


## Wastewater Solutions for Communities

University of Minnesota Extension Service  
 Onsite Sewage Treatment Program


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There are **600,000** on-site sewage treatment (septic) systems - (27% of households)

Over **30%** of new homes have septic systems

- Typically composed of a septic tank and drainfield



### What Is Sewage/Wastewater?




### What do we need a septic system to do?

- Clean up our used/ dirty water – recycle 
- Protect human health – our family & neighbors
- Protect the environment. 




### What makes wastewater "dirty"?

- Pathogens**
  - Virus, Bacteria (Fecal coliform bacteria)
- Nutrients**
  - Phosphorus
  - Nitrogen
  - Micro-nutrients; including heavy metals (make up, hair dye)
- Solids – organic and inorganic**
  - Organic: food, fat, grease, hair, human waste, etc.
  - Inorganic: sand, silt, washing hands, doing laundry, etc.
- Chemicals**
- Cleaners**
- Medications**
- Water treatment.**

*Gray water.....*  
*Black water.*

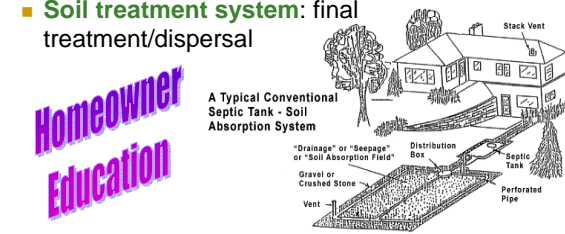
Treatment is the KEY




### Anatomy of a Septic System

- Plumbing:** wastewater collection
- Septic tank:** primary treatment
- Soil treatment system:** final treatment/dispersal

*Homeowner Education*



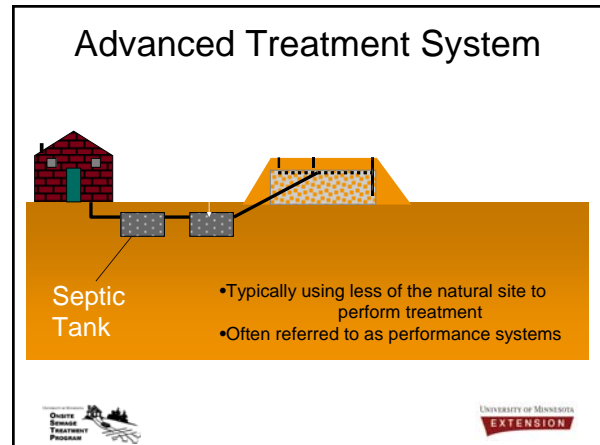
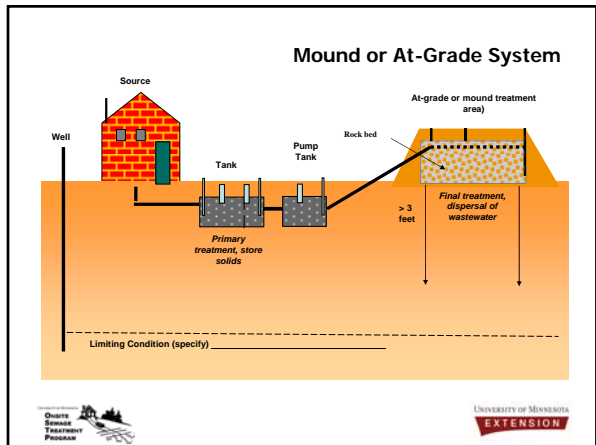
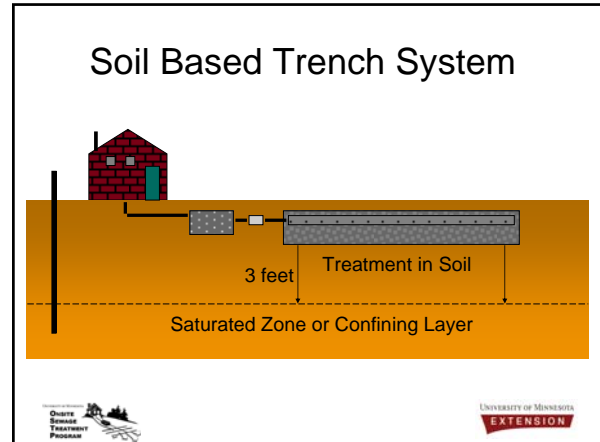


A Typical Conventional Septic Tank - Soil Absorption System



### Systems Failing to Protect Groundwater

- **Imminent Threat to Public Health (ITPHS)**
  - Surfacing system
  - Old system not properly abandoned
  - Other situation determined to be a threat to the groundwater by an inspector
  - **MUST** deal with these immediately according to codes
- **Other issues of non-compliance**
  - Do not meet county and/or state codes for separation, tank, size, other factors – need to bring up to code. Most often are older systems.
  - Have a seepage pit, cesspool, leach tank or other non-compliant tank. (*tanks must be watertight*)
  - Does not have a management plan in place – system is not being maintained regularly.



### General community wastewater management goals

- **Protect human/family health**
- **Protect ground & surface water - environment**
- **Affordable costs**
- **Consistent with community character & values – Informed residents:**
  - Part of process
  - Educated on use of systems
  - *Community drives the process*
- **All wastewater goes to a good treatment facility! Appropriate options for community**
- **All treatment facilities are well managed!**




### The Community Process

- Create **ownership** of issue and benefits of solving it on your own terms.
- Maintains **values, character of the community, our long-range plan.**
- Create understanding of **“the Shift”** from paying very little for disposal to paying \$\$ for treatment and management.
- Protects human and environmental health with affordable systems.
- All wastewater is **treated** and **managed!**




**Q: Do on-site systems ever fail to properly treat wastewater?**

- **A: Yes**
- **Design/construction** - type chosen - cesspools & bad soil determinations, breaks, leaks in & out (*designer, installer problems*)
- **Over loading** (*homeowner issues*)
- **“Bad” things down the drain** (*homeowner issues*)
- **Improper maintenance** - pumping frequency & techniques, knowledge, cost (*homeowner issues*)





**Q: Do centralized systems ever fail to properly treat wastewater?**

- **A: Yes**
- **Design/construction** - type chosen, breaks, infiltration/exfiltration - “leaks” in & out, “by-passes” (*designer, installer problems*)
- **Over loading** (*homeowner and/or management issues*)  
“Bad” things down the drain (*homeowner issues*)
- **Improper maintenance** - skills & money (*management issues*)



**Minnesota Pollution Control Agency**

- **Project Priority List (PPL)**
- **Goals:**
  - Preserve existing wastewater infrastructure investments
  - Provide assistance to existing systems at or near capacity
  - Protect and restore impaired waters
- **Change the scoring methods and the hierarchy**
- **Expect number of applications to increase and available funds to continue to decrease**
- <http://www.pca.state.mn.us/water/wastewater.html>
- Bill Dunn, MPCA, [bill.dunn@pca.state.mn.us](mailto:bill.dunn@pca.state.mn.us); 651-282-2663



**Minnesota Public Facilities Authority**

- PFA is a state agency governed by board of 6 state commissioners.
- Staff support provided by Dept of Employment and Economic Development.
- PFA functions as a bond bank to finance public infrastructure projects.
- 800-657-3858; [jeff.freeman@state.mn.us](mailto:jeff.freeman@state.mn.us)
- [www.dted.state.mn.us/pfa-f.asp](http://www.dted.state.mn.us/pfa-f.asp)
- Region 6E & 7W: Kathe Barrett, 651-205-4223; [kathe.barrett@state.mn.us](mailto:kathe.barrett@state.mn.us)



**USDA Rural Development**

- **Water and Waste Disposal Loans and Grants Program**
  - Loan and Grant funds available for:
    - Community water, sewer, and storm water systems
    - Individual septic systems when centrally owned
- **RD Financing**
  - A loan program with a grant component to reduce user costs.
- **Funding Partners**
  - Small Cities Development Program
  - Wastewater Infrastructure Fund
  - Environmental Infrastructure Assistance Program: Section 569.
  - Other assistance from the Midwest Assistance Program
- [www.rurdev.usda.gov/mn](http://www.rurdev.usda.gov/mn)
- Willmar office, USDA-RD, (320) 235-5612 Option #4
  - Kevin Friesen, [Kevin.Friesen@mn.usda.gov](mailto:Kevin.Friesen@mn.usda.gov)




**Minnesota Rural Water Association**

- A non-profit association
- Provide quality water supplies to rural areas.
- Provide proper wastewater treatment to rural areas.

217 12th Avenue SE, Elbow Lake 56531  
218-685-5197

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[frank.stuemke@mrwa.com](mailto:frank.stuemke@mrwa.com)

Tim Hagemeyer, Wastewater Technician:  
[tim.hagemeyer@mrwa.com](mailto:tim.hagemeyer@mrwa.com)



### Small Cities Development Program

- SCDP funds are granted for wastewater treatment projects, including collection systems and treatment plants; fresh water projects, including wells, water towers, and distribution systems; storm sewer projects; flood control projects; and street projects.
- Regional Rep:  
Dan Taylor, 800-657-3858  
[dan.taylor@state.mn.us](mailto:dan.taylor@state.mn.us)  
<http://www.deed.state.mn.us/faq/SCDP.htm>



### Midwest Assistance Program

**MAP:** Development assistance to help communities obtain or expand water or wastewater facilities.

Needs assessments, income surveys, dealing with engineers, financial packaging, application preparation, construction supervision, more.

<http://www.map-inc.org>

Curt Brekke

PO Box 187, Prior Lake, MN 55372  
952-440-3939, cbmmmap@aol.com



### Minnesota Initiative Foundations: *Southwest MN Foundation*

- 6 independent, nonprofit philanthropic organizations in MN.
- Most have programs to help communities with environmental issues

1390 Hwy 15 So.  
Hutchinson 55350  
800-594-9480

[info@swmnfoundation.com](mailto:info@swmnfoundation.com)  
[www.swmnfoundation.org](http://www.swmnfoundation.org)

#### Counties served

Big Stone, Chippewa, Cottonwood,  
Jackson, Kandiyohi, Lac Qui Parle,  
Lincoln, Lyon, McLeod, Meeker,  
Murray, Nobles, Pipestone,  
Redwood, Renville, Rock, Swift,  
Yellow Medicine



### Replace non-compliant ISTS

- Local agencies may have funds available to replace failed or non-compliant systems
- Not for new construction
- Most: loan rate 3 - 3.5%, 5 – 10 years
- Some can be added to the property tax statement
- Some are only for ag land; others include lakeshores and developments
- Contact local SWCD, Environmental Services or Watershed Management District



### USDA Rural Housing Loan and Grant Program

- Low interest loans and grants for low income families (many are 1%)
- Can be used to replace or upgrade septic systems.
- <http://www.rurdev.usda.gov/mn/SFH.htm>
- Brochures available.



### Management

- Establish or review a legal entity to provide operation and management services –
  - City Administration
  - Subordinate Service District or
  - Sanitary Sewer District
- Operating Permits
- Monitoring Plan
- Mitigation plan required along with flow measurement
- System evaluation and reporting critical to long term performance of system
- **Secure a management service provider**



### Possible Management Providers

- **ISTS contractor** – contract with a septic service provider
- **Product vendor** – often the system manufacturer provides management – especially with “alternative” systems
- **Utility company/cooperative** – many rural electric associations are entering the management arena
- **Employee of a management entity** – companies that provide a variety of management services
- **Hire a system manager** – MPCA is establishing a new category of septic professional, to operate mid-level systems; will be licensed.
- **Hire a large system manager** – licensed by MPCA
- **Combination**



### The Community Process

#### Finding a Viable Solution


That provides:

- **Effective treatment** - protects human & environmental health
- **Reasonable cost** - Life cycle costs = capital costs & O & M
  - Remember homeowners need to move from costs of occasional tank pumping to regular maintenance costs.
- **Socially acceptable** - community values, culture, esthetics



### Communications, Outreach


- Make sure all interests and “sides” receive equal information
- Utilize every public route available: local weekly newspapers, local radio, flyers on bulletin boards
- Establish a bulletin board devoted to this issue in a place people regularly go – gas station, grocery store, local school, meeting place, etc. Keep current info there
- Establish a way for residents to contact committee members easily, and in a comfortable manner
- Reach every resident regularly – at least BEFORE major action is taken via newsletter or personal contact
- Phone trees still work



### Keys to Success

- A community ‘vision’ or plan
- Civic engagement –
  - Responsibility
  - Ownership
- Setting the appropriate goals:
  - Treatment
  - Affordable
  - Community values/character
- Effective leadership
- Understanding that all professionals have biases & self interests
- Identify & evaluate all options
- Involve all interests at the table
- Keep everyone informed.

*Remember: This is YOUR project  
 not the county's not the consultants  
 not the engineers  
 It belongs to the residents*




**Apply the best technology for the situation & manage it!**

<b>DECENTRALIZED</b>	3. Septic tank, single pass sand filter, mound	7. Septic tank, aerobic tank, tip disposal
1. Septic tanks, rock trench	4. Septic tank, gravelless trench	8. Septic tank, aerobic tank, tip disposal
2. Septic tank, mound	5. Challenge: composting toilet, septic tank, reduced size drainfield	9. Gravity collector, stabilization ponds, discharge to stream
3. Septic tank, lined septic, unlined mound	6. Collection, large septic tank, mound	10. Gravity collector, stabilization ponds, discharge to stream
4. Septic tank, post filter, chamber trenches		

### The Pitfalls of Improper Planning!

