

A Quick Guide to

Small Community Wastewater Treatment Decisions

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What Is Wastewater?

Everyone generates wastewater. The typical home uses 75 to 100 gallons of water per person per day. When people “use” water it doesn’t go away; it becomes dirty and is wastewater or sewage. Wastewater contains *pathogens* (disease organisms), *nutrients* (nitrogen, phosphorus, etc.), *solids* (organic, inorganic), *chemicals* (from cleaners, disinfectants, medications) and *water*. Wastewater must be cleaned up before it is returned to the environment to be recycled for future generations. As individuals and members of a larger community, everyone must take responsibility for wastewater generated in their community.

How to Treat Wastewater

Wastewater treatment protects human and environmental health. There has been much debate over the best way to treat wastewater. Only in the last few years has the Environmental Protection Agency (EPA) acknowledged that *decentralized* systems (individual and small multiple-household wastewater treatment systems, sometimes called *on-site septic systems*) are as successful as municipal or *centralized* systems in treating wastewater to meet water quality standards in a cost-effective manner.

Regardless of the approach chosen, two things are clear: 1) all wastewater must be delivered to an effective treatment facility and 2) all treatment facilities must be well managed. These basic principles sound simple, but implementing them in an existing community is not an easy or quick task.

Wastewater Problems Are Community Problems

When a community faces wastewater treatment issues, a successful outcome is often more dependent on the process the community follows to address the issue than it is on the wastewater treatment technologies available to them. Engaging all of the members of the community early in the decision-making process leads to the best solutions and encourages responsibility. Finding appropriate technological solutions to a community’s wastewater problems is the easy part. Working together as a community is the challenge.

Communities that are successful in finding a technically effective, economical and socially acceptable solution have several distinguishing characteristics. People in these communities:

- Clearly and completely understand their current situation *before* they start looking for solutions.
- Realize that only they can make the best decisions for their community.
- Take responsibility for and ownership of the problem.

- Have or develop strong leadership from within.
- Have a clearly defined vision and mission, which leads to setting appropriate goals.
- Take the time and energy to identify and examine all options before making decisions.
- Gather information from as many sources as possible before taking action.
- Keep all affected parties involved and informed all along the way.
- Identify and use a set of criteria.

To implement an effective community process that will move the project to completion, a steering committee representing diverse interests must work with the entire community. The process, from start to finish, typically takes from three to seven years! Every community must *struggle* to find the right solution. *Struggling* through the process stimulates every one to learn, understand their differences, negotiate compromises and come to a conclusion that everyone can live with.

Before studying wastewater treatment options, communities must work with local units of government, agencies and organizations to assemble data to help them understand the present situation. Once the data is gathered, steering committee members, officials, experts and key members of the community need to carefully interpret the data to determine what it means. This provides a clear understanding of the current situation and gives a sense of direction.

Once the community understands its situation and resources, it must be prepared to examine options for treatment, legal structure and financing available to them. To do this the community team will need to work with a variety of professionals to find the solutions that best fit the community's needs.

Wastewater Treatment Options

Many small communities begin the process of addressing wastewater treatment needs by thinking that all they need to do is find the “recommended” treatment option and install it! However, each situation is unique and there are numerous treatment technologies available. Of course all treatment options have their advantages and disadvantages.

When deciding on the right treatment system, the community must have clear goals and specific criteria to use in making the decision. The system or systems chosen must provide the community with effective and manageable wastewater treatment at a reasonable cost. Depending on the overall population density, soil conditions and other factors, treatment systems follow one of two general concepts:

- **Decentralized:** Individual and multiple-household (cluster) on-site systems using standard or “alternative” treatment technologies with subsurface discharge (may include pretreatment processes)
- **Centralized:** Municipal style collection (gravity, pressure or vacuum) and centralized treatment with surface discharge (treatment involves primary, secondary, and perhaps tertiary processes)

A combination of these approaches is frequently the most viable solution.

Management of Wastewater Systems

Management of a wastewater system includes monitoring, operation and maintenance. By providing a high level of management to all systems, communities can meet water quality and cost objectives using a variety of treatment systems.

The benefits of good management include:

- Reduced overall costs
- Longer system life
- Improved system performance
- Increased reliability and overall satisfaction

Everyone involved must understand, carry out and be accountable for their role. The costs to replace a system, plus the hidden costs of human health risks and contamination of drinking water are incentives to do proper management.

Organizational Structures

Someone must be responsible for ownership, monitoring, operation, maintenance and the finances of wastewater treatment systems. This may be the owner of an individual system; however, multiple-household and community systems also require a *responsible management entity*—providing technical skills, legal authority and administrative capabilities.

Minnesota has several legal structures that can be used for wastewater projects. Each has advantages and disadvantages. Each project and community is unique and must find the one that fits best. Options for unincorporated areas include:

- Sanitary District
- Regional Sanitary Sewer District
- Special Legislative District
- Water Quality Cooperative
- Subordinate Service District
- Homeowner and Lake Association
- Joint Exercise of Powers Agreement
- Lake Improvement District
- Rural Water User District
- Watershed Management Organization
- Watershed District

Costs and Financing

The life cycle cost of wastewater treatment systems include design, construction, operation, maintenance, repair and replacement. Communities must be very careful when comparing costs. Usually construction costs are spread over a twenty-year period. When considering costs, pay special attention to the source of the information and be cautious of big differences in life expectancy.

People always look for “free money” to pay for construction of wastewater treatment systems because in the 1970s federal construction grant funds were available. Today very few grants are available and have been replaced by low-interest loans, bonding, service fees and people paying out of their pocket as methods to finance most wastewater systems. To control costs, first find the most cost-effective solution and then consider all financing options.

Communities must develop the fiscal, managerial and technical capacity to plan, design, install, operate and maintain the system(s) over time. Three levels of financial assistance need to be considered—local, state and federal. Thoroughly review the requirements of all funding sources before

making commitments because sometimes the reporting and additional work required may be more than the community is willing to do or cost more than the funds are worth.

Working with Professionals

Some of the best advice about working with professionals appears in *Assessing Wastewater Options for Small Communities: Trainer Manual for Local Decision Makers* published by the EPA-funded National Environmental Training Center in West Virginia. This publication states, “Many professionals may be biased toward particular technologies, so they may not seriously consider options they are unfamiliar with or simply don’t like.”

The community team will need to work with a variety of professionals (engineers, regulators, consultants, educators, etc.) who bring individual values, experiences, knowledge and profit motives with them in order to find the solutions that best fit the community’s needs. By screening proposals, interviewing candidates, checking references, using multiple sources of information, and involving diverse interests in the process, the community can find a solution that they can live with for many years to come. They must use good critical thinking skills to sort through all of the options and information.

Thousands of communities in Minnesota and across the country are facing wastewater treatment challenges. There are practical solutions available but it’s up to citizens, elected officials, and staff to find and implement them!

For More Information

Much more detailed information on all of these topics is available in the University of Minnesota Extension Service publication #BU-07734 *Small Community Wastewater Solutions: A Guide to Making Treatment, Management and Financing Decisions*, available through the Distribution Center, 800-876-8636 or local County Extension Offices. The On-Site Sewage Treatment Program also offers educational programs for communities. Consult the website at: www.bae.umn.edu/septic or contact Ken Olson at (800) 657-3516 for more information.

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