



*To strengthen and promote
the decentralized wastewater industry.*

Drip Management



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Presented By:

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Two Distinct Applications for Drip System Management

- Program Management
 - The business management required of sustainable management entities
- System Management
 - The specific activities necessary to inspect, monitor and maintain a functioning drip dispersal system

You are the future of a SUSTAINABLE Onsite Wastewater Management Program with -

- Some help from science and technology
- Effective rules, regulations and ordinances
- Viable approaches to system management and program management
- Competent people to:
 - assess sites,
 - design appropriate systems,
 - permit those systems,
 - monitor, inspect and maintain systems, and
 - manage local and state programs
 - To include the public who benefit from these efforts

Science and technology

Science

- Watershed science
 - Assimilative capacity
 - TMDL
- Wastewater biology
 - Nutrient removal
 - N
 - P
 - Disinfection
- Soil science
 - Hydraulics
 - Nutrients
 - Pathogen removal
- Management Science and Business

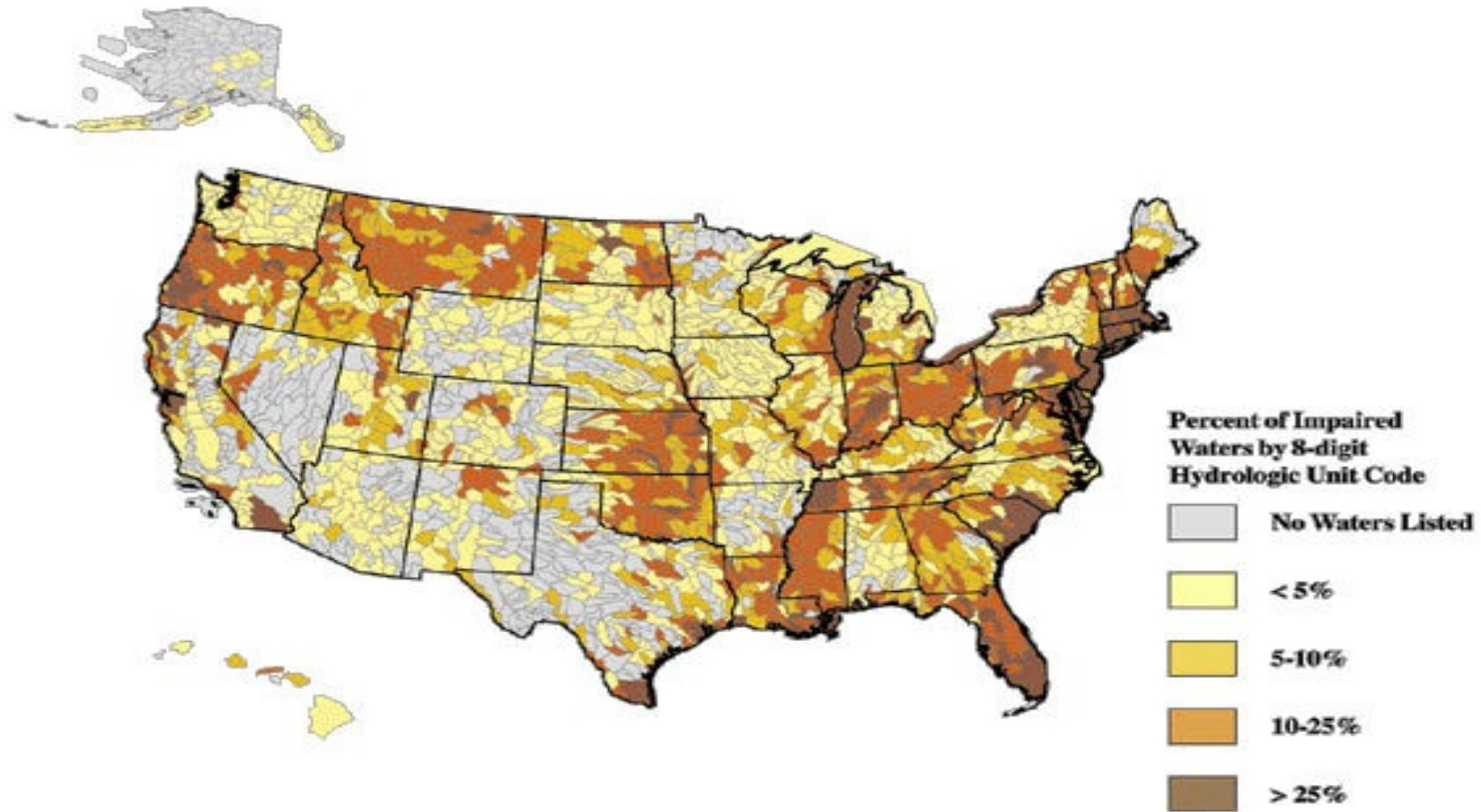
Technology

- Improved aeration
 - Fixed media
 - Suspended media
- Recirculation to achieve N loss
- Drip dispersal
- Top feed or bottom feed manifold

What have we learned from the application of science and technology to onsite wastewater

- Improved siting criteria
- New technologies
- Watershed impacts

Environmental issues – Impaired waters



Leading Causes of Impairment (305b) UPDATE!!!

	Rivers and Streams	Lakes, Ponds and Reservoirs	Estuaries
Pollutants	Siltation (38%) ^a	Nutrients (44%) ^a	Pathogens (47%) ^a
	Pathogens (36%)	Metals (27%)	Organic enrichment (42%)
	Nutrients (28%)	Siltation (15%)	Metals (27%)
Sources ^b	Agriculture (59%)	Agriculture (31%)	Municipal point sources (28%)
	Hydromodification (20%)	Hydromodification (15%)	Urban runoff/storm sewers (28%)
	Urban runoff/storm sewers (12%)	Urban runoff/storm sewers (12%)	Atmospheric deposition (23%)

^a Values in parentheses represent the percentage of surveyed river miles, lake acres, or estuary square miles that are classified as impaired.

^b Excluding unknown, natural, and “other” sources.

Source: EPA 2000. *National Water Quality Inventory 1998 Report to Congress*

Management Science and Business

- Management must be science/fact based – not innuendo or tradition
 - Management involves developing harmony not discord
 - Management infuses a cooperative ethic
 - Good managers strive to be the best and develop excellence in themselves and their staff
- Business plan
 - Succession
 - Asset management plan
 - Business is business-not Pro Bono
 - Business involves production, purchasing and distribution of goods, services, and ideas
 - Business requires standard transaction
 - Business=PROFIT
 - Business=Risk
 - Business involves managing people
 - Employees, patrons, agency personnel

Challenges

- Resilience – accommodate change in operation, response to storms, flooding, etc.
- Budget challenges (CAPEX and OPEX funds, Bonding capacity)
- Changing climate
- Succession planning

TBL approach may help address challenges

Motivation	Activity	Technical/Management Innovation
Finance (economy)	Resource recovery, material conversion, value added products	Industrial innovation, new treatment technology, irrigation, nutrient recovery, biomass, algae
	Operational efficiency	Asset management, EMS,
	Energy recovery and use	Fuel cell, anaerobic digestion,
Sustainability (environment)	Watershed assessment	Distributed systems
	Energy optimization	Energy recovery, improved efficiency (VSD pump),
	Green Infrastructure	Green roof, porous paver, local management
Social issues, EJ, Community well-being	Planning	Targeted improvements
	Greening	Managed distributed systems
	Partnering	Bio-resource recovery

Recognition

- The USEPA recognizes onsite and decentralized wastewater systems as a permanent and essential element of the nations wastewater infrastructure...
- Onsite systems **MUST** be managed as an element of infrastructure...
- Partnerships Essential

Decentralized Program Strategy

(Grumbles, 2005)

Vision:

Decentralized wastewater systems are appropriately managed, perform effectively, and are widely acknowledged as components of our nations' wastewater infrastructure.

Mission:

EPA will serve as a catalyst for improving system performance through partnering to upgrade professional standards of practice and institutionalize the concept of perpetual management.

Responsible Management

- Where site and soil conditions allow, traditional, low maintenance options remain the option of choice
- Where site and soil conditions pose some limitations, alternative treatment and dispersal options become the option of choice
- Regardless – systems must be managed

Responsible Management Entity (RME)

- Responsible for activities necessary to sustain systems in service area
- Legal entity with Managerial, Financial, and Technical capacity to assure long term, cost effective management
- Professionals staff required functions

Treatment Systems/Dispersal Systems

- **Treatment** – Component of System that Facilitates Physical, Chemical, Biological Processes that Render Liquid Suitable for Dispersal into Receiver Environment
- **Dispersal** – Component of System that Facilitates the Uniform Distribution of Liquid into Receiver Environment

These management services/activities include, but are not limited to:

1. Inspection of onsite systems to assure operational status
2. Monitoring vital system functions
3. Operate and maintain system components (pumps, tanks, controls, field)
4. Measuring indicators of system performance and status
5. Reporting status of systems to homeowners, regulatory agencies, and manufacturers
6. Collect operational records regarding components of systems (pumps, controls, tanks, etc.)
7. Provide information to stakeholders in community
8. Repair or replace system components as required
9. Assure financing available to sustain systems, people, and organization
10. **Management: all activities required to conduct routine inspections and monitoring, necessary maintenance and repair, and collect revenue to sustain program**

Early Detection-Timely Correction

- Assure long term operation
- Facilitate remedial operations
- Prevent failures
- Protect public health, environmental quality, property values, community values, and create opportunity

Sustainable, Program Management

- Technical criteria
 - Common technologies utilized throughout system, few parts, few operational issues,
 - Reliable technologies – meet user needs, effective monitoring and management
 - Appropriate for climactic zone
 - Optimize operator skills
 - Critical mass, circuit rider approach

Business management issues

- Paid, professional management staff for budgeting, forecasting, accounting, scheduling, monitoring
- Mechanism for overdue debt collection
- Reserve capacity for unexpected costs (this is inadequate in many areas because utility commissions do not understand onsite needs)

Finance issues

- Fiscal plan
- Sustainable recurring charge (cable model)
- Independent financial oversight committee
- Asset management plan
- Succession plan

Governance

- Political will and public support
- Enforcement/corrective action
- Laws, rules and ordinances

Specific Drip Irrigation System Management Activities – Specific aspects of Drip

- Management System/Entity
- Installation
- Operation and Maintenance

Treatment Systems/Dispersal Systems

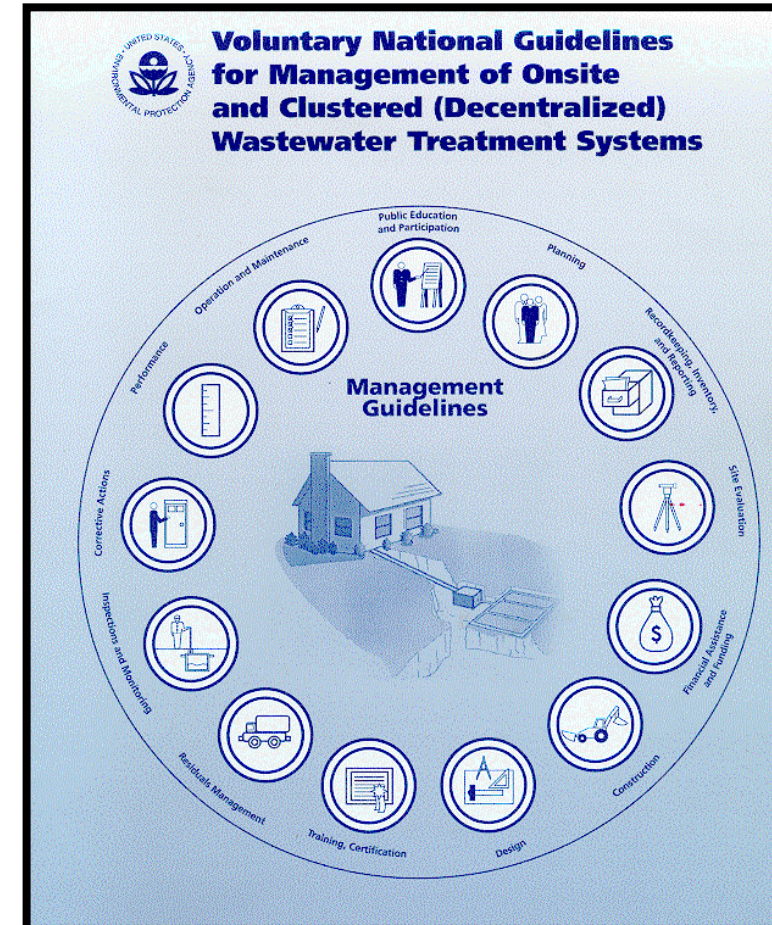
- **Treatment** – Component of System that Facilitates Physical, Chemical, Biological Processes that Render Liquid Suitable for Dispersal into Receiver Environment
- **Dispersal** – Component of System that Facilitates the Uniform Distribution of Liquid into Receiver Environment
- **Organization** – Component of System that assures proper long term management

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Management Entity

- The minimum program level IAW USEPA Guidelines is Level 3
- Level 4 and 5 should be used for large systems (Q>QQQ) and for any drip system in a sensitive area



Installation

- Assure automatic control for essential functions (dose/flush)
- Utilize flow meter or other measure to determine flow
- Check field with pressure gauges
- Use tracer wire to locate transport and header line
- Use solenoid or index valve in multi-zone systems



Operation and maintenance

- Assure adequate flow to completely fill all lines when checking network
- Periodically manually flush system components (even though this is done automatically)
- Check field lines with pressure gauge
- Walk zones, check fencing and potential wetness in low area



So, What does the future hold for us?

- All technology must be managed: inspection, monitoring, repair and replacement, reporting
- Can not be out-sourced, requires site visits
- Secure future if you stay current, continue to learn, improve business practice, participate in management programs, and
- It's not just going to disappear
- SO – BE NICE TO YOUR LOCAL REGULATORS, THEY ARE PARTNERS



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Questions

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