



Small Community Wastewater Systems

Individual or Cluster Systems: What are our Choices?

A good community wastewater treatment plan doesn't necessarily mean one wastewater treatment plant—but it does include a management and maintenance plan.

- *Decentralized Systems:*
 - * Individual systems (1/home)
 - * Small cluster systems (2—5 or so homes connected together)
 - * Large cluster systems (over 5 homes sharing one wastewater treatment system)
- *Centralized systems* (large, municipal type systems) (*note: these systems have a place in many communities. This publication is designed to help communities make choices between individual and decentralized systems.*)
- *Combinations:* the one-size-doesn't-fit-all concept— a combination of individual and group systems may be the best solution. Communities may incorporate individual systems and cluster systems under one management plan.
- The best solution(s) incorporate management and long-term maintenance of all systems in the area. All residents should be expected to participate in a structured management program that includes monitoring and maintenance.

General community wastewater management goals

All communities strive to accomplish some common goals with infrastructure issues, including wastewater treatment.

- Affordable costs (installation and long term maintenance)
- Consistent with community character & values – land use plan.
- Protect ground and surface waters
- All wastewater goes to a *treatment* facility.
- All wastewater treatment systems are well *managed*.

A good treatment choice for a community considers:

- The community character and values (the urban/rural character of the community—as the residents choose)
- The management plan—how will the system be maintained and managed for the long term?
- All treatment technologies including individual, cluster (multi-home) and large systems (municipal type). Consider combinations of technologies that will be efficient in cost and operation.
- A full assessment of the current situation (status of current systems, soil conditions, lot sizes, etc.)
- A look at the future—community goals, issues related to surface and ground water in the area, local political and environmental situation, potential growth, other issues.

Cluster or Individual Systems?

Advantages of cluster systems:

- 1 location to go for most management functions (improved management systems)
- Sometimes an advantage of 'scale' (larger system) for pre-treatment—more efficient
- Can solve treatment concerns on small lots
- Might be able to use parts of it for connection to municipal or larger systems in future

Advantages of individual systems:

- Lower impact on sites – trees/ topography
- Can have greater distances between homes
- Eliminates problems with system misuse by a few
- Independence of owners
- Management of systems is 'different' than cluster but can be just as good

Cluster System Variations:

Communities have several choices for cluster systems. These can include:

- Septic tank at each home - effluent (liquid) goes to a soil treatment/dispersal unit for group of homes.
- Large pipe takes all waste for several homes to a large septic tank, then to a large soil treatment/dispersal unit.
- Grinder pump at each home (or 2 homes), then all waste goes to a large septic tank and soil treatment/dispersal unit.
- Could add "pre-treatment" to any of these (nearly always between the septic tank and soil treatment).

Design systems with long-term performance and maintenance in mind

- Adequate capacity (immediate and predicted future use)
- Accessible manholes, alarms, insulation, clean out ports, water meters, effluent screens and filters
- Informed homeowners

Results of Good Management

- Reduced long term costs
- Lengthened life of the system, increased reliability
- Improved performance—better, more efficient treatment of wastewater
- Protection of ground and surface waters by properly treating wastewater, limiting phosphorus and nitrates levels.

“Alternatives”- Modifications or additions to trenches, mounds, beds, at-grades

Individual homeowners and clusters—groups of homes have several choices for alternative technologies to consider when traditional individual septics with a tank and drain field or mound provide too many limitations.

Pre-treatment: (Usually between the tank and the soil treatment system; does some of the treatment)

- Aerobic treatment units
- Single pass sand filters
- Peat filters
- Constructed (lined) wetlands
- Textile/fabric filters
- Re-circulating media filters

Final Treatment/dispersal

- Drip dispersal
- Constructed unlined wetland bed

Separation Technology

- Composting toilet and tank with trench or aerobic treatment unit

Drinking Water and Wastewater Options:

Communities have more choices than just wastewater systems. Often, a look at drinking water systems may yield more choices. Some options are:

- + Individual wells and individual septic systems
- + Individual wells and group septic systems

- + Individual septic systems and group water
- + Group water and group septic systems

Source: *Small Community Wastewater Solutions: A Guide to Making Treatment, Management and Financial Decisions.* BU-07734. University of Minnesota Extension Service, 2002.

Residential Cluster Development: Fact Sheet Series (MI-7059) has additional information on this topic.

Innovative Onsite Sewage Treatment Systems, PC- 07666 discusses alternative technologies for pre-treatment and final dispersal.

University of Minnesota Extension Service Septic program web site: <http://septic.umn.edu/>

University of Minnesota Extension web site: <http://www.extension.umn.edu>

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