# 25+ Years of Successful Onsite Management in Otter Tail, MN

*Sara Heger*
*sheger@umn.edu*
*http://septic.umn.edu*

## Presentation Overview

1. What is management?
2. Project background and district formation
3. Timeline and process of evaluation
4. Management in District
5. Outcomes

## Onsite Wastewater Management

Why should we care about managing decentralized?

- Onsite systems serve approximately 25 percent of the U.S. population and one-third of new development
- According to EPA, at least 10 percent of onsite systems fail each year
- State agencies report that these failing systems are the third most common source of groundwater contamination

## What is Management?

Implementation of comprehensive, life cycle series of management program elements, activities, practices that address……

## What is Management?

1. Public education & participation
2. Planning
3. Performance requirements
4. Site evaluation
5. System design
6. System construction

## What is Management?

7. Operation and maintenance
8. Residuals management
9. Training and certification/licensing
10. Inspections & monitoring
11. Corrective action/ enforcement
12. Records/ inventory/ reporting
13. Financial assistance/ funding

## Why Management?

"Properly managed decentralized wastewater treatment systems can provide the treatment necessary to protect public health and meet water quality standards JUST AS WELL AS CENTRALIZED TREATMENT SYSTEMS."

- *1997 USEPA Response to Congress*

## Why Management ?

1. Onsite systems are permanent !!
   - Must, therefore, be robust, dependable, effective at treatment function
2. Onsite technologies can be complex
   - Lift pumps
   - ATU's, sand filters, peat filters, foam filters, constructed wetlands, mounds, drip dispersal…

## Why Management?

To maximize the BENEFITS of Onsite Wastewater Treatment Systems

- Public Health and Environmental Protection
- Affordable
- Retain water resources within watershed
- Facilitate PLANNED development within zoning
- Manage Community Resources (sewer extensions)
- Provides a SUSTAINABLE infrastructure

## Why Management ?

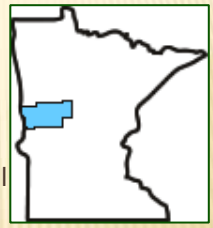
Failing systems raise concerns about:

- Public health impacts
- Environmental impacts
- Economics
  - Consumer investment in home/ business
  - Replacement/ repair costs
  - Value of surrounding properties
- Lifestyle/ standard of living
  - Insanitary conditions
  - Restriction to normal activities
  - Unpredictable and immediate demand on financial resources

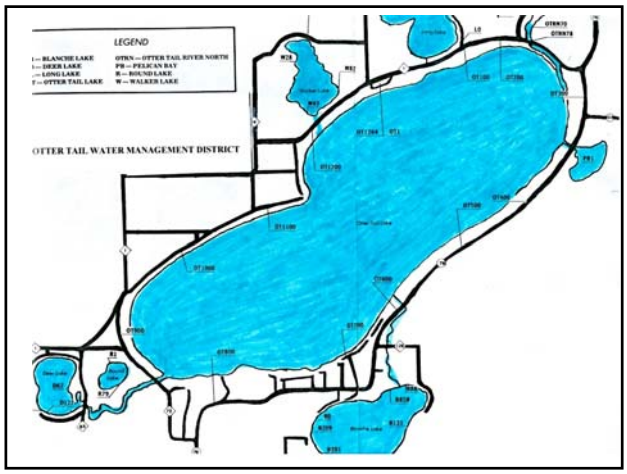
## Management…Where??

1. Everywhere!
2. Focused attention:
   - Particular program areas or practices
   - New Development
   - Innovative Development
   - Complex Technologies
   - Areas of greater health risk or sensitive natural resources
   - Areas where system failures are common

## Otter Tail Water Mgmt. District



1. 6 lakes
2. 55 square miles
3. 4 townships
4. Portions of City of Otter Tail
5. Properties:
   - 1984 ~1200 homes, cabins, businesses
   - 2014 ~ 1690 connections




## Why was District Formed?

1. Residents noticed reduced water quality
2. Identified several inputs/impacts to lake
   - Wastewater
   - Agricultural runoff
   - Reduction in native shore land
3. GOAL:
   Properly managed wastewater treatment at an affordable long term cost which would maintain the rural character of the community

## General Septic System Problems

1. Small lakeshore properties
2. Sandy soils with rapid transmissivity to lake
3. Many existing septic systems installed:
   - Too close to lake
   - Too deep in regard to elevation of lake

## District Powers and Responsibilities

1. Set fee structure to support District activities
2. Levy taxes to property tax statements
   - Needed 10% of the time
3. Write and enforce ordinance
4. Inspection and monitoring program
5. Issue compliance orders
   - Including interest and penalties

## Overall Timeline

1. 1978 -- Studies started
   - Education program which lead to 85% acceptance of project
2. 1981 -- District formed
   - 7 member board appointed by County board
3. 1981-82 -- completed Community Assessment Report (CAR) and Environmental Impact Study (EIS)
4. 1982 - 84 -- Final project design & public hearings
5. 1984 -- Construction started
6. 1985 -- Installations completed

## Community Assessment Report (CAR)

1. Integrate preliminary and field evaluations results for each parcel in the community
2. Formulate soil-based treatment options for the entire community
   - Individual conventional system
   - Individual advancded systems
   - Clusters
   - Combination

## CAR Contents

1. Estimate costs for each of the options
   - Construction
   - Management
   - Repair
   - Replacement
2. Identify preferred alternative with rationale
3. Integrated **CAR** into Preliminary Engineering Report

## CAR: Preliminary Evaluation

Develop accurate large scale map of community with known information

1. Homeowner survey information
   - Number of bedrooms and residents
   - Business?
   - Water using devices
   - System components location
   - System maintenance
2. Search government records:
   - Permits (or not)
   - Age of systems
   - System design and modifications
   - Well locations
   - Soil survey information

## CAR: Field Evaluations

1. Field check of every property
   - Status of current systems
   - Options available onsite
   - Cluster options available nearby
2. Map of findings
   - Well location
   - Property boundaries
   - Setbacks
   - Soils

## Benefits of Completing a CAR

1. Community gets a complete picture of its current wastewater treatment or disposal
2. A clear definition of problem/boundaries
3. Better ensures soil-based wastewater treatment options are assessed in detail
4. Provides preferred treatment option and estimated costs
5. Information can become part of a Preliminary Engineering Report

## Ottertail's CAR Results

1. 200 were compliant
2. 350 needed minor updates for compliance
3. Nearly 65% non-complying
   - 590 could install new systems on their own properties
   - 260 "couldn't comply" on their own property
     - Identified potential cluster sites

## Number & Types of Users in 1984

1. 1160 seasonal residents
   - 75%
2. 390 permanent residents
   - 25%
3. 48 resorts or businesses
   - 3% of total, 75% seasonal

## 1984 & 1985

1. Upgraded 850 sites
   - 13 cluster systems - 260 cluster hook ups
   - 590 Individual systems
2. 350 other systems:
   - Tanks pumped
   - Inspected
   - New tank covers installed
     - Water tightness
     - Management access


## Management Options

1. Passive
   - System is under District jurisdiction
   - Homeowner responsible for all maintenance & repairs
2. Active
   - District maintains from the tank & beyond

## Passive Maintenance

**1.District**

- inspects tanks for pumping, drain field failures, lift pump operation
- Maintain records/history of system
- Information/education on user "best management practices"

**2.Homeowner**

- Responsible for all costs associated with managing and replacing system
- Can switch to 'active' plan **if** you meet criteria

## Passive Management

1. District inspects permanent systems every 2 years & seasonal every 3 years
   - Notifies homeowner to pump & provides reply form when completed
2. Home owner maintains ownership & maintenance of the system
3. System less than 5 years old
   - can convert to the active management once the tanks are pumped, system inspected, is found to be in good working order and in compliance with District ordinances.
   - Anything older must be upgraded to existing codes
4. Once converted to active management there is a sliding fee for maintenance and repairs for the next 10 years.
   - It is a decreasing 10% scale of cost each year to the property
   - About 30 systems have converted to active management since 1984
5. The administrative fee that all properties pay, goes towards general overhead expenses
   - 2013 it was $50

## Active Management

- District inspects permanent systems every 2 years seasonal systems every 3 years
- District assumes responsibility of maintenance and repairs
- Pumping of the tanks is contracted out
- In 2012 new installations are required to be on active management
  - Prior to that about half of new systems were opting to go on active
- Annual fee for holding tank is $78 plus the actual pumping
- Annual fee for residential with pump/drain field is $244
- **Clusters must be on active plan**

## Management Fees in 2011

Passive
- Administrative fee only
- Dwelling $50
- Cluster or business user $60 + $5 per additional tank and duplex unit
  - Business $50-$300

Active depends on
- System type
  - Dwelling with & without a pump
  - Cluster versus dwelling
- Seasonal versus permanent
- Dwelling versus business

## Annual Cost of Active Plan

| Type of Active Facility | Annual Cost |
|---|---|
| Permanent residence with tank, pump & soil treatment system | $239 |
| Permanent residence with tank & soil treatment | $179 |
| Seasonal residence (based on 3 months average) | 30% of permanent |
| Permanent cluster system (single or multiple units) | $207 - 267 |
| Seasonal cluster system | $253 |
| Resorts and businesses | $170 - $2200 |

## Preventative Maintenance Inspections

- Includes evaluating:
  - Septic tanks
  - Pump tanks and pumps
  - Soil treatment system
- Permanent residences – every 2 years
- Seasonal residences – every 3 years


## Maintenance Activities

Septic tank
- Operation
  - Checking levels
  - Checking baffles
- Maintenance
  - Cleaning effluent filters
  - Clean tank as needed
    - When sludge and scum depth is greater than 25% of liquid capacity of tank

## Measurement of Scum

1. Measurement of scum can be done with a paddle stick as shown or an L-shaped rod or shovel
2. You can "feel" the bottom of the scum mat
3. The paddle can also be used to feel the level of the outlet baffle

## Devices for Measuring Sludge

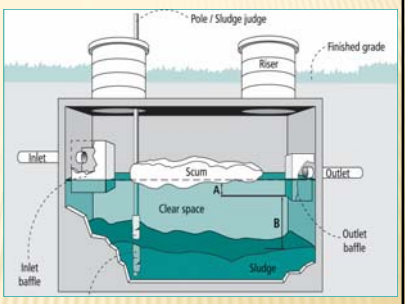
Towel wrapped on a stick

Clear tube with ball valve

Clear plastic tube with a check valve on the end

## Is it Full?

1. Dip tank
2. 60" deep
3. 6" of Scum
4. 18" of Sludge




[18"+ 6"] ÷ 60" x 100 = 40 %

## Financing

1. Initial Capital Investment
   - Grant expenditures for the installation of the initial systems were $5,621,700
   - $4700 per connection
   - $244,660 paid by county and landowners
2. On-going Operational Costs
   - Annual operating budget is approximately $200,000
   - Employs 1 full time staff, 1 part time office staff, 1 on call person to cover when the manager is away & 1 seasonal intern
   - $50 – $300 per property depending upon system
3. Escrow account for repairs/replacement

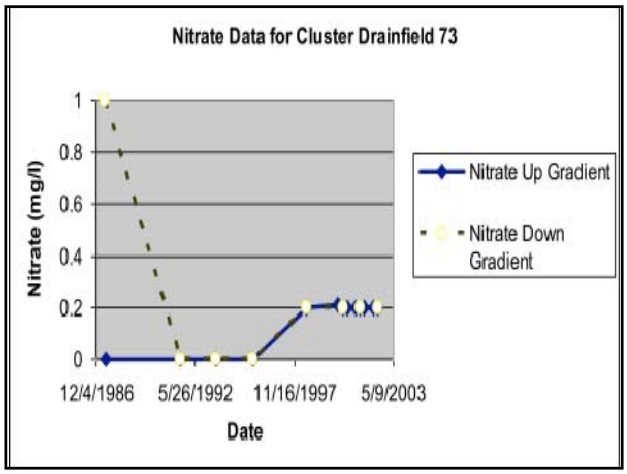
## Project Outcomes

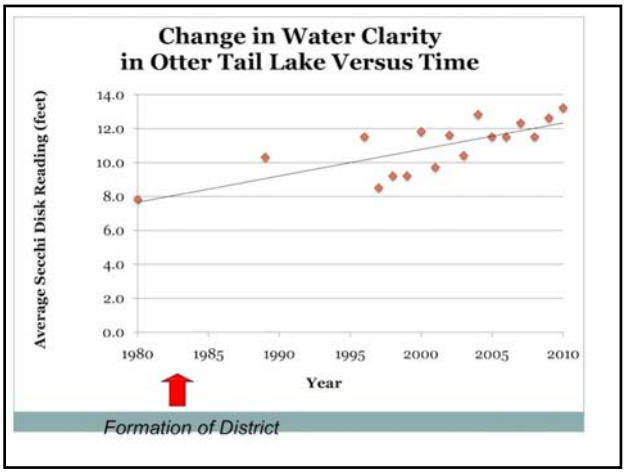
## System Failures over 30+ Yrs

- District has replaced 40 systems since 1986 = ~2% failure
- General reasons:
  - 20 were older systems installed prior to district formation
  - 18 were gravity beds
    - Home rebuild or additions
    - A few use related issues

## Ground & Water Quality Impacts

1. Groundwater monitoring wells
   - Originally 120 were required
   - Reduced to less then 30 due to no noticeable impacts
2. Lake water quality monitoring
   - Phosphorus levels
   - Water clarity




## Growth? More Development?

1. Development has been minimal which was one of the goals
2. Amount of seasonal versus permanent has not changed
3. Overall total connections has increased ~10% over 25 years

## Project Summary

1. Effective Treatment
2. Low cost
   - Unfortunately grants like they received do not exist today
3. Improved lake water quality
4. Limited impact to ground water
5. Successful management resulting in very low failure rate

## Relation to EPA Mngt. Guidelines

1. Fits into EPA's Management Areas 3 and 4
2. Passive Plan
   - Property owner owns system, under district jurisdiction, but owner responsible for maintenance, repairs and replacement
3. Active Plan
   - District provides all maintenance, repairs and replacement

## Minnesota Hierarchy for Funding

1. Replace failed systems with individual systems plus management
2. Replace failed systems with cluster systems plus management
3. Connect failed systems with existing managed treatment plant
4. Connect failed systems with new managed treatment plant

## New Study to be Released

1. Evaluation of use impacts on the need for tank pumping
2. Home owner use surveys
3. Data from district about sludge/scum = tank pumping
4. Will be released in early 2017
   - http://septic.umn.edu/research/

50

## More Information

NOWRA Paper:
http://septic.umn.edu/
→small community wastewater
→organizational options

University of Minnesota
Onsite Sewage Treatment Program

**District Manager**
**Rollie Mann**
**ottwmd@prtel.com**
**218-864-5538**

**Sara Heger**
**sheger@umn.edu**
**612-239-8918**