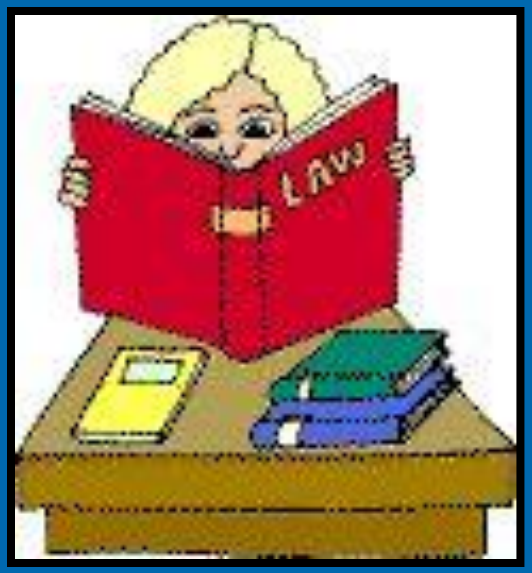
- Establishes operational checklists for evaluating systems
- Provides training for individuals to properly use the operational checklists and evaluate system performance
- Allows onsite wastewater treatment systems to become a permanent solution for our wastewater infrastructure.
- Gives credibility to the onsite industry

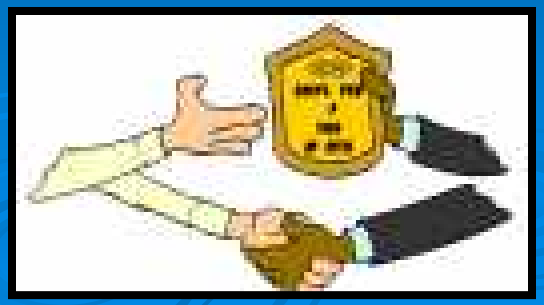
Why do this?

- O&M is needed for all systems
- Need O&M Service Providers to perform O&M
- Service Providers must be trained
- We developed this program to train more service providers

What is an O&M Service Provider?

- Professional providing a service to the public
  - Body of knowledge specifically related to performing O&M
  - Standards for admission (Certification Exam)
  - Standards for retention (Continuing Education)
  - Criteria for expulsion (Loss of License)



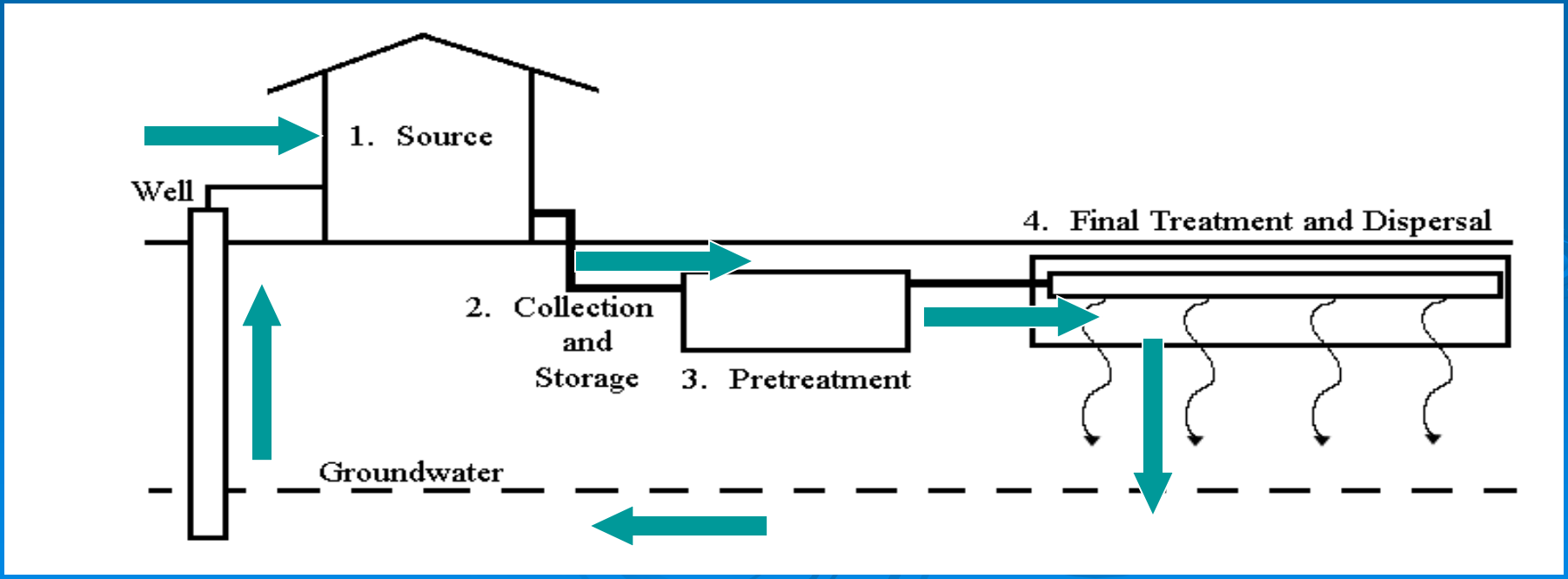


How do I function as an O&M Specialist?

- Perform operation service visits
- Collect and record information
  - Mechanical components
  - Component operational status
- Perform routine maintenance on systems
- Monitor system performance
- Report system status

What is an Onsite Wastewater Treatment System?

1. Wastewater Source
2. Collection and Storage
3. Pretreatment components
4. Final Treatment and Dispersal components



Wastewater Source

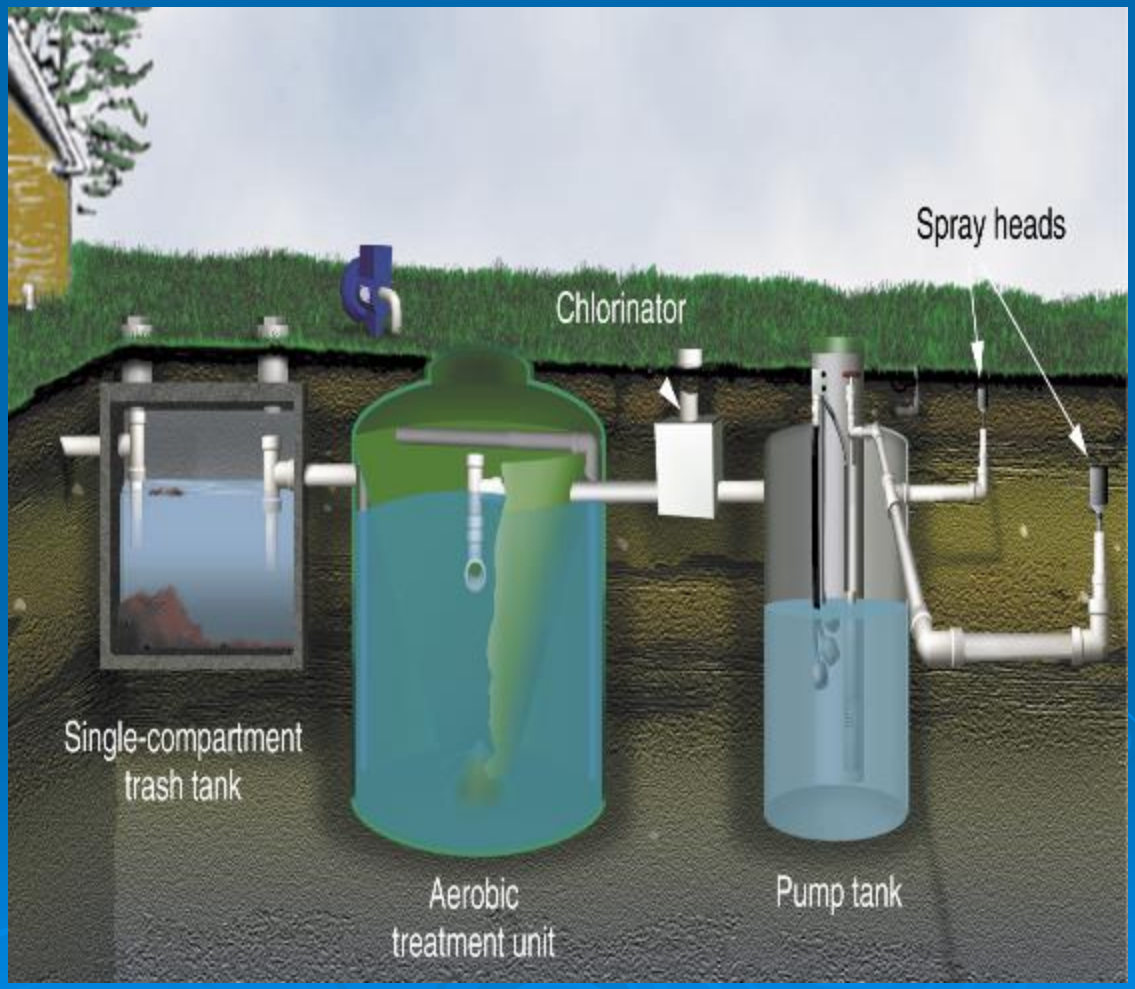
- User
  - Usually the Homeowner

Collection

- Piping from facility with cleanout
  - Blackwater
  - Graywater
- Holding tanks
- Composting Toilets
- Incinerating Toilets

Pretreatment Components

- Septic tanks
- Aerobic treatment units
- Media filters
- Constructed wetlands
- Lagoons
- Disinfection



Final Treatment and Dispersal Components

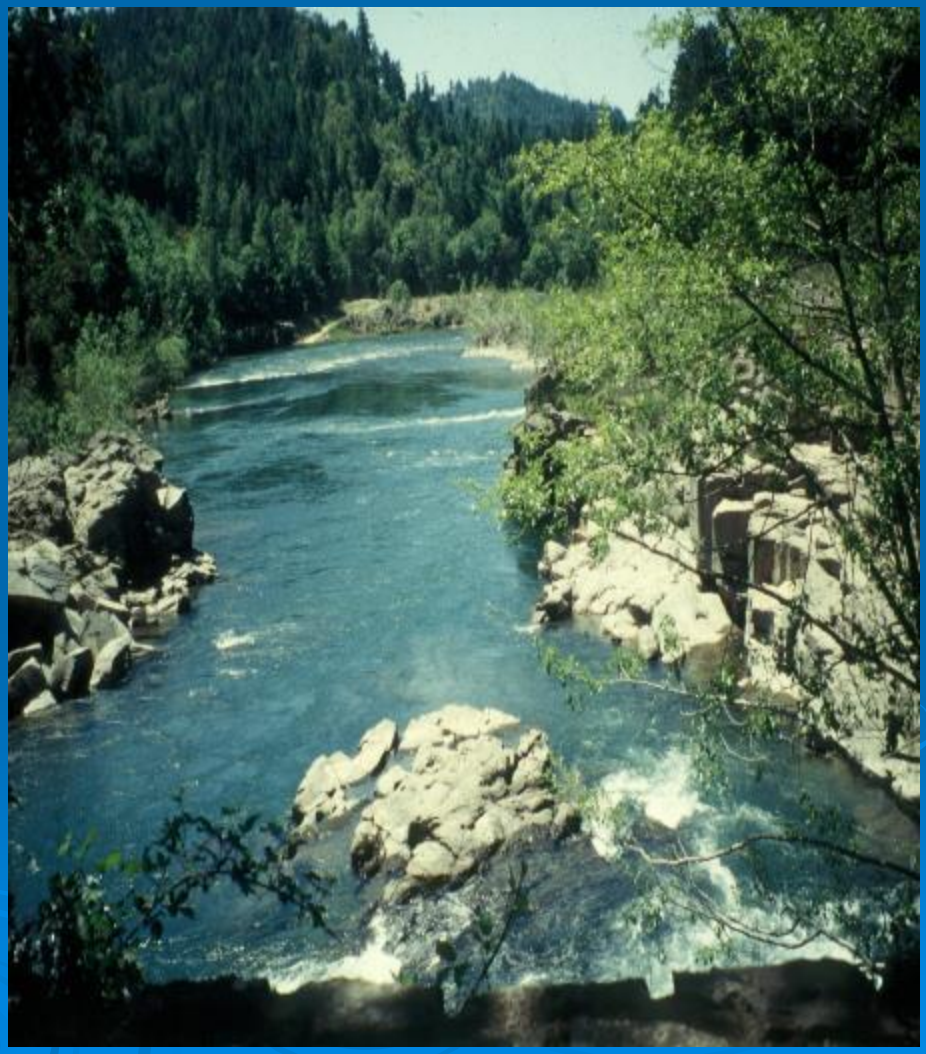
- Trench and bed distribution
- Evapotranspiration beds
- Low pressure distribution
- Subsurface drip distribution
- Spray distribution
- Discharging outfall systems

Program Implementation and Development

- Consortium of Institutes for Decentralized Wastewater Treatment
- Funding: EPA, Water Environment Research Foundation
- Writing team and review team
- Pilot training events

Why Perform O&M Service Visits?

- Keep systems functioning properly
- Maintain effluent quality
- Early detection of problems
- Public Health
- Environmental Protection
- System Reliability
- Customer Satisfaction



System Benefits

- Keep system functioning properly
- Maintain effluent quality
- Early detection of problems

Public Health

- Wastewater can contain disease causing Pathogens
  - Bacteria
  - Viruses

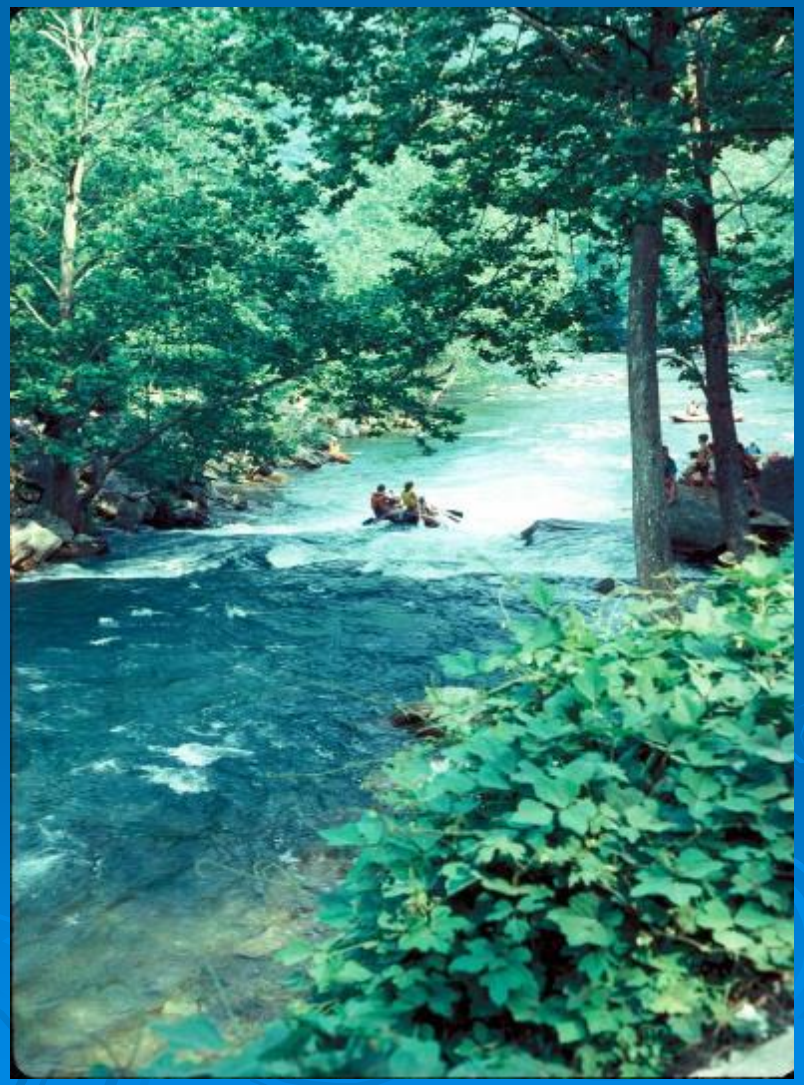
Environmental Protection

Treat contaminants before they reach Surface or Groundwater

- Nutrients
  - Phosphorus
  - Nitrogen
- Organic Loading

EPA Water Quality Programs

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



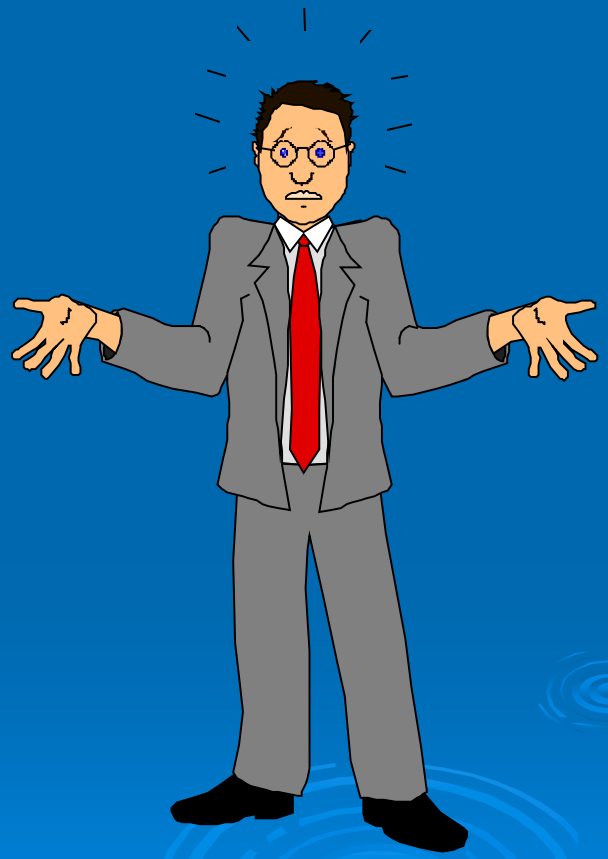
System Reliability

Performance of all system components must be functional to achieve full treatment

- Components require maintenance
- Service/maintenance should extend life of components

Customer Satisfaction

- **Satisfied** if system works
  - Enjoys the use of their property
- **Dissatisfied** if system does not work
  - Complaints
    - Permitting Authority
    - State Authority
    - Legal
  - Tells Everyone that will listen



Why is an O&M Service Provider Program Important?

- Expansion of the industry
- Standardization of services
  - Define services to be performed – Operational checklists
  - Liability protection

All Systems NEED Management

- The level of system management is set by:
  - Site conditions
  - Wastewater loading to the environment
  - Technology – system complexity

Site Conditions and Risk

- Deep well-drained soil has the potential for acceptance and treatment of wastewater contaminants
- Discharging systems and surface distribution has a greater risk of human contact
- Risk is related to Public and Environmental Health and Protection

Wastewater Loading Rates

- Dependent on density of development

Example:

Subdivisions with homes on small lots have a

GREATER LOADING RATE THAN

Homes on larger tracts of land

Monitoring Frequency

- State required residential systems
- Dependent on:
  - Loading Rate
  - Wastewater Loading
  - Human and Environmental Risks

Operation and Maintenance Frequency

- Related to the complexity of the:
  - Treatment process
  - Wastewater loading
  - Risk of failure
- Best performance
  - Average daily flow < 70% of design capacity
- Greater attention/monitoring needed
  - Average daily flow > 70% of design capacity
    - Peak flows are greater than the design capacity
    - Flow equalization reduces peaks
- Frequency may be set by regulatory agency or manufacturer

Summary

- What is Management - definitions?
- Why is it important?
- How do you set the Standards?
- How often should maintenance happen?