

## **Appendix E**

### **Case Studies**

(Excerpted from "Managing Wastewater: Prospects in Massachusetts  
for a Decentralized Approach")



## Nova Scotia, Canada

### **The noncontiguous district**

A law passed in 1982 allows Nova Scotia towns and municipalities to create Wastewater Management Districts. The idea is to provide uniform "flush and forget" services to building owners, regardless of the mix of technologies and regardless of who owns the systems. All property owners in the district are obliged to participate in the funding, paying an annual charge that covers capital recovery as well as operation and maintenance costs. Boundaries of the district need not coincide with the existing town boundaries, and would typically be smaller.

In fact, the district may be "noncontiguous," consisting of individual properties or groups of properties that require special consideration for environmental or historical reasons. The administrative institution is either a sewer or public works committee of the municipal council. It is vested with all the necessary authorities and duties. It can own or lease land, make contracts, and fix and collect charges. It is held responsible for overall planning; upgrades; and design, construction, inspection, operation and maintenance of all types of systems. Finally, it can enter private property to inspect, repair, or replace malfunctioning systems.

In Port Maitland (population 360), a preliminary study estimated a per household cost of \$6000 to \$10,000 to install a conventional plant. The town opted instead for a mix of individual onsite systems and four cluster systems fed by gravity sewers to central septic tanks, siphon chambers, and contour subsoil trenches. Installation costs were approximately \$2400 per unit. Maintenance, repair, and pumping are provided by private contractors with the District. Annual fees per household were \$65 in 1994. Recent studies have shown that despite seasonally high groundwater, the systems are functioning well.

Guysborough, with a similar population, adopted a plan that includes a small conventional treatment plant for part of the town, an aerated lagoon for another part, and individual onsite systems for a third part. All owners were assessed \$2100 initially, and were charged annual fees of \$125 in 1994.

Voter approval of those in the district is required; it must be presented to them as a complete plan that has considered sites, boundaries, servicing options, preliminary designs, and cost estimates. However, districts have often been voted down. Only three Nova Scotia towns had adopted such districts by the spring of 1994. Of sixteen others that considered it, decentralized management was actually recommended in fourteen cases. But six had

chosen to centralize, and five were still in nebulous discussion. Five others were actively considering OWMD programs. Equity of either service or cost has been an issue in towns considering a mixed approach. Furthermore, central sewerage is often regarded by the public as more desirable and less interfering. Aside from questions of equity, voters have not always perceived that a problem existed, or that a Wastewater Management District was the entity to fix it.

### **Sources**

Jordan D. Mooers and Donald H. Waller, 1994, **Wastewater management districts: the Nova Scotia experience**. In: E.C. Jowett, 1994, (see references). • Nova Scotia Dept of Municipal Affairs, 1983, **Wastewater management districts: an alternative for sewage disposal in small communities**. (No further information available.) • David A. Pask, 1995, **Personal communication**. Technical Services Coordinator, National Drinking Water Clearinghouse, West Virginia Univ, Box 6064, Morgantown, WV 26506. • Andrew Paton, 1995, **Review merits of Wastewater Management Districts**. (Municipal infrastructure action plan, Activity #15.) Community Planning Division, Provincial Planning Section, P.O. Box 216, Halifax, NS B3J 2M4.

## Cass County, Minnesota

### **Rural electric cooperatives manage service districts**

Cass County is typical of the counties in the "Northern Lake Ecoregion" which have evolved from an economy based on agriculture and timber to an economy where the lakes and associated tourism have become very important. Because much of the development and growth around the lake regions took place in earlier years, there wasn't great attention paid to lot sizes, soil types, or to consideration of water quality. Cass County is now faced with a growing number of nonconforming onsite septic systems around many of its rural lakes. Furthermore, the state Shorelands Management Act, and Minnesota Pollution Control Agency (MPCA) regulations, are setting tighter regulatory wastewater standards which Cass County is obliged to enforce. And many residents are in the unfortunate position of being unable to sell their homes due to the fact that they can not provide a "conforming" septic system on their property. Cass County has been pressed to look for answers.

In 1994, the county developed the concept of the "Environmental Subordinate Service District," whereby a township, as the local unit of government, can effectively provide, finance, and administrate governmental services for subsets of its residents. Establishment of such districts within a town is now authorized under Minnesota Statute 365A. So far, one district has been formed; five are in planning stages. The purpose of these districts is to provide a self-sufficient, effective, and consistent long-term management tool, chiefly for neighborhood alternative (STEP) collection and communal leach fields. This model is innovative, because it stays at the grass roots level where the affected property owners and the township remain involved. Cass County provides technical and support assistance when required, but is not directly involved on a daily basis. The partnering with the townships and the county has allowed resource sharing, improved communication, and thus has opened up prospects for other cooperative ventures such as land-use planning, road improvements, and geographic information systems.

Once a Subordinate Service District is created by petition and vote from the residents needing the specific service, a County/Township agreement is signed. The County then determines the system's design, handles construction oversight, gives final approval for the collection system, commits to yearly inspections, and assures regulatory compliance. The leach fields are located away from lakes, wells, and groundwater supplies. Cass County will allow systems to lie on county-administered land in order to defray residents' costs, or to enable optimal siting.

The township is the legal entity that secures management services needed for the district to function. Other key players are the MPCA's Brainerd Regional Office, providing regulatory and technical assistance, the Association of Cass County Lakes for lake and water quality monitoring and educational support, the Minnesota Association of Townships for their legal counsel, the Mutual Service Insurance Agency for insuring the townships and the district wastewater collection systems, the Tri-County Leech Lake Watershed (district) for their engineering funding, and the Woodland Bank of Remer for working with the township to obtain low interest financing for residents.

However, **another key and major player** is the Rural Utilities Services (formerly the Rural Electrification Association). The piece of the puzzle missing for the districts to actually work was an operations, maintenance, and management program. Therefore, Cass County sought out the local utility, Crow Wing Power and Light (Brainerd, MN), and asked them to consider helping. Crow Wing Power and Light now provides the following services as utility managers: (1) security monitoring; (2) monthly inspections (they also maintain the grounds); (3) through a subcontractor, pumping of individual septic tanks, and any other repair or maintenance required; and (4) record keeping—logs are kept of inspections and repairs/maintenance. Bills are sent to the residents involved every six months, totalling about \$200 per year per household.

A management maintenance contract is negotiated for the utility's services, thus reducing the need for additional staffing by the town itself. The township remains the legal entity guaranteeing any unpaid charges through its power to levy special district taxes.

#### **Source**

This (extracted) text has been supplied by Bridget I. Chard, Resource Consultant, Red River Ox Cart Trail, Rte 1, Box 1187, Pillager, MN 56734; tel. 218-825-0528.

## Stinson Beach, California

### **Another classic, enforceable by shutting off town water**

Stinson Beach is a small town in Marin County, located about 20 miles north of San Francisco. Part of the beach is a park that can draw 10,000 visitors on a weekend. The town *generally* answers to Marin County government. At present there are about 700 onsite systems in Stinson Beach. It is another early participant in the onsite management concept.

In 1961 a county survey concluded that surface and groundwaters were being polluted by many of the town's often antiquated onsite systems. In response, the county created the Stinson Beach County Water District, whose task would be solve the problem. The water district is governed by a five-member, elected Board of Directors who make policy and perform water quality planning. Between 1961 and 1973, nine separate studies and proposals for central treatment were rejected by voters. In 1973 the San Francisco Regional Water Quality Control Board (SFRWQCB) intervened, putting Stinson Beach on notice. All onsite systems would be eliminated by 1977, and a building moratorium would go into effect forthwith. Even so, a *tenth* central sewer proposal was rejected. Voters were not only alarmed by costs, but were unconvinced that alternatives had been sufficiently considered. An eleventh study, specifically undertaken to examine alternatives, concluded that onsite remediation was both the most cost effective and environmentally benign.

Concurrence was sought from both the regional board and the state legislature, which enacted special legislation (consistent with California Water Code provisions) in 1978 empowering the Stinson Beach County Water District to establish the Stinson Beach Onsite Wastewater Management Program. The program would answer directly to the SFRWQCB, rather than to Marin County. The program would govern the permitting, construction, inspection, repair, and maintenance of old and, later, new systems. Rules and regulations were approved by the regional board on a trial basis, and were later made permanent. The program went into effect with the passage of a series of town ordinances. Rules and regulations (and ordinances) have evolved as problems were encountered, there being few precedents to go on.

Ownership of the systems, and ultimately the responsibility for repairing or upgrading them, rest with the building owner. But program staff perform inspections out of which come permits to operate, or instead a citation that lists violations and provides a timetable for remediation. (Initially a house-to-house survey was used to identify the most critical failures or substandard sys-

tems from which came *interim* permits to operate.) As in the case of Georgetown, the permit to operate is conditional on authorizing the district to enter property for purposes of inspection and, if need be, repair. Conventional systems are inspected every two years, alternative systems (now stipulated for some areas) every quarter. The permit may carry conditions, or varying periods of validity. The regulations provide penalties for noncompliance of up to a \$500 fine or 60 days imprisonment, each day considered another count. The district also has the power to effect its own repairs and put a lien on the property until repaid. And it has access to low-interest state loan funds for low-income households. However, *it has rarely had to take strong measures because the district is also empowered to cut off the water supply of a non-complier*, something it has had to do occasionally. During the initial period, about half the existing systems were found to require repair or replacement.

Five staffers approve plans, and inspect and handle compliance. The budget is met partly out of tax revenues and partly by a \$53 per household semiannual fee. Special inspections or inspections for compliance are also charged for.

Problems encountered at Stinson Beach mostly had to do with delays as bugs were worked out and sudden demands were put on staff as well as private engineers and installers. One completely unanticipated problem: Access ports, required of system owners, were leading to a serious mosquito problem; redesign of the ports resulted. Then, in 1992, the RWQCB imposed a moratorium on new systems pending reevaluation of the program, revised (and tighter) technical, approval and tracking procedures, and the development of a more adequate staffing and fee structure. New ordinances were passed in 1994, and the program is back on track. Not without some growth pains, this 17-year old program is regarded as both successful and adaptable to other locales.

### **Sources**

Mark S. Richardson, 1989; (see references). • Stinson Beach County Water District, 19???. *Wastewater management program rules and regulations; and [Revisions of 1994]* (SBCWD Ordinance 1994-01); SBCWD, Box 245, Stinson Beach, CA 94970. • SBCWD, 1982. *Report on the Stinson Beach Onsite Wastewater Management District for the period January 17, 1978 through December 31, 1981*. SBCWD (see address above). • SBCWD, 1991. *Fifteenth annual report of the Onsite Wastewater Management Program*. (January 1, 1992 - December 31, 1992; including data summary of Jan 1, 1986 - Dec 31, 1991.) SBCWD (see address above). • Bonnie M. Jones, 1995, *Personal communication*. SBCWD (see address above).



## Keuka Lake, New York

### **A home-rule intermunicipal agreement, eight towns strong**

Lake Keuka lies in upper New York State's "Finger Lakes Region." The Keuka watershed supplies water for over 20,000 people; over 10,000 live on the lake's shores, which border 8 municipalities and two counties. Overall, water quality in the lake is good, but occasionally elevated levels of sediment, nutrients, and pathogens have been recorded. Pollution, and its potential impact on health, recreation, property values and the associated tourism industry, led local townspeople to identify watershed management as their leading concern.

This concern was uncovered by a civic group, the Keuka Lake Association; more than 30 years old, it ultimately comprised 1700 members and was able, via its nonprofit Foundation, to acquire \$180,000 in grants and other revenues for study and planning purposes. It went on, in 1991, to establish the Keuka Lake Watershed Project, whose more specific purpose was to promote uniform, coordinated, cooperative watershed management for the region. There were three prongs to its effort: (1) establish details of the current situation; (2) educate the public to the need for action; and (3) foster inter-institutional cooperation.

With regard to the latter, it encouraged the formation of individual Town Watershed Advisory Committees that would provide local participatory forums to address water issues, and at the same time report to the Project's director. An early suggestion of the individual committees was to form a single, oversight committee, consisting of elected officials from the eight municipalities around the lake. This committee came to be called the Keuka Watershed Improvement Cooperative (KWIC). Initially it had no official status.

The stated purpose of the Cooperative was to develop a model watershed law, and then identify who should administer it. In developing the law it specifically excluded facilities of such a size that they were already regulated by the state. When it came to administration, they examined and rejected forming a regulatory commission through the state's enabling procedures, and they examined and rejected county-based ("county-small") watershed districts. Instead, they opted for drawing up an intermunicipal agreement under the state's Home Rule provisions which allow the municipalities to do anything together (by agreement) that they could have done separately. The agreement, itself, was only 8 pages long. It legally formalized the cooperative, providing for a board of directors consisting of the Chief Executive Officer of each municipality, and for a professional watershed management staff. Voters were presented with a package consisting of the agreement, the proposed

watershed protection law, and recommended policy and procedures, including those for dispute resolution. After dozens of public meetings the package won by a landslide in every municipality.

Regulations govern permitting, design standards, inspection and enforcement. A program for all sites in "Zone One," the land within 200 feet of lake, calls for their inspection at least once every five years. Failures are cited and required upgrades stipulated. Aerobic and other alternative systems must be inspected annually, at which time the owner must show evidence of an extant maintenance contract. Specifications for the design, construction, and siting of replacement systems are also tighter than the state's, and approval may require the use of advanced or "Best Available Technology." Enforcement provisions define violations, and specify timetables for compliance and fines. The individual municipalities issue notices of violations and citations to appear in town or village court.

The Cooperative coordinates its activities with state and county health agencies, maintains a database and GIS system to track environmental variables and the performance of new technologies, continues with ongoing studies, and retains a Technical Review Committee to help with policy and regulatory modifications. Staff include a full time watershed manager, employed by KWIC, and part time inspectors, employed by the towns.

KWIC is financed by septic system permit fees, grants as available, and funds from each member municipality's annual budget. The annual KWIC budget forecasts permit fees, considers grant funds immediately available, and distributes the balance of funds needed evenly among the towns and villages.

### **Sources**

Peter Landre, 1995. **The creation of Keuka Lake's Cooperative Watershed Program.** *Clearwaters*, summer 1995, 28-30. • James C. Smith, 1995. **Protecting and Improving the waters of Keuka Lake.** *Clearwaters*, summer, 1995, 32-33. • Text is also partially based on a one-page description of KWIC provided by James Smith. • (Peter Landre can be reached through Cornell Cooperative Extension, 315-536-5123; James C. Smith, Keuka Lake Watershed Manager, can be reached at 315-536-4347.)

## Gloucester, Massachusetts

### **Exploring new approaches for Massachusetts' cities**

Gloucester is a fishing port (population, 30,000) on the rocky coast of Cape Ann, about 40 miles north of Boston. While 40% of the city is sewered, the particularly troublesome area of North Gloucester is not. Failed septic systems have resulted in the closing of shellfish beds, and since 1979 the city has been under a consent decree to comply by 1999 with state clean water standards. Numerous environmental problems were initially taken to imply that North Gloucester should be required to hook into the city sewer. These included shallow soil depth, a high groundwater table, wetland areas, and numerous private wells.

The hookup was partially underway when the EPA Construction Grants program was terminated in 1985, leaving Gloucester still with a problem, and still under a consent decree. Aware that centralized hookups would now become extremely expensive to homeowners, and also aware that the central sewer provided only primary treatment (albeit waived for the time being), the city began an examination of the many ramifications of decentralized management, and many discussions with the state's Department of Environmental Protection.

In ongoing negotiations for its consent decree, Gloucester is pioneering a new approach to wastewater management in Massachusetts. It is in the process of developing a citywide wastewater plan that avoids construction of additional conventional sewer lines by proposing STEP sewers and/or ensuring that all onsite systems are properly built and maintained. Small community systems and package plants would be administered by the city's Department of Public Works, although their ownership is still under discussion.

Individual systems would still be administered by the Board of Health, albeit in a framework tougher than the state's recently revised (Title 5) regulations. As it presently stands, key provisions relating to individual systems include the following: An initial inspection and pumping will be conducted by either Board of Health personnel or privately-licensed inspectors at the homeowner's option. Inspection will result in either an Operating Permit or an Order to Comply that stipulates upgrade or replacement requirements and a time frame for compliance. Regular inspections will follow, ranging from annual (for food industries) to every seven years (for residences). A BOH computer system now in development will record data from these inspections as well as from septage haulers. There are emergency repair provisions and financial relief (loan) provisions for qualifying homeowners to be funded through a

Betterment Bill bond issue. The system is to be financed by license fees from professionals and by inspection fees from homeowners. Contractors and haulers will be licensed annually by the city, which will also conduct training programs. Enforcement will rely on the ultimate power of the BOH to make repairs itself and then invoice, with collection falling to the city and courts.

In areas unsuited for conventional systems, alternative technologies permitted by the DEP will be stipulated. For those, technical advice can be obtained from the DPW as well as the BOH. Such systems must be accompanied by three-year maintenance contracts with either the DPW or a licensed manufacturer/installer. In North Gloucester a National Onsite Demonstration Project is underway to test innovative systems yet to receive general state approval. Not all details of Gloucester's plans are settled, and final approval has yet to be obtained from the DEP, which, however, is being consulted as the plan is developed.

### **Sources**

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