

Management of Decentralized Waste Water Systems in Maine





Maine towns that lack funds to build centralized sewer systems have found it difficult to encourage traditional village-type growth. Current zoning regulations tend to promote low-density development in areas where higher densities are desired (such as village growth centers). The Maine State Planning Office (SPO) hired Stone Environmental to determine if decentralized wastewater infrastructure could support higher densities in Maine's villages without compromising the quality of the state's watersheds.

Stone studied the state's environmental laws and regulations, and the characteristics of its soils, groundwater, and bedrock. We analyzed decentralized wastewater technologies and the options for managing decentralized infrastructures. We then compared our findings with Maine's growth goals to determine whether the use of decentralized wastewater systems is desirable and feasible in the state. Finally, we summarized our findings in a set of handouts and technical papers to educate local decision makers and real estate developers.

- An eight-page brochure, *Partners in Building Maine's Future: What Subdividers and Planners Need to Know about Septic System Options in Local "Growth" Areas*. It provides a comprehensive look at the issues surrounding decentralized water and wastewater infrastructure.
- Four two-page handouts that provide an overview of decentralized infrastructure from four angles.
 - *Technology Choices for Developers and Subdividers in Non-Sewered Areas*
 - *Management of Decentralized Wastewater Systems in Maine*
 - *Creating Communities with Decentralized Wastewater Solutions*
 - *Partners in Building Maine's Future: Decentralized Wastewater and Smart Growth.*
- Four technical assistance bulletins (TABs) that describe in detail the scientific basis for our findings.
 - *Decentralized Wastewater and Water Supply Technologies and Performance (TAB #9)*
 - *Management, Policy Options and Guidance for Water Supply and Decentralized Waste Water (TAB #10)*
 - *How to Make Growth Areas Work Without Sewers: Three Approaches Plus None of the Above (TAB #11)*
 - *Decentralized Wastewater and Water Supply: Further Reading (TAB #12)*

We conducted our work for the Maine SPO between May and December 2003.

Stone Environmental was founded in 1992 and quickly established itself as one of the top US firms evaluating the environmental effects of agrochemical use. Since then, we have grown into a successful multidisciplinary team of more than 25 scientists and 40 employees, and added services in the areas of water resources and wastewater, site investigation, and information for sustainable development. Stone is based in Montpelier, Vermont, an area admired for its quality of life and strong environmental values.

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SEPTIC SYSTEM TECHNOLOGY is a proven solution for addressing rural waste water needs. Proper management of septic systems allows this technology to solve more difficult environmental concerns, to provide infrastructure that supports growth, or to maximize land use.

Management of a variety of septic systems can be established in existing communities and in areas of new development. These systems can be of any size, for residential or commercial waste water treatment and disposal, and may be located onsite or on a separate property.

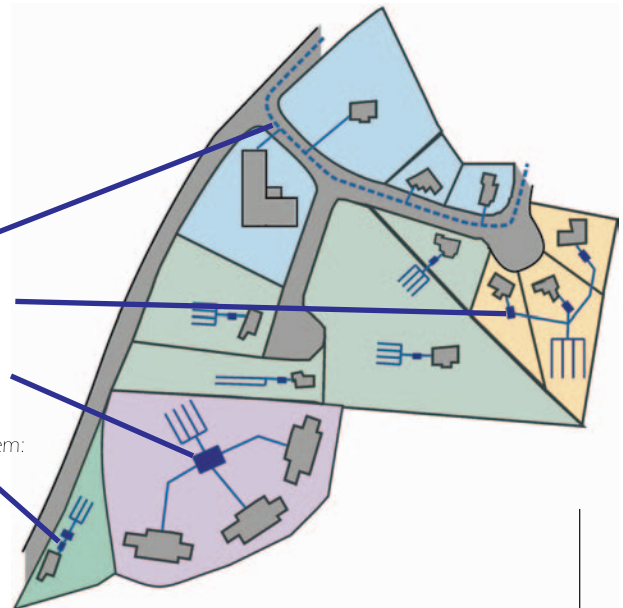
Small communities across the United States are implementing programs designed to better manage their decentralized water and waste water resources. In Maine, much of the legal authority needed to begin successful management programs is already in place.



A management program should include homeowner education on septic tank maintenance including installing risers and effluent filters.

Decentralized Septic Systems

- Centralized system: offsite disposal
- Cluster septic system: offsite disposal
- Cluster septic system: onsite disposal
- Individual septic system: onsite disposal



What is a “decentralized” system?

A decentralized system for waste water management may include one or several types of waste water treatment system, but the key is that all the systems have a centralized administration and management program.

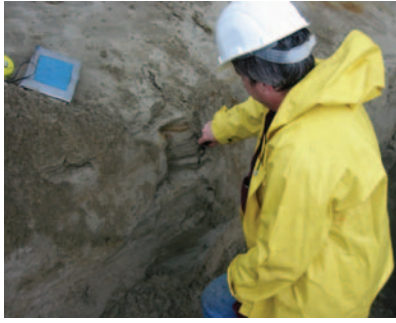
Decentralized systems can include traditional septic systems that serve individual homes or businesses (shown in green on the figure above).

They can also include larger septic systems that serve clusters of homes, subdivisions, apartment buildings, or businesses. These “cluster” systems may serve multiple buildings on a single property (shown in purple) or may serve several different properties (shown in yellow).

Finally, centralized systems with collection pipes, treatment, and soil-based disposal may also be a part of a decentralized waste water system (shown in blue). These systems are especially useful in villages with very small lot sizes or where there are valuable natural resources that need to be protected.

A management program is the glue that holds these different types of decentralized systems together. Usually, a management program for decentralized systems includes three major types of activities: planning and administration; construction, operation, and maintenance of the treatment systems; and compliance with local, state, and federal regulations and permits.

A Case Study: Town of Brownville, Maine



Thorough evaluation of sites for waste water disposal, including assessment of the soil profile, is an important part of system design and can be part of a town's wider management plan for septic systems.

The Town of Brownville constructed 11 subsurface systems in 1989 to treat and disperse waste water from residential and commercial properties in the Villages of Brownville and Brownville Junction. Industrial waste water is not treated by these systems, as they are situated above a sand and gravel aquifer that is also the water supply for the Villages. Before the systems were constructed, waste water was discharged to the Pleasant River untreated. The Town owns and operates each of these systems, which have design flows ranging from 300 gallons per day to 65,000 gallons per day and a total design flow of approximately 100,000 gallons per day. All 11 systems are regulated under a single Waste Discharge License issued by the Maine Department of Environmental Protection. Construction was funded primarily by loans from the Clean Water State Revolving Fund.

Brownville's systems are operated by the Water and Sewer Department. A chief operator takes care of the systems, including conducting a visual inspection and collecting flow information from each system on a weekly basis. The systems are self-financed, and service rates are determined by adding operating cost and capital improvements. All customers are currently charged at a flat rate of \$75.45 per quarter (or about \$25 a month).

"Systems are low-maintenance and easy to operate."

—Sophia Wilson, Town Manager

System Management in Maine

Many Maine communities have the tools in place to implement decentralized waste water management programs. Septic systems serving three or more properties that are owned by different people already must be managed, according to the Maine Subsurface Waste Water Disposal Rules. Under these rules, the system's manager has the responsibility to operate, maintain, repair, and replace (if necessary) the septic systems—regardless of their size, the number of systems, or the technology used to treat the waste water.

Examples of organizations that can create and run a decentralized waste water management program in Maine include municipal departments (existing public works departments), quasi-municipal agencies (water or sewer utilities), and private organizations (condominium or homeowners' associations).

Eight towns in Maine have already established programs to manage their septic systems. For more information about one of these programs, please see the sidebar on the Town of Brownville at left.

Decentralized Systems Protect Communities

When septic systems are designed, installed, and maintained properly, they protect public health, drinking water supplies, and the quality of nearby lakes, ponds, rivers, and coastal areas. Successful management of these systems preserves property values and can be less expensive than a conventional centralized sewer in terms of both construction and maintenance costs. Decentralized systems combined with a good management program can help communities in Maine achieve their growth and development goals while preserving residents' quality of life.

For More Information

Maine State Planning Office
(207) 287-3261
www.maine.gov/spo/

Maine Department of Environmental Protection
(207) 287-2111
www.maine.gov/dep/index.shtml

Maine Department of Human Services, Wastewater & Plumbing Control Program
(207) 287-5689
www.maine.gov/dhs/eng/plumb/index.html



Septic systems that use alternative technology, such as this textile filter system, generally require regular maintenance that can be included in a management program.