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 septic systems 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/disposal
- Drip disposal
- 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

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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/](http://septic.umn.edu/)
University of Minnesota Extension web site: [http://www.extension.umn.edu](http://www.extension.umn.edu)

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