
Onsite Wastewater Systems Management Manual for the New Jersey Pinelands

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New Jersey Pinelands Commission
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During the development of this manual, the Pinelands Commission convened a series of workshops attended by the following onsite wastewater experts and interested parties. Contributions from these individuals were essential to the development of the manual.

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Additional copies of this manual on CD-ROM may be requested from the Pinelands Commission, or downloaded from <http://www.state.nj.us/pinelands/landuse/waste/septic.html>. This web page also contains downloadable versions of the Microsoft Excel spreadsheet templates which were used to derive the OWTS management program cost estimates described in the manual.



EXECUTIVE SUMMARY

The Pinelands Area is an ecologically sensitive area with land use planning areas that allow onsite wastewater treatment systems (OWTS). These systems are primarily passive, traditional septic tank/disposal field systems. In the past five years, more complex OWTS that reduce nitrogen concentrations in wastewater have been installed in the Pinelands Area through a pilot program to allow development on one acre parcels while meeting water quality standards. “Management” of OWTS means providing appropriate institutionalized resources and programs to ensure that OWTS continue to protect public health and water quality, and maintain residents’ quality of life, while avoiding the expense of preventable repairs or replacement.

Management of OWTS in the Pinelands Area has two immediate drivers: 1) the New Jersey Department of Environmental Protection recently adopted new Water Quality Management Planning Rules that require OWTS management for unsewered areas; and 2) the Pinelands Commission’s Alternative Wastewater Treatment System Pilot Program has been successful and needs to be replaced by a long-term program that ensures alternative OWTS will be maintained properly in the future.

This manual is intended to be used as a tool for potential OWTS management entities, as well as by other stakeholders in the Pinelands Area. Potential management entities include local municipalities, county environmental health departments, municipal utilities authorities, private consultants, and cooperatives/non-profit organizations. Stakeholders include, but are not limited to:

- Property owners
- Local, County, State and Federal government agencies
- Environmental advocacy groups
- Professionals & Practitioners in the OWTS field
- Banking and financial institutions
- Real estate professionals
- Developers
- Title insurance agencies

Using fourteen elements of OWTS management programs from the United States Environmental Protection Agency (US EPA) voluntary management guidelines as a checklist, it appears that current levels of OWTS management in the Pinelands Area are variable. The management elements are:

- Administration
 - Public education and participation
 - Planning for OWTS management
 - Performance requirements
 - Record keeping, inventory and reporting
 - Funding (for starting OWTS management programs and for OWTS alterations and repairs)
- Installation

- Site Evaluation
- Design
- Construction
- Operation and Compliance
 - Operation and maintenance (O&M)
 - Residuals management
 - Compliance inspections / monitoring of existing systems
 - Corrective actions
 - Enforcement
 - Training and certification/licensing

A comprehensive program exists for site evaluation, design and installation of traditional OWTS in New Jersey, and the Pinelands Alternative Wastewater Treatment System Pilot Program includes a thorough management program for its pilot systems. Large OWTS (those with design flows greater than 2,000 gallons per day) are also adequately managed through operating permits issued by the New Jersey Department of Environmental Protection. However, there is no inventory of the roughly 50,000 traditional OWTS within the Pinelands at any level of government. Only through the recent revisions to the Water Quality Management Planning Rules are there any provisions for long-term planning, and funding for OWTS management programs is scarce.

Currently, with the exception of site evaluation, design, and installation elements, the management of traditional OWTS is largely in the hands of the property owner. **Property owners are currently responsible for all pumpouts and other maintenance of OWTS and, under most of the management models described in this manual, would remain the permittees or responsible parties for the ongoing care of OWTS in the Pinelands Area.** The Pinelands Alternative Wastewater Treatment System Pilot Program includes a requirement for an initial five year maintenance agreement for each advanced OWTS, due to the complexity of the systems. The regulatory and legal framework of OWTS management in the Pinelands, and extensive outreach to stakeholders and the general public, have both provided the basis for developing this manual for OWTS management in the Pinelands Area.

A risk-based approach for OWTS management focuses priorities and resources on areas or systems that have a higher risk of public health or water quality impact. In the Pinelands Area, low risk systems are traditional OWTS installed since approximately 1990; moderate risk systems include older traditional OWTS and advanced treatment OWTS; and high risk systems that are those which are currently malfunctioning or not meeting performance standards.

Historically, the State legislature has delegated responsibility for on-site wastewater management throughout New Jersey, including within the Pinelands Area, to the State Health Department (later to NJDEP), and to municipalities and counties. There is no intent to change the current site evaluation, design, and installation management elements, where NJDEP and the Pinelands Commission write rules establishing site evaluation, design, and construction requirements, which are implemented by either

county or local health departments. Thus, OWTS management models need to be collaborative to be effective. Four collaborative management models have been developed for the Pinelands Area:

- Municipal/County Inter-Local Agreement Management Model
- Utilities Authority Management Model
- Private Consultant/Municipal Engineer Contracts Management Model
- Cooperative/Non-Profit Organization Agreements Management Model

The Municipal/County Inter-Local Agreement Management Model is closest to the current program already in place in the Pinelands Area for OWTS installation-related management elements. In this model, the municipalities delegate wider authority over OWTS to County environmental health departments, which would implement the management program.

The Utility Authority Management Model expands the role of utility authorities from centralized wastewater infrastructure to distributed wastewater infrastructure (OWTS). This approach utilizes existing expertise and experience in wastewater infrastructure management.

The Private Consultant/Municipal Engineer Contracts Management Model is based on the way that many townships already contract out engineering services to consulting firms. Under this model, implementing the inventory, record keeping, operation and maintenance and inspection elements would be contracted to professionals, while the municipality retains responsibility for public outreach, planning, financial assistance, corrective actions, and enforcement.

The Cooperative/Non-Profit Organization Agreements Management Model is similar to the private consultant contracts model above, in that the municipality retains responsibility for program funding and corrective actions/enforcement, and contracts the remaining elements to the cooperative or non-profit.

The process of evaluating and selecting which model is appropriate for a particular area in the Pinelands is dependent on the availability, expertise, experience, and willingness of potential management entities. A process of evaluating models and fashioning key components for the specific elements is outlined in this manual, and advantages, disadvantages, and estimated cost allocations are provided for each model. Costs are broken down by whether they would be incurred by a municipality, management entity, or property owner.

Regardless of the management model chosen within a given jurisdiction, a simple or “minimum” OWTS management program should include the following elements in order to comply with existing regulations:

- Inventory of existing systems
- Ordinance to require regular septic tank pumpouts
- Renewable operating permit program and database to track pumpouts
- Enforcement mechanism to assure pumpouts are completed

Implementing a minimum OWTS management program will allow jurisdictions to build an inventory of OWTS installations and to understand current conditions—thus enabling better community decision making about whether elements of a more comprehensive management program are needed locally.

If advanced treatment systems were installed in a jurisdiction through the Pinelands Alternative Wastewater Treatment System Pilot Program, or if such systems could be installed in the future, the management program should include the following additional elements:

- Ordinance requiring advanced systems to be serviced under an O&M contract
- Special renewable permit issued to owners of advanced treatment systems and associated database to track O&M
- Enforcement mechanism to assure continued renewal of O&M contracts

A comprehensive OWTS management program for traditional OWTS could include, in addition to the elements described above, the following program activities:

- Routine inspections of OWTS components and function, including the condition of tanks, pumps and alarms, distribution devices, and the disposal field, completed using a consistent protocol.
- Creation of sketch plans for each OWTS with all components identified and located relative to the structure.
- Implementation of a low-interest loan program for distribution of revolving funds (if available) to assist low to moderate income property owners to implement repairs and replacement of system if malfunctions are discovered during pumpouts or inspections.

The Commission should take steps to establish a mechanism that assures continued progress is made by Pinelands Area municipalities in the adoption of OWTS management programs; however, this mechanism cannot constitute a top-down process. Participation by potential management entities and stakeholders will be essential to develop successful management programs for specific areas in the Pinelands.

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1. INTRODUCTION

The State-designated Pinelands Area covers approximately one million acres in southern New Jersey (Figure 1-1). The Pinelands Area was established at both the federal and state levels in the late 1970s. Among the purposes for designating the Pinelands Area as a national reserve and state area of ecological sensitivity were the protection of groundwater and surface water quality through implementation of land use planning and development controls.

The Pinelands Area Comprehensive Management Plan (CMP) prescribes the location of designated growth areas where centralized wastewater sewer collection and treatment systems are allowed. These growth areas are identified in the CMP as Regional Growth Areas, Pinelands Towns, Pinelands Villages, and developed portions of Federal Military Installations. New centralized wastewater collection and treatment systems or the extension of centralized sewers are not allowed outside of regional growth areas except to resolve documented public health problems. Thus, outside of these designated growth areas, onsite and decentralized wastewater infrastructure with soil-based disposal must serve as a permanent solution to wastewater treatment and disposal needs.

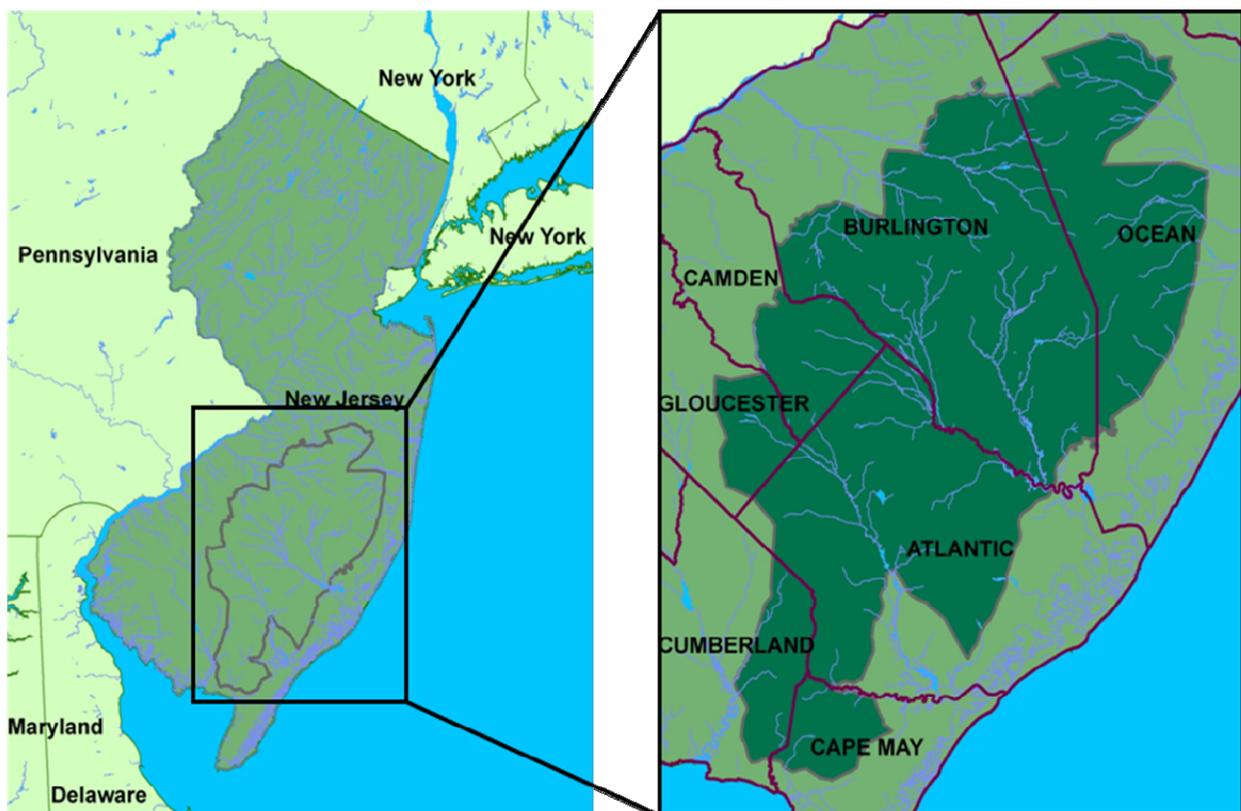


Figure 1-1. Map of Pinelands Area location, showing counties with land in the Pinelands Area.



The scale of wastewater treatment infrastructure addressed in this manual is primarily onsite wastewater treatment systems (OWTS) with design flows of less than 2,000 gallons per day (gpd). To ensure that this small-scale wastewater infrastructure is sustainable from an economic, public health, and environmental perspective, the Commission identified a need to evaluate options and develop practices for the long term management of OWTS in the Pinelands Area.

1.1. What is Wastewater Management?

In the context of wastewater treatment, “management” simply means a level of oversight that is appropriate both to the natural conditions and land use goals of an area, and to the level of risk that any wastewater treatment infrastructure poses to public health and to the environment. One way to think about management is to consider what happens at each step in the life cycle of a wastewater treatment system—regardless of its scale, the wastewater flows treated, or whether the system discharges to surface water or to groundwater (Figure 1-2).

- Regulations are enacted that govern different aspects of wastewater treatment.
- Sites for the system are evaluated, and a site is selected.
- The system is designed, and goes through the permitting process required for construction.
- The system is constructed (and inspected to make sure it was installed properly).
- The system is put into operation and is maintained regularly.
- Operation and maintenance activities, including regular monitoring of the system, are reported to the permitting authority.
- Information about the performance of the system is used to inform future changes in regulations.

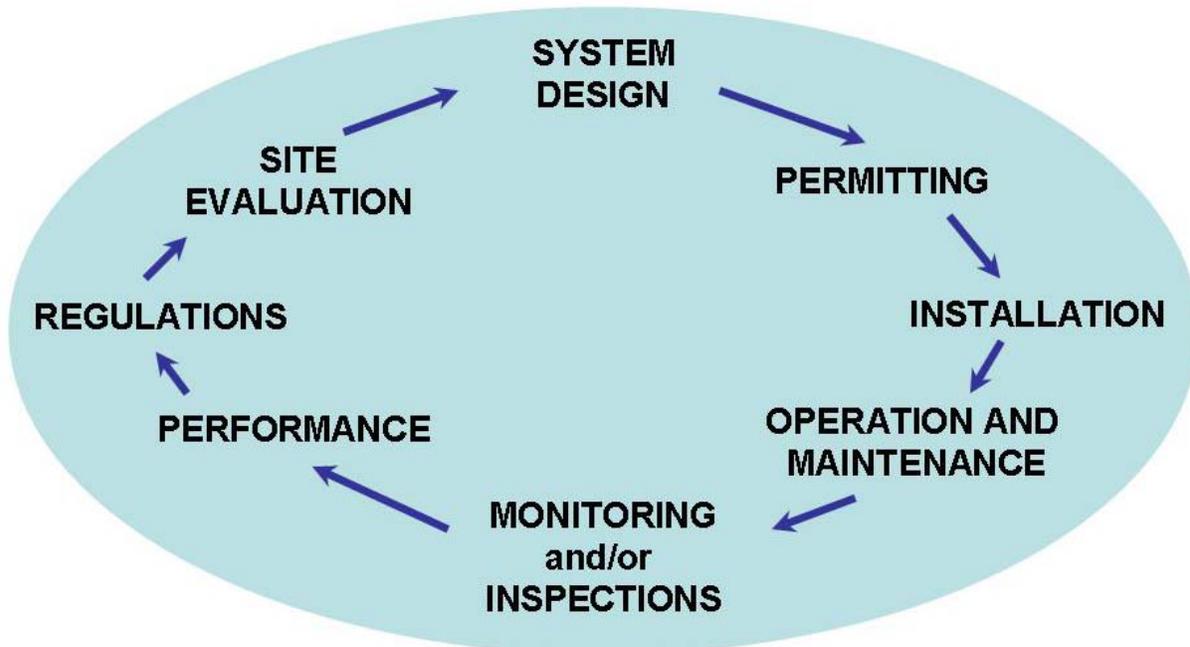


Figure 1-2. Management throughout the life cycle of a wastewater treatment system (based on Hoover, 1998)

In New Jersey, centralized wastewater treatment systems, OWTS with design flows of greater than 2,000 gallons per day, and OWTS installed through the Pinelands Alternate Design Wastewater Treatment System Pilot Program (Pilot Program) currently have some form of management in place for each step in this process. Traditional OWTS with design flows of less than 2,000 gallons per day are regulated, and are generally well-managed through the construction/installation step in their life cycles. The water quality provisions of the Pinelands CMP require periodic inspection and maintenance of all OWTS, though these provisions have not historically been enforced. For these small-scale OWTS, operation and maintenance and any ongoing inspections after construction are entirely the property owner's responsibility, enforcement is primarily based on complaints, there is no single inventory of the on-site wastewater treatment infrastructure currently operating in the Pinelands Area, and education of the owners who bear ultimate responsibility for compliance is inconsistent (Figure 1-3).

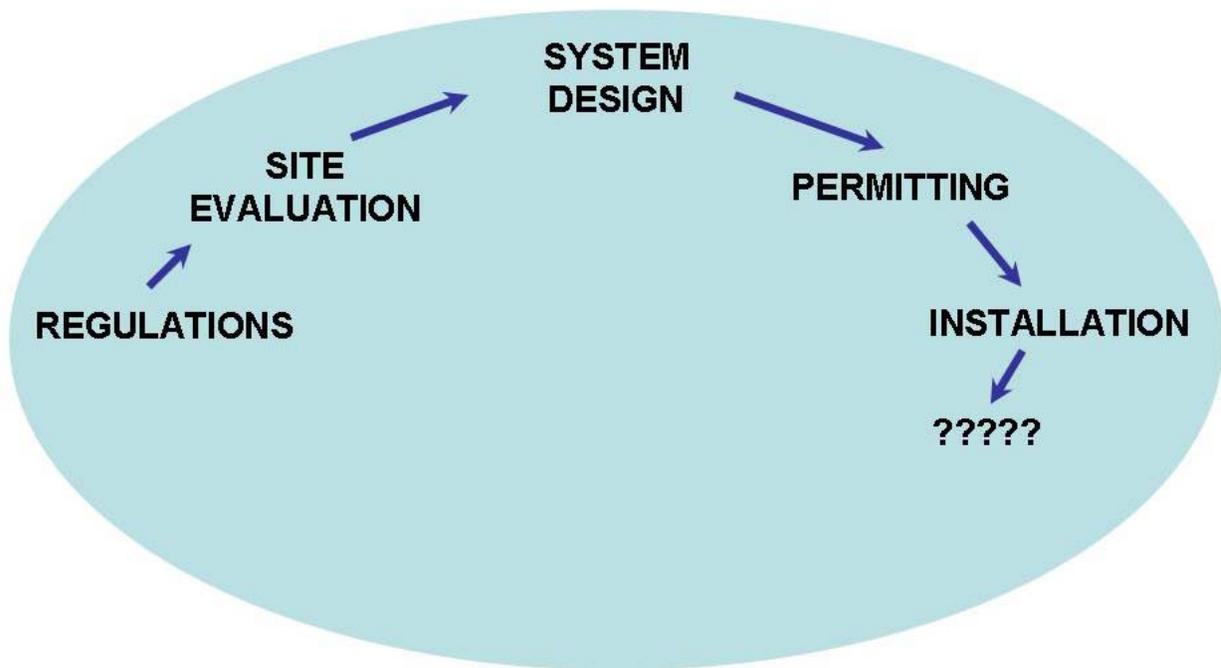


Figure 1-3. Current management situation for traditional OWTS with design flows of less than 2,000 gallons per day in the Pinelands Area (based on Hoover, 1998)

The current wastewater treatment infrastructure serving the Pinelands Area is described in more detail in Section 3 of this manual, while the current management of that infrastructure is discussed in Section 4.

1.2. Purpose and Objectives of This Manual

The Pinelands Commission is committed to the utilization of onsite wastewater treatment systems (OWTS) as a permanent infrastructure for protecting public health and water quality. To this end, OWTS need to be properly operated and maintained to ensure performance and longevity. This manual is a reference and a guidance document for stakeholders who are involved in the planning, implementation,

and evaluation of enhancements to existing management programs and/or the establishment of new management programs.

This manual was specifically developed for the Pinelands Area and:

- Defines OWTS management as it pertains to the region
- Describes the rationale for, and benefits of, OWTS management in the region
- Characterizes current OWTS infrastructure and management in the region
- Describes options for OWTS management that are appropriate to the region
- Provides references for additional information regarding OWTS management

Although it focuses on the Pinelands region, the manual's contents and practices are transferable, particularly to other regions in the State of New Jersey.

1.3. Why Should We Care About OWTS Management?

Proper OWTS management is essential to protecting public health and water quality, and to the continuation of responsible and sustainable development in the Pinelands Area. The Pinelands Area is particularly vulnerable to water quality impacts from malfunctioning OWTS, due to the sensitive ecology and reliance of its residents on groundwater as a primary source of drinking water. The State of New Jersey recently enacted revisions to the Water Quality Management Planning Rules (described in Section 1.3.3 below) that require OWTS management on a statewide basis, with the details of management programs to be established locally through the development and implementation of the wastewater component of watershed management plans. There are barriers to OWTS management, primarily due to the general public's lack of knowledge of how OWTS work, political concerns over the establishment of management programs, and financial limitations. Benefits of management of OWTS include protection of considerable investments in existing infrastructure, protecting the value of developed and developable real estate, and protection of public health and water quality.

1.3.1. Risks Posed by OWTS

Improperly sited, installed, or maintained OWTS can pose risks to public health, to ground water and surface waters, and to the economic value of properties in a community. The following paragraphs describe each of these risks in greater detail.

Improperly managed OWTS can pose direct risks to public health. The most apparent form of health risk is that from contact with incompletely treated effluent that rises to the ground surface from an improperly sited, installed, or maintained OWTS. Direct or indirect contact with incompletely treated effluent can expose people to parasites, bacteria, or viruses that cause communicable diseases (US EPA, 2002). Pathogens can also be transported, sometimes for great distances, in ground water, storm water, or surface waters.

Wastewater also contains nutrients, particularly nitrogen, which can be harmful to human health in excessive amounts. This situation can occur when a drinking water supply is located too close to an OWTS, or when traditional OWTS are constructed on relatively small lots such that nitrogen loading to the groundwater exceeds each lot's natural dilution capacity.

Although it is often difficult to measure and document specific cause-and-effect relationships between OWTS and the quality of water resources, it is widely accepted that improperly managed systems are contributors to major water quality problems. In the National Water Quality Inventory, 2000 Report to Congress, state agencies designated the top 10 potential contaminant sources that threaten their ground water resources. The second most frequently cited contamination source in that report was improperly functioning OWTS. Improperly managed wastewater systems can also adversely impact the water quality of surface waters such as rivers, lakes, and coastal waters.

A large geological formation of unconsolidated sand and gravel, known as the Cohansey Aquifer, underlies much of the Pinelands Area. This formation is a vast reservoir estimated to contain over 17 trillion gallons of some of the purest water in the country (Pinelands Commission, 1995). The water in this shallow aquifer frequently lies at or near the surface, producing bogs, marshes, and swamps. The streams of the Pinelands are fed by this aquifer, and are characteristically acidic and nutrient poor.

To safeguard Pinelands Area water resources, the water quality provisions of the Pinelands Area CMP related to OWTS focus on separation to groundwater, setbacks to surface waters/wetlands, and on controlling the amount of nitrogen that enters the environment:

- Maintaining adequate depth to groundwater is essential for the removal of sewage borne pathogens.
- Maintaining setback distances to surface waters and wetlands minimizes the risk of contamination of these water resources.
- Controlling the amount of nitrogen that enters the environment protects both public health and native Pinelands Area plants and animals.

Nitrogen is a significant point and nonpoint source pollutant due to its role in the eutrophication of surface water bodies. It is a useful indicator of overall Pinelands Area water quality and ecosystem health because it is naturally present in very low concentrations in the Pinelands environment. Thus, the Pinelands Area CMP focuses on controlling the amount of nitrogen that enters the environment. The water quality standards of the CMP permit the use of OWTS provided that the system's design and the size of the parcel on which the system is located will ensure that the concentration of nitrogen in the ground water exiting the parcel or entering a surface water body will meet the Commission's water quality standard of two parts per million (ppm). In order to comply with the Pinelands water quality standard, unsewered residential development on parcels smaller than 3.2 acres requires the use of advanced onsite denitrifying wastewater treatment technology.

Finally, properly functioning OWTS are an essential part of infrastructure and add to the value of a property. Like a roof or a furnace, though, keeping the OWTS in good repair is important, especially if or

when sale of the property is considered. It is common in New Jersey for lending institutions to require proof that an OWTS serving a residence is in good order before they will consider issuing a mortgage to a buyer. Outside of these inspections at the time of a sale, however, traditional OWTS rarely receive routine inspections, so property owners may remain unaware of problems until they become crises—until effluent surfaces in the yard, for example, or sewage backs up into the structure. OWTS management programs can ensure that systems are maintained and, thus, that problems are often identified before costly repairs become necessary. Conversely, in communities where OWTS are not managed, these onsite assets may become liabilities or even nuisances, resulting in lowered property values and reduced quality of life for residents.

1.3.2. Priorities

OWTS management programs can help to further several important priorities:

- Protecting public health and ecosystems by avoiding preventable malfunctions;
- Protecting system owners from unexpected costs due to preventable malfunctions;
- Providing continued opportunities for use of alternative systems, which, if properly managed, can enable sustainable development at allowable densities while protecting the Pinelands Area's ecology;
- Protecting property owners' investments in onsite water and wastewater infrastructure; and
- Protecting property values by assuring future buyers that OWTS have been, and will be, properly maintained.

1.3.3. Drivers Towards OWTS Management

In the Pinelands area, current initiatives to increase the level of OWTS management for both traditional and alternative design systems are driven by several important factors. For traditional OWTS, a lack of documentation—both an inventory of existing systems and of what maintenance is occurring on those systems—creates management challenges because the scale of a problem, if any, is not known.

Management programs for OWTS can not only enable the creation of such inventories and the recording of maintenance activities, but will protect landowners' investments in wastewater infrastructure by enabling appropriate maintenance. Traditional OWTS constructed after a management program is in place will benefit in a similar way, with appropriate oversight from siting and permitting through the entire service life of the system.

Alternative OWTS which have been installed under the Pinelands Alternate Design Waste Water Treatment Systems Pilot Program will continue to need ongoing maintenance, monitoring, and oversight even after the pilot program ends. There is a need to transition these existing alternative OWTS from the pilot program to a sustainable management approach. Also, alternative OWTS will likely continue to be installed, where conditions are appropriate, after the Pilot Program ends. These alternative OWTS will have similar needs for ongoing maintenance and monitoring as those which are already installed, and so programs need to be in place to support their ongoing use in a sustainable and cost-effective way.

There are also two separate regulatory movements towards increased management of all OWTS. The Pinelands Area CMP has contained provisions since its inception requiring that septic tanks be inspected and pumped out every three years, and that records of pumpouts be submitted to the local board of health; however, these provisions have never been enforced. Additionally, revisions to the Water Quality Management Planning Rules adopted in July 2008 essentially consolidate planning for wastewater treatment from the current 161 Wastewater Management Planning (WMP) agencies to the county level, and include new requirements for OWTS management. Under the revised rules, WMP agencies are required to include nitrate dilution analyses in their build-out analyses for areas that are not expected to be sewered in the future. The WMP agencies will need to recommend changes to zoning in these unsewered areas if future development densities according to the build-out analyses will result in groundwater nitrate concentrations greater than 2 milligrams per liter (mg/L). Finally, municipalities will be required to demonstrate that areas served by OWTS are subject to a mandatory maintenance program, likely implemented by local ordinance, which will ensure that all OWTS are functioning properly. The local programs will, according to the revised rule, “include requirements for periodic pump out and maintenance, as needed”.

The cost of wastewater treatment infrastructure, whether individual OWTS or a community wastewater system, is a significant driver for OWTS management. Proper OWTS management can protect property owners’ investment in wastewater treatment infrastructure. All types of system are costly to replace and there is a considerable range in costs of wastewater installation (Table 1-1). In the Pinelands area, sewer extensions are only permitted in designated Regional Growth Areas, Pinelands Towns, and Pinelands Villages. OWTS, on the other hand, are generally permitted throughout the Pinelands area for uses

Table 1-1. Typical cost ranges of wastewater infrastructure installation.

Type of Wastewater Management System	Type of Individual Residential Wastewater System Installation	Approximate Costs ¹			
		Typical Low-end Costs	Typical High-end Costs	Annual Payment on 20-year Loan ²	
Community Collection System (centralized)	Gravity Sewer Connection to Existing Sewer Line	\$3,000	\$6,000	\$262	\$523
	Gravity Sewer Connection Plus New Sewer Line Extension ³	\$10,000	\$30,000	\$690	\$1,991
Individual OWTS (decentralized)	Traditional Gravity Septic Tank/Leachfield System	\$8,000	\$12,000	\$697	\$1,046
	Pressure Dosed Systems	\$12,000	\$16,000	\$1,046	\$1,395
	Alternative Nitrogen Treatment Systems ⁴	\$25,000	\$35,000	\$2,180	\$3,051

1. These costs are approximate typical ranges for installation, assuming generally suitable soil conditions and moderate density of existing development based on experience in the Pinelands along with knowledge of general costs for installations in New Jersey and other northeastern states. This table should be used for general information only. Individual costs will vary depending on local ordinances, existing land use and building characteristics, site and soil conditions, system design, cost of labor, and materials.

2. Assuming 6% interest rate, compounded annually for on-lot installation with exception in footnote 3, below.

3. Assuming cost sharing of sewer line among multiple users with a 6% interest rate for on-lot installation; 2% interest rates municipal sewer extension in the public right-of-way; moderate to high density of residential units; and availability of wastewater treatment facility with adequate capacity to accept new flows.

4. Based on new advanced treatment OWTS installed in the Pinelands to provide nitrogen treatment.

that are in compliance with the Comprehensive Management Plan, as well as local land use and environmental regulations. On the national level over the past twenty years, there has been a shift in the funding paradigm for centralized wastewater treatment systems. While a primarily State and Federal grant-based financing approach was prevalent in the 1970s through the late 1980s, since that time State and Federal loans have generally replaced grants for municipal wastewater infrastructure construction. This funding shift has resulted in users being responsible for a greater portion of the true costs of new wastewater infrastructure, regardless of whether the infrastructure is centralized or distributed. Generally, if a sewer line already exists adjacent to a property served by OWTS, connecting to the centralized sewer is likely to be the lowest cost solution for replacing the OWTS if it malfunctions. However, the installation cost ranges of traditional and pressure dosed OWTS are comparable with the installation costs ranges of a centralized system if a sewer-line extension is required. Estimated costs for sewer line extensions will increase over the cost estimates given in Table 1-1 as the density of development decreases in rural areas.

1.3.4. Barriers to Management

The United States Environmental Protection Agency (U.S. EPA) has determined that “[a]dequately managed decentralized wastewater treatment systems are a cost-effective and long-term option for meeting public health and water quality goals” (U.S. EPA, 1997). Despite this, many barriers to using soundly managed decentralized systems to provide wastewater treatment remain that were identified by the U.S. EPA in their 1997 *Response to Congress*, including:

- Lack of knowledge and misperceptions about decentralized systems;
- Statutory and regulatory barriers at the state and local levels, such as lack of enabling regulation, regulatory authority split between agencies, and prescriptive regulatory codes;
- Lack of adequate management programs for decentralized systems in many regions;
- Liability and engineering fee issues; and
- Financial limitations.

All of these types of barriers are evident in the Pinelands Area. Consistent information and education at the homeowner, practitioner, professional, and regulatory levels is needed (see Section 4.3). An evaluation of the legal and regulatory framework for OWTS management described the multiple levels of jurisdiction and authority in the Pinelands Area (Stone Environmental, 2008). There are currently no OWTS management programs in the Pinelands Area that adequately address all elements of long term OWTS management. The liability and engineering fee issues pertain to the tendency of consultants to propose centralized sewer systems instead of onsite systems to minimize their liability for unmanaged systems, and to the typically higher engineering fees that result from larger scale wastewater infrastructure projects relative to those for small scale OWTS. A management program can be cost-effective in the long-term, but resources must be allocated to assessing, planning and implementing OWTS management programs, and financial means need to be established to pay for the programs.

1.3.5. Benefits of Management

Some of the benefits of management programs for OWTS, such as the protection of property values and environmental quality, were described above. Table 1-2 below summarizes how OWTS management can benefit different groups of people—whether a primary interest is land development, protection of sensitive resources, better communication and record-keeping, or protection of property values.

Table 1-2. Benefits of OWTS Management Programs for Different Stakeholders

Stakeholder Group	Benefits of OWTS Management
Homeowners	<p>Save money by avoiding unexpected repair or replacement costs</p> <p>If repairs are needed, owners can take advantage of low-interest loans for managed OWTS</p> <p>Protect property values</p> <p>Improve quality of life and environmental stewardship</p>
Municipalities	<p>Fee-based programs can improve services without raising taxes, and can allocate expenses based on risk</p> <p>Adopt voluntary or mandatory pumpout schedules to decrease public health risk, increase property values, and enhance image as a "clean" or "green" community</p>
Counties	<p>Reduce nuisance and malfunction complaints by improving maintenance</p> <p>Reduce processing of permits for unnecessary repairs/alterations of malfunctioning systems</p> <p>Decrease staff time needed to process and retrieve information by implementing digital plan and record drawing submittal</p> <p>Streamline record-keeping through automation</p>
Pinelands Area	<p>Coordinate partnership in managing advanced treatment systems</p> <p>Improve and emphasize regional coordination, collaboration, and cooperation in OWTS management</p> <p>Protect sensitive environments by implementing sustainable wastewater infrastructure</p>
Development Industry	<p>Enable continued development at allowable density</p> <p>Allow promotion and use of "green" technologies</p> <p>Increase confidence in and acceptance of OWTS by the home buying public</p>
Practitioners and Professionals	<p>Increased consistency in regulatory programs will make it easier to practice in multiple jurisdictions</p> <p>Improved credentialing, such as practitioner qualifications, service provider registration, and requirements for continuing education or professional development, will enhance the professionalism of the industry</p>

2. HOW TO USE THIS MANUAL

The manual is intended as a reference document and resource for the wide range of stakeholders and potential management entities interested in OWTS management. Instructions that point each of the major groups of users to information of particular interest to them are provided for each of the intended audiences of this manual.

2.1. How-to-use information by stakeholder

2.1.1. Property owners

Property owners are the users, and in the case of traditional systems, the operators of OWTS. Property owners need to understand the rationale behind OWTS management and the options available in their communities in order to make informed decisions on programs and budgets. Property owners are strongly encouraged to read this manual and understand the benefits of OWTS management and how management programs can be established. Informed input from property owners will significantly benefit the planning and establishment of OWTS management programs.

Property owners are particularly encouraged to read Sections 3, 4, and 5 of this manual.

2.1.2. Government Agencies

State-level government agencies, such as the New Jersey Department of Environmental Protection and the Pinelands Commission, create and administer the rules that govern important aspects of OWTS management. While they are already involved in fostering sustainable management, government agencies are encouraged to use this manual as a means to improve communication about and coordination of OWTS management programs. State government agency employees are particularly encouraged to read Sections 4, 6, and 11 of this manual.

Employees of local government agencies, such as county planning departments or environmental health agencies, are already familiar with some aspects of OWTS management. As OWTS become a more widely accepted, permanent solution for wastewater treatment needs, these agencies are likely to have an increasingly important role in creating and implementing OWTS management programs. Local government agency employees are encouraged to read Sections 4, 5, 6, and 7 of this manual.

2.1.3. Utility Authorities

Utilities authorities, especially those which already manage centralized wastewater infrastructure, may be particularly well-suited to creating new service offerings in order to sustainably manage OWTS. Interested utilities authority staff members are encouraged to read Sections 4, 5, 6, and 8 of this manual.



2.1.4. Environmental Advocacy Groups

The members and staff of watershed associations, environmental commissions, environmental advocacy organizations, and other groups centered around protecting wildlife habitat, open space, or water quality share one of the underlying goals of OWTS management, which is to maintain a balance between human impacts and environmental protection. Members of these organizations are encouraged to read Sections 3, 4, and 11, and those who think their organization may be interested in helping to manage OWTS in a particular area are encouraged to read Sections 6 and 10.

2.1.5. OWTS Management Stakeholders

Individuals in the following groups have a stake in the planning and implementation of OWTS management programs:

- Professionals and practitioners in the OWTS field
- Governmental organizations
- Developers
- Banking and Financial Institutions
- Real Estate Professionals
- Title Insurance Agencies
- Homeowners
- Landowners
- Business owners

These individuals should focus on Sections 1 through 6 and Section 11 while staying abreast of, and participating in, local initiatives to develop and implement OWTS management plans.

2.2. How-to-use information by types of potential management entities

Potential types of OWTS management agencies in the Pinelands Area include:

- Municipal government,
- County government
- State government
- Regional entities
- Non-profit environmental organizations
- Utility authorities
- Consulting firms and engineering companies

Interested individuals and organizations in these groups should refer to the whole manual with specific emphasis on the management models that apply to their group (e.g. utility authorities should refer to Section 8; and non-profit groups to Section 10).

3. WASTEWATER TREATMENT INFRASTRUCTURE IN THE PINELANDS AREA

PINELANDS AREA

Wastewater treatment systems in use in the Pinelands Area range from antiquated cesspools and septic tank/seepage pit systems, to traditional septic tank/disposal field systems serving single family homes, up to centralized sewer collection/wastewater treatment systems that serve entire communities. Each of these types of wastewater treatment infrastructure is described in the following sections.

3.1. Onsite Wastewater Treatment Systems

Onsite wastewater treatment systems (OWTS) collect, treat, and disperse wastewater on the property where the wastewater is generated. The treated wastewater is usually distributed into unsaturated soil, and slowly filters down to recharge the groundwater.

The most basic and widely used OWTS type is the traditional or traditional system (Figure 3-1). These systems often consist of only 3 components: a septic tank, a distribution device, and a disposal field. The septic tank removes some of the solids from the wastewater and provides a small amount of treatment through biological activity. After leaving the septic tank, the wastewater is called effluent. The distribution device evenly doses effluent into the pipe network within the disposal field. The disposal field provides both further treatment of the effluent and storage capacity. If the disposal field is at-grade or downhill from the septic tank, as is often the case, the wastewater is treated and dispersed by gravity, and the system functions without the need for electricity or moving parts.

The final component of a traditional OWTS is the soil itself. Final treatment and dispersal of the treated effluent occurs exclusively in the soil. This is the last step in the treatment process. After moving through the soil, the treated wastewater becomes part of the groundwater aquifer. Soil characteristics, including

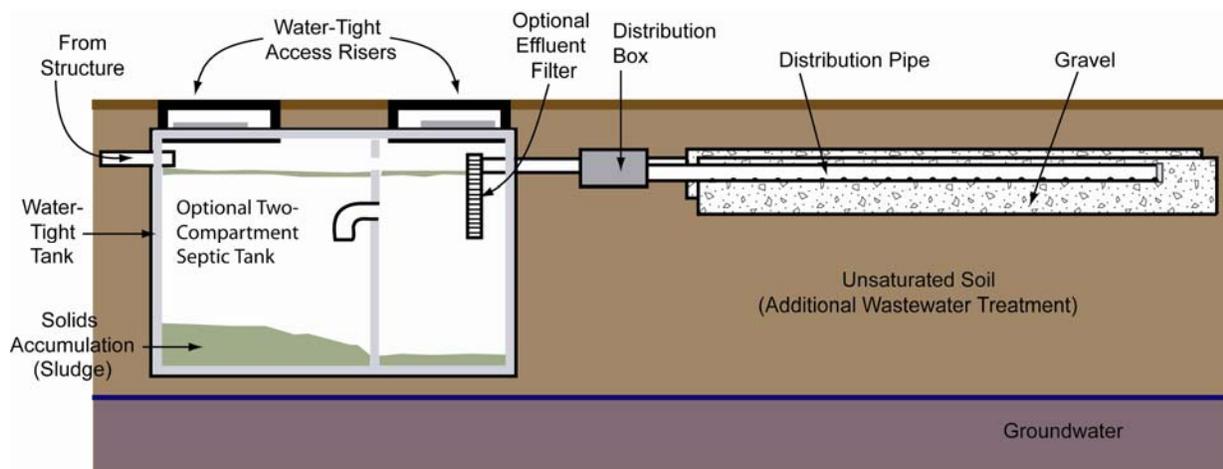


Figure 3-1. Schematic drawing of a traditional onsite wastewater treatment system.



the depth to groundwater, determine the quality of this final stage of treatment.

Two other types of traditional OWTS may also be found in the Pinelands Area, particularly serving structures built before the advent of modern OWTS regulations in the mid-1970s. A cesspool (Figure 3-2) combines the septic tank and disposal system into a single component. The walls of the cesspool are lined

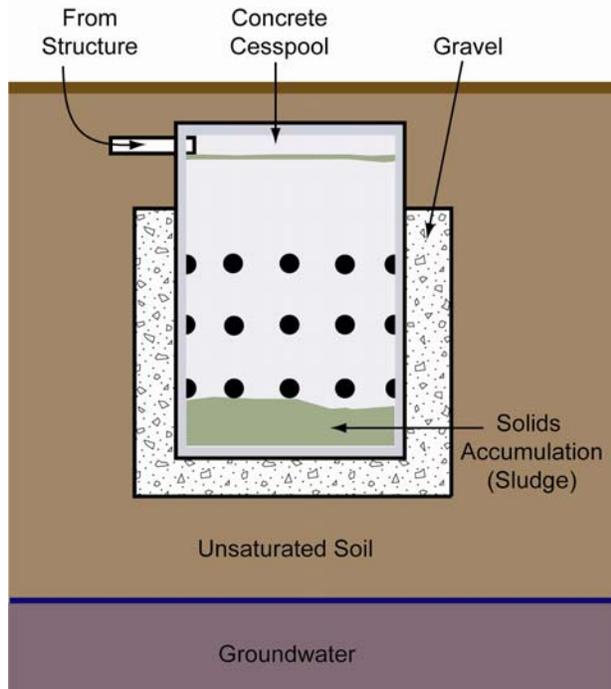


Figure 3-2. Schematic drawing of a cesspool.

with stone, concrete block, or pre-cast concrete to form a masonry-lined pit into which raw sewage is discharged. Solids remain in the cesspool, while effluent is absorbed into soil below and at the sides of the cesspool. While cesspools have been used for a long time, they are now generally considered to be obsolete, and new cesspool installations are not allowed in New Jersey.

A seepage pit system (Figure 3-3) is essentially a cesspool which is preceded by a septic tank. The septic tank removes solids and oils/grease, as described above, and the seepage pit is a covered pit with an open-jointed lining that allows septic tank effluent to seep out into the surrounding soil.

At locations with challenging site conditions, traditional OWTS may not be able to adequately

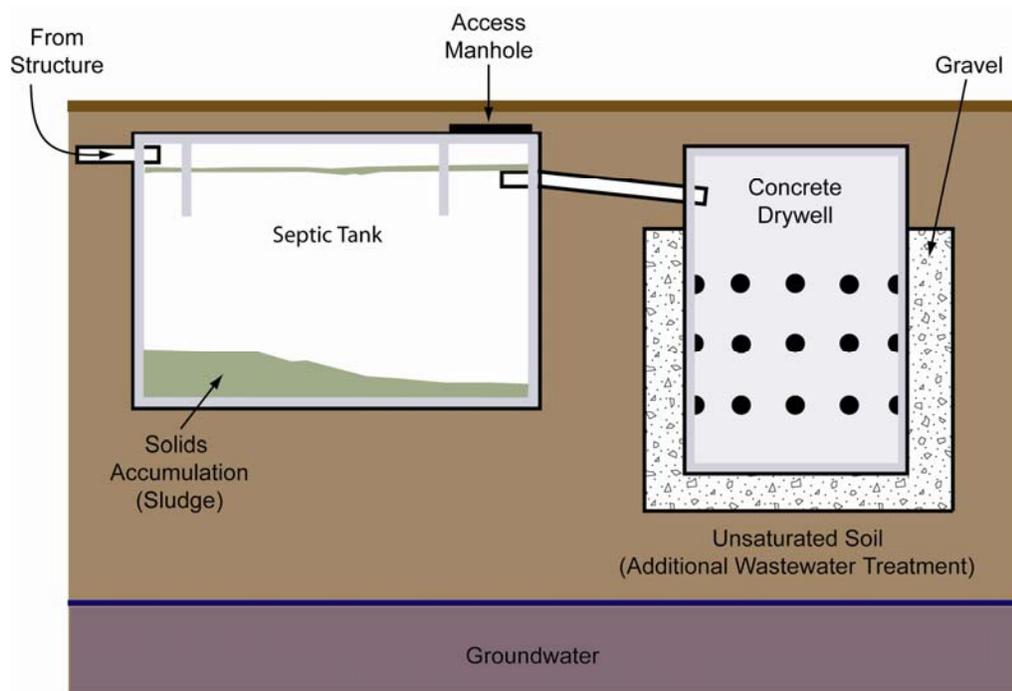


Figure 3-3. Schematic drawing of a legacy septic tank-seepage pit onsite wastewater treatment system.

treat wastewater before it reaches the groundwater. Advanced treatment systems have the same components as traditional systems, with the addition of technologies that provide further treatment to the septic tank effluent before it is distributed to

the disposal field.

Advanced treatment systems are often designed to reduce the concentrations of specific contaminants in the wastewater. For the Pinelands Alternate Design Wastewater Treatment System Pilot Program, the reduction of nitrogen is a main concern (see Section 4.2.3).

Table 3-1 lists the advanced treatment technologies currently authorized by the Pilot Program for single family residential applications.

Table 3-1. Nitrogen Reducing Treatment System Authorized for the Pilot Program

System Name	Vendor	Process Type
Amphidrome	F R Mahoney and Associates	Fixed film sequencing batch reactor
Bioclere	Aquapoint Inc.	Modified trickling filter
Cromaglass ¹	Cromaglass Corp.	Sequencing batch reactor
FAST	Bio-Microbics Inc.	Fixed activated sludge

Source: Adapted from a presentation by Ed Wengrowski, Pinelands Alternate Design Wastewater Treatment System Pilot Program, June 18, 2007.

¹ Approval of this system for nitrogen removal in new installations was suspended in November 2006, and has not been reauthorized as of the time of printing this manual

The Pinelands CMP provides a non-pilot permitting program for design flows below 2,000 gpd for the use of nitrogen removing systems at commercial or institutional facilities in the Pinelands. Two approvals have been issued by the Pinelands Commission in 2008 to allow development of new pharmacies in the regional growth areas of two townships, where the nitrogen dilution standard could not be met by using a traditional OWTS. As a condition of approval, the developer agreed that if the nitrogen removal system was not meeting performance requirements for nitrogen removal, sufficient land to meet nitrogen dilution requirements would be purchased and deed restricted from future development.

3.2. Multi-User Wastewater Treatment Systems

Systems that collect wastewater from multiple sources and then provide treatment at a central location generally come in two forms; small cluster systems and large sewer systems. These two types vary greatly in scale, cost, and complexity. However, they share the same two basic components: a collection system and a treatment facility.

Small-scale collection and treatment systems, also called “cluster” or “community” systems, can collect wastewater from just a few homes or an entire subdivision. Cluster systems are often included in the definition of onsite or decentralized wastewater treatment systems for the following reasons:

- Each home in the system can have its own septic tank
- Wastewater treatment occurs in close proximity to its source
- Advanced treatment and distribution technologies are similar to those of single-user advanced treatment systems

- Homeowners or business owners often have a stake in system ownership and operation and maintenance activities
- Cluster systems employ soil dispersal, not surface water discharge

Systems that collect and treat wastewater from entire municipalities or regions are “centralized wastewater treatment systems.” These systems are typified by a large collection system that flows to a central treatment works, which discharges the treated water to the environment either through a groundwater discharge or a direct discharge into a surface water body. Direct discharges to surface waters are not permitted in the Pinelands Area, although some portions of the Pinelands are served by centralized systems with direct discharges located outside of the Pinelands Area and other systems in the Pinelands with direct discharge to surface waters are bound by consent agreements to end such discharges. Though they are part of the wastewater treatment infrastructure in the Pinelands Area, centralized wastewater treatment systems are already well-managed and are not the focus of this manual.

3.3. Wastewater Treatment Infrastructure in the Pinelands Area

The current infrastructure for wastewater treatment and dispersal in the Pinelands Area is a mixture of centralized and decentralized systems, with permitting, reporting, and management requirements that vary widely between types of wastewater infrastructure.

Several centralized sewer systems serve areas of dense development in the Pinelands Area. Planning for these facilities, including delineation of their current and future service areas and flows, is done through Wastewater Management Plans (WMPs). These planning documents are amendments to Water Quality Management Plans that provide 20-year planning primarily for centralized wastewater treatment facilities, and are maintained by individual wastewater management planning agencies. Centralized systems with surface water discharge are permitted through the New Jersey Pollutant Discharge Elimination System (NJPDES).

The New Jersey Department of Environmental Protection (NJDEP) maintains geographic information about the current or planned method of wastewater disposal for each WMP area, i.e., whether the wastewater will be collected to a regional treatment facility or treated on site and disposed of through a surface water or a groundwater discharge (NJDEP, Bureau of Geographic Information Systems, 2006). While this dataset reflects the most current information available, the WMPs from which the data were drawn may not themselves be current. The attributes for the dataset distinguish between current and “planning” or future wastewater flows, but there is no way to distinguish which parts of the sewer service areas are currently served and which are planned for future service.

Wastewater treatment facilities with soil-based dispersal and design flows of more than 2,000 gallons per day are also permitted and managed through the NJPDES (see Section 4.2.1). These OWTS may be issued individual groundwater discharge permits or a general permit (also referred to as the T1 permit), depending on the system’s size, complexity, and operating requirements. If these groundwater discharge systems are located within a WMP area, they may be included in that area’s Wastewater Management

Plan. If this is the case, the facility's service area will be shown in the geographic dataset described above. Many NJPDES T-1 permitted systems are not included in WMPs; however, their locations are recorded in the geographic dataset of all NJPDES-permitted groundwater discharges which is also maintained by NJDEP. As of 2007, there appear to be no more than 189 NJPDES T-1 permitted systems within the Pinelands Area.

OWTS with design flows of less than 2,000 gpd for residential or commercial use are permitted by county health departments, using design standards maintained and promulgated by the NJDEP. OWTS using alternative technology or components that are outside the regulatory experience of the county health departments may be approved individually with an additional layer of review by NJDEP through the Treatment Works Approval (TWA) process (see Section 4.2.2). The Alternate Design Wastewater Treatment System Pilot Program currently underway in the Pinelands Area (Section 4.2.3) has a blanket TWA permit to expedite permitting of the alternate design systems by local health departments.

Design and permitting information for each OWTS is maintained at the offices of the administrative authority (in the Pinelands Area, this information is retained at the county health department offices). Most Pinelands Area counties have an electronic tracking system for traditional OWTS permitting, but these systems usually include only general information about each OWTS. Design information and other details are available only on paper or, in some cases, on microfiche. While the county health departments have the most accurate information about where OWTS were installed, this information may not be current (for example, some areas where OWTS were originally installed have since been sewered and the OWTS have been abandoned).

There is no definitive estimate of the number of OWTS with design flows of less than 2,000 gpd in the Pinelands Area. However, a recent analysis of census data by the Pinelands Commission provides the basis for a rough estimate of the number of small OWTS in the Pinelands based on Census blocks. As of the 2000 census, approximately 277,000 people lived within the Pinelands Area and there were approximately 105,000 housing units. The number of housing units served by OWTS can be roughly estimated by using the range of potentially sewered areas. Since the number of sewered parcels in the Pinelands Area is not known, the percentage of population that that lives outside designated growth areas can be used to arrive at a range of OWTS installations within the Pinelands. As of 2000, approximately 55% of the Pinelands Area population lived outside of Regional Growth Areas, and 39% lived outside of designated growth areas (Regional Growth Areas, Pinelands Towns, and Pinelands Villages). Therefore, there may be between 41,000 and 58,000 OWTS in the Pinelands Area.

Based on the information collected during the creation of this manual, it appears that no government agency has a current inventory of OWTS in any county or municipality within the Pinelands Area.

4. OWTS MANAGEMENT ELEMENTS AND CURRENT MANAGEMENT SITUATION IN THE PINELANDS

All OWTS require some level of management. Even a gravity-distributed traditional OWTS, with no electrical components or moving parts, must be pumped out on a regular schedule to avoid long term damage to the disposal field. In reality, without a basic level of homeowner awareness and regulatory oversight, many systems are not adequately maintained. This fact is acknowledged by the state Standards for Individual Subsurface Sewage Disposal Systems (N.J.A.C. 7:9A-3.14), which require local health departments to notify system owners of proper O&M procedures every three years.

As systems increase in complexity, the O&M requirements increase proportionately. Advanced treatment and cluster systems add components to the system design that require frequent monitoring and maintenance. When specific system treatment standards are set (e.g. nitrate reduction), monitoring and oversight of continuing system performance is necessary.

4.1. Elements of OWTS Management Programs

The US EPA has identified 13 key elements of OWTS management programs in their voluntary guidelines (US EPA, 2005). Figure 4-1 summarizes these management program elements, and the following sections provide brief, general descriptions of each element.

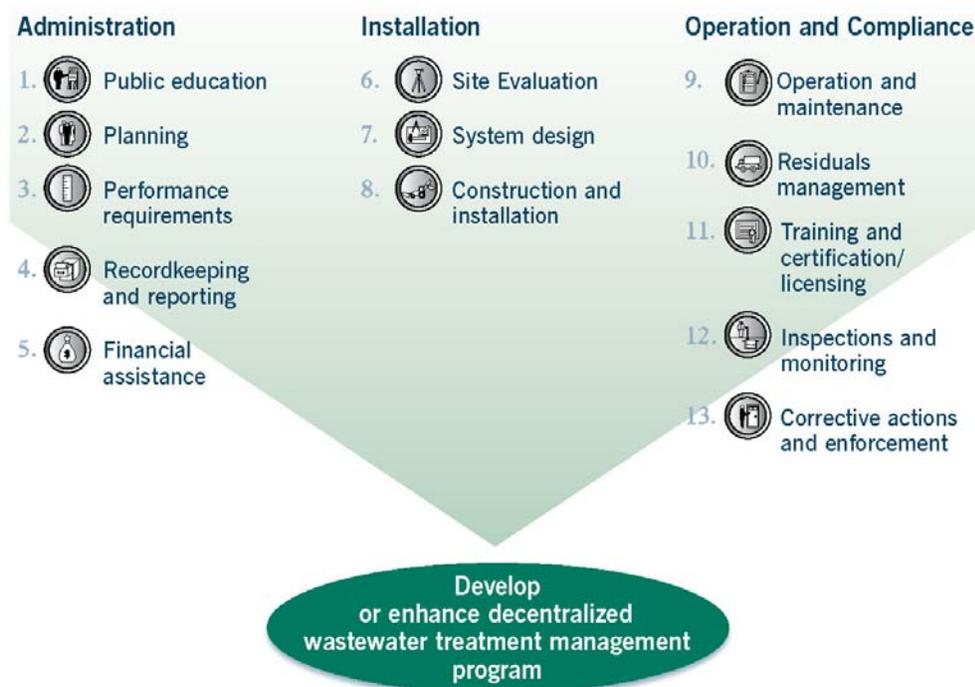


Figure 4-1. Summary of US EPA OWTS management program elements (from US EPA, 2005).

4.1.1. Public Education

In the simplest form, public education can consist of periodic maintenance reminders, and notification of rule revisions and public meetings. But public education can also include involving homeowners in the rule making process, training sessions and demonstrations, and the development of locally-focused educational materials.

Participation by OWTS owners is essential to management program success. At a minimum, the public should be informed of upcoming rule revisions, but they should also be engaged as active participants.

4.1.2. Planning

This management element describes a broader, regional vision of the geographical management area. Environmentally sensitive areas and nutrient reduction goals in a receiving body of water are considerations that factor into both zoning and wastewater management planning. Dealing with the public health risks of OWTS on a community-wide scale also require considered planning. Planning is the foundation that most of the other OWTS management elements are built upon. For example, the Water Quality Management Plans required by N.J.A.C. 7:15 provide direction to wastewater planning in New Jersey with the revisions to that regulation in the summer of 2008.

4.1.3. Performance Requirements

Performance requirements are developed to achieve the goals created during the planning process. Types of performance requirements include:

- Specific nutrient reductions in OWTS effluent (e.g. 14 mg/l total nitrogen)
- Designation of acceptable system designs and technologies (acceptable system types can be tailored to specific areas based on site conditions)
- Monitoring and reporting of specific system performance objectives

Performance requirements can also be considered on a larger scale. The level of contaminants found in critical surface waters or groundwater can be used to measure performance.

4.1.4. Recordkeeping and Reporting

Useful recordkeeping for OWTS management requires an accurate and up-to-date inventory of all OWTS within the management area. The USEPA describes inventories as a being a pre-requisite for even the most basic levels of OWTS management and oversight (see Section 6.1). A comprehensive OWTS inventory would track:

- Original permitting information- system type, capacity, date, drawings, etc
- System location (in a GIS or as latitude/longitude coordinates in a database)
- Current system ownership
- System modifications/replacements/repairs

- OWTS abandonments, usually occurring when sewer becomes available
- Entity responsible for O&M, including current contracts
- System performance standards and monitoring reports
- System maintenance history

Many modern inventory systems make use of current technology, including well-designed databases and field units that record GPS locations and inspection information.

4.1.5. Financial Assistance

Funding sources for the implementation of an OWTS management program depend greatly on the specific type of management entity. At a minimum, a funding source could be the shared resources (personnel, equipment, and materials) of existing local agencies that may share management responsibilities (e.g. health departments, commission staff). A more independent management entity, a wastewater regional authority for example, would likely collect income through user fees.

4.1.6. Site Evaluation

The suitability of a site for an OWTS is determined by characterizing the site's environmental and physical features. A comprehensive site evaluation is essential to matching the appropriate system type, size, and location to the existing site conditions. Performance standards may be in place for systems installed in certain site conditions that are identified during the site evaluation.

4.1.7. System Design

The design of OWTS is often carried out according to state statute and administrative codes (like N.J.A.C. 7:9A, Standards for Individual Subsurface Sewage Disposal Systems). However, additional system design requirements can be applied to meet performance standards and achieve regional water quality goals. Risk-based designs based on regional or local management can allow greater flexibility in property development while maintaining performance standards.

4.1.8. Construction and Installation

Oversight of OWTS installation by the regulatory authority decreases the chances of system malfunctions or sub-standard system performance due to improper installation. Elements of construction and installation oversight can include:

- Site inspections by regulators during system construction
- Required training or certification for installers
- Pre-construction conferences between system designers, installers, and regulators
- Field verification of site location and all system components by regulatory authority

4.1.9. Operation and Maintenance

The ongoing operation and maintenance (O&M) that takes place after OWTS installation is the key to system performance and longevity. Although comprehensive O&M is often missing from a management picture, it is an essential element of the management of every system (see Figures 1.1 and 1.2).

Operation and maintenance covers a range of activities that are dependent on the components and complexity of the OWTS itself. The maintenance for a gravity-flow, traditional OWTS with no moving parts might consist of periodic septic tank pumping and a basic awareness by the user of what can and can't be discharged into the system. A more complex system could require more frequent and detailed maintenance inspections, including: checking pumps and other components, monitoring the system processes and effluent quality, or even remote monitoring of the treatment process by the operator.

The goal of successful O&M is to sustain a high level of system performance and increase system longevity through preventative maintenance and managed operation of the system. Elements and approaches to O&M can include:

- Increasing user awareness of appropriate system inputs through education and outreach
- Technology specific maintenance regimes
- Contracts for maintenance services by certified technicians
- Required reporting on system maintenance and performance
- System inventory and tracking of O&M by the regulatory authority
- O&M objectives are tied to operation permit renewal
- All operation, maintenance, and reporting is accomplished by the RME

4.1.10. Residuals (Septage) Management

Septage is periodically pumped out of OWTS tanks and hauled to an approved location for treatment and disposal. These activities must be in compliance with federal regulations (40 CFR Part 503, Use and Disposal of Sewage Sludge), as well as state and local requirements. The local capacity to treat and dispose of residuals should be examined periodically.

4.1.11. Inspection and Monitoring

The inspection and monitoring of systems in current operation can take a variety of forms. It can take place after complaints of system failure, during property transfers, or at regular intervals. In a risk-based approach, system inspection intervals would be determined by system complexity and the risk posed to public health and environmental receptors, such as wetlands, ground water, or surface waters.

4.1.12. Corrective Actions and Enforcement

The authority of any OWTS management program must include the ability to take corrective actions and enforcement measures to ensure compliance with regulations and the program's requirements. These can include the ability to:

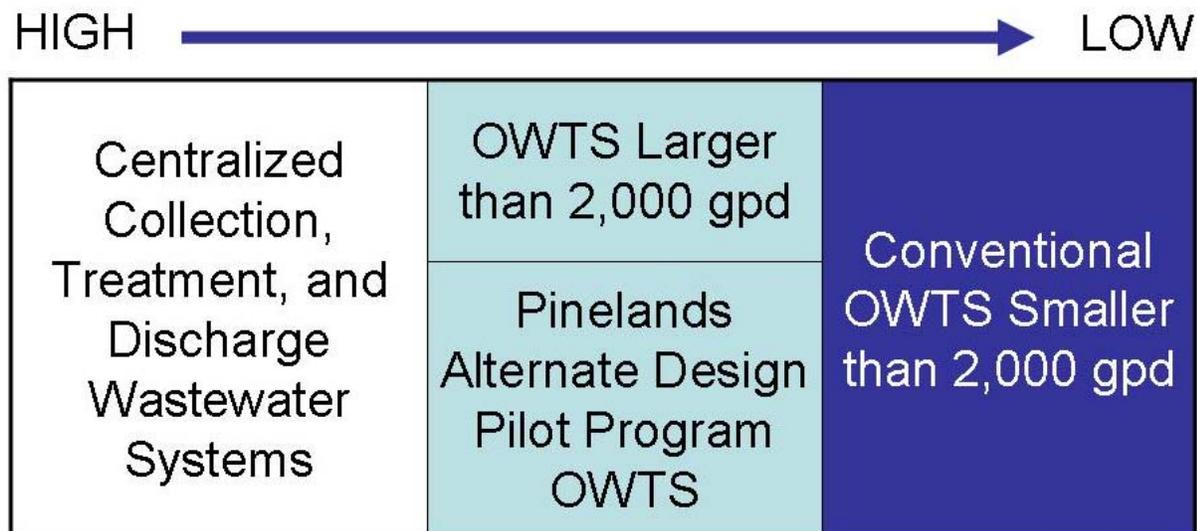
- Respond to complaints
- Issue a Notice of Violation (NOV)
- Levee fines or penalties
- Initiate civil or criminal actions
- Negotiate a compliance plan and schedule with the RME or system owner

4.1.13. Training and certification/licensing

The service providers involved with OWTS management include planners, regulators, designers, installers, operators, pumpers, and inspectors. Certifications, supported by training programs, increase the quality of service that these professions can provide. Certifications can be obtained regionally, and from national organizations and trade groups.

4.2. Overview of Existing OWTS Management Programs in New Jersey

Currently in New Jersey, the management of wastewater treatment systems can be thought of as a continuum. Centralized wastewater collection systems, with treatment plants, and land based or surface water discharges, are highly managed from siting and permitting through operations, maintenance, monitoring, and reporting (Figure 4-1). Onsite and decentralized systems with design flows greater than 2,000 gpd, as well as systems with TWA permits and systems installed under the Pinelands Alternate Design Treatment Systems Pilot Program, generally have less stringent reporting requirements but are still generally well-managed. Traditional, small-scale OWTS are well-managed from initial site evaluations through permitting and installation. Management programs for each of these types of OWTS



are described below.

Figure 4-2. Current types of wastewater infrastructure in the Pinelands Area, showing respective levels of management for each of these types of treatment system.

4.2.1. Large-Scale OWTS (New Jersey Pollution Discharge Elimination System)

Onsite wastewater treatment systems with design flows of greater than 2,000 gallons per day are permitted by the New Jersey DEP, typically through the New Jersey Pollution Discharge Elimination System (NJPDES) program and the Treatment Works Approval Program. Systems permitted through NJPDES may be operating either under an individual NJPDES permit, or under the Sanitary Subsurface Disposal General Permit (NJ0130281, also known as the “T1 permit”). Significant management requirements are in place to ensure that these systems operate properly:

- The systems must be inspected at least monthly;
- Records of inspections and maintenance activities must be kept at the facility;
- Training must be provided to personnel conducting the inspections at least every two years; and
- Septic tanks must be pumped at least once every five years.

4.2.2. Treatment Works Approvals Program

The Treatment Works Approval (TWA) program, also operated by the NJDEP, regulates the construction and operation of domestic wastewater collection, conveyance and treatment facilities, including treatment plants, pumping stations, interceptors, sewer mains and other collection, holding and conveyance systems. A TWA permit is needed for OWTS with design flows of less than 2,000 gpd where, for example:

- The design or construction part of the system will not conform to the *Standards for Individual Subsurface Sewage Disposal Systems* (N.J.A.C. 7:9A);
- The system will be a “cluster” or “community” system serving more than one property, dwelling, commercial unit or other realty improvement (see Section 3.2);
- The system will serve five or more realty improvements and/or receive a design flow greater than 2,000 GPD (in which case a NJPDES permit is also required, as described in Section 4.2.1).
- The system uses unproven technology or is experimental; or
- The system is designed to provide wastewater treatment in order to meet effluent quality limitations or ground water quality standards as prescribed by applicable State or Federal regulations or statutes.

The permits issued through the TWA program often contain requirements for maintenance, monitoring, and reporting that are specific to the individual system being permitted. For example, OWTS installed as part of the Pinelands Alternate Design Treatment Systems Pilot Program have a blanket TWA permit to expedite permitting of the alternate design systems by local health departments (see Section 4.2.3). The blanket TWA permit states that the pilot systems require ongoing maintenance in order to ensure adequate functioning, and that the systems must be maintained according to the manufacturers’ specifications for the life of the system.

It is important to note that the TWA permit is a ‘one-time’ approval. While such a permit may contain requirements for ongoing maintenance or monitoring, it does not generally require the reporting of inspection or monitoring data to NJDEP or any other agency. Also, unlike the NJPDES permits, the TWA permit is issued not for a specific time period but for the life of the system.

4.2.3. Pinelands Alternate Design Treatment Systems Pilot Program

The Pinelands Commission formed a committee in 2000 to investigate alternate OWTS technologies that would better meet the water quality requirements described above on lots smaller than 3.2 acres that are authorized by the Pinelands CMP. Based on extensive research and the results of the Pinelands Septic Dilution Model, the committee identified five technologies that could meet the water quality requirements: the Amphidrome, Cromaglass, Bioclere™, and FAST® treatment systems for use on lots of 1 to 3.2 acres; and the Ashco RFS^{III} for use on lots of 1.5 to 3.2 acres. The committee recommended a pilot program for the approval, installation, and monitoring of these technologies, which was implemented in August, 2002. The alternate design treatment technologies were originally only allowed in municipalities which adopted an ordinance that implements the pilot program; however, amendments to the CMP approved in September 2007 now allow their use where appropriate in all Pinelands Area municipalities.

The pilot program provides a means to test whether the technologies can be operated and maintained to meet the CMP's water quality standards in a way that homeowners can follow. Each pilot system installed under this program is sold with a five-year warranty and a five-year operation and maintenance contract, and quarterly effluent sampling and analysis is required during each system's first three years of operation, with reporting of the results to the Pinelands Commission.

The relatively limited use of the pilot program technologies has not yet provided sufficient data from which to draw definitive conclusions about the ability of these technologies to reliably meet Pinelands Water Quality Standards. The September 2007 CMP amendments extended the pilot program through August 5, 2010 and made a number of other revisions:

- The Ashco RFS^{III} technology was not installed during the evaluation period and was removed from the pilot program.
- A handful of municipalities did not adopt the model ordinance to implement the pilot program. Property owners in these municipalities were thus unable to proceed with development on lots smaller than 3.2 acres, even though such development otherwise fully complies with applicable land use ordinances. The Commission approved an amendment authorizing the use of alternate design systems in all Pinelands Area municipalities for the duration of the pilot program, regardless of whether all the program's standards are reflected in municipal ordinances.
- The monitoring provisions of the pilot program were extended through August 5, 2009.

Currently, four entities act as management agents for alternate design pilot program systems in the Pinelands Area:

- Mid State Electrical Contracting, Inc. (management agent for Cromaglass systems)
- Advanced Nitrate Solutions (management agent for Bioclere™ systems)
- Site Specific Design, Inc. (management agent for FAST® systems)
- F.R. Mahoney (management agent for Amphidrome systems)

These companies perform maintenance, inspections, and effluent quality sampling; respond to alarms; and keep records of all activities and testing results for reporting to the Pinelands Commission. Each company contracts with the system owner as part of the initial pilot system permitting, design, and installation process for a period of five years after the system's construction.

4.2.4. Traditional OWTS Management

Statewide, the *Standards for Individual Subsurface Sewage Disposal Systems* (N.J.A.C. 7:9A) mandate local health department oversight of the siting, design, and installation of traditional OWTS by requiring system permits. In addition, local health departments must send information to system owners every three years, describing proper operation and maintenance practices for their systems. In practice, permits are issued for new construction and repairs, but ongoing oversight of systems is not common. If implemented, this scenario would correspond to the lowest level of management recommended by the USEPA (see Section 6).

The current level of management for traditional OWTS with design flows less than 2,000 gpd in the Pinelands Area is limited to permitting and response to complaints for traditional systems. System inspections are typically performed only when properties change ownership, and the inspections are driven by the requirements of lending institutions.

Management programs that account for ongoing maintenance and record-keeping activities for traditional OWTS with design flows of less than 2,000 gpd do exist in New Jersey. Eight municipalities, located in Morris, Somerset, and Sussex counties, have implemented local OWTS management programs. These programs require licenses for the operation of each OWTS. Unlike permits issued for the construction of systems, operation licenses provide for the continuing oversight of OWTS by local health departments or municipalities, acting as the management entity. These operation licenses must be renewed, typically every three years. When system owners apply for their license renewal, they must show that the conditions of renewal have been met; typically that the septic tank has been pumped or inspected, and that the system appears to be functioning properly.

4.3. Gaps in Current OWTS Management in Pinelands

Though many elements of management for Pinelands alternate design OWTS and for small-scale, traditional OWTS are well-managed in the Pinelands Area, some areas remain where improvements can be made. Some of the "gaps" in the framework for OWTS management in the Pinelands were described in earlier sections of this manual. Table 4-1 summarizes the level of implementation that currently exists for each element of a sustainable management framework in the Pinelands. The rest of this section describes some of the more important gaps in greater detail.

Table 4-1. OWTS Management Framework and Gaps in the Pinelands Area

Program Element	Current Level of Implementation
Public Education and Participation	Blue
Planning for OWTS Management	Blue
Performance	Blue
Record Keeping, Inventory and Reporting	Blue
Funding (for starting OWTS management programs)	Blue
Funding (for OWTS alternations and repairs)	Blue
Site Evaluation	Green
Design	Green
Construction (inspections during)	Green
Operation and Maintenance (O&M)	Blue
Residuals Management	Blue
Compliance Inspections / Monitoring of existing systems	Blue
Corrective Actions	Blue
Enforcement	Blue
Training and Certification/ Licensing	Blue

	Already being done and precedent well-established; few or no changes recommended
	Authority exists, but not fully implemented; recommendations proposed in this manual
	Gap in current OWTS management framework

Several different agencies, from NJDEP and the Pinelands Commission to local health departments and municipal governments, have some authority or regulatory responsibility for OWTS in New Jersey. Though there is some interaction between these various entities on the subject of OWTS management, there is no institutional means—for example, a regional OWTS advisory group—for these interests to coordinate or cooperate in moving forward with OWTS management initiatives. Also, although N.J.A.C. 7:9A requires local health departments to send educational information to each owner of an OWTS once every three years, this requirement is not strongly enforced. As a result, information provided to the public about OWTS and their ongoing maintenance needs is inconsistent and, depending on where residents live, may be difficult to obtain. These two gaps ultimately result in inefficient, inconsistent communication and education about OWTS and their management across jurisdictions in the Pinelands Area.

Long-range planning for wastewater treatment in New Jersey only occurs consistently for centralized wastewater treatment facilities, through 20-year Wastewater Management Plans (WMPs), which are amendments to county Water Quality Management Plans (WQMPs) under the requirements of the Water Quality Management Planning Rules (N.J.A.C. 7:15). These WMPs currently address specific planning areas or sewer service areas and are maintained by wastewater management planning entities, such as municipalities, municipal utilities authorities, or regional utility authorities. Several WQMPs for counties in the Pinelands Area (most notably Atlantic and Cape May Counties) do mention OWTS as a non-point source of pollution and provide varying information on managing these systems. However, most WMPs for planning areas in the Pinelands Area contain no mention of OWTS or their management. This lack of long-range planning for the management of onsite wastewater infrastructure is a major gap in the framework for OWTS management in the Pinelands Area; however, recent revisions to the WQMP Rules adopted in July 2008, if implemented, will go far towards closing this gap (see Section 1.3.3).

As local jurisdictions begin to implement the sort of OWTS management program envisioned in the revised WQMP Rules, with requirements for periodic pump-outs of systems and reporting, an immediate barrier they will meet is that there is no current inventory of traditional OWTS anywhere in the Pinelands Area. Most local health departments within the Pinelands Area now have some form of electronic database to track the progress and issuance of permits, but system designs and other documents are in paper files or, in some cases, on microfiche. The files are often complete but dated—for instance, when an area is sewered and OWTS are abandoned, the abandonments are rarely recorded in the local health departments' individual OWTS records.

A related gap in the overall framework for small-scale OWTS management, and a gap that this manual specifically aims to overcome, is that there are no consistent, sustainable programs for routine O&M, inspection, or monitoring in the Pinelands Area. As discussed earlier in this manual, traditional OWTS are currently inspected, if at all, during real estate transfers, if the involved financial institutions require an inspection as a condition of the transaction. System operation, maintenance, and monitoring for small-scale OWTS is therefore currently limited to systems installed through the Pinelands Alternate Design Treatment System Pilot Program. There is currently no mechanism in place to track basic maintenance of traditional OWTS, such as septic tank pump-outs, in the Pinelands Area.

A final significant gap in the framework of OWTS management in New Jersey, and one that will severely limit the successful implementation of management programs if not addressed, is the lack of sufficient funding available to local jurisdictions to begin the actual implementation of OWTS management programs. Though once these programs are operating, they can recoup some costs through permitting fees, the startup costs must be borne by the potential management entity before the first operating permit can be issued. Some limited funding to start OWTS management programs is available through water quality and non-point source pollution abatement programs established in the Clean Water Act (the Section 319(h) and 604 (b) programs, respectively) and administered by NJDEP; however, the funding need will far outstrip what is currently available.

4.3.1. Limited number of N-removal technologies approved in the Pilot Program

Four advanced treatment nitrogen-reducing technologies are currently approved for inclusion in the Alternate Design Treatment Systems Pilot Program (Table 3-1). New installations of the Cromaglass system are temporarily suspended, due to the inability of some Cromaglass installations to achieve the 14 mg/l target concentrations for total nitrogen in their system effluent (Pinelands Commission, 2007).

There are several additional widely available technologies that have met or exceeded the 14 mg/l nitrogen standard in various test locations around the United States. Including these proven technologies in the Pilot Program would provide more flexibility in tailoring solutions to each individual site (Table 4-2).

Table 4-2. Additional Nitrogen Reducing Treatment Systems with Facility Testing Data

System Name	Vendor	Process Type	Median N (mg/l)
Advantex	Orenco Systems Inc.	Textile media filter	14-15 ¹
HOOT ANR	Hoot Systems Inc.	Media filter/aerator/carbon feed	6 ²
Nitrex	Lombardo & Associates	Media filter*	3-4 ¹
Waterloo Biofilter	Waterloo Biofilter Systems Inc.	Fixed film trickling filter	13 ³ /15 ⁴

*requires prior nitrification treatment process

1 La Pine Testing Facility, 2007

2 NSF Executive Summary, n.d.

3 ETV, 2003

4 Costa et al, 2002

5. RISK-BASED APPROACH

Risk, as it pertains to OWTS, can be characterized by a variety of factors, such as soil and site conditions; the standards in place when systems were permitted; the complexity of system components that require maintenance; the environmental sensitivity of receiving waters; or combinations of these factors. The risks potentially posed by OWTS operating within the Pinelands Area were described in Section 1.3.1. The following sections discuss the levels of risk that differing types of OWTS may pose to public health and the environment, and the OWTS management activities that may be appropriate in each case to mitigate those risks.

5.1. Low Risk OWTS

Traditional OWTS that were installed in 1990 or later under modern design standards (N.J.A.C. 7:9A), and are still operating properly, generally pose the lowest risk of any of the types of wastewater treatment infrastructure operating in the Pinelands Area. For low-risk traditional OWTS that are already installed and operating properly, the following management activities are appropriate:

- Create and maintain a current inventory (spreadsheet or database) of OWTS (see Section 6.6.1);
- Institute a public outreach (user education) program (see Section 11.1); and
- Ensure that O&M is performed periodically, through a program of voluntary reporting or through the issuance of operating permits or licenses upon proof of inspection and/or pumpout (see Section 6.6.5).

When new traditional OWTS are installed, or existing traditional OWTS are altered or repaired, this activity represents an opportunity to add the OWTS to an existing inventory database and require an operating permit. These actions ensure that an OWTS will have informed owners and adequate maintenance throughout the useful life of the system.

Fees charged to issue the operating permits can pay for the staff needed to keep track of the inventory of existing systems and to otherwise administer the OWTS management program (see Section 6.6.6).

5.2. Moderate Risk OWTS

Alternative OWTS, including mounded systems, pressure dosing systems, gravity dosing systems, and the advanced nitrogen removing systems installed through the Pinelands Alternate Design Treatment System Pilot Program (Section 4.2.3), use components, such as pumps and filters, which are more complex than those used in traditional OWTS. These components need regular maintenance in order to function properly, and so the risk of malfunction if regular maintenance is not performed is higher than for traditional OWTS. Additionally, since alternative OWTS are generally installed to overcome difficult site conditions such as small lot size or shallow groundwater, if they malfunction there is less opportunity for mitigation before negative environmental impacts will occur.



Older OWTS, particularly those that were installed before the advent of current state-wide standards for site evaluation and system design, may also fit within the category of moderate risk. Systems installed prior to 1974 pose perhaps the most risk, since before this time design standards were not consistent across jurisdictions. Systems installed from 1974 through 1989 pose a somewhat lesser risk as a result of the Chapter 199 standards, which provided uniformity to design standards but did not rise to the same level of protection now provided in the 1990 release of N.J.A.C. 7:9A. In general, systems which were constructed 20 years ago or longer may be reaching the end of their useful lives due to inadequate maintenance.

In addition to the management activities appropriate for low-risk OWTS, the following activities may be appropriate for moderate-risk OWTS:

- Annual inspections and reporting (see Section 6.6.3); and
- Maintenance inspections and monitoring on a more frequent basis for mechanical systems (e.g., pumped dosing systems) and alternative denitrification systems, if recommended by the treatment system manufacturer.

5.3. High Risk OWTS

High-risk OWTS include any system that is actively malfunctioning, through effluent backing up into a structure, surfacing at or near the dispersal system, or which exhibits evidence of improper siting (e.g., proximity to surface water, groundwater, wetlands, water supply wells, or other sensitive receptors). System malfunctions, if discovered during one of the baseline or routine inspections described above, would be noted and abatement would be pursued through the following already established management activities:

- Permitting and execution of an alteration or repair through the existing permitting process (Section 6.6.7);
- Investigate funding opportunities for repair cost assistance; and
- If alterations or repairs are not completed, corrective actions and enforcement proceedings can be initiated.

6. OWTS MANAGEMENT MODELS AND PROGRAMS

The US EPA's five management models for OWTS are a useful framework to use in thinking about management programs. Any OWTS management program within the Pinelands Area, however, will need to incorporate and work within the framework of state and local regulations that already exists in order to be successful. Four different models, each specific to the Pinelands Area, are described briefly in this section, with details for implementing each model laid out in the following chapters. This section also provides guidance on choosing an appropriate management model for your local situation, and on implementing an OWTS management program.

6.1. EPA Management Models

The US EPA has established five management models for OWTS that are useful to consider as broad conceptual approaches to management (US EPA, 2003). The five models include:

- Model 1: Homeowner Awareness Model
- Model 2: Maintenance Contract Model
- Model 3: Operating Permit Model
- Model 4: Responsible Management Entity (RME) Operation and Maintenance Model
- Model 5: RME Ownership Model

These categories increase in management control from Model 1 to Model 5, with Model 1 having the least OWTS oversight and Model 5 having the most. The increasing management control of each model generally corresponds to increasingly sensitive environmental conditions and increasingly complex onsite wastewater systems. Therefore, these conceptual models can be matched with the specific needs of a region to facilitate the formation of a targeted and appropriate OWTS management plan.

Common to all 5 US EPA management models is the need for comprehensive documentation and inventory of the OWTS. In even the lowest level of management, a system inventory permits the basic tracking and planning functions that allow for the proper oversight and management of a local area. More details about the US EPA management models can be found in Appendix E.

6.2. The USEPA models operating locally

Management of traditional OWTS in New Jersey operates generally under the Homeowner Awareness Model, US EPA Model 1. The New Jersey Administrative Code (NJAC), Section 7:9A, sets standards for OWTS siting, design, and installation. Local health departments regulate OWTS construction and are required to notify home owners of appropriate maintenance practices.

As of 2005, eight New Jersey municipalities (out of 566) had implemented local management programs roughly equivalent to the Operating Permit Model, US EPA Model 3. The eight municipalities (all in Morris, Somerset, and Sussex counties) require operating permits or licenses to be renewed at regular



intervals (see Section 4.2.4). Montgomery Township (Somerset County), for example, requires renewal of the license to operate each OWTS every 3 years. A condition of license renewal is proof that the system has been pumped and maintained, or that an inspection has been performed showing that the septic tank is not in need of pumping. Only qualified personnel, licensed or approved by the Montgomery Township Board of Health, may complete an OWTS inspection.

The program “elements” (Figure 4-1) that EPA recommends for use in managing decentralized systems are a useful organizing strategy that is applicable to each of the five EPA “Management Models”. All of the management models require that a management entity administer activities related to OWTS management. The following section details examples of existing organizations that could serve as OWTS management entities in the Pinelands Area.

6.3. The Range of Potential OWTS Management Entities in the Pinelands Area

A number of different entities can perform successful management of traditional and alternate OWTS in the Pinelands Area, including existing utilities, utility authorities, governmental or quasi-governmental organizations, and private utilities or other privately owned companies specializing in certain areas of OWTS management.

6.3.1. Government Entities

Throughout the State of New Jersey, local management of OWTS has historically been strongly encouraged by staff at NJDEP, and has recently been mandated through amendments to the WQMP Rules. The NJDEP has published guidelines for the inspection of existing OWTS (Section 4.2.4) and has provided technical assistance, upon request, to communities that are considering OWTS management programs.

Through its administration of the Alternate Design Treatment Systems Pilot Program, the Pinelands Commission already performs some of the recordkeeping, performance, planning, and public education functions that are generally included in management programs for OWTS.

County or regional water quality management planning agencies are only indirectly involved in OWTS management at present. Wastewater management plans, included as amendments to the 208 Water Quality Management Plans prepared by these agencies, currently do not include much information about or planning for OWTS management. Now that revisions to the Water Quality Management Planning Rules (N.J.A.C. 7:15) have been adopted which require OWTS management, both wastewater management planning agencies and water quality management planning agencies may become more involved.

County health departments or boards of health currently administer OWTS permitting under N.J.A.C. 7:9A and provide enforcement when violations are reported. They also keep records about systems that

have been constructed, altered, or repaired; and are required to provide educational materials about OWTS maintenance.

All Pinelands Area counties, except Burlington County, have a county utilities authority which is responsible for collection and treatment of wastewater at one or more regional wastewater treatment plants (Table 6). Some of these authorities also provide other services, such as drinking water or solid waste disposal. The Municipal and County Utilities Authority Law (N.J.S.A. 40:14B-1 et seq.) defines the “district” or service areas of these utility authorities as “the area within the territorial boundaries of the county, or of the municipality or municipalities, which created or joined in or caused the creation or organization of a municipal authority”. The law establishes the powers of a utilities authority to include property access for inspection, repair, and other activities involving failing OWTS; establishment of an inspection program for all OWTS within the utilities authority’s district; and to keep records of OWTS inspections and repairs.

Individual municipalities may act as management entities for OWTS within their jurisdictions, as is done by several communities in northern New Jersey (Section 4.2.4). Either a local board of health/health department or a municipal utilities authority can establish a management program for OWTS at the local level. A number of municipal utilities authorities are already established within the Pinelands Area.

6.3.2. Private Entities

There are no privately owned utility entities currently managing OWTS in the Pinelands Area, although the Pinelands Wastewater Company, which is a subsidiary of Middlesex Water Company, operates a municipal wastewater treatment facility in Southampton Township. This utility is regulated by the Board of Public Utilities and all rate requests involve the Board and the New Jersey Department of the Public Advocate, Division of Rate Counsel.

Wastewater management companies serving Pinelands area schools and other NJPDES-permitted businesses, such as campgrounds, apartment buildings or condominiums, and mobile home parks, are already fulfilling many OWTS management functions. These companies provide permitting assistance, construction supervision, operation and maintenance services, and record-keeping for the OTWS they service. There is significant overlap between these organizations and the other potential types of private-company OWTS management entities discussed below.

Wastewater treatment plant operators are required to be licensed by the NJDEP. These operators provide operation, maintenance, monitoring, compliance, and record-keeping services for NJPDES-permitted centralized collection systems and both centralized and decentralized treatment plants with both surface water and groundwater discharge. Operators of OWTS with design flows of more than 2,000 gallons per day (facilities permitted under the NJPDES T1 general permit, see Section 4.2.1) may not always be certified operators, but they still must be trained to conduct inspections and operate the systems properly. A listing of NJDEP licensed operators is available from the Department.

Consulting engineering firms employ New Jersey-licensed professional engineers (N.J.P.E.s) and wastewater operators and typically offer many of these management services to their clients, including design, permitting, and construction assistance; O&M activities; and inspection, monitoring, and reporting functions.

Management agents for alternate design systems authorized through the Pinelands Alternate Design Treatment System Pilot Program (see Section 4.2.3) perform several operations and management functions for these systems. These companies perform maintenance, inspections, and effluent quality sampling; respond to alarms; and keep records of all activities and testing results for reporting to the Pinelands Commission. Each company contracts with the system owner as part of the initial pilot system permitting, design, and installation process for a period of five years after the system's construction. Commission staff report that maintenance in perpetuity for the pilot program systems will likely be required in future CMP amendments.

Septic tank pumpers are licensed as solid waste transporters by the NJDEP's Division of Solid and Hazardous Waste. In addition to septic tank pumping and septage hauling, these service providers often offer OWTS inspections, and some offer construction and alteration services as well. In Ocean County, a manifest system is already in effect for every septic hauler, with copies of the manifests submitted to the health department to provide tracking of septage from place of generation to place of disposal.

Independent OWTS inspection companies are another type of potential OWTS management entity. These companies provide time-of-sale OWTS inspections and are often not affiliated with septage haulers or construction contractors. In order for a licensed home inspector to perform OWTS inspections, the home inspector must also be a licensed P.E. or Registered Environmental Health Specialist (R.E.H.S.) in New Jersey. Firms and individuals that do not provide licensed home inspection services may inspect OWTS without N.J.P.E. or R.E.H.S. credentials.

6.4. Collaborative Management Approaches

Of the range of potential entities and models considered in the early stages of developing this manual, the four models for OWTS management programs described briefly below were considered to be suitable models given the regulatory environment and existing institutional resources in New Jersey and in the Pinelands Area. These approaches are meant to be examples, and strict conformance with one model is not necessary. One model program will not fit each and every situation. The specifics of any management program must be customized to local environmental conditions, wastewater management needs, social conditions, land use planning opportunities and constraints, available institutional resources, and available financial resources.

Any OWTS management effort in the Pinelands Area is likely to be integrated or cooperative to some extent, and will incorporate interaction between many of the entities and service providers described above. Although Sections 7-10 provide details about all of the OWTS management elements that the

USEPA describes as components of successful programs for each of the models, no single organization is responsible for ALL of these elements.

6.4.1. Municipal / County Inter-Local Agreements

Inter-local agreements between municipalities and counties would most likely entail delegation of OWTS management by the municipalities to counties, similar to the existing arrangement between counties and townships or boroughs for environmental health services in the Pinelands Area. Currently, most townships and boroughs have delegated their authority to the county health departments for permitting of OWTS construction, alteration, or repair, and enforcement. This authority could be extended by local ordinance to include one or more elements of the on-going management of OWTS. A major benefit of this approach is that utilizing the county environmental health departments for OWTS management can keep the OWTS management elements, such as inventory and record keeping, in one agency. A drawback of this approach is that, while the counties can collect permitting fees to cover the costs of this program, those fees are likely to be directed into a county's general fund, rather than being used specifically to fund OWTS management program improvements.

6.4.2. Utility Authority / Municipality Agreements

The use of Utility Authorities as responsible entities for OWTS management is premised on the fact that utilities already possess expertise in the management of environmental infrastructure. It is anticipated that utilities that would agree to manage OWTS would likely be wastewater utilities. Utility authorities have responsibility for wastewater management in their service area, which currently applies to properties served or potentially served by centralized sewers and wastewater treatment facilities. Utility authorities would typically have to expand their service areas to include OWTS-only service areas outside of existing or potential sewer service areas. A major advantage of this approach is that in expanding the responsibilities of utility authorities to include OWTS, utility authorities can utilize their existing ability to develop and maintain system inventories, field operation and maintenance services; and billing of customers – among other OWTS management elements. One drawback of this approach is that utility authorities have not typically managed OWTS and might need to modify existing business practices to effectively manage them.

6.4.3. Private Consultant / Municipal Engineer Contracts

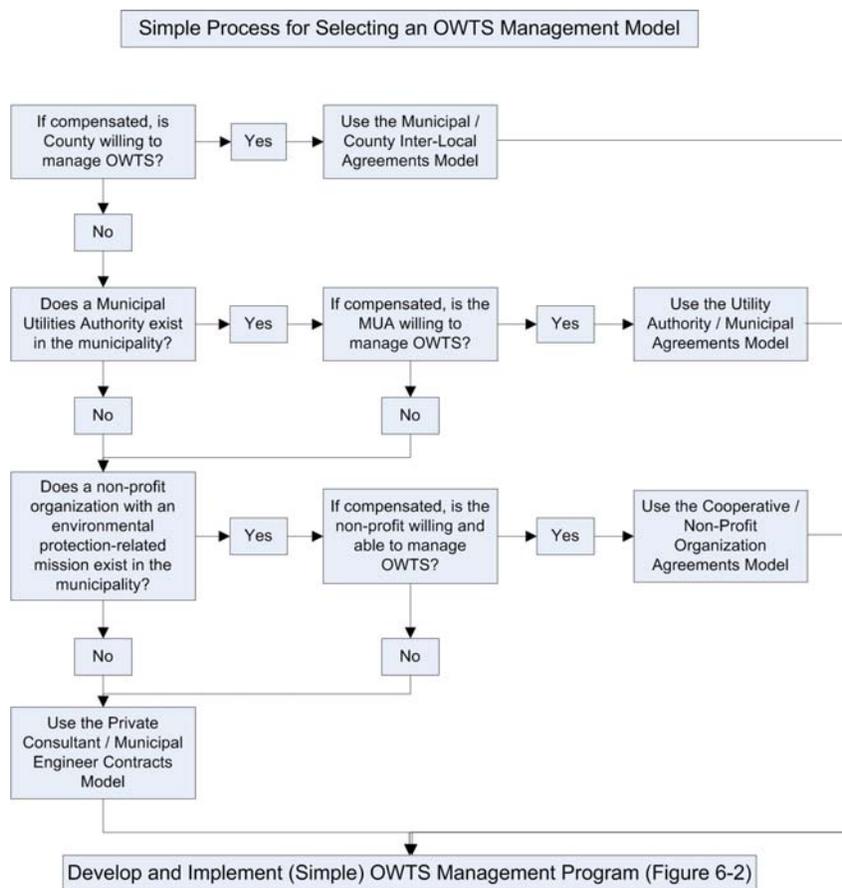
Private consultants could implement OWTS management using the same approach that many townships already use to engage consulting engineers or consulting firms to perform various tasks, such as designing public works projects and reviewing private engineering designs for site development. This model may work best for municipalities or counties which do not have sufficient management needs to support hiring full time permanent professional, administrative, and/or technical staff, but a sufficient amount of intermittent management needs for a consultant or consulting firm to implement on an as-needed basis. A potential major disadvantage of this approach might be the higher cost of private-sector professional staff

compared to public-sector professional employees, if the workload eventually increases to near-full time responsibilities for individuals at those firms.

6.4.4. Cooperative / Non-Profit Organization Agreements

Cooperatives are used in New Jersey for agricultural production and distribution and, in one instance, for rural electric supply. A number of non-profit organizations have been established for water quality and watershed protection purposes. OWTS management elements can be delegated to either a cooperative or a non-profit organization, in a manner similar to the model of contracting for engineering or consulting services described above. The OWTS management tasks can be performed by the professional, administrative, and/or technical staff of these organizations. Two major advantages of utilizing this approach are the organizations’ intrinsic emphasis on water quality and watershed protection, and the ability of non-profits to pursue grant funding for program enhancement. A major disadvantage of this approach is the potential need to establish new permanent service models and training for these organizations and their staff.

6.5. Choosing an Appropriate Management Model



Each of the management models described above has the potential to work in the Pinelands Area. However, factors unique to different counties or municipalities—such as a large number of older traditional OWTS, the presence of strong local interest in OWTS management, or the unwillingness of an organization to take management responsibility—may tip the balance in favor of one management model over another. Figure 6-1 provides an example of a process to follow in deciding which OWTS management model will be the best choice for implementation in a given jurisdiction. The following sections present

Figure 6-1. Simple decision tree for determining an appropriate OWTS management model.

information about how to establish an OWTS management program once a model is chosen.

6.5.1. What Level of Management is Right?

Each OWTS management program will be unique to the conditions within a local jurisdiction. However, the best approach is to start small, simple, and inexpensive, with a program that meets the minimum requirements of the CMP and the WQMP Rules, and to grow an OWTS management program with increasing numbers of installations and with staff experience. For instance, a jurisdiction might start with the minimum management activities required under the WQMP Rules, and then add support for funding OWTS repairs later on if there is a demonstrated need for that funding. Examples of the types of OWTS management activities that might be included in a simple and a more comprehensive program are shown in Table 6-1.

Table 6-1. Examples of Activities Included in Simple and Comprehensive OWTS Management Programs.

Simple Program	Comprehensive Program
Inventory	Inventory
Operating permit	Operating permit
Inspection / pumpout to renew permit	Periodic visit/site inspection by RME
	Full inspection required at time of property transfer
	Manifest system for residuals
	Requirements for continuing education
	Ongoing outreach program
	Licensing/certification program for installers
	Provide financing for repairs
	Pumpout discounts via participating haulers

In order to meet the regulatory requirements of the CMP and of the recently revised WQMP Rules, the simple OWTS management program should include the following elements:

- Ordinance that requires regular septic tank pumpouts (see Appendix C for model ordinances and examples from existing OWTS management programs in New Jersey)
- Renewable operating permit program that follows the ordinance requirements (see Section 6.6 for more detail on this and the following activities)
- Up-do-date inventory of existing OWTS and database to track pumpouts
- Enforcement mechanism to assure pumpouts are completed

If advanced treatment systems were installed in a jurisdiction through the Pinelands Alternative Wastewater Treatment System Pilot Program, or if such systems could be installed in the future, the management program should include the following additional elements:

- Ordinance requiring advanced systems to be serviced under an O&M contract (see Appendix D for an outline of this ordinance; additional guidance, including model ordinances, will be provided by Commission staff at the conclusion of the pilot program)

- Special renewable permit issued to owners of advanced treatment systems and associated database to track O&M (see Section 6.6)
- Enforcement mechanism to assure continued renewal of O&M contracts

Once a simple OWTS management program is established, additional components can be added to the program to improve the reliability of traditional OWTS and to assist property owners in making needed repairs if systems malfunction. Some of these management activities might include:

- Routine inspections of OWTS components and function, including the condition of tanks, pumps and alarms, distribution devices, and the disposal field, completed using a consistent protocol such as the NJDEP's recommended inspection guidance document, *Technical Guidance for Inspections of Onsite Wastewater Treatment and Disposal Systems*. The frequency of onsite inspections would be dependent on the needs or desires of the local jurisdiction; for example, inspections could occur every "x" years or at time of property transfer (see Section 6.6.3 for more on inspection schedules)
- Creation of sketch plans for each OWTS with all components identified and located relative to the structure.
- Implementation of a manifest system to track the residuals from septic tank pumpouts, to ensure that residuals are properly handled once they are removed from tanks.
- Creation of local grant or low-interest loan programs for financing OWTS repairs, particularly for low-income property owners.

6.6. How to Fashion the Key Components of an Effective Management Program

Once an OWTS management model is chosen, the next step is to develop OWTS Management Program Implementation Plan. The major components of such a plan are briefly described below, and a flowchart outlining an example process to follow in developing and implementing an OWTS management program is shown in Figure 6-2.

6.6.1. Inventory & Tracking: Create database and establish inventory of existing systems

Determining the number of OWTS within an agency's jurisdiction is the first step in setting up a management program. Several different data sources can be used to generate at least a reasonably accurate inventory of OWTS locations, if not the specific components and conditions of those systems (Table 6-2).

The number of OWTS within the management area, even if it is a preliminary estimate, will help determine the type of data management that will be needed during the implementation of a management program. A few hundred OWTS or less can be managed effectively with a simple spreadsheet. Once the systems number over a few hundred systems, a relational database is more effective, both for storing data and for tracking and monitoring system operation, maintenance, and (if necessary) performance. Some examples of available relational databases that can be used for OWTS management include:

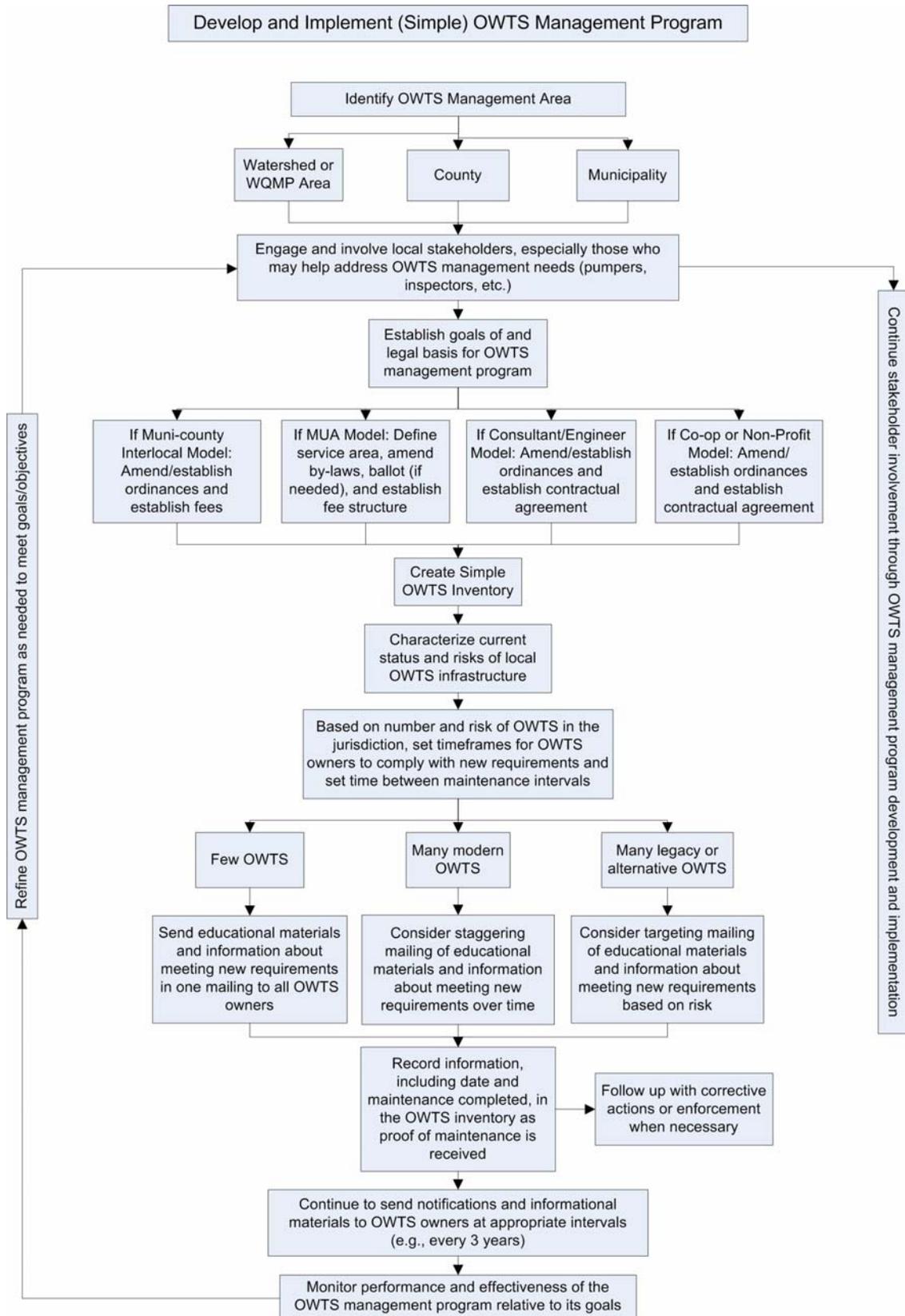


Figure 6-2. Decision tree for developing and implementing a simple OWTS management program.

Table 6-2. Data Sources for Estimating Numbers of OWTS Installations.

Data Source	Types of OWTS Information Available	Potential Data Formats
Assessor's files or database	Parcel-specific land use, which can be used to determine whether the property would require a wastewater system. May define type of wastewater service on a parcel, and may also be linked to Geographic Information System (GIS) that can locate developed parcels. Owner/location addresses, parcel-specific identifying numbers, etc. may be exported or linked to a database used for OWTS management.	Paper files, GIS shape files, CAD files, or relational databases
Census data	Number of Residential Housing Units in a municipality can be estimated by dividing the municipal population by the average number of persons per residence.	US Census data are available online: http://www.census.gov/
E-911 data	Depending on the level of GIS-enhanced 911 emergency dispatch mapping implemented at the local level, address-specific information about property use and building location may be available.	GIS shape files, if available
Utilities Authority files or database	If a wastewater utilities authority exists, its billing records can be used to identify homes already receiving sewer service. Those within a management area but not being billed for sewer service might reasonably be assumed to have property served by OWTS.	Paper files, accounting/billing software, relational databases
County health department files	Detailed, property-specific information about OWTS permits. Records accurate at time permits issued, but generally not updated if OWTS abandoned.	Paper files or microfiche; relational databases or spreadsheets for tracking permitting actions.
Local land use planning / zoning department files	Information about permitted land use	Paper files, GIS shape files (of zoning districts)
Local building department files	Information about building permits issued, including permits for OWTS construction, alteration, repair, or abandonment.	Paper files, some relational databases for permit tracking.
Pinelands Commission files	OWTS permits issued within the Pinelands Area since approximately 1980	Paper files

- The Wastewater Information System Tool (TWIST), a free Microsoft Access database developed by the USEPA to help local health departments and others track information related to small wastewater treatment facilities, including homes and facilities served, permits, site evaluations, types of systems, inspections and complaints. It is available at http://cfpub.epa.gov/owm/septic/septic.cfm?page_id=220.
- Proprietary, web-based database applications developed specifically for OWTS management (for example, those by Carmody Environmental Management Services (<http://www.carmody.biz/>)) Rather than purchasing new software for OWTS management, it may be possible to add onto or expand permit tracking databases that already exist in many Pinelands County health departments to track O&M activities or operating permits instead of only tracking construction, alteration, and repair permits.
- Some environmental health departments, particularly in northern New Jersey (Sussex County, for example), are moving towards digital documentation of all activities; lessons and data management processes they are learning now may be transferable into the Pinelands Area as OWTS management programs are developed.

Other variables to consider in choosing between available data management options include:

- What is the overall purpose of the data management system?
 - Documenting system permit data
 - Documenting Compliance with the OWTS management program
 - Sending invoices and reminders to OWTS owners
 - Creating reports
- What are the sources of existing data, and are they compatible with each other?
 - Paper files
 - Tax assessor files
 - Existing digital files (spreadsheets, databases, CAD files)
 - Existing GIS and GIS-compatible data
- How complex will your management program be? Are there many different types of OWTS in your jurisdiction, with different management requirements?
- What fiscal and personnel resources are available for helping set up and implement the OWTS management program?

Finally, once a data management system is chosen and once the system is initially populated with relevant information, a process (and staff time) will be needed to keep the information within it up to date.

6.6.2. Decide whether baseline inspections for existing systems are necessary

System inspections provide documentation of system components, condition, and need for changes in operation, maintenance and repair or replacement of a system. Baseline, or initial, inspections are more thorough than routine operation and maintenance inspections as the system location, components, and their condition is being evaluated and documented, often for the first time since installation.

An OWTS inspection manual for traditional systems has been developed by the NJDEP (NJDEP, 2003). Inspections should be conducted by trained practitioners or professionals in the field of OWTS design, installation operation, and maintenance. Baseline inspections are also an opportunity to install risers on septic tanks to facilitate future inspections, pumpouts, and other operation and maintenance.

Baseline inspections can be phased in at time of property transfer, or performed en masse on an area-wide or neighborhood basis. Phasing has significant advantages, including lower initial costs. Another approach to phasing is to base an inspection on the level of risk that a given type of system poses—for example, OWTS in areas of shallow groundwater, or of pre-1974 construction, might be inspected first.

6.6.3. Develop periodic inspection schedules

Inspections can be triggered by real estate transfers, or on a schedule established based on risk of system malfunctioning or impacting water quality in environmentally sensitive areas. Examples of inspection intervals from a variety of existing OWTS management programs are shown in Table 6-3. Inspection

intervals for advanced OWTS should be based on permit requirements, manufacturers’ recommendations, or the system designer’s recommendations, whichever is most conservative.

Table 6-3. Examples of OWTS Inspection and Pumpout Intervals.

OWTS Management Program Location	Inspection Interval
Borough of Hopatcong, New Jersey	Every 3 years for traditional OWTS
Byram Township, New Jersey	Every 3 years for traditional OWTS
Chatham Township, New Jersey	Every 3 years for traditional OWTS
Frankford Township, New Jersey ¹	Every 3 years for traditional OWTS
Montgomery Township, New Jersey ¹	Every 3 years for traditional OWTS
Montville Township, New Jersey ¹	Every 3 years for traditional OWTS
Mount Olive Township, New Jersey ¹	Every 3 years for traditional OWTS
Sparta Township (Lake Mohawk Watershed), New Jersey	Every 3 years for traditional OWTS
Town of South Kingstown, Rhode Island	All OWTS inspected within 7 years of program implementation; intervals for future inspections TBD
Town of Tisbury, Massachusetts	Every 7 years for traditional OWTS Every year for alternative OWTS
Bradford Township, Pennsylvania	Every month for alternative OWTS Every 3 years (septic tank pumping)
Carroll Township, Pennsylvania	Every 3 years for traditional OWTS
Newberry Township, Pennsylvania	Every 4 years for traditional OWTS As specified by manufacturer for alternative OWTS

¹ Only required for new construction; older systems can opt out until alteration or replacement needed.

6.6.4. Develop system performance criteria

Performance of traditional OWTS relates primarily to system functioning and public health protection. System malfunctions include surfacing wastewater, wastewater backing up into the house and contamination of a drinking water supply. Traditional system performance can be confirmed using inspections at the frequency of septic tank pumpouts (see Table 6-3) or at a prescribed frequency (e.g., every 3 years). Rather than pumping the tank during every visit, the pumper can measure the liquid level in the septic tank, solids accumulation in the septic tank, and whether disposal fields are excessively ponding below the ground surface.

Advanced OWTS performance is intended to provide wastewater quality improvements beyond what can be offered by traditional OWTS before the treated wastewater is dispersed in disposal fields. System performance for the Alternate Design Treatment Systems Pilot Program systems has been specified by the Pinelands Commission (see Section 4.2.3). Performance assessments for advanced OWTS designed to remove nitrogen should include sampling of effluent on at least an annual, but ideally quarterly, basis. Performance assessments for advanced OWTS that are only intended to lower biochemical oxygen demand and total suspended solids can be based on visual observation of microbial growth and effluent properties to confirm system conditions are favorable.

6.6.5. Develop system management programs

A management program should be developed using the USEPA elements (described in Section 4.1 and used throughout this manual) as a check list. The process of developing the management program should be publicized and open to input from stakeholders. Any program developed should not “re-invent the wheel”—meaning that it should be inclusive of and compatible with existing regulations and programs, such as the NJDEP regulations for OWTS installation (N.J.A.C. 7:9A) and county-level OWTS permitting programs. Consideration should also be given to phased implementation to keep costs low and allow community acceptance to build. Administrative and operation/compliance categories of the USEPA management program elements should be addressed using existing local resources to the greatest extent possible, in compliance with the recently adopted revisions to the Water Quality Management Planning Rules (N.J.A.C. 7:15). Examples of models for management programs using different management entities were introduced in Section 6.4, and each model is discussed in detail in Sections 7, 8, 9 and 10.

The Water Quality Management Planning Rules (N.J.A.C. 7:15-58(a)3) require an OWTS management program that includes mandatory adoption of a local ordinance requiring periodic pumpouts and tracking of pumpout locations in a database. Municipalities will need to decide if they wish to stop there or whether the operation, maintenance, and monitoring elements of the management program should require maintenance contracts between property owners and service providers, individual operating permits, or a general permit issued to a management entity which maintains all OWTS in a service area.

6.6.6. Secure program funding through existing or new funding mechanisms

Municipalities, counties, and utility authorities typically have no excess resources to finance an individual OWTS management program. Financing of the planning stage is the first step. The planning stage should include a process to explore means of funding the OWTS management program that is sustainable. Table 6-4 describes the range of potential funding sources available for starting OWTS management programs, depending on the management model being followed.

Table 6-4. Summary of Funding Sources for Starting OWTS Management Programs.

Funding Source	New Jersey Department of Environmental Protection	New Jersey Pinelands Commission	Pinelands Area County Health Departments	Pinelands Area Cities, Townships and Boroughs	Pinelands Area Utilities Authorities	Contracted Consultants/ Professional Engineers	Cooperatives / Non-Profit Organizations
State Treasury							
County General Funds							
Municipal General Funds							
Permitting Fees							
"Connection Fees" or service charges							
Bonding							
Clean Water Act Related Grant Funding							
Foundation Grant Funding							
Potential Start-up Funding from Clean Water State Revolving Fund Loans, through NJDEP/NJEIT							

Note: Shaded box indicates that the indicated agency can utilize the funding source in the left-hand column.

6.6.7. Enforce program requirements

Mandatory components of OWTS management need to be backed up with a clear and fair enforcement process. Enforcement programs should be enacted through local ordinance adoption, and should include clear notice of requirements and documentation of non-compliance and provide an opportunity for violation abatement. Only after voluntary abatement opportunities are exhausted should enforcement actions be taken. Most current enforcement programs utilize the local or superior court system. Enforcement should be the rare exception, but should not be avoided. An OWTS management program with a clear enabling ordinance and a well documented notification program is the right path to developing a legally defensible program when a property owner in non-compliance is the subject of enforcement.

6.6.8. Periodically review program and implement changes if needed

The OWTS management program should include a periodic program assessment to measure the effectiveness of the program in achieving established goals and objectives. The management program

should be reviewed in detail on an annual basis to determine whether the program is on the right track towards achieving its goals and objectives. The results of the program assessment should be incorporated in an annual report to the governing body and made available to the public. The ability to improve the management program should be incorporated into the program in order to address emerging issues. Ideally, the users of the program should be given an opportunity to provide feedback to ensure local ownership of the program.

6.7. Management Elements Common to All Models

The overall objective in OWTS management is to enable and ensure appropriate operation and maintenance of OWTS in the Pinelands Area. To meet that objective, all of the models described in detail in Sections 7 through 10 of this manual have a number of elements which are driven by external rules and regulations (Table 6-5).

The OWTS management elements pertaining to installation (site evaluation; design; and construction) are currently being effectively implemented through existing regulatory standards and county health departments in the Pinelands Area, and do not necessarily need to be addressed separately in local, county, or regional OWTS management programs. It should be noted, however, that local authorities may adopt more stringent standards than those in N.J.A.C. 7:9A, if desired. The local management programs do need to be compatible with existing regulatory permitting and installation programs, and the data collected during the installation elements should be integrated into the inventory/recordkeeping elements of local, county, or regional OWTS management programs.

Table 6-5. External OWTS Management Elements Common to all Management Models.

OWTS Management Program Element	External Requirement
Public Education & Outreach	Required by Standards for Individual Subsurface Sewage Disposal Systems (N.J.A.C. 7:9A)
Planning for OWTS Management	Required by WQMP Rules (NJAC 7:15)
Performance	Required for all OWTS (N.J.A.C. 7:9A & Pinelands Commission for N-removing systems)
Site Evaluation	Required by N.J.A.C. 7:9A
Design	Required by N.J.A.C. 7:9A
Construction	Required by N.J.A.C. 7:9A
Operation and Maintenance (O&M)	Required by Pinelands CMP (every three years for traditional systems and quarterly for N-removing systems)
Residuals Management	Licensed pumpers & disposal facilities
Compliance Inspections / Monitoring of existing systems	Required by Pinelands CMP for N-removing systems
Corrective Actions and Enforcement	Municipal & Superior Court system
Training and Certification/ Licensing	Professional engineers; Septic system pumpers; Wastewater treatment system operators

Local, county, or regional OWTS management programs should be focused on the following elements that are within the control of local, regional, and county-level entities:

1. Administrative Elements
 - a. Public Outreach & Education
 - b. Planning
 - c. Inventory and Recordkeeping
 - d. Financial Assistance Implementation
2. Operation and Compliance Elements
 - a. Operation and Maintenance
 - b. Inspection and Monitoring
 - c. Corrective Actions and Enforcement

The following elements of OWTS management may be more appropriately addressed on a broader (e.g., regional or state-wide) scale, and will therefore not be emphasized in the models discussed in Sections 7 through 10 of this manual:

1. Financial Assistance Program Development
2. Performance Requirements
3. Operation and Maintenance Requirements
4. Inspection and Monitoring Implementation
5. Training and Certification /Licensing
6. Residuals Management

7. MUNICIPAL / COUNTY INTER-LOCAL AGREEMENT MANAGEMENT MODEL FOR THE PINELANDS AREA

7.1. Description of Approach

Under this model, a municipality contracts with the County Health Department for Responsible Management Entity (RME) services. Variations on this model are possible. For example, a municipality could enter an inter-local agreement with another municipality, or a county agency other than a health department. For simplicity, this section will deal generally with an inter-local agreement between a municipality and a county health department.

The legal framework for this type of model is well-established (N.J.S.A. 26:3; N.J.S.A. 26:3A2), and most municipalities already either contract for public health services or have delegated their authority in this matter to the County level. County health departments in the Pinelands Area already charge fees to administer permitting for OWTS construction and alteration, but, depending on the financing mechanism, there may be limits on dollar amounts which can be charged to support an operating-permit type OWTS management program. A program financed through a municipal general fund may not be able to charge fees in excess of the actual costs of permitting, making it difficult to save for improvements to the program. However, a permit fee-based program may be able to charge the cost of reviewing, processing, and tracking the operating permit and the proportional cost of the management program that supports that permit.

7.2. Potential RMEs under this management model

- Atlantic County Environmental Health Department
- Burlington County Environmental and Consumer Health
- Camden County Health Department
- Cape May County Environmental Health
- Cumberland County Department of Health
- Gloucester County Department of Health and Senior Services
- Ocean County Health Department
- Vineland Health Department
- Other individual municipal boards of health and/or health departments

7.3. Potential Responsibilities of Municipalities under this Model

Municipalities are now charged by NJDEP to be involved in the OWTS management planning process. Municipalities that select the inter-local agreement model will need to expand the authorities that are delegated to the county health departments (with the exception of Vineland, which does not delegate environmental health authority to the county). Municipalities could elect to delegate responsibility for all



of the management program elements to the County or may choose to retain responsibility for some of those elements. Similarly, municipalities may retain or delegate responsibility for collecting fees from residents for participation in the management program.

7.4. Potential Responsibilities of Counties under this Model

Counties would be responsible for some or all of the following elements as underlined in the following sections, depending on the needs and desires of the delegating municipality:

1. Administrative Elements
 - a. Public Outreach & Education
 - b. Planning
 - c. Inventory and Recordkeeping
 - d. Financial Assistance Implementation
2. Operation and Compliance Elements
 - a. Operation and Maintenance
 - b. Inspection and Monitoring
 - c. Corrective Actions and Enforcement

7.5. Administrative Elements

The administrative elements essential to a sustainable OWTS management program are detailed in this section. County agencies are well positioned to provide each of these elements, but some municipalities may elect to provide some of these elements in house.

7.5.1. Public Education and Participation

Without the public's appreciation of the value of OWTS management, there will be little support for or even outright rejection of such programs. Thus, public education is necessary, both to explain the benefits of such programs to property owners and to enable property owners to understand the environmental and public health drivers for an OWTS management program. Public education is also necessary to provide homeowners with information on how to comply with program requirements. Both the NJDEP and the Pinelands Commission can help ensure the accuracy of information concerning OWTS management across the Pinelands Area. Other excellent sources of information about OWTS maintenance and management include the County Health Departments, the Water Resources Program at the Rutgers New Jersey Agricultural Experiment Station, and County Extension agents.

- Under this model, County and local health departments will continue to provide outreach information to OWTS owners as mandated by N.J.A.C. 7:9A-3.14 (or they will begin to provide such information if they are not already doing so). Existing NJDEP, Pinelands Commission, Health Department, and Rutgers Fact Sheets are all excellent sources of accurate and concise information for property owners.

7.5.2. Planning for OWTS Management

With the July 2008 revisions to the Water Quality Management Planning Rules, county governments are designated as wastewater management planning (WMP) agencies and are required to plan for OWTS management. In the Pinelands Area, this responsibility likely falls to the County planning departments, since they are already responsible in most cases for maintaining the Water Quality Management Plans (WQMPs) for their respective counties or regions. Activities related to OWTS management that the WMP agencies are now responsible for include:

- Performing build-out analyses, including watershed-based nitrate dilution analyses, for areas that are served by OWTS
- Adjusting zoning to be consistent with the allowable number of additional equivalent dwelling units at build-out, based upon nitrate dilution modeling.

Also under the May 2008 revisions to the WQMP Rules, municipalities will be required to demonstrate to the WMP planning agency that “areas to be served by individual subsurface sewage disposal systems are subject to a mandatory maintenance program, such as an ordinance, which ensures that all individual subsurface sewage disposal systems are functioning properly. This shall include requirements for periodic pump out and maintenance, as needed” (N.J.A.C. 7:15-5.25(e)3). In the Pinelands Area, although such ordinances may be passed at the local municipal level, most municipalities have delegated or contracted authority for environmental health services, including OWTS permitting, to County health departments (see Sections 4.2.4 and 7.5.3). Thus, responsibility for wastewater planning and information related to existing OWTS will now reside at the County level—in the Planning Departments and Health Departments, respectively.

7.5.3. Record Keeping, Inventory and Reporting

In order to comply with the current N.J.A.C. 7:9A-3.14 requirement that local health departments notify OWTS owners of maintenance needs, the Pinelands CMP pumpout requirement, and the management requirements for OWTS in the recent revisions to the WQMP Rules, any potential RME needs an accurate inventory of existing OWTS.

In the Pinelands Area, County health departments already have the best start on an inventory of existing OWTS by virtue of their existing permitting responsibilities.

- County health department staff can create an inventory of existing OWTS, including, if desired, GIS location data (Section 6.6.1).
- County health department staff can also assist in the determination and mapping of existing and planned sewer service areas within their respective jurisdictions.
- Finally, to improve documentation of OWTS installations, county health departments can amend their permit application requirements to require that engineers submit design plans and supporting materials in digital format, and that parcel identifiers and GPS coordinates for system and component locations

be included in the application package. Digital as-built design drawings could also be required to reflect any modification to proposed designs made during OWTS construction.

7.5.4. Performance Requirements

In New Jersey, performance requirements for all OWTS include:

- The OWTS should not contaminate nearby wells or surface water bodies by sewage or effluent as indicated by the presence of fecal bacteria where the ratio of fecal coliform to fecal streptococci is four or greater;
- Sewage or effluent should not break out or pond onto the surface of the ground;
- Sewage or effluent should not seep into portions of buildings below ground; and
- Sewage should not back up into the building served.

In addition to these performance requirements, Pinelands alternate design wastewater treatment systems are expected to reduce nitrate concentrations in effluent (Section 4.2.3); however, individual system owners are held harmless if their systems are maintained correctly but fail to meet the nitrogen reduction target.

Pinelands alternate design (denitrifying) wastewater treatment systems rely on mechanical components to reduce pollutant loads in treated wastewater. In order to ensure that these advanced treatment technologies are performing properly, periodic inspections and monitoring by trained O&M personnel is needed. The management program must develop and maintain a record keeping system to track maintenance. The tracking system could also be used to track treatment system performance. Record keeping will be key to assuring that all systems are being adequately maintained and would identify instances where enforcement actions are necessary to attain compliance with the maintenance requirements. Regardless of which OWTS management model is adopted at the local level, performance requirements are particularly important for Pinelands alternate design systems (Section 4.2.3). The Pinelands Commission intends to develop amendments to the CMP to address performance of the pilot program alternate design treatment systems at the conclusion of the current pilot program.

7.5.5. Financial Assistance and Funding

7.5.5.1. Funding for OWTS Management Program Startup and Administration

Several different sources of funding are currently (or potentially) available to County health departments for starting and administering OWTS management programs.

- County health departments can apply to the NJDEP Division of Watershed Management Nonpoint Source Pollution Management Program for federal Section 319(h) grant funding to be used to implement programs and projects designed to reduce nonpoint source pollution. Though the emphasis of 319(h) grant funding has shifted from TMDL and restoration plan development to implementation in recent years, 319(h) funding supported the creation of this manual.

- County health departments can also apply to the NJDEP Division of Watershed Management Nonpoint Source Pollution Management Program for federal Section 604(b) grant funding to create OWTS management plans. NJDEP emphasized the development of OWTS management plans in state fiscal years 2005 and 2006.
- County health departments can charge fees to support the staffing/equipment requirements of an OWTS management program. Ideally, these fees would be committed to a dedicated fund established to offset costs of the OWTS management program.
- Start-up costs for a management program could be financed through a budget item in the municipalities' or County's general funds.
- A loan program using Clean Water State Revolving Loan funds (SRF) could be developed by NJDEP and the New Jersey Environmental Infrastructure Trust (NJEIT) that would allow municipalities or Counties to pay off startup costs over time through user fees or gradual general fund increases.

7.5.5.2. Funding for OWTS Upgrades or Alterations

As implementation of OWTS management programs progresses, it is possible that periodic inspections and pumpouts will reveal malfunctions in situations where property owners do not have the ability to pay the up-front costs of alterations or repairs to bring the OWTS into compliance. The municipalities and Counties should collaborate with NJDEP to develop municipal OWTS funding programs (either grants or low-interest loans) to help homeowners enrolled in an OWTS management program or district pay for alterations and repairs, particularly in areas where such funding is not already available for low-income owners. The process for implementing such loan programs includes the following steps:

- NJDEP sets criteria for counties or municipalities to get SRF money for failed OWTS repair and replacement
- All organizations involved (NJDEP, counties, municipalities, lending institutions) provide OWTS owners with information on low interest loans

7.6. System Installation Elements

The following is a list of OWTS installation elements under this management approach. These elements would remain unchanged from the current OWTS permitting and installation activities.

7.6.1. Site Evaluation

Site evaluations (soil and groundwater) are performed under the direct supervision of a N.J. licensed P.E.. Administrative authorities can witness field testing and ultimately review and approve or disapprove soil test results attained through test procedures identified in N.J.A.C. 7:9A. This process would not change under any of the management models described in this manual.

7.6.2. Design

OWTS designs are prepared by N.J. licensed P.E.s and submitted to county or local administrative authorities for approval. The OWTS design process would remain relatively unchanged under any of the management models described in this manual. County health department staff will continue to rely on NJDEP to issue generic or individual Treatment Works Approvals for non-N.J.A.C. 7:9A compliant systems, such as N removing systems.

As County health departments move towards digital file storage, the permit application procedures may change to require engineers to submit design and as-built plans and application materials in digital format, and provide coordinates for system locations compatible with GIS (see Section 7.5.3)

7.6.3. Construction and Installation

OWTS installations require the issuance of a permit or approval from the administrative authority. The construction and installation process for OWTS is already well-documented and regulated, and would not change under this model. Authorized agents (N.J.P.E.s or REHS) of the administrative authority (County health department) or a N.J.P.E. employed by the applicant issues a certificate of conformance for traditional OWTS, while the technology provider and NJPE both issue such certificates for advanced technologies, including N removing systems.

7.7. Operation and Compliance Elements

The following detailed breakdown of responsibilities for operation and compliance elements under this management approach would introduce ongoing administrative oversight of the long-term maintenance of OWTS. Through this approach, periodic inspections and maintenance of systems would be assured through a “permit to operate” management program. Implementation of managing the operation and maintenance of traditional systems could be carried out through the County health departments, while the existing advanced OWTS pilot permitting and monitoring program could shift from the Pinelands Commission to the County health departments.

7.7.1. Operation and Maintenance (O&M)

With this management model, either the municipality or county would issue a permit to the property owner to use the OWTS for a finite period, and would require evidence of maintenance to be submitted in order for the permit to be routinely reissued. Under this model, O&M activities such as septic tank pumpouts or routine system inspections for both traditional and alternative OWTS would be performed by service providers contracted by individual property owners. Inspection records, sampling results (where applicable), pumpout receipts, and other documentation (if needed) would be submitted to the County health department or the municipality by the property owner in order to obtain or renew the system’s operating permit. (See Section 7.7.3 for more detail on determining frequencies for performing O&M and inspection-related activities.)

The County health department or municipality, under this model, administers a fee-based operating permit for both traditional and advanced (N removing) OWTS. Operating permit fees would be used to finance the ongoing administration of this management program.

7.7.2. Residuals Management

Management of OWTS should incorporate a mandatory inspection and pumpout requirement. To increase public support and reduce O&M costs, pumpouts might only be required when residual levels within a tank meet established criteria, as opposed to being strictly mandated on a time-based standard (e.g., every three years). The enforcement of existing Pinelands CMP and local ordinances adopted in response to the recently adopted WQMP Rules are expected to result in the generation of larger quantities of septic tank residuals for disposal. The agency responsible for tracking pumpouts should ensure that adequate septage treatment capacity is available regionally to accommodate the increase in septage volume that a pumpout program will generate.

Under this model, once an OWTS inventory is established, the County health department staff can characterize septage management needs resulting from mandatory O&M inspections and pumping (as needed), and estimate septage production. The management entity needs to be knowledgeable with respect to treatment facility capabilities in order to direct service providers as to where to properly dispose of residuals.

7.7.3. Compliance Inspections / Monitoring

As described in Section 7.7.1, several different scenarios can be considered for inspection frequencies, depending on the type of OWTS, the risk it poses to public health or the environment, or other factors. Currently, inspections of operating traditional OWTS are conducted by contracted service providers and typically occur only at the time of property transfer. This approach could continue under this management model with inspection reports submitted to the County health department. Inspections (and O&M activities such as pump-outs) could also be conducted by contracted service providers at specified intervals (for example, once every 3 years as required in the Pinelands CMP) with reporting of those results to the County health department.

Pinelands Commission staff report that future rule making will transition the alternate OWTS installed under the Pinelands Alternate Design Treatment Systems Pilot Program to a sustainable management system. Future requirements are likely to mimic those of the pilot program and are expected to include mandatory O&M contracts. Continued monitoring of the alternate OWTS will likely be performed by approved service providers under contract to property owners, as is already the case in the pilot program, with reporting to the County health department instead of to the Pinelands Commission. Inspection and monitoring frequencies for the alternate OWTS could be specified in the operating permits for each system based on manufacturers' recommendations and/or local requirements.

7.7.4. Corrective Actions

Currently, County health department staff initiate corrective actions through the issuance of a Notice of Violation, typically after receiving complaints about malfunctioning OWTS. As part of a more comprehensive management program, health departments are likely to become aware of systems malfunctioning more frequently and will likely need to oversee abatement of system malfunctions identified through routine inspections.

7.7.5. Enforcement

Under any of the management models in this manual, enforcement would rely primarily upon existing statutes, rules, and ordinances, with amended or additional rules or ordinances adopted as needed.

7.7.6. Training and Certification/ Licensing

OWTS management programs will benefit from a knowledgeable workforce, including pumpers, O&M service providers, engineers, and others. RMEs may wish to consider registering service providers as a means to ensure a competent workforce. Service providers that do not meet ongoing performance standards could be de-certified as necessary. Ongoing training/certification is particularly important for:

- O&M Service Providers
- System Inspectors
- Regulators
- Professional Engineers
- Pumpers

In order to accommodate the need for increased educational opportunities for regulators, designers, and service providers, local colleges and universities, Rutgers Cooperative Extension, private consultants, and technology service providers can all expand training opportunities.

7.8. Advantages/Disadvantages of the County/Municipality Inter-Local Agreement Model

The advantages and disadvantages of the County/Municipality inter-local agreement model are listed in Table 7-1. In this table, advantages and disadvantages that are unique to this management model are highlighted in green.

Table 7-1. Advantages and Disadvantages of the County/Municipality Inter-Local Agreement Model.

Element	Advantages	Disadvantages
Public Outreach & Education	Improve property owners', practitioners', and professionals' knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program
Planning	Provide community input on long-range goals and objectives	Initial planning would require staff resources prior to collection of fees for program
Inventory and Recordkeeping	Existing permit records are in County files	Existing land use data dispersed amongst local, county, Pinelands, & utility authorities
Financial Assistance/Funding Implementation	Property owners are already accustomed to coming to County for environmental health permitting Setting up fee-based program would allocate responsibility for where resources are utilized.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS
Performance	No significant changes proposed	
Site Evaluation	No significant changes proposed	
Design	No significant changes proposed	
Construction	No significant changes proposed	
Operation and Maintenance	Follow-up permitting of OWTS will increase systems' reliability/longevity	Requires private sector O&M resources to be available; and additional permit program & staff to monitor compliance.
Inspection and Monitoring	Following up on permits confirms systems' performance	Requires property owner to pay for either county or private sector inspection/monitoring
Residuals Management	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or incur high cost to ship septage out of area
Training and Licensing	County is familiar with practicing professionals and service providers. Enhances overall level, and consistency, of expertise among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing
Corrective Actions and Enforcement	Utilizes & enhances existing means of enforcement; ensures compliance with management program.	Requires additional regulatory cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals.

Shaded areas denote advantages or disadvantages that are unique to the municipal/county inter-local agreement model.

7.9. Cost Estimates

The cost estimates presented in this manual are intended to be illustrative only. Each OWTS management program developed for a county or municipality in the Pinelands Area will have its own unique costs, and these should be determined individually during the program development stage. Depending upon the needs and conditions in each locality, some jurisdictions may be able to provide equivalent services at higher or lower cost. The tables below are based on Microsoft Excel spreadsheets, which can be used as a template for local authorities trying to develop their own costs and are available from the Pinelands Commission website.

The costs of this model were estimated based on two scenarios: A management program for 1,000 traditional OWTS that meets the minimum requirements set forth in the WQMP Rules (Table 7-2) and a more comprehensive OWTS management program, again for 1000 traditional OWTS (Table 7-3). No matter which path a municipality takes with regard to OWTS management, advanced OWTS will require additional inspections and monitoring, so those costs were estimated separately per 100 advanced OWTS (Table 7-4). Appendix A has a cost comparison table and side-by-side tables from Sections 7, 8, 9, and 10 for at-a-glance comparisons of the models.

Although there are many ways to implement a management program, the basic assumptions of this cost estimate are:

- For all management approaches:
 - It will take one year to establish a management program (Year 1), including establishing ordinances and developing an inventory database.
 - One-third of the existing traditional OWTS will have septic tanks pumped in each of the first three years of the program (Years 2-4).
- The current Alternative Design Treatment Systems Pilot Program requires quarterly effluent monitoring for a total of twelve monitoring events. Although long-term monitoring requirements for advanced OWTS have not been established, the estimate below assumes one inspection / monitoring event per system per year, though the technology manufacturers may recommend 4 or more visits per year.
- A comprehensive program would also include the following activities:
 - One-third of the existing traditional OWTS will be thoroughly inspected in each of the first three years of the program (Years 2-4). This thorough inspection would in many cases involve locating and characterizing the existing system components.
 - Routine inspections for traditional OWTS will be conducted in Year 5 and beyond.
 - A loan program will be developed and implemented to help property owners finance repairs and replacement of systems that are not functioning properly

There will be some economy of scale in such programs as the number of systems managed by a single entity increases over time. The costs shown in this table do not include the eventual replacement of systems as they age beyond their expected design life, which is typically 20-30 years (particularly for older OWTS that have not been consistently managed) These costs are provided as general indicators of relative costs for comparison between the management models included in this manual, and as examples of the types of costs which should be estimated when starting an OWTS management program. Specific cost estimates should be developed during the planning and implementation stages of individual, local OWTS management programs.

Table 7-2. Minimum Management Program Cost Estimates per 1,000 Traditional OWTS for Inter-Local Agreement Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years				
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 + Annual Cost
Public Education/Outreach ¹	1000	Systems	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625
System Inventory ²	1000	Systems	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000
Recordkeeping & Notification ³	1000	Systems	\$20	\$20,000	\$7,000	\$7,350	\$7,718	\$8,103
Equipment Purchases/Replacement	1	Lump Sum	\$20,000	\$20,000	\$2,000	\$2,100	\$2,205	\$2,315
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Operation & Maintenance ⁵	1000	Systems	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034
Total:				\$90,000	\$100,550	\$105,578	\$110,856	\$108,654
Annual Onsite System User Fee ⁶ :				\$90	\$31	\$32	\$34	\$28
Annual O&M Cost ⁶ :				\$0	\$70	\$74	\$77	\$81
Annual Total User Cost:				\$90	\$101	\$106	\$111	\$109
Five Year Average Annual Total User Cost:								\$103
Notes and Assumptions:								
= Costs included in OWTS management program operating permit fee								
= Costs borne by users which are not included in OWTS management program operating permit fee								
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.								
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to pumpouts; Years 5: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.								
3. Record Keeping - Year 1: full cost to set up database; Years 2-4: 33% initial cost while data from pumpouts are entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for database and computer acquisition, maintenance and replacement. Included 10% markup assumed on equipment purchases and replacement)								
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.								
5. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$200 per year. Dispersal System O&M borne by user.								
6. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.								

Table 7-3. Comprehensive Management Program Cost Estimates per 1,000 Traditional OWTS for Inter-Local Agreement Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years					
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 Annual Cost	
Public Education/Outreach ¹	1000	Systems	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625	
System Inventory ²	1000	Systems	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	
Recordkeeping & Notification ³	1000	Systems	\$20	\$20,000	\$7,000	\$7,350	\$7,718	\$8,103	
Equipment Purchases/Replacement	1	Lump Sum	\$56,000	\$56,000	\$4,000	\$4,200	\$4,410	\$4,631	
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	
Loan Program for System Upgrades ⁵									
Start-Up & Program Administration	1000	Loans	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	
Inspections ⁶	1000	Systems	\$1,000	\$10,000	\$350,000	\$367,500	\$385,875	\$175,000	
Operation & Maintenance ⁷	1000	Systems	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034	
Total:				\$146,000	\$462,550	\$485,678	\$509,961	\$297,545	
				Annual Onsite System User Fee ⁸ :	\$136	\$43	\$45	\$47	\$42
				Annual O&M/ Inspection Cost ⁸ :	\$10	\$420	\$441	\$463	\$256
				Annual Total User Cost:	\$146	\$463	\$486	\$510	\$298
Five Year Average Annual Total User Cost:								\$380	
Notes and Assumptions:									
= Costs included in OWTS management program operating permit fee									
= Costs borne by users which are not included in OWTS management program operating permit fee									
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.									
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to inspections; Years 5: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.									
3. Record Keeping - Year 1: full cost to set up database; Years 2-4: 33% initial cost while data from inspections is entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data.									
Equipment costs are for database and computer acquisition, maintenance and replacement									
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.									
5. Loan Program - Year 1: Cost to establish program and establish qualification and priority criteria for loans - Years 2-4: assume 2% of inspected systems will apply for loans; Year 5 assume 1% of all systems applying for loans each year.									
6. Inspections - Year 1: initial cost to set up program; Years 2-4: conduct detailed initial inspections with contractor hired by owners to expose system; Year 5 conduct "check-up" inspections at assumed 50% cost of initial inspection every three years to									
7. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$200 per year. Dispersal System O&M borne by user.									
8. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.									
9. Suggested User Fee is average of Years 1 - 5 total annual.									

Table 7-4. Management Program Cost Estimates per 100 Advanced OWTS for Inter-Local Agreement Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years	
				Initial Year	Year 2 +
				Set Up Cost	Cost ⁷
Public Education/Outreach ¹	100	Systems	\$20	\$2,000	\$1,050
System Inventory ²	100	Systems	\$50	\$10,000	\$1,500
Recordkeeping ³	100	Systems	\$50	\$5,000	\$5,250
Compliance & Enforcement ⁴	100	Systems	\$1,000	\$1,000	\$1,050
Operational Inspections ⁵	100	Systems	\$900	\$90,000	\$94,500
Operation & Maintenance ⁶	100	Systems	\$267	\$32,040	\$28,035
Total:				\$140,040	\$137,954
Annual Onsite System User Fee:				\$180	\$89
Minimum Annual O&M/Inspection Fee ⁷ :				\$1,220	\$1,225
Annual Total Cost Per User:				\$1,400	\$1,314
Five Year Average Annual Total User Cost:					\$1,413
Notes and Assumptions:					
= Costs included in OWTS management program operating permit fee					
= Costs borne by users which are not included in OWTS management program operating permit fee					
1. Year 1: Four mailings; Year 2 and beyond (Year 2+): one mailing per year.					
2. Year 1: 200% full cost of importing/entering data; Year 2+: 100% initial cost for four quarterly updates of O&M/inspection data.					
3. Assume equipment purchased under traditional system management program. Years 1 and 2+: fixed rate to enter O&M and upgrade data at 50% start up cost					
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.					
5. Assumed four operational equipment inspections per year to confirm system is operating properly, check parts, collect effluent sample once per year, and laboratory analysis. Actual cost and frequency of operation inspections will depend on technology,					
6. Assumed septic tank pumping every three years at \$200/pumpout + \$200/year replacement parts.					
7. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.					

8. UTILITY AUTHORITY MANAGEMENT MODEL FOR THE PINELANDS AREA

8.1. Description of Approach

Under this model, a municipality or municipalities contract with an existing wastewater utilities authority for RME services—or an existing municipal or county MUA takes on OWTS management as an additional service offering within their service area. Alternately, a municipality or a municipal utilities authority could contract with a private utility to provide OWTS management services. The legal authority and powers/responsibilities for an MUA taking on an OWTS management program are well-defined (N.J.S.A. 40:14B-1 et seq.), but it appears that no MUA in the Pinelands Area (nor in New Jersey) currently utilizes this model to operate an OWTS management program.

8.2. Potential RMEs under this management model

- Atlantic County Utilities Authority
- Camden County Municipal Utilities Authority
- Cape May County Municipal Utilities Authority
- Cumberland County Utilities Authority
- Gloucester County Utilities Authority
- Ocean County Utilities Authority
- Hamilton Township Municipal Utilities Authority
- Weymouth Township Municipal Utilities Authority
- Evesham Township Municipal Utilities Authority
- Medford Township Municipal Utilities Authority
- Pemberton Township Municipal Utilities Authority
- Franklin Township Municipal Utilities Authority
- Monroe Township Municipal Utilities Authority
- Toms River Township Municipal Utilities Authority
- Jackson Township Municipal Utilities Authority
- Lacey Township Municipal Utilities Authority
- Ocean Township Municipal Utilities Authority
- New Jersey American Water Company, Applied Water Management Group
- Aqua New Jersey, Inc.

8.3. Potential Responsibilities of Municipalities under this Model

Municipalities are now charged by NJDEP to be involved in the OWTS management planning process. Municipalities that select the utility authority management model will want to delegate specific management duties to a utility authority and may wish to delegate other management duties to the county



or local health departments. Municipalities may choose to retain responsibility for collecting fees from residents for participation in the management program, or they may choose to transfer this responsibility to the utility authority.

8.4. Potential Responsibilities of Utility Authorities under this Model

Utility authorities would be responsible for some or all of the following elements as underlined in the following sections:

1. Administrative Elements
 - a. Public Outreach & Education
 - b. Planning
 - c. Inventory and Recordkeeping
 - d. Financial Assistance Implementation/Funding
2. Operation and Compliance Elements
 - a. Operation and Maintenance
 - b. Inspection and Monitoring
 - c. Corrective Actions and Enforcement

8.5. Administrative Elements

The administrative elements essential to a sustainable OWTS management program are detailed in this section. Utility authorities are well positioned to provide each of these elements; however, some municipalities may elect to provide some of these elements in house. The ability to inventory systems, maintain and update records, and administer fees for service are notable strengths of the utility authority as RME.

8.5.1. Public Education and Participation

Without the public's appreciation of the value of OWTS management, there will be little support for or even outright rejection of such programs. Thus, public education is necessary, both to explain the benefits of such programs to property owners and to enable property owners to understand the environmental and public health drivers for an OWTS management program. Public education is also necessary to provide homeowners with information on how to comply with program requirements. Both the NJDEP and the Pinelands Commission can help ensure the accuracy of information concerning OWTS management across the Pinelands Area. Other excellent sources of information about OWTS maintenance and management include the County Health Departments, the Water Resources Program at the Rutgers New Jersey Agricultural Experiment Station, and County Extension agents.

- Under this model, the utility authority would develop and maintain an inventory of OWTS installations, rather than the County health department, so the utility authority could also provide information to OWTS owners per the requirements of N.J.A.C. 7:9A.

8.5.2. Planning for OWTS Management

With the July 2008 revisions to the Water Quality Management Planning Rules, county governments are designated as wastewater management planning (WMP) agencies and are required to plan for OWTS management. In the Pinelands Area, this responsibility likely falls to the County planning departments, since they are already responsible in most cases for maintaining the Water Quality Management Plans (WQMPs) for their respective counties or regions. Activities related to OWTS management that the WMP agencies are now responsible for include:

- Performing build-out analyses, including watershed-based nitrate dilution analyses, for areas that are served by OWTS
- Adjusting zoning to be consistent with the allowable number of additional equivalent dwelling units at build-out, based upon nitrate dilution modeling.

Also under the July 2008 revisions to the WQMP Rules, municipalities will be required to demonstrate to the WMP planning agency that “areas to be served by individual subsurface sewage disposal systems are subject to a mandatory maintenance program, such as an ordinance, which ensures that all individual subsurface sewage disposal systems are functioning properly. This shall include requirements for periodic pump out and maintenance, as needed” (N.J.A.C. 7:15-5.25(e)3).

- Municipalities or counties in the Pinelands Area that already have utility authorities managing centralized wastewater treatment facilities may choose to seek to have the utility authorities manage OWTS through amendments to existing ordinances.

8.5.3. Record Keeping, Inventory and Reporting

In order to comply with the current N.J.A.C. 7:9A-3.14 requirement that local health departments notify OWTS owners of maintenance needs, the Pinelands CMP inspection and pumpout requirement (N.J.A.C. 7:50-6.85), and the management requirements for OWTS in the recent revisions to the WQMP Rules, any potential RME needs an accurate inventory of existing OWTS.

In the Pinelands Area, County health departments have the best start on an inventory of existing OWTS by virtue of their existing permitting responsibilities.

- Utilities authority staff can work with County health department staff to create an inventory of OWTS, including collecting GIS location data (Section 6.6.1).
- Utilities authority staff could work with WMP agencies, municipalities, and the NJDEP to determine and map the extent of existing and planned sewer service areas within their respective jurisdictions.
- Utilities authorities could inventory existing OWTS by sorting municipal tax assessment databases to identify locations of approved systems and subtract those parcels which are connected to the authority’s centralized collection and treatment system(s).
- To improve documentation of OWTS installations, County health departments could amend their permit application requirements to require that engineers submit design plans and supporting materials in digital format, and require that parcel identifiers and GPS coordinates for system and component

locations be included in the application package. Digital as-built design drawings could also be required to reflect any modification to proposed designs made during OWTS construction.

8.5.4. Performance Requirements

In New Jersey, performance requirements for all OWTS include:

- The OWTS should not contaminate nearby wells or surface water bodies by sewage or effluent as indicated by the presence of fecal bacteria where the ratio of fecal coliform to fecal streptococci is four or greater;
- Sewage or effluent should not break out or pond onto the surface of the ground;
- Sewage or effluent should not seep into portions of buildings below ground; and
- Sewage should not back up into the building served.

In addition to these performance requirements, Pinelands alternate design wastewater treatment systems are expected to reduce nitrate concentrations in effluent (Section 4.2.3); however, individual system owners are held harmless if their systems are maintained correctly but fail to meet the nitrogen reduction target.

Pinelands alternate design (denitrifying) wastewater treatment systems rely on mechanical components to reduce pollutant loads in treated wastewater. In order to ensure that these advanced treatment technologies are performing properly, periodic inspections and monitoring by trained O&M personnel is needed. The management program must develop and maintain a record keeping system to track maintenance. The tracking system could also be used to track treatment system performance. Record keeping will be key to assuring that all systems are being adequately maintained and would identify instances where enforcement actions are necessary to attain compliance with the maintenance requirements. Regardless of which OWTS management model is adopted at the local level, performance requirements are particularly important for Pinelands alternate design systems (Section 4.2.3). The Pinelands Commission intends to develop amendments to the CMP to address performance of the pilot program alternate design treatment systems at the conclusion of the current pilot program.

8.5.5. Financial Assistance and Funding

8.5.5.1. Funding for OWTS Management Program Startup and Administration

Several different sources of funding are available (or potentially available) to utilities authorities for starting and administering OWTS management programs.

- MUAs are not directly eligible for 319(h) or 604(b) grant funding, though they likely can work with eligible entities, such as municipal or county planning departments, health departments, or Boards on funding applications.
- MUAs can charge a variety of fees—for instance, “connection” fees for a new system joining a management program, or periodic fees for ongoing service, to support the program’s staffing/equipment requirements.

- MUAs can also extend credit or make loans for planning, designing, constructing, etc. sewage treatment systems or wastewater treatment systems within the district.
- Privately owned utilities have similar powers to charge fees, but their fee structures (and any subsequent changes to those structures) must be approved by the Board of Public Utilities.
- As with the inter-local agreement model, start-up costs for a management program could be financed through a budget item in the municipalities' or County's general funds.
- UAs and sewerage authorities can apply directly for SRF loan funds for infrastructure repairs. However, funding for starting OWTS management programs is not currently allowed and no points are awardable for this use in the Priority Ranking System. Thus, UAs may also benefit from the development of a loan program using SRF funds that could be developed by NJDEP/NJEIT to allow the UAs to pay off startup costs over time through user fees.

8.5.5.2. Funding for OWTS Upgrades or Alterations

As implementation of OWTS management programs progresses, it is possible that periodic inspections and pumpouts will reveal malfunctions in situations where property owners do not have the ability to pay the up-front costs of alterations or repairs to bring the OWTS into compliance. The municipalities and Counties should collaborate with NJDEP to develop municipal OWTS funding programs (either grants or low-interest loans) to help homeowners enrolled in an OWTS management program or district pay for alterations and repairs, particularly in areas where such funding is not already available for low-income owners. The process for implementing such loan programs includes the following steps:

- NJDEP sets criteria for counties or municipalities to get SRF money for failed OWTS repair and replacement
- All organizations involved (NJDEP, counties, municipalities, lending institutions) provide OWTS owners with information on low interest loans

Additionally, MUA staff can research the feasibility of providing low-interest loans for upgrades within their service areas using internal funding—or of constructing upgrades using MUA personnel and even possibly taking over system operation.

8.6. Installation Elements

The following is a list of OWTS installation elements under this management approach. These elements would remain unchanged from the current OWTS permitting and installation activities.

8.6.1. Site Evaluation

Site evaluations (soil and groundwater) are performed under the direct supervision of a N.J. licensed P.E.. Administrative authorities can witness field testing and ultimately review and approve or disapprove soil test results attained through test procedures identified in N.J.A.C. 7:9A. This process would not change under any of the management models described in this manual.

8.6.2. Design

OWTS designs are prepared by N.J. licensed P.E.s and submitted to county or local administrative authorities for approval. The OWTS design process would remain relatively unchanged under any of the management models described in this manual. County health department staff will continue to rely on NJDEP to issue generic or individual Treatment Works Approvals for non-N.J.A.C. 7:9A compliant systems, such as N removing systems.

As County health departments move towards digital file storage, the permit application procedures may change to require engineers to submit design and as-built plans and application materials in digital format, and provide coordinates for system locations compatible with GIS (see Section 8.5.3)

8.6.3. Construction and Installation

OWTS installations require the issuance of a permit or approval from the administrative authority. The construction and installation process for OWTS is already well-documented and regulated, and would not change under this model. Authorized agents (N.J.P.E.s or REHS) of the administrative authority (County health department) or a N.J.P.E. employed by the applicant issues a certificate of conformance for traditional OWTS, while the technology provider and NJPE both issue such certificates for advanced technologies, including N removing systems.

8.7. Operations and Compliance Elements

The following detailed breakdown of responsibilities for operation and compliance elements under this management approach would introduce ongoing administrative oversight of the long-term maintenance of OWTS. Through this approach, periodic inspections and maintenance of systems would be assured through a “permit to operate” management program. Implementation of managing the operation and maintenance of traditional systems could be carried out through the utilities authorities, while the existing advanced OWTS pilot permitting and monitoring program could shift from the Pinelands Commission to the County health departments or the utilities authorities.

8.7.1. Operation and Maintenance (O&M)

Operation and maintenance activities could be completed and documented in two different ways under this model.

One way is similar to the Municipal/County Inter-local Agreement Model, where either the municipality or county would issue a permit to the property owner to use the OWTS for a finite period, and would require evidence of maintenance to be submitted in order for the permit to be routinely reissued. O&M activities for both traditional and alternative OWTS are completed by the UA under this model, or by service providers contracted by the UA or the homeowner. Inspection records, sampling results (where applicable), pumpout receipts, and other documentation (if needed) will be submitted to the County health department or the municipality by the property owner in order to obtain or renew the system’s operating

permit. (See Section 6.6.3 for more detail on determining frequencies for performing O&M and inspection-related activities.)

Another way is more akin to a “sewer service” model where the UA is essentially the permittee, and either directly performs O&M activities on a fee basis or contracts with a service provider to perform O&M services. In this case, the UA submits pumpout receipts, documentation, etc. to the County health department for issuance/renewal of OWTS operating permits.

Still another alternative is for the utility authority to assume the role of record-keeping and issuing permits, essentially fulfilling the role of the County environmental health departments (see Section 7.7.1).

8.7.2. Residuals Management

Management of OWTS should incorporate a mandatory inspection and pumpout requirement. To increase public support and reduce O&M costs, pumpouts might only be required when residual levels within a tank meet established criteria, as opposed to being strictly mandated on a time-based standard (e.g., every three years). The enforcement of existing Pinelands CMP and local ordinances adopted in response to the recently adopted WQMP Rules are expected to result in the generation of larger quantities of septic tank residuals for disposal. The agency responsible for tracking pumpouts should ensure that adequate septage treatment capacity is available regionally to accommodate the increase in septage volume that a pumpout program will generate.

Under this model, once an OWTS inventory is established, the utilities authority staff can characterize septage management needs resulting from mandatory O&M inspections and pumping (as needed), and estimate septage production. The management entity needs to be knowledgeable with respect to treatment facility capabilities in order to direct service providers as to where to properly dispose of residuals.

8.7.3. Compliance Inspections / Monitoring

As described in Section 6.6.3, several different scenarios can be considered for inspection frequencies, depending on the type of OWTS, the risk it poses to public health or the environment, or other factors. Currently, inspections of traditional OWTS are conducted by contracted service providers and happen only at the time of property transfer, and this model could continue with reporting of the inspection results to the County health department. This approach could continue under this management model with inspection reports submitted by property owners to the County health department. Inspections (and O&M activities such as pump-outs) could also be conducted by either by UA staff or by contracted service providers at specified intervals (for example, once every 3 years as required in the Pinelands CMP) with periodic (perhaps annual) reporting of those results to the County health department.

Pinelands Commission staff report that future rule making will transition the alternate OWTS installed under the Pinelands Alternate Design Treatment Systems Pilot Program to a sustainable management system. Future requirements are likely to mimic those of the pilot program and are expected to include

mandatory O&M contracts. Continued monitoring of the alternate OWTS can be performed by approved service providers under contract to property owners, as is already the case in the pilot program, or the monitoring could be completed by UA staff, with reporting to the County health department instead of to the Pinelands Commission. Inspection and monitoring frequencies for the alternate OWTS could be specified in the operating permits for each system based on manufacturers' recommendations and/or local requirements.

8.7.4. Corrective Actions

Currently, County health department staff members initiate corrective actions through the issuance of a Notice of Violation, typically after receiving complaints about malfunctioning OWTS. As part of a more comprehensive management program, utilities authority and health department staffs are likely to become aware of systems malfunctioning more frequently and will likely need to oversee abatement of system malfunctions identified through routine inspections.

8.7.5. Enforcement

Under any of the management models in this manual, enforcement would rely primarily upon existing statutes, rules, and ordinances, with amended or additional rules or ordinances adopted as needed.

8.7.6. Training and Certification/ Licensing

OWTS management programs will benefit from a knowledgeable workforce, including pumpers, O&M service providers, engineers, and others. RMEs may wish to consider registering service providers as a means to ensure a competent workforce. Service providers that do not meet ongoing performance standards could be de-certified as necessary. Ongoing training/certification is particularly important for:

- O&M Service Providers
- System Inspectors
- Regulators
- Professional Engineers
- Pumpers

In order to accommodate the need for increased educational opportunities for regulators, designers, and service providers, local colleges and universities, Rutgers Cooperative Extension, private consultants, and technology service providers can all expand training opportunities.

8.8. Advantages/Disadvantages of the Utility Authority Management Model

The advantages and disadvantages of the Utility Authority management model are listed in Table 8-1. In this table, advantages and disadvantages that are unique to this management model are highlighted in green.

Table 8-1. Advantages and Disadvantages of the Utility Authority Management Model.

Element	Advantages	Disadvantages
Public Outreach & Education	Improve property owners, practitioners and professional knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program Need to educate users that utility authority (UA) will provide OWTS management along side centralized management
Planning	Provide community input on long-range goals and objectives	Initial planning would require staff resources prior to collection of fees for program May need to expand service areas to include areas served by OWTS
Inventory and Recordkeeping	UAs have existing data management and billing systems	Need to import existing permit records and land use data from local, county & Pinelands Commission; need to update records from county as property transfers occur
Financial Assistance/Funding Implementation	Fee collection process in place; consolidates all wastewater operation & maintenance responsibility in one entity.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS
Performance	No significant changes proposed	
Site Evaluation	No significant changes proposed	
Design	No significant changes proposed	
Construction	No significant changes proposed	
Operation and Maintenance	Follow-up permitting of OWTS will increase systems' reliability/longevity UA coordinates all O&M in service area	Requires additional permit program & staff to monitor compliance Decreases private sector role in O&M; UA personnel will need to adapt to small scale technologies.
Inspection and Monitoring	Following up on permits confirms systems' performance. UA coordinates all inspections/monitoring in service area.	Requires property owner pay for UA inspection/monitoring
Residuals Management	Prevent under-pumping and over-pumping of septic tanks Consolidates residuals management for septage with other biosolids	Need to confirm local capacity for septage treatment; or high cost to ship septage out of area
Training and Licensing	Enhances overall level of expertise and consistency among practitioners and professionals UA has expertise in wastewater and water quality management	Requires overcoming resistance of practitioners and professionals to acquire training and licensing UA may not be familiar with practicing professionals and service providers.
Corrective Actions and Enforcement	Can utilize & enhance existing means of enforcement UA ensures compliance with management program	Requires additional authority cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals UA will need to develop procedures for corrective action and enforcement

= Shaded areas denote advantages or disadvantages that are unique to the utility authority management model.

8.9. Cost Estimates

The cost estimates presented in this manual are intended to be illustrative only. Each OWTS management program developed for a county or municipality in the Pinelands Area will have its own unique costs, and these should be determined individually during the program development stage. Depending upon the needs and conditions in each locality, some jurisdictions may be able to provide equivalent services at higher or lower cost. The tables below are based on Microsoft Excel spreadsheets, which can be used as a template for local authorities trying to develop their own costs and are available from the Pinelands Commission website.

The costs of this model were estimated based on two scenarios: A management program for 1,000 traditional OWTS that meets the minimum requirements set forth in the WQMP Rules (Table 8-2) and a more comprehensive OWTS management program, again for 1000 traditional OWTS (Table 8-3). No matter which path a municipality takes with regard to OWTS management, advanced OWTS will require additional inspections and monitoring, so those costs were estimated separately per 100 advanced OWTS (Table 8-4). Appendix A has a cost comparison table and side-by-side tables from Sections 7, 8, 9, and 10 for at-a-glance comparisons of the models.

Although there are many ways to implement a management program, the basic assumptions of this cost estimate are:

- For all management approaches:
 - It will take one year to establish a management program (Year 1), including establishing ordinances and developing an inventory database.
 - One-third of the existing traditional OWTS will have septic tanks pumped in each of the first three years of the program (Years 2-4).
- The current Alternative Design Treatment Systems Pilot Program requires quarterly effluent monitoring for a total of twelve monitoring events. Although long-term monitoring requirements for advanced OWTS have not been established, the estimate below assumes one inspection / monitoring event per system per year, though the technology manufacturers may recommend 4 or more visits per year.
- A comprehensive program would also include the following activities:
 - One-third of the existing traditional OWTS will be thoroughly inspected in each of the first three years of the program (Years 2-4). This thorough inspection would in many cases involve locating and characterizing the existing system components.
 - Routine inspections for traditional OWTS will be conducted in Year 5 and beyond.
 - A loan program will be developed and implemented to help property owners finance repairs and replacement of systems that are not functioning properly

There will be some economy of scale in such programs as the number of systems managed by a single entity increases over time. The costs shown in this table do not include the eventual replacement of systems as they age beyond their expected design life, which is typically 20-30 years (particularly for

older OWTS that have not been consistently managed). These costs are provided as general indicators of relative costs for comparison between the management models included in this manual, and as examples of the types of costs which should be estimated when starting an OWTS management program. Specific cost estimates should be developed during the planning and implementation stages of individual, local OWTS management programs.

The difference with the cost per user in the utility authority model is that if the utility authority provides O&M, the user would only pay one entity the total cost of the user fee and operation and maintenance fee. Thus, it would appear that compliance with O&M/inspections would be easier to obtain with one entity providing O&M inspections, when compared to having the individual property owner find an O&M/inspection provider and coordinate their services in order to comply with the requirements of the management program.

The municipal utility authority model is assumed to have lower costs than the other models for public education/outreach and recordkeeping/notification due to their existing capacities in these areas. There are start-up costs for the MUA to complete operation and maintenance and inspection activities that are not required for other models. The ongoing cost of inspections of traditional OWTS under the comprehensive approach and for advanced OWTS are assumed to be lower than other models due to the consolidation of all services in one management entity that is familiar with infrastructure inspection, operation, and maintenance procedures.

Table 8-2. Minimum Management Program Cost Estimates per 1,000 Traditional OWTS Under the Utility Authority Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years					
				Initial Year	Y2	Y3	Y4	Y5 and on	
				Set Up Cost	Cost	Cost	Cost	Annual Cost	
Public Education/Outreach ¹	1000	Systems	\$4	\$8,000	\$4,200	\$4,410	\$4,631	\$2,100	
System Inventory ²	1000	Systems	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	
Recordkeeping & Notification ³	1000	Systems	\$16	\$16,000	\$5,600	\$5,880	\$6,174	\$6,483	
Equipment Purchases/Replacement	1	Lump Sum	\$20,000	\$20,000	\$2,000	\$2,100	\$2,205	\$2,315	
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	
Operation & Maintenance ⁵	1000	Systems	\$200	\$16,000	\$70,000	\$73,500	\$77,175	\$81,034	
Total:				\$100,000	\$98,100	\$103,005	\$108,155	\$106,508	
				Annual Onsite System User Fee ⁶ :	\$84	\$28	\$30	\$31	\$25
				Annual O&M Cost ⁵ :	\$16	\$70	\$74	\$77	\$81
				Annual Total User Cost:	\$100	\$98	\$103	\$108	\$107
Five Year Average Annual Total User Cost:								\$103	
Notes and Assumptions:									
= Costs included in OWTS management program operating permit fee									
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.									
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to pumpouts; Years 5: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.									
3. Record Keeping - Year 1: full cost to set up data base; Years 2-4: 33% initial cost while data from pumpouts are entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for data base									
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.									
5. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$200 per year. Dispersal System O&M borne by user.									
6. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.									

Table 8-3. Comprehensive Management Program Cost Estimates per 1,000 Traditional OWTS Under the Utility Authority Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years					
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 Annual Cost	
Public Education/Outreach ¹	1000	Systems	\$4	\$8,000	\$4,200	\$4,400	\$4,620	\$2,100	
System Inventory ²	1000	Systems	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	
Recordkeeping & Notification ³	1000	Systems	\$16	\$16,000	\$5,600	\$5,880	\$6,174	\$6,483	
Equipment Purchases/Replacement	1	Lump Sum	\$56,000	\$56,000	\$4,000	\$4,200	\$4,410	\$4,631	
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	
Loan Program for System Upgrades ⁵									
Start-Up & Program Administration	1000	Loans	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	
Inspections ⁶	1000	Systems	\$700	\$50,000	\$245,000	\$257,250	\$270,113	\$122,500	
Operation & Maintenance ⁷	1000	Systems	\$200	\$20,000	\$70,000	\$73,500	\$77,175	\$81,034	
Total:				\$200,000	\$355,100	\$372,845	\$391,487	\$242,899	
				Annual Onsite System User Fee ⁸ :	\$130	\$40	\$42	\$44	\$39
				Annual O&M/ Inspection Cost ⁸ :	\$70	\$315	\$331	\$347	\$204
				Annual Total User Cost:	\$200	\$355	\$373	\$391	\$243
Five Year Average Annual Total User Cost:								\$312	
Notes and Assumptions:									
= Costs included in OWTS management program operating permit fee									
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.									
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to inspections; Years 5+: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.									
3. Record Keeping - Year 1: full cost to set up database; Years 2-4: 33% initial cost while data from inspections is entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for database									
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.									
5. Loan Program - Year 1: Cost to establish program and establish qualification and priority criteria for loans - Years 2-4: assume 2% of inspected systems will apply for loans; Year 5 assume 1% of all systems applying for loans each year									
6. Inspections - Year 1: initial cost to set up program; Years 2-4: conduct detailed initial inspections with contractor hired by owners to expose system; Year 5 conduct "check-up" inspections at assumed 50% cost of initial inspection every three years to									
7. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$300 per year. Dispersal System O&M borne by user.									
8. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.									

Table 8-4. Management Program Cost Estimates per 100 Advanced OWTS Under the Utility Authority Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years	
				Initial Year	Y2
				Set Up Cost	Cost
Public Education/Outreach ¹	100	Systems	\$16	\$1,600	\$840
System Inventory ²	100	Systems	\$50	\$10,000	\$1,500
Recordkeeping ³	100	Systems	\$40	\$4,000	\$4,200
Compliance & Enforcement ⁴	100	Systems	\$1,000	\$1,000	\$1,050
Operational Inspections ⁵	100	Systems	\$630	\$90,090	\$66,150
Operation & Maintenance ⁶	100	Systems	\$267	\$32,040	\$28,035
Total:				\$138,730	\$106,864
Annual Onsite System User Fee:				\$166	\$76
Minimum Annual O&M/Inspection Fee ⁷ :				\$1,221	\$942
Annual Total Cost Per User:				\$1,387	\$1,018
Five Year Average Annual Total User Cost:					\$1,155
Notes and Assumptions:					
= Costs included in OWTS management program operating permit fee					
1. Year 1: Four mailings; Year 2 and beyond (Year 2+): one mailing per year.					
2. Year 1: 200% full cost of importing/entering data; Year 2+: 100% initial cost for four quarterly updates of O&M/inspection data.					
3. Assume equipment purchased under traditional system management program. Years 1 and 2+: fixed rate to enter O&M and upgrade data at 50% start up cost					
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.					
5. Assumed four operational equipment inspections per year to confirm system is operating properly, check parts, collect effluent sample once per year, and laboratory analysis. Actual cost and frequency of operation inspections will depend on technology,					
6. Assumed septic tank pumping every third year at \$300 year + \$200/year replacement parts.					
7. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.					

9. PRIVATE CONSULTANT/MUNICIPAL ENGINEER CONTRACTS MANAGEMENT MODEL FOR THE PINELANDS AREA

9.1. Description of Approach

Under this model, local health departments or municipalities contract with private consulting or engineering firms to perform management services, such as database management, routine inspections, or other management activities. The approach would be analogous to a township hiring an engineering firm to provide the services of the Township Engineer under a contract.

9.2. Potential RMEs under this management model

The municipalities or counties would be the RMEs under this model, and they would contract out technical and management services to a consulting/engineering firm (or firms) who could serve multiple municipalities or counties under a professional services contract. Solicitation for these management services could be sought through the municipality's issuance of a request for proposals.

9.3. Potential Responsibilities of Municipalities under this Model

Municipalities are now charged by NJDEP to be involved in the OWTS management planning process. Municipalities that select this management model will want to delegate specific management duties to a consultant or engineering firm, and may wish to delegate other management duties to the county or local health departments. Municipalities will likely retain responsibility for collecting fees from residents for participation in the management program under this model. Under this model, the municipality would administer the following aspects of an OWTS management program:

1. Administrative
 - a. Public Outreach & Education
 - b. Planning
 - c. Financial Assistance Implementation/Program Funding
2. Operation and Compliance Implementation
 - a. Corrective Actions and Enforcement

9.4. Potential Responsibilities of Private Consultant/Municipal Engineer under this Model

The private consultant/municipal engineer would be responsible for some or all of the following elements as underlined in the following sections:



1. Administrative Elements
 - a. Inventory and Recordkeeping
2. Operation and Compliance Elements
 - a. Operation and Maintenance
 - b. Inspection and Monitoring
 - c. Referring issues to municipal officials for corrective action or enforcement

9.5. Administrative Elements

The administrative elements essential to a sustainable OWTS management program are detailed in this section.

9.5.1. Public Education and Participation

Without the public's appreciation of the value of OWTS management, there will be little support for or even outright rejection of such programs. Thus, public education is necessary, both to explain the benefits of such programs to property owners and to enable property owners to understand the environmental and public health drivers for an OWTS management program. Public education is also necessary to provide homeowners with information on how to comply with program requirements. Both the NJDEP and the Pinelands Commission can help ensure the accuracy of information concerning OWTS management across the Pinelands Area. Other excellent sources of information about OWTS maintenance and management include the County Health Departments, the Water Resources Program at the Rutgers New Jersey Agricultural Experiment Station, and County Extension agents.

- Under this model, the consultant/engineer keeps an inventory of OWTS installations, rather than the local health department. Either the consultant/engineer or the municipality provides outreach and public information to OWTS owners per the requirements of N.J.A.C. 7:9A. Existing NJDEP, Pinelands Commission, Health Department, and Rutgers Fact Sheets are all excellent sources of accurate and concise information for property owners.

9.5.2. Planning for OWTS Management

With the July 2008 revisions to the Water Quality Management Planning Rules, county governments are designated as wastewater management planning (WMP) agencies and are required to plan for OWTS management. In the Pinelands Area, this responsibility likely falls to the County planning departments, since they are already responsible in most cases for maintaining the Water Quality Management Plans (WQMPs) for their respective counties or regions. Activities related to OWTS management that the WMP agencies are now responsible for include:

- Performing build-out analyses, including watershed-based nitrate dilution analyses, for areas that are served by OWTS
- Adjusting zoning to be consistent with the allowable number of additional equivalent dwelling units at build-out, based upon nitrate dilution modeling.

Also under the July 2008 revisions to the WQMP Rules, municipalities will be required to demonstrate to the WMP planning agency that “areas to be served by individual subsurface sewage disposal systems are subject to a mandatory maintenance program, such as an ordinance, which ensures that all individual subsurface sewage disposal systems are functioning properly. This shall include requirements for periodic pump out and maintenance, as needed” (N.J.A.C. 7:15-5.25(e)3). In the Pinelands Area, although such ordinances may be passed at the local municipal level, most municipalities have delegated or contracted authority for environmental health services, including OWTS permitting, to County health departments (see Section 4.2.4). Thus, responsibility for wastewater planning and information related to existing OWTS will now reside at the County level—in the Planning Departments and Health Departments, respectively.

- The contracted consulting/engineering firm could be used in an advisory manner relative to zoning adjustments, and the firms could be contracted to perform build-out analyses, complete nitrogen dilution modeling, or refine management program ordinance language if appropriate.

9.5.3. Record Keeping, Inventory and Reporting

In order to comply with the current N.J.A.C. 7:9A-3.14 requirement that local health departments notify OWTS owners of maintenance needs, the Pinelands CMP pumpout requirement, and the management requirements for OWTS in the recent revisions to the WQMP Rules, any potential RME needs an accurate inventory of existing OWTS.

In the Pinelands Area, County health departments have the best start on an inventory of existing OWTS by virtue of their existing permitting responsibilities.

- Contracted consultants/engineers can work with County health department staff to create an inventory of existing OWTS, including, if desired, GIS location data (Section 6.6.1).
- Contracted consultants can also assist in the determination and mapping of existing and planned sewer service areas within their respective jurisdictions.
- Finally, to improve documentation of OWTS installations, County health departments can amend their permit application requirements to require that engineers submit design plans and supporting materials in digital format, and that parcel identifiers and GPS coordinates for system and component locations be included in the application package. Digital as-built design drawings could also be required to reflect any modification to proposed designs made during OWTS construction.

9.5.4. Performance Requirements

In New Jersey, performance requirements for all OWTS include:

- The OWTS should not contaminate nearby wells or surface water bodies by sewage or effluent as indicated by the presence of fecal bacteria where the ratio of fecal coliform to fecal streptococci is four or greater;
- Sewage or effluent should not break out or pond onto the surface of the ground;
- Sewage or effluent should not seep into portions of buildings below ground; and

- Sewage should not back up into the building served.

In addition to these performance requirements, Pinelands alternate design wastewater treatment systems are expected to reduce nitrate concentrations in effluent (Section 4.2.3); however, individual system owners are held harmless if their systems are maintained correctly but fail to meet the nitrogen reduction target.

Pinelands alternate design (denitrifying) wastewater treatment systems rely on mechanical components to reduce pollutant loads in treated wastewater. In order to ensure that these advanced treatment technologies are performing properly, periodic inspections and monitoring by trained O&M personnel is needed. The management program must develop and maintain a record keeping system to track maintenance. The tracking system could also be used to track treatment system performance. Record keeping will be key to assuring that all systems are being adequately maintained and would identify instances where enforcement actions are necessary to attain compliance with the maintenance requirements. Regardless of which OWTS management model is adopted at the local level, performance requirements are particularly important for Pinelands alternate design systems (Section 4.2.3). The Pinelands Commission intends to develop amendments to the CMP to address performance of the pilot program alternate design treatment systems at the conclusion of the current pilot program.

9.5.5. Financial Assistance and Funding

9.5.5.1. Funding for OWTS Management Program Startup and Administration

Several different sources of funding are currently (or potentially) available to municipalities for starting and administering OWTS management programs.

- Municipalities can apply to the NJDEP Division of Watershed Management Nonpoint Source Pollution Management Program for federal Section 319(h) grant funding to be used to implement programs and projects designed to reduce nonpoint source pollution. Though the emphasis of 319(h) grant funding has shifted from TMDL and restoration plan development to implementation in recent years, 319(h) funding supported the creation of this manual.
- Municipalities can also apply to the NJDEP Division of Watershed Management Nonpoint Source Pollution Management Program for federal Section 604(b) grant funding to create OWTS management plans. NJDEP emphasized the development of OWTS management plans in state fiscal years 2005 and 2006.
- Start-up costs for a management program could be financed through a budget item in the municipalities' or County's general funds.
- Municipalities can charge fees to cover the costs of management activities.
- A loan program using Clean Water State Revolving Loan funds (SRF) could be developed by NJDEP and the New Jersey Environmental Infrastructure Trust (NJEIT) that would allow municipalities or Counties to pay off startup costs over time through user fees or gradual general fund increases. The permit fees could be collected by the contracting agency, but would be payable to the municipality or

county to be deposited in a dedicated fund that is established for program activities that can generate income to offset costs for the OWTS management program.

- A contractor/consultant could also fund the start-up cost of an OWTS management program, with guaranteed revenues from fees paid by OWTS owners. The county/municipality would require ongoing management inspections, O&M contracts, and sampling (for advanced technologies).

9.5.5.2. Funding for OWTS Upgrades or Alterations

As implementation of OWTS management programs progresses, it is possible that periodic inspections and pumpouts will reveal malfunctions in situations where property owners do not have the ability to pay the up-front costs of alterations or repairs to bring the OWTS into compliance. The municipalities and counties should collaborate with NJDEP to develop municipal OWTS funding programs (either grants or low-interest loans) to help homeowners enrolled in an OWTS management program or district pay for alterations and repairs, particularly in areas where such funding is not already available for low-income owners. The process for implementing such loan programs includes the following steps:

- NJDEP sets criteria for counties or municipalities to get SRF money for failed OWTS repair and replacement
- All organizations involved (NJDEP, counties, municipalities, lending institutions) provide OWTS owners with information on low interest loans

9.6. Installation Elements

The following is a list of OWTS installation elements under this management approach. These elements would remain unchanged from the current OWTS permitting and installation activities.

9.6.1. Site Evaluation

Site evaluations (soil and groundwater) are performed under the direct supervision of a N.J. licensed P.E.. Administrative authorities can witness field testing and ultimately review and approve or disapprove soil test results attained through test procedures identified in N.J.A.C. 7:9A. This process would not change under any of the management models described in this manual.

9.6.2. Design

OWTS designs are prepared by N.J. licensed P.E.s and submitted to county or local administrative authorities for approval. The OWTS design process would remain relatively unchanged under any of the management models described in this manual. County health department staff will continue to rely on NJDEP to issue generic or individual Treatment Works Approvals for non-N.J.A.C. 7:9A compliant systems, such as N removing systems.

As County health departments move towards digital file storage, the permit application procedures may change to require engineers to submit design and as-built plans and application materials in digital format, and provide coordinates for system locations compatible with GIS (see Section 9.5.3)

9.6.3. Construction and Installation

OWTS installations require the issuance of a permit or approval from the administrative authority. The construction and installation process for OWTS is already well-documented and regulated, and would not change under this model. Authorized agents (N.J.P.E.s or REHS) of the administrative authority (County health department) or a N.J.P.E. employed by the applicant issues a certificate of conformance for traditional OWTS, while the technology provider and NJPE both issue such certificates for advanced technologies, including N removing systems.

The process currently in place for site evaluation, which includes County administrative authorities and licensed N.J.P.E.s, would not change under any of the management models described in this manual. Under this model, approved design data would be submitted by the applicant's consultant to the contract consulting/engineering firm for transfer into the inventory database.

9.7. Operation and Compliance Elements

The following detailed breakdown of responsibilities for operation and compliance elements under this management approach would introduce ongoing administrative oversight of the long-term maintenance of OWTS. Through this approach, periodic inspections and maintenance of systems would be assured through a “permit to operate” management program. Implementation of managing the operation and maintenance of traditional systems could be carried out through the County health departments and private consultants, while the existing advanced OWTS pilot permitting and monitoring program could shift from the Pinelands Commission to the County health departments.

9.7.1. Operation and Maintenance (O&M)

With this management model, either the municipality or county would issue a permit to the property owner to use the OWTS for a finite period, and would require evidence of maintenance to be submitted in order for the permit to be routinely reissued. Under this model, O&M activities such as septic tank pumpouts or routine system inspections for both traditional and alternative OWTS would be performed by service providers contracted by individual property owners.

Inspection records, sampling results (where applicable), pumpout receipts, and other documentation (if needed) will be submitted to the contracted consultant by the property owners in order to obtain or renew the system's operating permit. (See Section 6.6.3 for more detail on determining frequencies for performing O&M and inspection-related activities.)

The municipality, under this model, administers a fee-based operating permit for both traditional and advanced (N removing) OWTS. Operating permit fees would be used to finance the ongoing administration of this management program.

9.7.2. Residuals Management

Management of OWTS should incorporate a mandatory inspection and pumpout requirement. To increase public support and reduce O&M costs, pumpouts might only be required when residual levels within a tank meet established criteria, as opposed to being strictly mandated on a time-based standard (e.g., every three years). The enforcement of existing Pinelands CMP and local ordinances adopted in response to the recently adopted WQMP Rules are expected to result in the generation of larger quantities of septic tank residuals for disposal. The agency responsible for tracking pumpouts should ensure that adequate septage treatment capacity is available regionally to accommodate the increase in septage volume that a pumpout program will generate.

Under this model, once an OWTS inventory is established, the contracted consultants can, if requested by the municipality, characterize septage management needs resulting from mandatory O&M inspections and pumping (as needed), and estimate septage production. The management entity needs to be knowledgeable with respect to treatment facility capabilities in order to direct service providers as to where to properly dispose of residuals.

9.7.3. Compliance Inspections / Monitoring

As described in Section 7.7.1, several different scenarios can be considered for inspection frequencies, depending on the type of OWTS, the risk it poses to public health or the environment, or other factors. Currently, inspections of operating traditional OWTS are conducted by contracted service providers and typically occur only at the time of property transfer at the mortgage lenders' insistence. This approach could continue under this management model with reporting of the inspection results to the contracted consultant for inclusion in the inventory database. Such time of transfer inspections could be standardized by using NJDEP protocols and mandated through a local ordinance. Inspections (and O&M activities such as pump-outs) could also be conducted by contracted service providers at specified intervals (for example, once every 3 years as required in the Pinelands CMP) with reporting of those results to the contracted consultant.

Pinelands Commission staff report that future rule making will transition the alternate OWTS installed under the Pinelands Alternate Design Treatment Systems Pilot Program to a sustainable management system. Future requirements are likely to mimic those of the pilot program and are expected to include mandatory O&M contracts. Continued monitoring of the alternate OWTS will likely be performed by approved service providers under contract to property owners, as is already the case in the pilot program, with reporting to the County health department instead of to the Pinelands Commission. Inspection and monitoring frequencies for the alternate OWTS could be specified in the operating permits for each system based on manufacturers' recommendations and/or local requirements. Monitoring completed by service providers under contract to property owners can be reported to the contract consulting/engineering firm, who prepare annual reports for the municipality and the Pinelands Commission.

9.7.4. Corrective Actions

Currently, County health department staff members initiate corrective actions through the issuance of a Notice of Violation, typically after receiving complaints about malfunctioning OWTS. As part of a more comprehensive management program, health departments are likely to become aware of systems malfunctioning more frequently and will likely need to oversee abatement of system malfunctions identified through routine inspections. Under this model, the contracted consultants would forward information about malfunctioning OWTS or other needs for corrective action to the local health department for further action.

9.7.5. Enforcement

Under any of the management models in this manual, enforcement would rely primarily upon existing statutes, rules, and ordinances, with amended or additional rules or ordinances adopted as needed. The contracting consultant/engineer could refer violations to the County health department or local official for enforcement.

9.7.6. Training and Certification/ Licensing

OWTS management programs will benefit from a knowledgeable workforce, including pumpers, O&M service providers, engineers, and others. RMEs may wish to consider registering service providers as a means to ensure a competent workforce. Service providers that do not meet ongoing performance standards could be de-certified as necessary. Ongoing training/certification is particularly important for:

- O&M Service Providers
- System Inspectors
- Regulators
- Professional Engineers
- Pumpers

In order to accommodate the need for increased educational opportunities for regulators, designers, and service providers, local colleges and universities, Rutgers Cooperative Extension, private consultants, and technology service providers can all expand training opportunities.

9.8. Advantages/Disadvantages of the Private Consultant/Municipal Engineer Contracts Model

The advantages and disadvantages of the Private Consultant/Municipal Engineer Contracts management model are listed in Table 9-1. In this table, advantages and disadvantages that are unique to this management model are highlighted in green.

Table 9-1. Advantages and Disadvantages of the Private Consultant/Municipal Engineer Contracts Model.

Element	Advantages	Disadvantages
Public Outreach & Education	Improve property owners', practitioners', and professional knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program
Planning	Provide community input on long-range goals and objectives	Initial planning requires staff resources prior to collection of fees for program
Inventory and Recordkeeping	There may be a positive perception of objectivity by having third party manage data, instead of the regulatory agency.	Need to develop, purchase or subscribe to OWTS data management system; need to import existing permit records and land use data from local, county utility authorities & Pinelands Commission; need to update records from county as property transfers occur
Financial Assistance/Funding Implementation	Property owners are already accustomed to coming to County for Environmental Health permitting; Setting up fee-based operating permit program would consolidate permit fees in one location.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS
Performance	No significant changes proposed	
Site Evaluation	No significant changes proposed	
Design	No significant changes proposed	
Construction	No significant changes propose	
Operation and Maintenance	Follow-up permitting of OWTS will increase systems' reliability/longevity Utilizes expertise of designers to oversee O&M	Requires private sector O&M resources to be available; requires additional permit program & staff to monitor compliance.
Inspection and Monitoring	Following up on permits confirms systems' performance Utilizes expertise of designers to oversee inspections and monitoring	Requires property owner pay for contractor or other private sector inspection/ monitoring entity.
Residuals Management	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or high cost to ship septage out of area
Training and Licensing	County is familiar with practicing professionals and service providers. Enhances overall level, and consistency, of expertise among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing
Corrective Actions and Enforcement	Utilize & enhance existing means of enforcement; ensures compliance with management program.	Requires additional regulatory cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals. Private contractor would need to report non-complying systems to County or Township for orders for corrective action/ enforcement.

= Shaded areas denote advantages or disadvantages that are unique to the private consultant/municipal engineer contract management model

9.9. Cost Estimates

The cost estimates presented in this manual are intended to be illustrative only. Each OWTS management program developed for a county or municipality in the Pinelands Area will have its own unique costs, and these should be determined individually during the program development stage. Depending upon the needs and conditions in each locality, some jurisdictions may be able to provide equivalent services at higher or lower cost. The tables below are based on Microsoft Excel spreadsheets, which can be used as a template for local authorities trying to develop their own costs and are available from the Pinelands Commission website.

The costs of this model were estimated based on two scenarios: A management program for 1,000 traditional OWTS that meets the minimum requirements set forth in the WQMP Rules (Table 9-2) and a more comprehensive OWTS management program, again for 1000 traditional OWTS (Table 9-3). No matter which path a municipality takes with regard to OWTS management, advanced OWTS will require additional inspections and monitoring, so those costs were estimated separately per 100 advanced OWTS (Table 9-4). Appendix A has a cost comparison table and side-by-side tables from Sections 7, 8, 9, and 10 for at-a-glance comparisons of the models.

Although there are many ways to implement a management program, the basic assumptions of this cost estimate are:

- For all management approaches:
 - It will take one year to establish a management program (Year 1), including establishing ordinances and developing an inventory database.
 - One-third of the existing traditional OWTS will have septic tanks pumped in each of the first three years of the program (Years 2-4).
- The current Alternative Design Treatment Systems Pilot Program requires quarterly effluent monitoring for a total of twelve monitoring events. Although long-term monitoring requirements for advanced OWTS have not been established, the estimate below assumes one inspection / monitoring event per system per year, though the technology manufacturers may recommend 4 or more visits per year.
- A comprehensive program would also include the following activities:
 - One-third of the existing traditional OWTS will be thoroughly inspected in each of the first three years of the program (Years 2-4). This thorough inspection would in many cases involve locating and characterizing the existing system components.
 - Routine inspections for traditional OWTS will be conducted in Year 5 and beyond.
 - A loan program will be developed and implemented to help property owners finance repairs and replacement of systems that are not functioning properly

The consultant/town engineer model is assumed to have approximately higher costs for the consultant's services due to estimated profit (15%) and market factor adjustment (10%), and a markup on equipment

(10%). There will be some economy of scale in such programs, however, as the number of systems managed by a single entity increases over time. The costs shown in this table do not include the eventual replacement of systems as they age beyond their expected design life, which is typically 20-30 years (particularly for older OWTS that have not been consistently managed). These costs are provided as general indicators of relative costs for comparison between the management models included in this manual, and as examples of the types of costs which should be estimated when starting an OWTS management program. Specific cost estimates should be developed during the planning and implementation stages of individual, local OWTS management programs.

Table 9-2. Minimum Management Program Estimated Costs per 1,000 Traditional OWTS under the Consultant/Engineer Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years				
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 + Annual Cost
Public Education/Outreach ¹	1000	Systems	\$6	\$12,500	\$6,563	\$6,891	\$7,235	\$3,281
System Inventory ²	1000	Systems	\$38	\$37,500	\$7,875	\$8,269	\$8,682	\$3,750
Recordkeeping & Notification ³	1000	Systems	\$25	\$25,000	\$8,750	\$9,188	\$9,647	\$10,129
Equipment Purchases/Replacement	1	Lump Sum	\$22,000	\$22,000	\$2,000	\$2,100	\$2,205	\$2,315
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Operation & Maintenance ⁵	1000	Systems	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034
Total:				\$107,000	\$105,188	\$110,447	\$115,969	\$112,086
Annual Consultant User Fee ⁶ :				\$97	\$25	\$26	\$28	\$19
Annual Municipal User Fee ⁶ :				\$10	\$10	\$11	\$11	\$12
Annual O&M/ Inspection Cost ⁶ :				\$0	\$70	\$74	\$77	\$81
Annual Total User Cost:				\$107	\$105	\$110	\$116	\$112
Five Year Average Annual Total User Cost:								\$110
Notes and Assumptions:								
= Costs included in consultant portion of OWTS management program operating permit fee (includes 15% profit+10% market factor adjustment)								
= Costs included in municipal portion of OWTS management program operating permit fee								
= Costs borne by users which are not included in OWTS management program operating permit fee								
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.								
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to pumpouts; Years 5: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.								
3. Record Keeping - Year 1: full cost to set up data base; Years 2-4: 33% initial cost while data from pumpouts are entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for data base								
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.								
5. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$300 per year. Dispersal System O&M borne by user.								
6. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.								

Table 9-3. Comprehensive Management Program Estimated Costs per 1,000 Traditional OWTS under the Consultant/Engineer Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years				
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 + Annual Cost
Public Education/Outreach ¹	1000	Systems	\$6	\$12,500	\$6,563	\$6,891	\$7,235	\$3,281
System Inventory ²	1000	Systems	\$38	\$37,500	\$7,875	\$8,269	\$8,682	\$3,750
Recordkeeping & Notification ³	1000	Systems	\$25	\$25,000	\$8,750	\$9,188	\$9,647	\$10,129
Equipment Purchases/Replacement	1	Lump Sum	\$61,600	\$61,600	\$4,000	\$4,200	\$4,410	\$4,631
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Loan Program for System Upgrades ⁵								
Start-Up & Program Administration	1000	Loans	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Inspections ⁶	1000	Systems	\$1,000	\$10,000	\$350,000	\$367,500	\$385,875	\$175,000
Operation & Maintenance ⁷	1000	Systems	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034
Total:				\$166,600	\$467,188	\$490,547	\$515,074	\$300,977
Annual Consultant User Fee ⁸ :				\$137	\$27	\$29	\$30	\$22
Annual Municipal User Fee ⁸ :				\$20	\$20	\$21	\$22	\$23
Annual O&M/ Inspection Cost ⁸ :				\$10	\$420	\$441	\$463	\$256
Annual Total User Cost:				\$167	\$467	\$491	\$515	\$301
Five Year Average Annual Total User Cost:								\$388
Notes and Assumptions:								
= Costs included in consultant portion of OWTS management program operating permit fee (includes 15% profit+10% market factor adjustment)								
= Costs included in municipal portion of OWTS management program operating permit fee								
= Costs borne by users which are not included in OWTS management program operating permit fee								
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.								
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to inspections; Years 5: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.								
3. Record Keeping - Year 1: full cost to set up data base; Years 2-4: 33% initial cost while data from inspections is entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for data base								
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.								
5. Loan Program - Year 1: Cost to establish program and establish qualification and priority criteria for loans - Years 2-4: assume 2% of inspected systems will apply for loans; Year 5 assume 1% of all systems applying for loans each year								
6. Inspections - Year 1: initial cost to set up program; Years 2-4: conduct detailed initial inspections with contractor hired by owners to expose system; Year 5 conduct "check-up" inspections at assumed 50% cost of initial inspection every three years to								
7. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$300 per year. Dispersal System O&M borne by user.								
8. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.								

Table 9-4. Management Program Estimated Costs per 100 Advanced OWTS under the Consultant/Engineer Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years	
				Initial Year Set Up Cost	Y2 + Cost
Public Education/Outreach ¹	100	Systems	\$25	\$2,500	\$1,313
System Inventory ²	100	Systems	\$63	\$12,500	\$1,875
Recordkeeping ³	100	Systems	\$63	\$6,250	\$6,563
Compliance & Enforcement ⁴	100	Systems	\$1,000	\$1,000	\$1,050
Inspections ⁵	100	Systems	\$1,000	\$100,000	\$105,000
Operation & Maintenance ⁶	100	Systems	\$400	\$48,000	\$42,000
Total:				\$170,250	\$165,690
Annual Consultant User Fee:				\$213	\$98
Annual Municipal User Fee:				\$10	\$11
Minimum Annual O&M/Inspection Fee ⁷				\$1,480	\$1,470
Annual Total Cost Per User				\$1,703	\$1,578
Five Year Average Annual Total User Cost:					\$1,698
Notes and Assumptions:					
= Costs included in consultant portion of OWTS management program operating permit fee (includes 15% profit + 10% market factor adjustment)					
= Costs included in OWTS management program operating permit fee					
= Costs borne by users which are not included in OWTS management program operating permit fee					
1. Year 1: Four mailings; Year 2: one mailing per year.					
2. Year 1: 200% full cost of importing/entering data; Year 2: 100% initial cost for four quarterly updates of O&M/inspection data.					
3. Assume equipment purchased under traditional system management program. Year 1-2: fixed rate to enter O&M and upgrade data at 50% start up cost					
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.					
5. Assumed four operational equipment inspections per year to confirm system is operating properly, check parts, collect effluent sample once per year, and laboratory analysis. Actual cost and frequency of operation inspections will depend on technology,					
6. Assumed septic tank pumping every year at \$200/year + \$200/year replacement parts.					
7. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.					

10. COOPERATIVE/NON-PROFIT ORGANIZATION AGREEMENTS MANAGEMENT MODEL FOR THE PINELANDS AREA

10.1. Description of Approach

This approach is similar to the private consultant/municipal engineer contracts model, except that the organization providing management services is a cooperative or a non-profit organization. A cooperative or non-profit organization acting in the capacity of an RME has the advantage of potentially being able to secure grant funding to help with implementation costs. Another advantage is the fact that the goal of OWTS management, namely the protection of the environment and public health, falls clearly within the core mission of many of these groups. A disadvantage of using an existing cooperative or non-profit organization in this capacity is the fact that not many of these organizations currently conducting activities in the Pinelands Area have the technical capacities that would be needed in order to provide highly technical OWTS management services. They could, however, provide the administrative functions related to system inventories and the issuance of operating permits.

10.2. Potential RMEs under this management model

- Pinelands Preservation Alliance
- Association of New Jersey Environmental Commissions
- New Jersey Council of Watershed Associations
- Watershed associations
 - Great Egg Harbor Watershed Association
 - Citizens United to Protect the Maurice River
 - South Jersey Land and Water Trust
 - Barnegat Bay Watershed and Estuary Foundation
 - Pinelands Watershed Alliance
 - Save Barnegat Bay
- Barnegat Bay Estuary Program
- Jacques Cousteau National Estuarine Research Reserve (Coastal Facility)
- Rutgers Cooperative Extension
- New Jersey Environmental Health Association
- New Jersey Septage Management Association
- A 501(c)3 non-profit organization (or other non-profit) formed specifically as an RME



10.3. Potential Responsibilities of Municipalities under this Model

Townships and boroughs will need to be involved in the OWTS management planning process. The outcome of the planning process will be a revision of the authorities that are delegated between the local health departments and the cooperatives or non-profit organizations. Municipalities may still have the responsibility of collecting fees from residents for operating permits. Under this model, the municipality would administer the following aspects of an OWTS management program:

1. Administrative Elements
 - a. Program Funding
2. Operation and Compliance Elements
 - a. Corrective Actions and Enforcement

10.4. Potential Responsibilities of Cooperative/Non-Profit Organization under this Model

The cooperative or a non-profit organization would be responsible for the following elements as underlined in the following sections:

1. Administrative Elements
 - a. Public Outreach & Education
 - b. Planning
 - c. Financial Assistance Implementation
 - d. Inventory and Recordkeeping
2. Operation and Compliance Elements
 - a. Operation and Maintenance
 - b. Inspection and Monitoring

10.5. Administrative Elements

The administrative elements essential to a sustainable OWTS management program are detailed in this section.

10.5.1. Public Education and Participation

Without the public's appreciation of the value of OWTS management, there will be little support for or even outright rejection of such programs. Thus, public education is necessary, both to explain the benefits of such programs to property owners and to enable property owners to understand the environmental and public health drivers for an OWTS management program. Public education is also necessary to provide homeowners with information on how to comply with program requirements. Both the NJDEP and the Pinelands Commission can help ensure the accuracy of information concerning OWTS management across the Pinelands Area. Other excellent sources of information about OWTS maintenance and management include the County Health Departments, the Water Resources Program at the Rutgers New Jersey Agricultural Experiment Station, and County Extension agents.

- Under this model, the cooperative or non-profit keeps an inventory of OWTS installations, rather than the local health department. Depending on the division of responsibility between the municipality and the organization, either entity could retain responsibility for providing outreach and public information to OWTS owners per the requirements of N.J.A.C. 7:9A.. Existing NJDEP, Pinelands Commission, Health Department, and Rutgers Fact Sheets are all excellent sources of accurate and concise information for property owners.

10.5.2. Planning for OWTS Management

With the July 2008 revisions to the Water Quality Management Planning Rules, county governments are designated as wastewater management planning (WMP) agencies and are required to plan for OWTS management. In the Pinelands Area, this responsibility likely falls to the County planning departments, since they are already responsible in most cases for maintaining the Water Quality Management Plans (WQMPs) for their respective counties or regions. Activities related to OWTS management that the WMP agencies are now responsible for include:

- Performing build-out analyses, including watershed-based nitrate dilution analyses, for areas that are served by OWTS
- Adjusting zoning to be consistent with the allowable number of additional equivalent dwelling units at build-out, based upon nitrate dilution modeling.

Also under the May 2008 revisions to the WQMP Rules, municipalities will be required to demonstrate to the WMP planning agency that “areas to be served by individual subsurface sewage disposal systems are subject to a mandatory maintenance program, such as an ordinance, which ensures that all individual subsurface sewage disposal systems are functioning properly. This shall include requirements for periodic pump out and maintenance, as needed” (N.J.A.C. 7:15-5.25(e)3). In the Pinelands Area, although such ordinances may be passed at the local municipal level, most municipalities have delegated or contracted authority for environmental health services, including OWTS permitting, to County health departments (see Section 4.2.4). Thus, responsibility for wastewater planning and information related to existing OWTS will now reside at the County level—in the Planning Departments and Health Departments, respectively.

- Any role of the cooperatives/non-profits in this element would be advisory, or these organizations could be contracted to perform build-out analyses, complete nitrogen dilution modeling, or refine management program ordinance language.

10.5.3. Performance Requirements

In New Jersey, performance requirements for all OWTS include:

- The OWTS should not contaminate nearby wells or surface water bodies by sewage or effluent as indicated by the presence of fecal bacteria where the ratio of fecal coliform to fecal streptococci is four or greater;
- Sewage or effluent should not break out or pond onto the surface of the ground;

- Sewage or effluent should not seep into portions of buildings below ground; and
- Sewage should not back up into the building served.

In addition to these performance requirements, Pinelands alternate design wastewater treatment systems are expected to reduce nitrate concentrations in effluent (Section 4.2.3); however, individual system owners are held harmless if their systems are maintained correctly but fail to meet the nitrogen reduction target.

Pinelands alternate design (denitrifying) wastewater treatment systems rely on mechanical components to reduce pollutant loads in treated wastewater. In order to ensure that these advanced treatment technologies are performing properly, periodic inspections and monitoring by trained O&M personnel is needed. The management program must develop and maintain a record keeping system to track maintenance. The tracking system could also be used to track treatment system performance. Record keeping will be key to assuring that all systems are being adequately maintained and would identify instances where enforcement actions are necessary to attain compliance with the maintenance requirements. Regardless of which OWTS management model is adopted at the local level, performance requirements are particularly important for Pinelands alternate design systems (Section 4.2.3). The Pinelands Commission intends to develop amendments to the CMP to address performance of the pilot program alternate design treatment systems at the conclusion of the current pilot program.

10.5.4. Record Keeping, Inventory and Reporting

In order to comply with the current N.J.A.C. 7:9A-3.14 requirement that local health departments notify OWTS owners of maintenance needs, the Pinelands CMP pumpout requirement, and the management requirements for OWTS in the recent revisions to the WQMP Rules, any potential RME needs an accurate inventory of existing OWTS.

In the Pinelands Area, County health departments already have the best start on an inventory of existing OWTS by virtue of their existing permitting responsibilities.

- Cooperative or non-profit staff can work with County health department staff to create a current inventory of OWTS, including collecting GIS data for local OWTS inventories (Section 6.6.1).
- Cooperative/non-profit staff can also work with WMP agencies, municipalities, and the NJDEP to determine and map the extent of existing and planned sewer service areas within their respective jurisdictions.
- Finally, to improve documentation of OWTS installations, County health departments can amend their permit application requirements to require that engineers submit design plans and supporting materials in digital format, and that parcel identifiers and GPS coordinates for system and component locations be included in the application package. Digital as-built design drawings could also be required to reflect any modification to proposed designs made during OWTS construction.

10.5.5. Financial Assistance and Funding

10.5.5.1. Funding for OWTS Management Program Startup and Administration

Several different sources of funding are available (or potentially available) to municipalities and cooperatives/non-profits for OWTS management program startup and administration.

- Watershed associations and other 501(c)3 non-profit organizations can apply for federal 319(h) and 604(b) grant funding, as described for other models above. These organizations may also be able to leverage grant funding from foundations or other philanthropic organizations in ways that private companies or municipal entities cannot.
- Start-up costs for a management program could be financed through a budget item in the municipalities' or County's general funds. The County or municipality would contract with a cooperative/non-profit organization, which would hire or train staff to perform RME functions.
- County health departments can charge fees to support the staffing/equipment requirements of an OWTS management program. Ideally, these fees would be committed to a dedicated fund established to offset costs of the OWTS management program.
- A loan program using Clean Water State Revolving Loan funds (SRF) could be developed by NJDEP and the New Jersey Environmental Infrastructure Trust (NJEIT) that would allow municipalities or Counties to pay off startup costs over time through user fees or gradual general fund increases. The permit fees could be collected by the contracting cooperative or non-profit organization, but would be payable to the municipality or county to be deposited in a dedicated fund that is established for program activities that can generate income to offset costs for the OWTS management program.

10.5.5.2. Funding for OWTS Upgrades or Alterations

As implementation of OWTS management programs progresses, it is possible that periodic inspections and pumpouts will reveal malfunctions in situations where property owners do not have the ability to pay the up-front costs of alterations or repairs to bring the OWTS into compliance. Municipalities or co-op/non-profit staff should collaborate with NJDEP to develop municipal OWTS funding programs (either grants or low-interest loans) to pay for alterations and repairs, particularly in areas where such funding is not already available for low-income owners. The process for implementing such loan programs can include the following:

- NJDEP sets criteria for counties or municipalities to get SRF money for failed OWTS repair and replacement
- All organizations involved (NJDEP, counties, municipalities, lending institutions) provide OWTS owners with information on low interest loans.

10.6. Installation Elements

The following is a list of OWTS installation elements under this management approach. These elements would remain unchanged from the current OWTS permitting and installation activities.

10.6.1. Site Evaluation

Site evaluations (soil and groundwater) are performed under the direct supervision of a N.J. licensed P.E.. Administrative authorities can witness field testing and ultimately review and approve or disapprove soil test results attained through test procedures identified in N.J.A.C. 7:9A. This process would not change under any of the management models described in this manual.

10.6.2. Design

OWTS designs are prepared by N.J. licensed P.E.s and submitted to county or local administrative authorities for approval. The OWTS design process would remain relatively unchanged under any of the management models described in this manual. County health department staff will continue to rely on NJDEP to issue generic or individual Treatment Works Approvals for non-N.J.A.C. 7:9A compliant systems, such as N removing systems.

As County health departments move towards digital file storage, the permit application procedures may change to require engineers to submit design and as-built plans and application materials in digital format, and provide coordinates for system locations compatible with GIS (see Section 10.5.4)

10.6.3. Construction and Installation

OWTS installations require the issuance of a permit or approval from the administrative authority. The construction and installation process for OWTS is already well-documented and regulated, and would not change under this model. Authorized agents (N.J.P.E.s or REHS) of the administrative authority (County health department) or a N.J.P.E. employed by the applicant issues a certificate of conformance for traditional OWTS, while the technology provider and NJPE both issue such certificates for advanced technologies, including N removing systems. Under this model, approved design data would be submitted by the applicant's consultant to the cooperative/non-profit for transfer into the inventory database.

10.7. Operation and Compliance Elements

The following detailed breakdown of responsibilities for operation and compliance elements under this management approach would introduce ongoing administrative oversight of the long-term maintenance of OWTS. Through this approach, periodic inspections and maintenance of systems would be assured through a “permit to operate” management program. Implementation of managing the operation and maintenance of traditional systems could be carried out through the county health departments and cooperatives or non-profit organizations, while the existing advanced OWTS pilot permitting and monitoring program could shift from the Pinelands Commission to the county health departments.

10.7.1. Operation and Maintenance (O&M)

With this management model, either the municipality or county would issue a permit to the property owner to use the OWTS for a finite period, and would require evidence of maintenance to be submitted in

order for the permit to be routinely reissued. Under this model, O&M activities such as septic tank pumpouts or routine system inspections for both traditional and alternative OWTS would be performed by service providers contracted by individual property owners.

Inspection records, sampling results, pumpout receipts, and other documentation (if needed) would be submitted to the cooperative or non-profit by the property owners in order to obtain or renew the system's operating permit. (See Section 10.7.3 for more detail on determining frequencies for performing O&M and inspection-related activities.)

The county or municipality, under this model, administers a fee-based operating permit for both traditional and advanced (N removing) OWTS. Operating permit fees would be used to finance the ongoing administration of this management program.

10.7.2. Residuals Management

Management of OWTS should incorporate a mandatory inspection and pumpout requirement. To increase public support and reduce O&M costs, pumpouts might only be required when residual levels within a tank meet established criteria, as opposed to being strictly mandated on a time-based standard (e.g., every three years). The enforcement of existing Pinelands CMP and local ordinances adopted in response to the recently adopted WQMP Rules are expected to result in the generation of larger quantities of septic tank residuals for disposal. The agency responsible for tracking pumpouts should ensure that adequate septage treatment capacity is available regionally to accommodate the increase in septage volume that a pumpout program will generate.

Under this model, once an OWTS inventory is established, the cooperative or non-profit can, if requested by the municipality, characterize septage management needs resulting from mandatory O&M inspections and pumping (as needed), and estimate septage production. The management entity needs to be knowledgeable with respect to treatment facility capabilities in order to direct service providers as to where to properly dispose of residuals.

10.7.3. Compliance Inspections / Monitoring

As described in Section 6.6.3, several different scenarios can be considered for inspection frequencies, depending on the type of OWTS, the risk it poses to public health or the environment, or other factors. Currently, inspections of operating traditional OWTS are conducted by contracted service providers and typically occur only at the time of property transfer. This approach could continue under this management model with reporting of the inspection results to the cooperative/non-profit for inclusion in the inventory database. Inspections (and O&M activities such as pump-outs) could also be conducted by contracted service providers at specified intervals (for example, once every 3 years as required in the Pinelands CMP) with reporting of those results to the cooperative/non-profit.

Pinelands Commission staff report that future rule making will transition the alternate OWTS installed under the Pinelands Alternate Design Treatment Systems Pilot Program to a sustainable management system. Future requirements are likely to mimic those of the pilot program and are expected to include mandatory O&M contracts. Continued monitoring of the alternate OWTS will likely be performed by approved service providers under contract to property owners, as is already the case in the pilot program, with reporting to the County health department or other RME instead of to the Pinelands Commission. Inspection and monitoring frequencies for the alternate OWTS could be specified in the operating permits for each system based on manufacturers' recommendations and/or local requirements. Monitoring completed by service providers under contract to property owners can be reported to the cooperative/non-profit, who prepare annual reports for the municipality or county and the Pinelands Commission.

10.7.4. Corrective Actions

Currently, County health department staff members initiate corrective actions through the issuance of a Notice of Violation, typically after receiving complaints about malfunctioning OWTS. As part of a more comprehensive management program, health departments are likely to become aware of systems malfunctioning more frequently and will likely need to oversee abatement of system malfunctions identified through routine inspections. Under this model, the cooperative/non-profit would forward information about malfunctioning OWTS or other needs for corrective action to the local health department for further action.

10.7.5. Enforcement

Under any of the management models in this manual, enforcement would rely primarily upon existing statutes, rules, and ordinances, with amended or additional rules or ordinances adopted as needed.

10.7.6. Training and Certification/ Licensing

OWTS management programs will benefit from a knowledgeable workforce, including pumpers, O&M service providers, engineers, and others. RMEs may wish to consider registering service providers as a means to ensure a competent workforce. Service providers that do not meet ongoing performance standards could be de-certified as necessary. Ongoing training/certification is particularly important for:

- O&M Service Providers
- System Inspectors
- Regulators
- Professional Engineers
- Pumpers

In order to accommodate the need for increased educational opportunities for regulators, designers, and service providers, local colleges and universities, Rutgers Cooperative Extension, private consultants, and technology service providers can all expand training opportunities.

10.8. Advantages/Disadvantages of the Cooperative/Non-Profit Organization Agreements Model

The advantages and disadvantages of the Cooperative/Non-Profit Organization Agreements management model are listed in Table 10-1. In this table, advantages and disadvantages that are unique to this management model are highlighted in green.

Table 10-1. Advantages and Disadvantages of the Cooperative/Non-Profit Organization Agreements Model

Element	Advantages	Disadvantage
Public Outreach & Education	Improve property owners, practitioners and professional knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program
	Co-ops/Non-profits are likely to be perceived as environmental advocates	Need to overcome skepticism that co-op/non-profit may not appear to be balanced in environmental advocacy
Planning	Provide community input on long-range goals and objectives.	Initial planning requires staff resources prior to collection of fees for program
	May need to establish new cooperative or non-profit for this purpose.	
Inventory and Recordkeeping	There may be a positive perception of objectivity by having third party manage data, rather than the regulatory agency.	Need to develop, purchase or subscribe to OWTS data management system; Need to import existing permit records and land use data from local, county utility authorities & Pinelands Commission; need to update records from county as property transfers occur
Financial Assistance/Funding Implementation	Property owners are used to coming to County for Environmental Health permitting; setting up fee-based operating permit program would consolidate permit fees in one location.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS
	Coop/non-profits may be eligible to apply for grants or loans and may have experience in that arena.	
Performance	No significant changes proposed	
Site Evaluation	No significant changes proposed	
Design	No significant changes proposed	
Construction	No significant changes propose	
Operation and Maintenance	Follow-up permitting of OWTS will increase systems' reliability/ longevity	Requires private sector O&M resources to be available, and requires additional permit program & staff to monitor compliance.
	Utilizes expertise of water quality professionals to oversee O&M program	
Inspection and Monitoring	Following up on permits confirms systems' performance	Requires that property owner pay for either co-op/non-profit or other private sector inspection/monitoring entity
	Utilizes expertise of water quality professionals to oversee inspections and monitoring	
Residuals Management	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or high cost to ship septage out of area
Training and Licensing	County is familiar with practicing professionals and service providers. Enhances overall level, and consistency, of expertise among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing
Corrective Actions and Enforcement	Utilize & enhance existing means of enforcement; Ensures compliance with management program.	Requires additional regulatory cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals.

 = Shaded areas denote advantages or disadvantages that are unique to the cooperative/non-profit organization management model

10.9. Cost Estimates

The cost estimates presented in this manual are intended to be illustrative only. Each OWTS management program developed for a county or municipality in the Pinelands Area will have its own unique costs, and these should be determined individually during the program development stage. Depending upon the needs and conditions in each locality, some jurisdictions may be able to provide equivalent services at higher or lower cost. The tables below are based on Microsoft Excel spreadsheets, which can be used as a template for local authorities trying to develop their own costs and are available from the Pinelands Commission website.

The costs of this model were estimated based on two scenarios: A management program for 1,000 traditional OWTS that meets the minimum requirements set forth in the WQMP Rules (Table 10-2) and a more comprehensive OWTS management program, again for 1000 traditional OWTS (Table 10-3). No matter which path a municipality takes with regard to OWTS management, advanced OWTS will require additional inspections and monitoring, so those costs were estimated separately per 100 advanced OWTS (Table 10-4). Appendix A has a cost comparison table and side-by-side tables from Sections 7, 8, 9, and 10 for at-a-glance comparisons of the models.

Although there are many ways to implement a management program, the basic assumptions of this cost estimate are:

- For all management approaches:
 - It will take one year to establish a management program (Year 1), including establishing ordinances and developing an inventory database.
 - One-third of the existing traditional OWTS will have septic tanks pumped in each of the first three years of the program (Years 2-4).
- The current Alternative Design Treatment Systems Pilot Program requires quarterly effluent monitoring for a total of twelve monitoring events. Although long-term monitoring requirements for advanced OWTS have not been established, the estimate below assumes one inspection / monitoring event per system per year, though the technology manufacturers may recommend 4 or more visits per year.
- A comprehensive program would also include the following activities:
 - One-third of the existing traditional OWTS will be thoroughly inspected in each of the first three years of the program (Years 2-4). This thorough inspection would in many cases involve locating and characterizing the existing system components.
 - Routine inspections for traditional OWTS will be conducted in Year 5 and beyond.
 - A loan program will be developed and implemented to help property owners finance repairs and replacement of systems that are not functioning properly

The non-profit/cooperative model is assumed to have generally similar costs to the inter-local agreement model with the exception of higher initial costs of system inventory and record-keeping/notification at the

non-profit/cooperative entity. There will be some economy of scale in such programs as, over time, they include larger numbers of OWTS. The costs shown in this table do not include the eventual replacement of systems as they age beyond their expected design life, which is typically 20-30 years (particularly for older OWTS that have not been consistently managed) These costs are provided as general indicators of relative costs for comparison between the management models included in this manual, and as examples of the types of costs which should be estimated when starting an OWTS management program. Specific cost estimates should be developed during the planning and implementation stages of individual, local OWTS management programs.

Table 10-2. Minimum Management Program Estimated Costs per 1,000 Traditional OWTS under the Co-Op/Non-Profit Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years					
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 + Annual Cost	
Public Education/Outreach ¹	1000	Systems	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625	
System Inventory ²	1000	Systems	\$40	\$49,900	\$10,479	\$11,003	\$11,553	\$4,990	
Recordkeeping & Notification ³	1000	Systems	\$20	\$25,000	\$7,000	\$7,350	\$7,718	\$8,103	
Equipment Purchases/Replacement	1	Lump Sum	\$20,000	\$20,000	\$2,000	\$2,100	\$2,205	\$2,315	
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	
Operation & Maintenance ⁵	1000	Systems	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034	
Total:				\$114,900	\$104,729	\$109,965	\$115,464	\$110,644	
				Annual Co-op or Non-Profit User Fee ⁶ :	\$105	\$25	\$26	\$27	\$18
				Annual Municipal User Fee ⁶ :	\$10	\$10	\$11	\$11	\$12
				Annual O&M/ Inspection Cost ⁶ :	\$0	\$70	\$74	\$77	\$81
				Annual Total Cost Per User	\$115	\$105	\$110	\$115	\$111
Five Year Average Annual Total User Cost:								\$111	
Notes and Assumptions:									
 = Costs included in co-op or non-profit portion of OWTS management program operating permit fee = Costs included in municipal portion of OWTS management program operating permit fee = Costs borne by users which are not included in OWTS management program operating permit fee									
1. Public Education Outreach - Year 1 : Two mailings and four new spaper articles; Years 2 - 4: One mailing and two new spaper articles; Year 5 and beyond: One mailing per year.									
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost w hile inventory is updated due to inspections; Years 5: 10% initial cost to									
3. Record Keeping - Year 1: full cost to set up data base; Years 2-4: 33% initial cost w hile data from inspections is entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for data bas									
4. Compliance and Enforcement - Assume 1% of systems w ill require enforcement each year.									
5. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$300 per year. Dispersal System O&M borne by user.									
6. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars w ith an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.									

Table 10-3. Comprehensive Management Program Estimated Costs per 1,000 Traditional OWTS under the Co-Op/Non-Profit Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years				
				Initial Year Set Up Cost	Y2 Cost	Y3 Cost	Y4 Cost	Y5 Annual Cost
Public Education/Outreach ¹	1000	Systems	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625
System Inventory ²	1000	Systems	\$40	\$49,900	\$10,479	\$11,003	\$11,553	\$4,990
Recordkeeping & Notification ³	1000	Systems	\$20	\$25,000	\$7,000	\$7,350	\$7,718	\$8,103
Equipment Purchases/Replacement	1	Lump Sum	\$56,000	\$56,000	\$4,000	\$4,200	\$4,410	\$4,631
Compliance and Enforcement ⁴	1000	Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Loan Program for System Upgrades ⁵								
Start-Up & Program Administration	1000	Loans	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Inspections ⁶	1000	Systems	\$1,000	\$10,000	\$350,000	\$367,500	\$385,875	\$175,000
Operation & Maintenance ⁷	1000	Systems	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034
Total:				\$170,900	\$466,729	\$490,065	\$514,569	\$299,535
Annual Co-op or Non-Profit User Fee:				\$141	\$27	\$28	\$29	\$20
Annual Municipal User Fee ⁸ :				\$20	\$20	\$21	\$22	\$23
Annual O&M/ Inspection Cost ⁸ :				\$10	\$420	\$441	\$463	\$256
Annual Total Cost Per User				\$171	\$467	\$490	\$515	\$300
Five Year Average Annual Total User Cost:								\$388
Notes and Assumptions:								
= Costs included in co-op or non-profit portion of OWTS management program operating permit fee								
= Costs included in municipal portion of OWTS management program operating permit fee								
= Costs borne by users which are not included in OWTS management program operating permit fee								
1. Public Education Outreach - Year 1: Two mailings and four newspaper articles; Years 2 - 4: One mailing and two newspaper articles; Year 5: One mailing per year.								
2. System Inventory - Year 1: full cost; Years 2-4: 20% initial cost while inventory is updated due to inspections; Years 5: 10% initial cost to update inventory as needed. Equipment purchase is for custom database software.								
3. Record Keeping - Year 1: full cost to set up database; Years 2-4: 33% initial cost while data from inspections is entered from one-third of number of systems per year, Years 5: fixed rate to enter O&M and upgrade data. Equipment costs are for database								
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.								
5. Loan Program - Year 1: Cost to establish program and establish qualification and priority criteria for loans - Years 2-4: assume 2% of inspected systems will apply for loans; Year 5 assume 1% of all systems applying for loans each year								
6. Inspections - Year 1: initial cost to set up program; Years 2-4: conduct detailed initial inspections with contractor hired by owners to expose system; Year 5 conduct "check-up" inspections at assumed 50% cost of initial inspection every three years to								
7. Operation & Maintenance - Assumed Septic Tank Pumping every three years at \$300 per year. Dispersal System O&M borne by user.								
8. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.								

Table 10-4. Management Program Estimated Costs per 100 Advanced OWTS under the Co-Op/Non-Profit Model.

Program Components	Equivalent Users	Unit	Unit Cost	Years	
				Initial Year	Y2
				Set Up Cost	Cost
Public Education/Outreach ¹	100	Systems	\$20	\$2,000	\$1,050
System Inventory ²	100	Systems	\$67	\$13,300	\$1,995
Recordkeeping ³	100	Systems	\$50	\$5,000	\$5,250
Compliance & Enforcement ⁴	100	Systems	\$1,000	\$1,000	\$1,050
Inspections ⁵	100	Systems	\$900	\$90,000	\$94,500
Operation & Maintenance ⁶	100	Systems	\$267	\$32,040	\$28,035
Total:				\$143,340	\$138,474
Annual Co-op or Non-Profit User Fee:				\$203	\$83
Annual Municipal User Fee:				\$10	\$11
Minimum Annual O&M/Inspection Fee ⁷				\$1,220	\$1,225
Annual Total Cost Per User				\$1,433	\$1,319
Five Year Average Annual Total User Cost:					\$1,421
Notes and Assumptions:					
= Costs included in co-op or non-profit portion of OWTS management program operating permit fee					
= Costs included in OWTS management program operating permit fee					
= Costs borne by users which are not included in OWTS management program operating permit fee					
1. Year 1: Four mailings; Year 2: one mailing per year.					
2. Year 1: 200% full cost of importing/entering data; Year 2: 100% initial cost for four quarterly updates of O&M/inspection data.					
3. Assume equipment purchased under traditional system management program. Year 1-2: fixed rate to enter O&M and upgrade data at 50% start up cost					
4. Compliance and Enforcement - Assume 1% of systems will require enforcement each year.					
5. Assumed four operational equipment inspections per year to confirm system is operating properly, check parts, collect effluent sample once per year, and laboratory analysis. Actual cost and frequency of operation inspections will depend on technology,					
6. Assumed septic tank pumping every third year at \$200/year + \$200/year replacement parts.					
7. All repair, replacement and upgrade costs borne by users. These costs are in 2008 dollars with an assumed 5% adjustment for anticipated future increases in unit costs due to factors such as inflation and increasing energy costs.					

11. MOVING FORWARD WITH OWTS MANAGEMENT

COORDINATION IN THE PINELANDS

Several different agencies, from NJDEP and the Pinelands Commission to local health departments and municipal governments, have some authority or regulatory responsibility for OWTS in New Jersey. Though there is significant interaction between these entities in matters concerning OWTS management, there was little institutional means for these agencies to coordinate on advancing OWTS management initiatives until the recent adoption of the WQMP Rules by NJDEP. Moreover, while N.J.A.C. 7:9A requires local health departments to send educational information to each owner of an OWTS installed since 1990 once every three years, and the CMP requires property owners to have their systems inspected and pumped every three years, these requirements do not appear to be strongly enforced. As a result, information provided to the public about OWTS and their ongoing maintenance needs has often been inconsistent. The recent WQMP Rule amendments, as well as action by the Pinelands Commission, will enhance education of OWTS owners and improve OWTS management throughout the Pinelands Area.

The Commission is scheduled to assess the Alternate Design Wastewater Treatment Systems Pilot Program in November 2009. If the Executive Director decides that the pilot program has been successful for one or more of the advanced technology systems, an amendment to the CMP will be proposed to permit installation of said technology or technologies on a permanent basis. Approval of the advanced technology system outside of a pilot program can only proceed if institutional and governmental arrangements are in place to ensure adequate maintenance and monitoring of each technology. In the coming year, the Commission will establish policy through rule making, setting forth the minimum requirements of OWTS management programs throughout the Pinelands Area. Management of advanced OWTS technologies as well as traditional OWTS will be addressed in these CMP requirements. These amendments will transition management of advanced technology systems from the pilot program to management at the local or sub-regional level and require maintenance of all OWTS. Commission staff will also prepare and distribute to each Pinelands Area municipality a Pinelands Model OWTS Management Ordinance to assure the adequacy of maintenance programs and to avoid duplication of effort on the part of each municipality.

All OWTS management programs, whether administered under inter-local agreement, utility authority, consultant, or non-profit models, can draw on a variety of resources to achieve the management goals of each municipality. While local programs may ultimately vary in complexity and in individual requirements, each program must meet the minimum requirements of NJDEP's WQMP Rules, the minimum Pinelands requirement, and meet Commission objectives. For this reason, municipalities may wish to implement basic management programs initially, and then enhance the programs over time.



11.1. Update and Implement Public Outreach and Participation Program

OWTS are a permanent part of the wastewater infrastructure in the Pinelands Area, and their reliable operation is essential for the area's rural residents. State regulators in New Jersey recognize this and require that informational materials to help owners maximize the life of these systems be provided to property owners on a regular basis. Unfortunately, not all local jurisdictions disseminate this information and many homeowners remain ill informed.

The Pinelands Commission has taken important steps to assure that OWTS are protective of public health and the environment. The Commission has also conducted homeowner information sessions to help system owners protect their investment in their systems. However, many resources are available to aid in the building and implementation of continued outreach efforts, including the US EPA's *Getting in Step: A Guide to Effective Outreach in Your Watershed* (<http://www.epa.gov/watertrain/pdf/NEWgettinginstep.pdf>) and the National Extension Water Quality Outreach Education website (<http://wateroutreach.uwex.edu/>).

Successful outreach efforts will generally include the following steps:

1. Determine the program's audience/stakeholders, objectives, and main messages
2. Create (or use existing) materials and activities that support the main messages
3. Distribute the messages / implement the program
4. Periodically revisit the program and messages, as the effort's objectives often change over time

Much of the framework for an effective outreach effort around OWTS management in the Pinelands Area is already in place. During the process of creating this manual, stakeholders were identified and engaged to varying extents. Moving forward, stakeholders will include both those interested in helping to implement OWTS management and those who will be affected by that management:

- NJDEP staff involved with OWTS permitting, water quality/wastewater management planning, and infrastructure/management financing
- Pinelands Commission staff
- County officials and employees (including OWTS permitting/REHS, utility authority staff, and planners)
- Local officials, staff, and board members (incl. local utilities authorities)
- Professionals & practitioners in OWTS field, including engineers, pumpers, and sanitarians
- Environmental advocacy groups
- Developers and realtors
- Banking
- Title insurance agencies (and other insurance agencies, as appropriate)
- Property owners
- Utility Authorities
- Private sector management entities

A web page about OWTS management in the Pinelands Area was created as part of the process leading to this manual of management practices (<http://www.nj.gov/pinelands/landuse/waste/septic.html>). This web page could easily be expanded to incorporate additional educational resources from by topic (such as “What is Management?”, “Maintenance for Homeowners”, “So You Need a Permit”, etc.). Links to external resources, such as the National Environmental Services Center (NESC), NJDEP, and Rutgers Cooperative Extension could be added as well. Importantly, the web page can and should continue to serve as a clearinghouse for information about ongoing OWTS management efforts, and as a transparent and accessible resource for state of the art management planning.

Other activities and materials that may be considered in creating and implementing an outreach plan around OWTS management in the Pinelands Area include:

- Public meetings at local government offices
 - Create handouts, PowerPoint presentations, and materials for use at meetings
 - Document with meeting announcements, agendas, and summaries
 - Web site postings of meetings, along with meeting summaries or minutes
- Informational articles or press releases
 - Local newspapers
 - Pinelands newsletter
 - Newsletters of advocacy organizations, such as the Association of New Jersey Environmental Commissions (ANJEC), Pinelands Preservation Alliance, New Jersey Conservation Foundation, and others.
- Presentations and/or informational workshops at conferences and meetings, including:
 - New Jersey Environmental Health Association Annual Conference
 - New Jersey State League of Municipalities Annual Conference
 - Association of New Jersey Environmental Commissioners Annual Congress
 - Annual Pinelands Short Course
 - Annual Pinelands Newly-Elected Officials Seminar
 - Pinelands Municipal Council Meetings

11.2. Explore Demonstration Projects for Implementing OWTS Management Districts

Demonstration projects are an effective way to use limited funding resources to provide a demonstration of establishing and management program. The need for demonstration projects in New Jersey has increased due to the recent WQMP rules, requiring OWTS management. If demonstration project funding can be made available at the State or Federal level, the Pinelands Area would be an ideal location for a municipal and/or county OWTS management demonstration project because of the Area’s ecological sensitivity and the presence of advanced treatment technologies for onsite wastewater.

Appendix A: Management Models at a Glance



Table A-1. Comparison of Advantages and Disadvantages of Models

Element	County/Municipality Inter-Local Agreement Model (page 53)		Utility Authority Management Model (page 67)		Private Consultant/Municipal Engineer Contracts Model (page 81)		Cooperative/Non-Profit Organization Agreements Model (page 96)	
	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantages	Advantages	Disadvantage
Public Outreach & Education	Improve property owners', practitioners', and professionals' knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program	Improve property owners, practitioners and professional knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program	Need to educate users that utility authority (UA) will provide OWTS management along side centralized management	Improve property owners', practitioners', and professional knowledge of OWTS management needs	Need to overcome skepticism over what is perceived to be a new government program	Improve property owners, practitioners and professional knowledge of OWTS management needs
				Need to overcome skepticism that co-op/non-profit may not appear to be balanced in environmental advocacy				
Planning	Provide community input on long-range goals and objectives	Initial planning would require staff resources prior to collection of fees for program	Provide community input on long-range goals and objectives	Initial planning would require staff resources prior to collection of fees for program	May need to expand service areas to include areas served by OWTS	Provide community input on long-range goals and objectives	Initial planning requires staff resources prior to collection of fees for program	Provide community input on long-range goals and objectives.
				Initial planning requires staff resources prior to collection of fees for program				
Inventory and Recordkeeping	Existing permit records are in County files	Existing land use data dispersed amongst local, county, Pinelands, & utility authorities	UAs have existing data management and billing systems	Need to import existing permit records and land use data from local, county & Pinelands Commission; need to update records from county as property transfers occur		There may be a positive perception of objectivity by having third party manage data, instead of the regulatory agency.	Need to develop, purchase or subscribe to OWTS data management system; need to import existing permit records and land use data from local, county utility authorities & Pinelands Commission; need to update records from county as property transfers occur	Need to develop, purchase or subscribe to OWTS data management system; Need to import existing permit records and land use data from local, county utility authorities & Pinelands Commission; need to update records from county as property transfers occur
Financial Assistance/Funding Implementation	Property owners are already accustomed to coming to County for environmental health permitting	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS	Fee collection process in place; consolidates all wastewater operation & maintenance responsibility in one entity.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS	Setting up fee-based operating permit program would consolidate permit fees in one location.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS	Setting up fee-based operating permit program would consolidate permit fees in one location.	Limited existing funding; need to collect fees; need to change state statutes to remove requirement for documentation of problems prior to establishment of management district/awarding funds for repair of individual OWTS
	Setting up fee-based program would allocate responsibility for where resources are utilized.							
Performance, Site Evaluation, Design, and Construction	No significant changes proposed							
Operation and Maintenance	Follow-up permitting of OWTS will increase systems' reliability/longevity	Requires private sector O&M resources to be available; and additional permit program & staff to monitor compliance.	Follow-up permitting of OWTS will increase systems' reliability/ longevity	Requires additional permit program & staff to monitor compliance	Follow-up permitting of OWTS will increase systems' reliability /longevity	Requires private sector O&M resources to be available; requires additional permit program & staff to monitor compliance.	Follow-up permitting of OWTS will increase systems' reliability/ longevity	Requires private sector O&M resources to be available, and requires additional permit program & staff to monitor compliance.
	Utilizes existing REHS expertise to oversee O&M		Utilizes existing wastewater treatment professionals' expertise; UA coordinates all O&M in service area	Decreases private sector role in O&M; UA personnel will need to adapt to small scale technologies.	Utilizes expertise of designers to oversee O&M		Utilizes expertise of water quality professionals to oversee O&M program	
Inspection and Monitoring	Following up on permits confirms systems' performance	Requires property owner to pay for either county or private sector inspection/monitoring	Following up on permits confirms systems' performance.	Requires property owner pay for UA inspection/monitoring	Following up on permits confirms systems' performance	Requires property owner pay for contractor or other private sector inspection/ monitoring entity.	Following up on permits confirms systems' performance	Requires that property owner pay for either co-op/non-profit or other private sector inspection/ monitoring entity
	Utilizes existing REHS expertise to oversee O&M		Utilizes existing wastewater treatment professionals' expertise; UA coordinates all inspections in service area.	Utilizes expertise of designers to oversee inspections and monitoring	Utilizes expertise of water quality professionals to oversee inspections and monitoring			
Residuals Management	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or incur high cost to ship septage out of area	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or high cost to ship septage out of area	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or high cost to ship septage out of area	Prevent under-pumping and over-pumping of septic tanks	Need to confirm local capacity for septage treatment; or high cost to ship septage out of area
Training and Licensing	County is familiar with practicing professionals and service providers. Enhances overall level, and consistency, of expertise among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing	Enhances overall level of expertise and consistency among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing	Practicing professionals and service providers already familiar with County. Enhances overall level, and consistency, of expertise among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing	Practicing professionals and service providers already familiar with County. Enhances overall level, and consistency, of expertise among practitioners and professionals	Requires overcoming resistance of practitioners and professionals to acquire training and licensing
			UA has expertise in wastewater and water quality management	UA may not be familiar with practicing professionals and service providers.				
Corrective Actions and Enforcement	Utilize & enhance existing means of enforcement; ensures compliance with management program.	Requires additional regulatory cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals.	Can utilize & enhance existing means of enforcement	Requires additional authority cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals	Utilize & enhance existing means of enforcement; ensures compliance with management program.	Requires additional regulatory cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals.	Utilize & enhance existing means of enforcement; ensures compliance with management program.	Requires additional regulatory cost, and political will, to follow through on non-complying property owners, practitioners and/or professionals.
			UA Ensures compliance with management program	UA will need to develop procedures for corrective action / enforcement				

Shaded areas denote advantages or disadvantages that are unique to each management model. Advantages and disadvantages are compiled from Tables 7.1 (page 55), 8.1 (page 69), 9.1 (page 83), and 10.1 (page 98). Advantages and disadvantages are for comparative purposes only, and should not necessarily be considered to have equal weights between models (e.g., six disadvantages in one model does not equal six disadvantages in another model).

Table A-2. Comparison of Minimum Management Program Cost Estimates for Each Model

Minimum Management Program Cost Estimates, Interlocal Agreement Model									Minimum Program Cost Estimates, UA Model						Minimum Program Cost Estimates, Consultant Model						Minimum Program Cost Estimates, Non-Profit/Co-op								
Program Components	Equivalent Users	Unit	Unit Cost	Years					Unit Cost	Set Up Cost	Years					Unit Cost	Set Up Cost	Years					Unit Cost	Set Up Cost	Years				
				Initial Year	Y2	Y3	Y4	Y5 +			Initial Year	Y2	Y3	Y4	Y5 +			Initial Year	Y2	Y3	Y4	Y5 +			Initial Year	Y2	Y3	Y4	Y5 +
Public Education/Outreach ¹	1000 Systems	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625	\$4	\$8,000	\$4,200	\$4,410	\$4,631	\$2,100	\$6	\$12,500	\$6,563	\$6,891	\$7,235	\$3,281	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625				
System Inventory ²	1000 Systems	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	\$38	\$37,500	\$7,875	\$8,269	\$8,682	\$3,750	\$40	\$49,900	\$10,479	\$11,003	\$11,553	\$4,990				
Recordkeeping & Notification ³	1000 Systems	\$20	\$20,000	\$7,000	\$7,350	\$7,718	\$8,103	\$16	\$16,000	\$5,600	\$5,880	\$6,174	\$6,483	\$25	\$25,000	\$8,750	\$9,188	\$9,647	\$10,129	\$20	\$25,000	\$7,000	\$7,350	\$7,718	\$8,103				
Equipment Purchases/Replacement	1 Lump Sum	\$20,000	\$20,000	\$2,000	\$2,100	\$2,205	\$2,315	\$20,000	\$20,000	\$2,000	\$2,100	\$2,205	\$2,315	\$22,000	\$22,000	\$2,000	\$2,100	\$2,205	\$2,315	\$20,000	\$20,000	\$2,000	\$2,100	\$2,205	\$2,315				
Compliance and Enforcement ⁴	1000 Systems	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576				
Operation & Maintenance ⁵	1000 Systems	\$200	\$200,000	\$70,000	\$73,500	\$77,175	\$81,034	\$200	\$16,000	\$70,000	\$73,500	\$77,175	\$81,034	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034				
Total:			\$90,000	\$100,550	\$105,578	\$110,856	\$108,654		\$100,000	\$98,100	\$103,005	\$108,155	\$106,508		\$117,000	\$105,188	\$110,447	\$115,969	\$112,086		\$114,900	\$104,729	\$109,965	\$115,464	\$110,644				
Annual Consultant or Co-op/Non-Profit User Fee ⁶ :															\$97	\$25	\$26	\$28	\$19		\$105	\$25	\$26	\$27	\$18				
Annual Municipal Onsite System User Fee ⁶ :			\$90	\$31	\$32	\$34	\$28		\$84	\$28	\$30	\$31	\$25		\$10	\$10	\$11	\$11	\$12		\$10	\$10	\$11	\$11	\$12				
Annual O&M Cost ⁶ :			\$0	\$70	\$74	\$77	\$81		\$16	\$70	\$74	\$77	\$81		\$0	\$70	\$74	\$77	\$81		\$0	\$70	\$74	\$77	\$81				
Annual Total User Cost:			\$90	\$101	\$106	\$111	\$109		\$100	\$98	\$103	\$108	\$107		\$107	\$105	\$110	\$116	\$112		\$115	\$105	\$110	\$115	\$111				

Note: Minimum management program costs for each model were compiled from Tables 7.2 (page 57), 8.2 (page 72), 9.2 (page 86), and 10.2 (page 100). For footnotes and costing assumptions, please see the original tables.

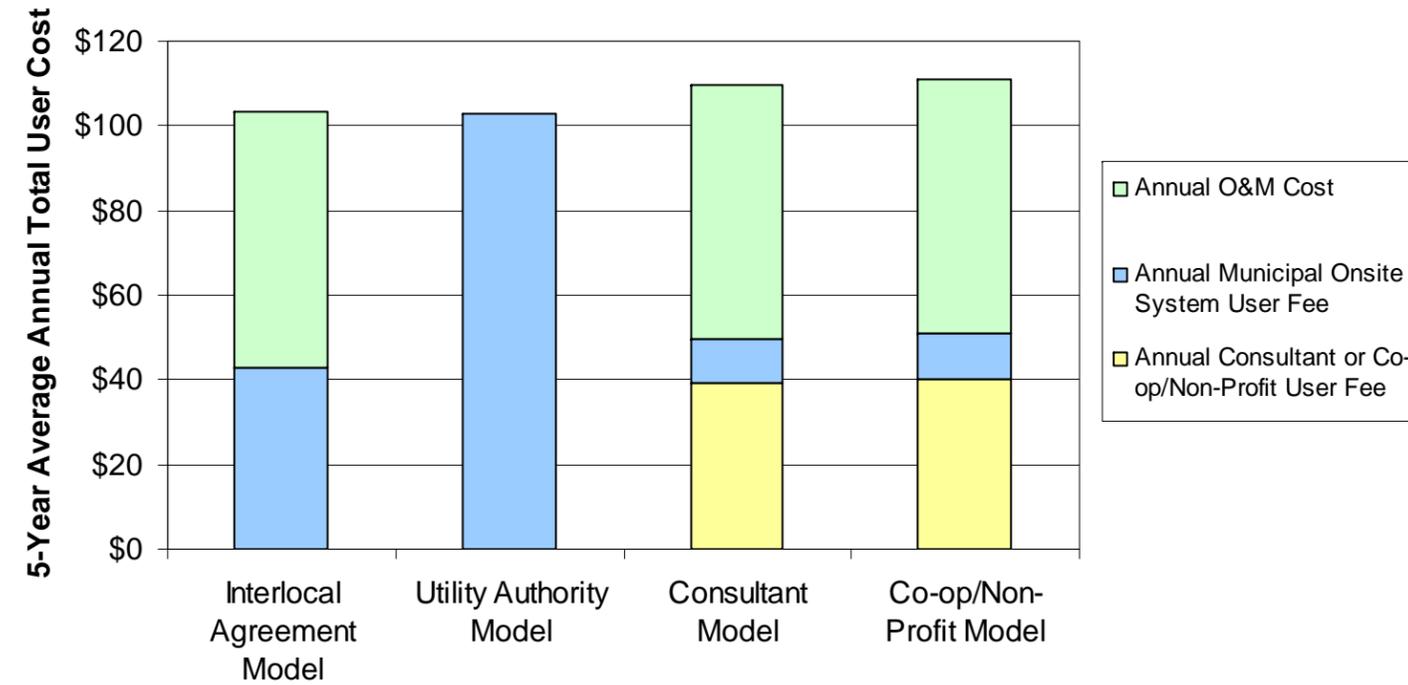


Figure A-1. Proportions of User Fees Paid to Each Entity under Each Model, Minimum Management Program

Table A-3. Summary of Five Year Average Total User Costs for All Models, Minimum Management Program.

	Interlocal Agreement Model	Utility Authority Model	Consultant Model	Co-op/Non-Profit Model
Annual Consultant or Co-op/Non-Profit User Fee			\$39	\$40
Annual Municipal Onsite System User Fee	\$43	\$103	\$11	\$11
Annual O&M Cost	\$60	\$60	\$60	\$60
Five Year Average Annual Total User Cost	\$103	\$103	\$110	\$111

Note: Costs summarized from Tables 7.2, 8.2, 9.2, and 10.2 as noted above.

Table A-4. Comparison of Comprehensive Management Program Cost Estimates for Each Model.

Comprehensive Management Program Cost Estimates, Interlocal Agreement Model										Comprehensive Program Cost Estimates, UA Model					Comprehensive Cost Estimates, Consultant Model					Comprehensive Cost Estimates, Non-Profit/Co-op Model						
Program Components	Equivalent Users	Unit	Unit Cost	Years					Unit Cost	Years					Unit Cost	Years					Unit Cost	Years				
				Initial Year	Y2	Y3	Y4	Y5 +		Initial Year	Y2	Y3	Y4	Y5 +		Initial Year	Y2	Y3	Y4	Y5 +		Initial Year	Y2	Y3	Y4	Y5 +
Public Education/Outreach ¹	1000 Systems		\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625	\$4	\$8,000	\$4,200	\$4,400	\$4,620	\$2,100	\$6	\$12,500	\$6,563	\$6,891	\$7,235	\$3,281	\$5	\$10,000	\$5,250	\$5,513	\$5,788	\$2,625
System Inventory ²	1000 Systems		\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	\$30	\$30,000	\$6,300	\$6,615	\$6,946	\$3,000	\$38	\$37,500	\$7,875	\$8,269	\$8,682	\$3,750	\$40	\$49,900	\$10,479	\$11,003	\$11,553	\$4,990
Recordkeeping & Notification ³	1000 Systems		\$20	\$20,000	\$7,000	\$7,350	\$7,718	\$8,103	\$16	\$16,000	\$5,600	\$5,880	\$6,174	\$6,483	\$25	\$25,000	\$8,750	\$9,188	\$9,647	\$10,129	\$20	\$25,000	\$7,000	\$7,350	\$7,718	\$8,103
Equipment Purchases/Replacement	1 Lump Sum		\$20,000	\$56,000	\$4,000	\$4,200	\$4,410	\$4,631	\$56,000	\$56,000	\$4,000	\$4,200	\$4,410	\$4,631	\$61,600	\$61,600	\$4,000	\$4,200	\$4,410	\$4,631	\$56,000	\$56,000	\$4,000	\$4,200	\$4,410	\$4,631
Compliance and Enforcement ⁴	1000 Systems		\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$1,000	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Loan Program for System Upgrades ⁵																										
Start-Up & Program Administration	1000 Loans			\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576	\$500	\$10,000	\$10,000	\$10,500	\$11,025	\$11,576
Inspections ⁶	1000 Systems		\$1,000	\$10,000	\$350,000	\$367,500	\$385,875	\$175,000	\$700	\$50,000	\$245,000	\$257,250	\$270,113	\$122,500	\$1,000	\$10,000	\$350,000	\$367,500	\$385,875	\$175,000	\$1,000	\$10,000	\$350,000	\$367,500	\$385,875	\$175,000
Operation & Maintenance ⁷	1000 Systems		\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034	\$200	\$20,000	\$70,000	\$73,500	\$77,175	\$81,034	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034	\$200	\$0	\$70,000	\$73,500	\$77,175	\$81,034
Total:				\$156,000	\$462,550	\$485,678	\$509,961	\$297,545		\$200,000	\$355,100	\$372,845	\$391,487	\$242,899		\$176,600	\$467,188	\$490,547	\$515,074	\$300,977		\$180,900	\$466,729	\$490,065	\$514,569	\$299,535
Annual Consultant or Co-op/Non-Profit User Fee ⁸ :															\$137	\$27	\$29	\$30	\$22		\$141	\$27	\$28	\$29	\$20	
Annual Municipal Onsite System User Fee ⁹ :				\$136	\$43	\$45	\$47	\$42		\$130	\$40	\$42	\$44	\$39		\$20	\$20	\$21	\$22	\$23		\$20	\$20	\$21	\$22	\$23
Annual O&M Cost ¹⁰ :				\$10	\$420	\$441	\$463	\$256		\$70	\$315	\$331	\$347	\$204		\$10	\$420	\$441	\$463	\$256		\$10	\$420	\$441	\$463	\$256
Annual Total User Cost:				\$146	\$463	\$486	\$510	\$298		\$200	\$355	\$373	\$391	\$243		\$167	\$467	\$491	\$515	\$301		\$171	\$467	\$490	\$515	\$300

Note: Comprehensive management program costs for each model were compiled from Tables 7.3 (page 58), 8.3 (page 73), 9.3 (page 87), and 10.3 (page 10). For foot notes and costing assumptions, please see the original tables.

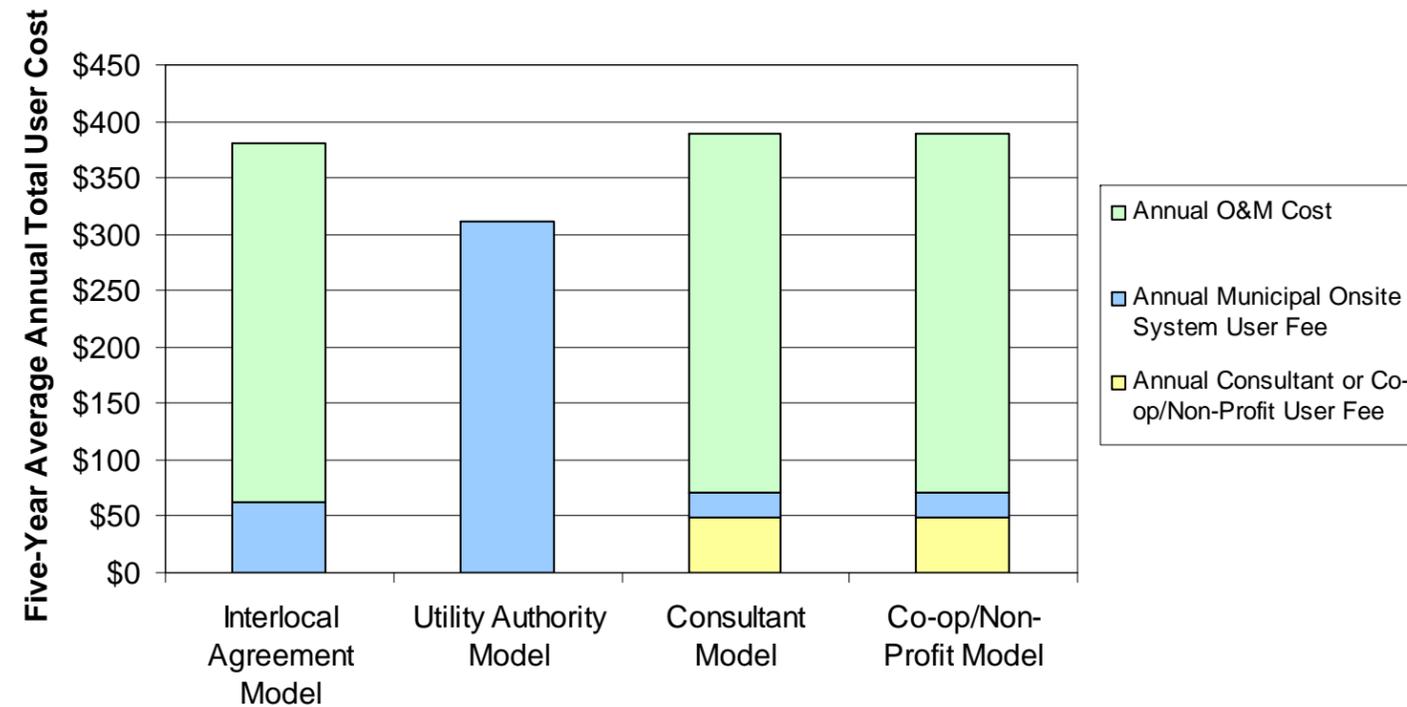


Table A-5. Summary of Five Year Average Total User Costs for All Models, Comprehensive Management Program.

	Interlocal Agreement Model	Utility Authority Model	Consultant Model	Co-op/Non-Profit Model
Annual Consultant or Co-op/Non-Profit User Fee			\$49	\$49
Annual Municipal Onsite System User Fee	\$62	\$312	\$21	\$21
Annual O&M Cost	\$318		\$318	\$318
Five Year Average Annual Total User Cost	\$380	\$312	\$388	\$388

Note: Costs summarized from Tables 7.3, 8.3, 9.3, and 10.3 as noted above.

Figure A-2. Proportions of User Fees Paid to Each Entity under Each Model, Comprehensive Management Program

Table A-6. Comparison of Advanced Treatment Management Program Cost Estimates for Each Model.

Program Components	Equivalent Users	Unit	Inter-Local Agreement Model			Utility Authority Model			Consultant/Engineer Model			Co-op/Non-Profit Model		
			Unit Cost	Initial Year Set Up Cost	Year 2 + Cost ⁷	Unit Cost	Initial Year Set Up Cost	Year 2 + Cost ⁷	Unit Cost	Initial Year Set Up Cost	Year 2 + Cost ⁷	Unit Cost	Initial Year Set Up Cost	Year 2 + Cost ⁷
Public Education/Outreach ¹	100 Systems		\$20	\$2,000	\$1,050	\$16	\$1,600	\$840	\$25	\$2,500	\$1,313	\$20	\$2,000	\$1,050
System Inventory ²	100 Systems		\$50	\$10,000	\$1,500	\$50	\$10,000	\$1,500	\$63	\$12,500	\$1,875	\$67	\$13,300	\$1,995
Recordkeeping ³	100 Systems		\$50	\$5,000	\$5,250	\$40	\$4,000	\$4,200	\$63	\$6,250	\$6,563	\$50	\$5,000	\$5,250
Compliance & Enforcement ⁴	100 Systems		\$1,000	\$1,000	\$1,050	\$1,000	\$1,000	\$1,050	\$1,000	\$1,000	\$1,050	\$1,000	\$1,000	\$1,050
Operational Inspections ⁵	100 Systems		\$900	\$90,000	\$94,500	\$630	\$90,090	\$66,150	\$1,000	\$100,000	\$105,000	\$900	\$90,000	\$94,500
Operation & Maintenance ⁶	100 Systems		\$267	\$32,040	\$28,035	\$267	\$32,040	\$28,035	\$400	\$48,000	\$42,000	\$267	\$32,040	\$28,035
Total:				\$140,040	\$137,954		\$138,730	\$106,864		\$170,250	\$165,690		\$143,340	\$138,474
Annual Consultant or Co-op/Non-Profit User Fee ⁶ :										\$213	\$98		\$203	\$83
Annual Onsite System User Fee:				\$180	\$89	\$134	\$166	\$76		\$10	\$11		\$10	\$11
Minimum Annual O&M/Inspection Fee ⁷ :				\$1,220	\$1,225	\$1,223	\$1,221	\$942		\$1,480	\$1,470		\$1,220	\$1,225
Annual Total Cost Per User:				\$1,400	\$1,314		\$1,387	\$1,018		\$1,703	\$1,578		\$1,433	\$1,319

Note: Advanced system management program costs for each model were compiled from Tables 7.4 (page 59), 8.4 (page 74), 9.4 (page 88), and 10.4 (page 102). For footnotes and costing assumptions, please see the original tables.

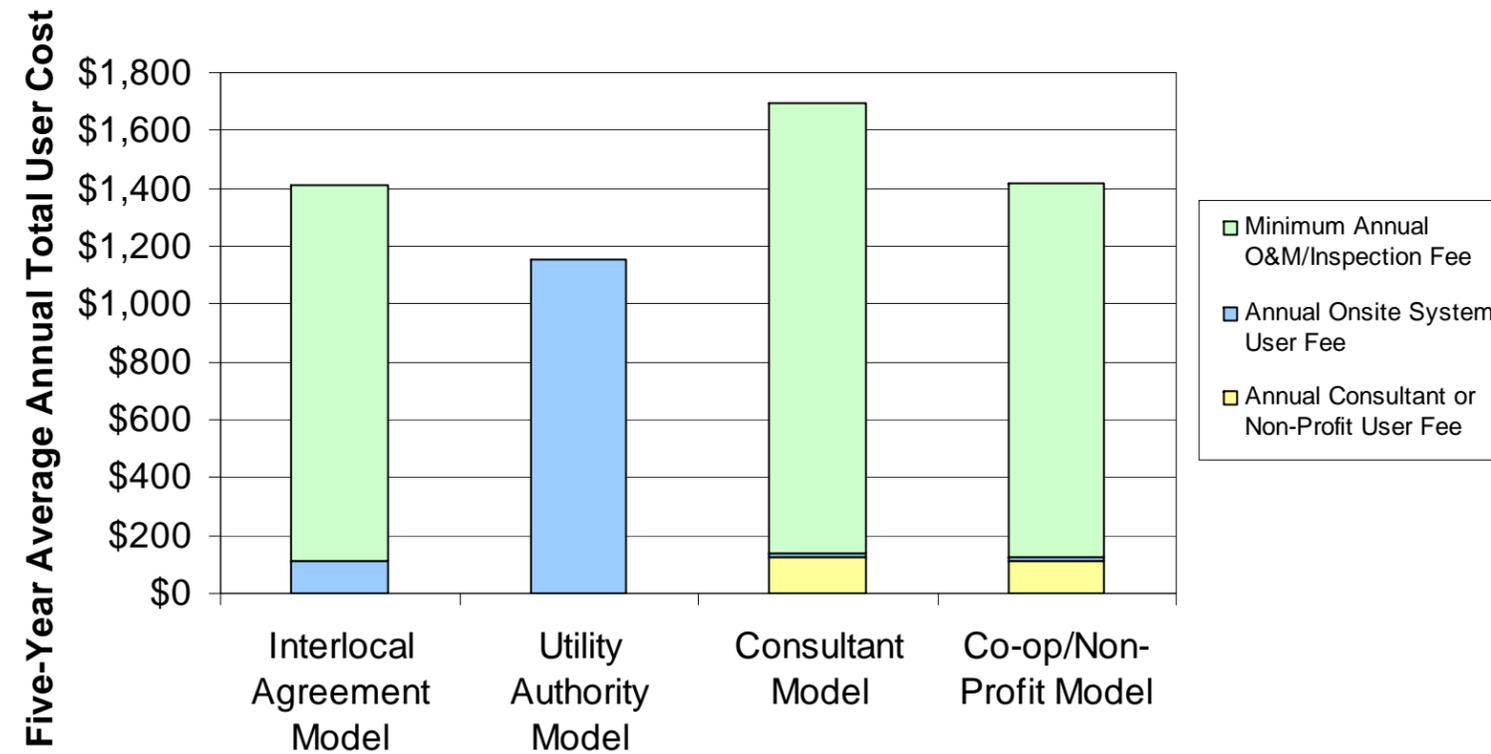


Figure A-3. Proportions of User Fees Paid to Each Entity under Each Model, Advanced Treatment Systems Management Program

Table A-7. Summary of Five Year Average Total User Costs for All Models, Advanced Systems Management Program.

	Interlocal Agreement Model	Utility Authority Model	Consultant Model	Co-op/Non-Profit Model
Annual Consultant or Co-op/Non-Profit User Fee			\$126	\$112
Annual Municipal Onsite System User Fee	\$113	\$1,155	\$11	\$11
Annual O&M Cost	\$1,300		\$1,560	\$1,298
Five Year Average Annual Total User Cost	\$1,413	\$1,155	\$1,698	\$1,421

Note: Costs summarized from Tables 7.4, 8.4, 9.4, and 10.4 as noted above.

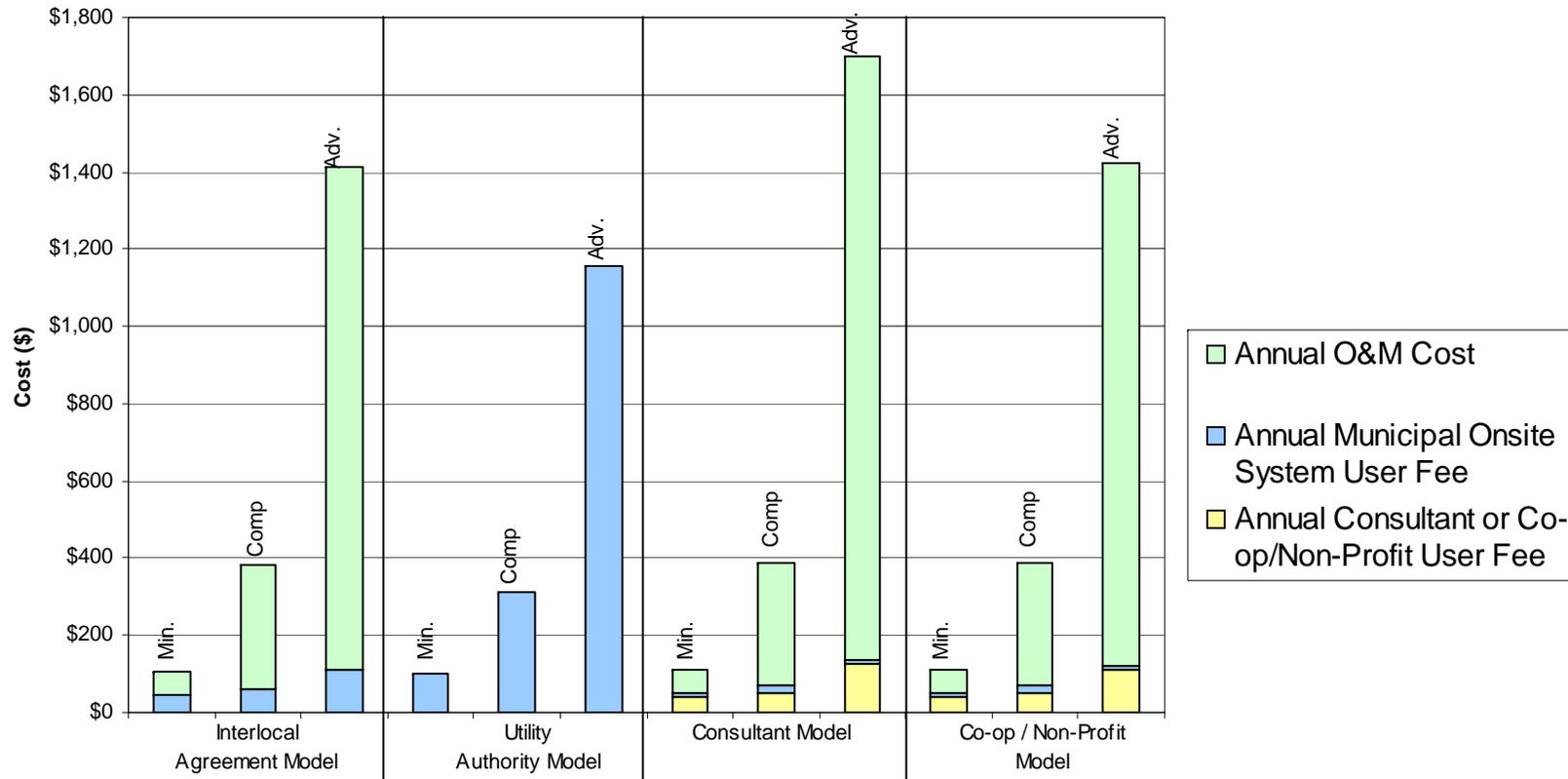


Figure A-4: Cost Summary and Proportions of Five-Year Average Annual User Costs for All Management Models and Programs.

Table A-8. Comparison of Estimated Annual Average User Costs for each Model and Management Program.

Management Model	Management Program		
	Simple	Comprehensive	Advanced OWTS
Inter-local Agreement Model	\$103	\$380	\$1,413
Municipal Utility Authority Model	\$103	\$312	\$1,155
Private Consultant/Engineer Model	\$110	\$388	\$1,698
Non-Profit/Cooperative Model	\$111	\$388	\$1,421

Appendix B: Definitions

Administrative Authority: Under N.J.A.C. 7:9a, the board of health having jurisdiction or its authorized agent (a licensed health officer, licensed professional engineer or first-grade sanitarian) acting on its behalf.

Advanced or Alternative Wastewater Treatment Systems: An onsite wastewater treatment system other than a traditional septic tank and disposal field design. Alternative systems are used to accommodate a variety of site conditions (e.g., high ground water, low-permeability soil) or to provide additional treatment. Examples of alternative systems include sand mounds, sand filters, anaerobic filters, and disinfection systems.

Alteration: Under N.J.A.C. 7:9a, any change in the physical configuration of an existing individual subsurface sewage disposal system or any of its component parts, including replacement, modification, addition or removal of system components, such that there will be a change in the location, design, construction, installation, size, capacity, type or number of one or more components.

Alternate Design Treatment Systems Pilot Program: An interim program for the approval, installation, and monitoring of wastewater treatment technologies that utilize biological nutrient removal processes to reduce nitrogen levels in treated wastewater on lots in the Pinelands Area, between 1 and 3.2 acres in size, which are located in unsewered, designated growth areas.

Biological Nutrient Reduction: The removal of nutrients, such as nitrogen and/or phosphorus, during wastewater treatment.

Centralized Wastewater Treatment Systems: Wastewater systems containing collection sewers and a centralized treatment facility, generally used to collect and treat large volumes of wastewater. At the treatment facility, the wastewater is treated to standards required for discharge to a surface water body.

Cluster Wastewater Treatment Systems: Wastewater treatment systems designed to serve two or more sewage-generating dwellings or facilities with multiple ownership; typically includes a comprehensive, sequential land-use planning component and private ownership.

Comprehensive Management Plan (CMP): The Pinelands CMP implements, and is an exercise of, the powers granted to the Pinelands Commission by the 1979 New Jersey Pinelands Protection Act and the Federal National Parks and Recreation Act of 1978. The CMP is designed to promote orderly development of the Pinelands so as to preserve and protect its significant and unique natural, ecological, agricultural, archaeological, historical, scenic, cultural and recreational resources.

Database: A relational data structure used to store, query, and retrieve information, usually presented in a standardized format searchable by computer.

Decentralized Wastewater Treatment Systems: wastewater treatment systems for collection, treatment, and dispersal/reuse of wastewater from individual homes, clusters of homes, isolated communities, industries, or institutional facilities, wastewater treatment systems located at or near the point of waste generation.

Design Flow: Estimated volume of wastewater per unit of time for which a component or system is designed.

Dilution: The process by which a solute (such as nitrate-nitrogen) entering groundwater is mixed with uncontaminated water and becomes reduced in concentration.

Direct Discharge: Also known as point source emissions; refers to any intentional release of wastes through direct pumping or pipeline discharge. In the context of this manual, the term refers to the discharge of treated sanitary waste from a wastewater treatment plant to surface water.

Disposal Field: Under N.J.A.C. 7:9a, a disposal bed or a group of one or more disposal trenches (also known as a leachfield or drainfield); an OWTS component consisting of a covered excavation made within soil or fill material to contain filter material in which one more distribution laterals have been placed for the disposal of septic tank effluent.

Distribution Box: Under N.J.A.C. 7:9a, a water-tight structure which receives sanitary sewage effluent from a septic tank and distributes such sewage effluent in equal portions to two or more pipelines leading to the disposal field.

Geographic Information System (GIS): A system of hardware and software used for storage, retrieval, mapping, and analysis of geographic data. Spatial features are stored in a coordinate system that references a particular place on the earth. Spatial data and associated tabular information in the same coordinate system can be layered together for mapping and analysis. GIS is often used for scientific investigations, resource management, and development planning.

Management: A level of oversight of wastewater treatment infrastructure that is appropriate both to the natural conditions and land use goals of an area, and to the level of risk that the infrastructure poses to public health and to the environment.

New Jersey Pollution Discharge Elimination System (NJPDES): the New Jersey Pollutant Discharge Elimination System is set forth in N.J.S.A. 58:10A-1 et seq. and in N.J.A.C. 7:14A. These regulations set requirements for, among other types of discharges, those for centralized wastewater treatment plants and OWTS with design flows of greater than 2,000 gallons per day.

Nitrogen: A chemical element that has the symbol N. Soluble forms of nitrogen, such as nitrate, are an important limiting factor in the growth of certain bacteria in aquatic systems. In the Pinelands Area, groundwater is near the ground surface and generally has very low nitrate-nitrogen levels. To ensure that this water is not substantially degraded, new wastewater treatment systems must be designed so that discharges do not raise nitrate-nitrogen levels on the property to more than two parts per million.

Nuisance: Defined in the Public Health Nuisance Code of New Jersey (1953) as, among other things, “[p]ollution or existence of a condition or conditions which cause or threaten pollution of any waters in this municipality in such manner as to cause or threaten injury to any of the inhabitants of this municipality, either in their health, comfort or property.” The PHNC is the primary enforcement tool used by administrative authorities in investigating complaints and in subsequent enforcement actions, if needed.

Onsite Wastewater Treatment System (OWTS): A system for disposal of sanitary sewage into the ground that is designed and constructed to treat the sanitary sewage in a manner that will retain most of the settleable solids in a septic tank and discharges the liquid effluent to a disposal field.

Repair: Under N.J.A.C. 7:9a, to fix, refurbish or replace one or more components of an individual subsurface sewage disposal system in a manner that will restore, preserve, and not change the original location, design, construction and installation, size, capacity, type, or number of the components of the system.

Residuals: Also known as septage; material removed from septic tanks, cesspools, holding tanks, or other sewage treatment storage units and taken to a centralized wastewater plant or septage treatment facility for further treatment and disposal.

Septic Tank: Under N.J.A.C. 7:9a, a water-tight receptacle which receives the discharge of sanitary sewage from a building sewer or part thereof, and is designed and constructed to permit settling of settleable solids from the liquid, partial digestion of the organic matter, and discharge of the liquid portion into a disposal field or seepage pit.

Treatment Works Approval (TWA): A permit issued by the NJDEP pursuant to N.J.A.C. 7:14A-12.3 for a subsurface sewage disposal system which is beyond the scope or not in strict conformance with the requirements of N.J.A.C. 7:9a.

Wastewater Management Plan (WMP): Under N.J.A.C. 7:15, a written and graphic description of existing and future wastewater-related jurisdictions, wastewater service areas, and selected environmental features and treatment works. Under the 2008 revisions to the WQMP Rules, these WMPs will now need to account for areas which are served by OWTS and are not expected to be sewered in the future.

Water Quality Management Planning Rules (WQMP Rules): These rules (also known as N.J.A.C. 7:15) establish policies, procedures and standards which, wherever attainable, help to restore, enhance

and maintain the chemical, physical and biological integrity of the waters of the State, including ground waters. The rules include requirements and a process for water quality management planning; including planning for wastewater management and comprehensive regional wastewater management planning.

Appendix C: Model Ordinance and Codes for Existing OWTS Management Programs in New Jersey

C.1. Association of New Jersey Environmental Commissions Model Ordinance

MODEL SEPTIC MANAGEMENT ORDINANCE

In consultation with NJDEP and an attorney, ANJEC developed this model ordinance.

This model ordinance regulates only the operation and maintenance of on-site sewage disposal systems, not the siting and construction of such systems.

AN ORDINANCE TO AMEND THE CODE OF THE BOARD OF HEALTH OF THE (INSERT NAME OF JURISDICTION) TO ESTABLISH REQUIREMENTS FOR THE OPERATION AND MAINTENANCE OF ON-SITE SEWAGE DISPOSAL SYSTEMS.

BE IT ORDAINED by the Board of Health of the (INSERT NAME OF JURISDICTION) in the County of (Insert Name of County) and State of New Jersey as follows:

SECTION ONE

A. FINDINGS

It is found and declared that:

1. Individual and non-individual on-site subsurface sewage disposal systems are in use within the (insert name of jurisdiction).
2. Existing subsurface sewage disposal systems have malfunctioned even when the systems have been designed, constructed, and sited in accordance with applicable standards, largely due to lack of proper system management or improper operation and maintenance. These malfunctions have been shown to adversely affect public health and welfare and the environment. Such systems constitute a potential source of pollution of ground and surface waters, contamination of potable water supplies, foul odors, nuisance problems and other hazards to public health.
3. It is determined to be in the interest of public health, safety and welfare to establish provisions to regulate the management of such systems to protect the public against system failures and resultant pollution.
4. The licensing provisions contained in this Ordinance are necessary to protect the public health safety and welfare and it is therefore necessary to exceed the provisions contained in N.J.A.C. 7:9A-1 et seq. This is hereby declared to be a “special ordinance” in accordance with N.J.A.C. 7:9A-3.1(b) and shall be forwarded to the New Jersey Department of Environmental Protection within 10 days of adoption.

OR

A. PURPOSE

In addition to the purposes set forth in N.J.A.C. 7:9A-1.1, it is the purpose of this ordinance:

1. To establish a management program for individual and non-individual subsurface sewage disposal systems in the (insert name of jurisdiction) in order to ensure the proper operation and maintenance of such systems. This ordinance requires existing, new and proposed individual and non-individual

subsurface sewage disposal systems to be pumped out at least once every three years in order to minimize future malfunctions of such systems.

2. To regulate individual and non-individual subsurface sewage disposal systems in the program area in such a way as to protect public health and welfare and the environment, and to provide for a means of educating owners/operators, as defined herein, in the characteristics of such systems and the proper procedures for altering, operating and maintaining them.

3. To develop a management program to maintain records and manage systems in the program area.

4. To promote and assure the proper management and maintenance of individual and non-individual sewage disposal systems through time.

SECTION TWO. TITLE

This Ordinance shall be known as the Subsurface Sewage Disposal System Management Ordinance of the (insert name of jurisdiction.)

SECTION THREE. DEFINITIONS

All definitions given in Subchapter 2 (N.J.A.C. 7:9A-2.1 et. seq.) of the New Jersey Department of Environmental Protection (NJDEP) Standards for the Construction of Individual Subsurface Sewage Disposal Systems, N.J.A.C. 7:9A-1.1 et seq., and any amendments thereto (“NJDEP Regulations”) are hereby incorporated into this article, with the following additions:

ACTIVE USE – For initial licenses, this term shall mean: “The use or direction of waste water to a system after the adoption date of this ordinance.” For renewal licenses, this term shall mean: “The use or direction of waste water to a system at any time during the period of the license.”

BOARD OF HEALTH – The Board of Health of the (insert name of jurisdiction)

EDUCATION PROGRAM – An educational program prepared and administered by the Board of Health regarding the fundamentals of individual and non-individual subsurface sewage disposal systems and the proper procedures for the operation and maintenance of such systems. The educational program shall be deemed to be in accordance with N.J.A.C. 7:9A-3.14.

ENFORCING OFFICIAL – The (Insert name of officer) of the (insert jurisdiction) or his designee.

INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM – An individual subsurface sewage disposal system, as defined at N.J.A.C. 7:9A-2.1, serving a single family detached residential housing unit.

LICENSED SEPTIC SLUDGE REMOVAL OPERATOR – Any person, firm or corporation which has been duly examined by the enforcing official and found qualified to pump out an individual or non-individual subsurface sewage disposal system, and who has been issued a license.

MANAGEMENT DISTRICT – (This definition is necessary if the ordinance is to be applied only to a portion of a jurisdiction. The definition must be developed locally and specifically describe the geographic area to be subject to the ordinance.)

NON-INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM – An on-site subsurface sewage disposal system serving a property other than a single family home. Such systems include but are not limited to those systems defined in N.J.A.C. 7:9A-1.8(c)2. Typical examples include but are not limited to: commercial buildings, restaurants, food establishments, commercial/residential mixed uses, and systems servicing multiple units.

OPERATOR’S LICENSE – A license issued to an applicant pursuant to this ordinance for the operation of an individual or non-individual subsurface sewage disposal system.

OWNER OR OPERATOR – The person who owns or leases the realty upon which an individual or non-individual subsurface sewage disposal system is located and/or the person who uses or operates said system. The owner of the realty and the operator of the system, if different, are jointly and severally liable for the obligations imposed by this ordinance.

PLOT PLAN – A sketch drawn by the owner/operator, or agent on their behalf, showing the type (if known) and location of the individual or non-individual subsurface sewage disposal system servicing the property, as well as the location and type of any on-site water supply. All plots shall be drawn to scale and list the dimensions used.

RETAIL FOOD ESTABLISHMENT – Any fixed or mobile restaurant; coffee shop; cafeteria; short order cafe; luncheonette; grill; tearoom; sandwich shop; soda fountain; tavern; bar; cocktail lounge; night club; roadside stand; industrial feeding establishment; private, public, or nonprofit organization, institution, or group preparing, storing or serving food; catering kitchen; commissary; box lunch establishment; retail bakery; meat market; delicatessen; grocery store; public food market, or any similar place in which food or drink is prepared for retail sale or service on the premises or elsewhere, and any other retail eating or drinking establishment or operation where food is served, handled or provided for the public with or without charge.

SYSTEM – An individual or non-individual subsurface sewage disposal system, including all of the component parts thereof.

SECTION FOUR. SCOPE, APPLICABILITY AND EXEMPTIONS

A. SCOPE. The owner and/or occupant of any realty improvement serviced by an individual or non-individual on-site subsurface sewage disposal system located in the (Option One – Management District) (Option Two – insert name of jurisdiction) shall be subject to all of the requirements of this chapter.

B. APPLICABILITY. No person within the (insert name of jurisdiction) area shall operate an individual or non-individual subsurface sewage disposal system unless such construction, installation, alteration, maintenance or operation is in accordance with all applicable sanitary regulations and this ordinance.

C. EXEMPTIONS. Any system not in active use shall be exempted from this Ordinance. The Board of Health may require an owner or operator of a system seeking exemption under this section to submit proof in the form acceptable to the Board so as to qualify for this exemption.

SECTION FIVE. LICENSE TO OPERATE

A. REQUIREMENT FOR LICENSE: On and after (insert effective date) no owner or occupant of a property in the (insert name of jurisdiction) upon which an individual or non-individual subsurface sewage disposal system is located shall use or operate the system unless a currently valid license to operate the system has been issued by the Board of Health in accordance with the schedule herein to the owner of the property on which the system is located.

1. The Board of Health or its designee may issue a license to operate and educational information relative to the proper operation and maintenance practices (pursuant to N.J.A.C. 7:9A-3.14) to the owner and occupant of a property upon one or more of the following events:

- a. Issuance of a certificate of compliance for a new system.
- b. Issuance of a certificate of compliance for the alteration of a system
- c. Upon the sale or transfer of a premises.
- d. For all existing individual and non-individual sewerage disposal systems in accordance with the following schedule

Option 1 – Immediate effective date for all systems

Option 2 – Deferred effective date for all systems

Option 3 – Phased in date for existing systems

2. All licenses issued pursuant to this section shall be on a form provided by the Board of Health. Once issued, a license shall be transferable upon change of ownership or occupancy of the premises for which the license has been issued. A fee as provided in section eleven of this ordinance thereof shall accompany each application for a license or renewal.

The initial application for a license shall include a plot plan showing the location of the septic system (both the tank and the disposal area) and of any private water source on the property. The plot plan shall also include the general location, if known, of any wells, and septic systems on adjoining properties.

B. EXPIRATION/RENEWAL: The license to operate shall expire three (3) years after issuance. The Board of Health shall notify the licensee or its designee at least (INSERT REASONABLE TIME) before the license expires and shall be directed to apply for a renewal of the license. The renewal notice shall include educational materials relative to the proper operation and maintenance practice for such systems in accordance with N.J.A.C. 7:9A-3.14.

1. Requirements for Renewal: The Board of Health or its designee shall not renew the license unless the licensee has submitted the following to the Board of Health or its designee:

JURISDICTIONS SHOULD CHOOSE EITHER OPTION 1 OR OPTION 2

OPTION 1

a. Evidence that the septic tank (or in the case of an alternate system, the comparable component of such system) has been pumped by a licensed septic sludge removal operator as required by Section Seven of this Ordinance; or

b. Submission of a Septic System Inspection* Report on a form approved by the Board of Health indicating that the system has been maintained, is not in need of pumping, and is functioning in conformance with the requirements of this chapter. Said form shall be prepared, completed and certified by:

- i) A staff member of the Board of Health;
- ii) A licensed septic installer;
- iii) A NJDEP registered inspector;
- iv) A NJDEP registered waste hauler;
- v) A licensed professional engineer;
- vi) A licensed health officer or sanitarian;
- vii) Insert local option, if any); or
- viii) Other person acceptable to the Board of Health.

Any such inspection under this section shall include but not be limited to the following:

- i) A complete walkover of the septic field;
- ii) Measurement of the effluent in inspection ports, (if any) and a reading of the groundwater monitoring port when such ports were included in the original septic design; and
- iii) An inspection of baffles and internal integrity of the tank.

OPTION 2

Submission of a Septic System Inspection* Report only as required in OPTION 1 on this page (Section Five B1b).

* Any such inspection shall be conducted in accordance with any NJDEP approved protocol, guidance or regulations. If the inspection indicates that a pumpout of the tank or other maintenance, alteration, or repair of the system is necessary, the Board of Health shall issue a notice of pumping, alteration or repair. Following pumpout or other maintenance, alteration or repair of the system, the owner /operator shall submit to the Board of Health a completed alteration/pumpout report prepared and signed by the person performing the required work.

No person shall test an individual or non-individual subsurface sewage disposal system in a manner that will adversely affect the functioning of the system. Hydraulic loading shall not be applied in excess of the design flow capacity. All solids shall have been removed from the septic tank and/or grease trap prior to testing unless the hydraulic loading is applied at a point that will bypass the septic tank and/or grease trap.

2. Renewal Term: Any license renewed under section B.1.a (Actual pumping) shall be renewed for a period of three years.

Any license renewed under Option 2 (Inspection) shall be renewed for period of (insert term) years.

3. As a condition precedent to a license renewal, the owner/operator shall pay the fee required by section eleven herein.

C. SUSPENSION OF LICENSE: The Board of Health or its designee may suspend or revoke the license to operate in the following circumstances:

1. It has been determined that the system is malfunctioning based upon criteria provided for in N.J.A.C. 7:9A-3.4(a) and the licensee fails to take steps to correct said malfunction as directed by the Board of Health or its designee;

2. The owner or occupant of the premises served by the system violates any provision of this chapter with respect to operation and maintenance of the system; or

3. The owner or occupant of the premises served by the system denies the right of entry to the Board of Health or its designee, or to the New Jersey Department of Environmental Protection (NJDEP), as required in N.J.A.C. 7:9A-3.19, or in any way interferes with the administration or enforcement of this ordinance.

D. MODIFIED TERM OF LICENSE: The Board of Health may on its own motion, upon notice and opportunity to the property owner or operator for a hearing, or upon application of a property owner or system operator, alter the time period of a license to operate. The Board of Health may consider the following factors in determining that a more frequent licensing renewal or pumping/inspection schedule may be necessary:

1. Limited size of the septic tank or disposal field;

2. The fact that the existing system may be a cesspool;

3. The age of the system;

4. Past history of malfunction or other non-compliance;

5. Location of the existing system in a flood hazard, wetland area, wetland transition zone or other environmentally sensitive area as defined in (insert reference);

6. Proximity of the system to a well or water body.

E. SPECIAL LICENSING PROVISIONS FOR RETAIL FOOD HANDLING ESTABLISHMENTS:



The license to operate for a retail food handling establishment shall expire one year after issuance or one year from the date of the documented pumpout, whichever comes first. The owner of said establishment shall have the right to apply to the Board of Health for a longer license renewal period, but in no case shall the license renewal period exceed three years. In considering any such application the Board of Health may consider the establishment's demonstrated compliance history with management of the system.

SECTION SIX. STANDARDS ON THE USE OF SUBSURFACE SEWAGE DISPOSAL SYSTEMS

A. GENERAL

1. The subsurface sewage disposal system shall be used only for the disposal of wastes of the type and origin provided for in the approved engineering design. No permanent or temporary connection shall be made to any source of wastes, waste water or clean water other than those plumbing fixtures which are normally present within the type of facility indicated in the approved engineering design.
2. Drainage from basement floors, footings or roofs shall not enter the sewage disposal system and shall be diverted away from the area of the disposal field.
3. As set forth in N.J.S.A. 58:10A-17, no person shall use or introduce or cause any other person to use or introduce into any sewage water disposal system any sewage system cleaner containing any restricted chemical material.
4. Disposal of materials containing toxic substances into a subsurface sewage disposal system is prohibited. Materials containing toxic substances include, but are not limited to, waste oil (other than cooking oil), oil based or acrylic paints, varnishes, photographic solutions, pesticides, insecticides, paint thinners, organic solvents or degreasers and drain openers.
5. Inert or non-biodegradable substances should not be disposed of in the subsurface sewage disposal system. Such substances include, but are not limited to, disposable diapers containing plastic, cat box litter, coffee grounds, cigarette filters, sanitary napkins, facial tissues and wet-strength paper towels.
6. Large quantities of cooking greases or fats shall not be discharged into systems not equipped with a grease trap designed and constructed as prescribed in N.J.A.C. 7:9A-8.1.
7. Major plumbing leaks shall be repaired promptly to prevent hydraulic overloading of the system.
8. Vehicle traffic and vehicular parking shall be kept away from the aspects of the system, unless the system has been specifically designed to support vehicular traffic.

B. DISPOSAL FIELD MAINTENANCE

1. The area of the disposal field shall be kept free of encroachments from decks, pools, sprinkler systems, driveways, patios, accessory buildings, additions to the main building and trees or shrubbery whose roots may cause clogging of any part of the system.
2. Grading shall be maintained in a condition that will promote run-off of rainwater and prevent ponding.
3. All drainage from roofs, footing drains, ditches or swales shall be diverted away from the disposal field.
4. Vegetation shall be maintained to prevent soil erosion.
5. Vehicle traffic and vehicular parking shall be kept away from the area of the disposal field, unless the disposal field has been specifically designed to support vehicular traffic.

C. ABANDONED SYSTEMS

1. When it is necessary to abandon a system or components of a system, all septic tanks, dosing tanks, seepage pits, dry wells and cesspools which are to be abandoned shall be emptied of wastes and removed or filled completely with sand, gravel, stones or soil material in a manner which is acceptable to the Board of Health or its designee.
2. Except when done as part of or in conjunction with an alteration, a permit must be obtained from the Board of Health prior to abandoning a septic system or component of a septic system.

D. ADDITIONAL INSPECTION AND MAINTENANCE REQUIREMENTS FOR SYSTEMS WITH GREASE TRAPS

1. Grease traps shall be inspected and cleaned out at a frequency adequate to prevent the volume of grease from exceeding the grease retention capacity. Grease shall be removed whenever seventy-five percent (75%) of the grease retention capacity has been reached.
2. Pumping of grease traps shall be performed by a solid waste hauler registered with the NJDEP in accordance with the requirements of N.J.A.C. 7:26-3.1
3. Equipment used in the pumping of grease traps shall meet the following requirements:
 - a. Mobile tanks shall be securely mounted on trucks or trailers, shall be watertight and provided with a leak-proof cover and shall be vented to permit the escape of gases but not the liquid or solid contents of the tank.
 - b. Pumps and hoses shall be maintained and operated in a condition that will prevent the leakage of sewage.
 - c. Equipment shall be available to permit accurate measurement of the volume of grease in relation to the grease retention capacity of the grease trap.
 - d. Pumping of grease traps shall be conducted in such a manner that the entire contents of the grease trap including both liquids and solids are removed.
 - e. Pumping shall be carried out in a manner that will prevent spillage of sewage onto the ground. If any spillage occurs, the solid portion shall be immediately removed and disposed of in a sanitary manner and the area of the spill shall be disinfected using a suitable chlorine-bearing compound.
 - f. Grease and other waste materials removed from grease traps shall be disposed of in accordance with the requirements of the Statewide Sludge Management Plan adopted pursuant to N.J.S.A. 13:1E-1 et seq. and N.J.S.A. 7:11A-1 et seq., as well as any other applicable State or local rules, regulations, ordinances or directives.

E. MAINTENANCE OF DOSING TANKS

1. Dosing tanks and associated pumps, siphons, switches, alarms, electrical connections and wiring shall be maintained in proper working order.
2. Any solids that accumulate in the dosing tank shall be removed and disposed of in a sanitary manner.

SECTION SEVEN. REMOVAL OF SEPTIC TANK SLUDGE

- A. Any person, partnership, firm or corporation who empties, relieves or pumps out all or a portion of an individual or nonindividual sewage disposal system within the (insert jurisdiction) shall first apply to the Board of Health to become a licensed septic sludge removal operator. The applicant shall have the following qualifications: (Insert qualifications.) Any such license shall be for a term of (insert time period) and shall be subject to the payment of a fee as provided in section eleven of this ordinance.
- B. Prior to emptying, relieving or pumping out all or a portion of any individual or non-individual subsurface sewage disposal system within the (insert name of jurisdiction), the licensed septic sludge removal operator shall obtain a septic sludge removal permit from the Board of Health.

C. The septic sludge removal operator shall complete all information on the septic sludge removal permit and deliver one (1) copy to the property owner and one copy to the Board of Health within 72 hours of the time that the individual or nonindividual sewage disposal system is pumped. Failure to deliver said report within the required time frame shall be considered to be a violation of this ordinance.

D. In addition to the license required under section A above, the pumping of septic tanks shall be performed by a solid waste hauler registered with the NJDEP in accordance with the requirements of N.J.A.C. 7:26-3.c.

E. The Board of Health may suspend or refuse to renew the license of any septic sludge removal operator who fails to comply with this ordinance.

F. Equipment used in the pumping of septic tanks shall meet the following requirements:

1. Mobile tanks shall be securely mounted on trucks or trailers, shall be watertight and provided with a leak-proof cover and shall be vented to permit the escape of gases but not the liquid or solid contents of the tank.

2. Pumps and hoses shall be maintained and operated in a condition that will prevent the leakage of sewage.

3. Equipment shall be available to permit the accurate measurement of the sludge and scum levels in relation to the bottom of the outlet baffle.

G. Pumping of septic tanks shall be conducted in such a manner that the entire contents of the septic tank including both liquids and solids are removed.

H. Pumping shall be carried out in a manner that will prevent spillage of sewage onto the ground. If any spillage occurs, the solid portion shall be immediately removed and disposed of in a sanitary manner and the area of the spill shall be disinfected using a suitable chlorine-bearing compound.

I. Septage shall be disposed of at a sewage treatment plant designated in accordance with District and/or State Solid Waste Management Plans pursuant to the Statewide Sludge Management Plan adopted pursuant to N.J.S.A. 13:1E-1 et seq. and N.J.S.A 58:1A-1 et seq.

SECTION EIGHT. APPEAL TO BOARD OF HEALTH

Any person aggrieved by any decision of a designee of the Board of Health made pursuant to this chapter shall have the right to appeal that decision to the Board of Health. Any aggrieved person seeking a hearing under this section shall make application to the Board in writing within 30 days of the decision to be appealed. The Board of Health shall schedule the matter for a hearing within 45 days thereafter. The hearing shall be conducted at a meeting held pursuant to the Open Public Meetings Act.

SECTION NINE. ENFORCEMENT

A. NUISANCES TO BE CORRECTED

1. Any on-site sewage disposal system or component thereof that is found to be malfunctioning (as defined in N.J.A.C. 7:9A-2.1 and 3.4) shall constitute a nuisance and shall be repaired, modified or replaced pursuant to an order of the Board of Health or its designee to correct the condition caused by the malfunction. Alterations shall be performed in accordance with "Standards for the Construction of Individual Subsurface Sewage Disposal Systems" as adopted and implemented by the Board of Health by virtue of this Code and any amendments thereto.

2. Any individual or non-individual subsurface sewage disposal system which has not been maintained in accordance with N.J.A.C. 7:9A:12.3, Septic Tank Maintenance, is hereby declared a nuisance.

3. Any individual or non-individual subsurface sewage disposal system which is constructed, installed, altered, operated or maintained in violation of this section, the DEP Regulations, any rule or regulation

promulgated pursuant to this ordinance or any permit, certificate or license issued pursuant to this ordinance is hereby declared to be a nuisance.

4. In addition the powers provided for in N.J.A.C. 7:9A-1.1 et seq., the Board of Health retains its authority to abate any nuisance in accordance with the provisions of N.J.S.A. 26:3-45 et.seq.

B. MALFUNCTIONING SUBSURFACE SEWAGE DISPOSAL SYSTEM: INSPECTIONS OF SYSTEM; REVOCATION OF LICENSE

1. The Board of Health shall have the right to inspect any system which shows evidence of any malfunction. Such evidence may include, but not be limited to, foul odors, leakage to ground surface, or soggy ground over system. Water and/or soil samples may be taken to confirm the existence of a malfunctioning system.

2. The Board of Health may require that any malfunctioning system be corrected by servicing or by replacement or alteration of the system.

3. Until any necessary replacement or alteration of a system has been accomplished, the Board of Health may require pumping and the removal of the entire contents of the septic tank for the system (both liquids and solids) at intervals specified by the Board.

4. No provision to this Ordinance shall be interpreted as precluding the Board of Health from revoking a license issued by the Board for the operation of a system in the event that the Board shall determine that such action is necessary and appropriate for the enforcement of this Ordinance. Any such revocation shall be upon Notice to the owner/operator, with an opportunity to comment or appeal.

SECTION TEN. RIGHT OF ENTRY

In furtherance of the rights granted to the Board of Health in N.J.S.A. 26:3-45 et seq. and N.J.A.C. 7:9-3.19, the (insert name of enforcing official) or his designee, upon presentation of identification, shall have the right to enter upon property where an individual or non-individual subsurface sewage disposal system is located for the purpose of observation, inspection, monitoring and/or sampling of the on-site sewage disposal system. This authority is exercised by virtue of N.J.S.A. 26:3-31 as a necessary and reasonable method of furthering the duties of the Board of Health as enumerated therein.

SECTION ELEVEN. FEES

- A. Initial License
- B. Renewal License
- C. Board of Health Inspection at time of license renewal
- D. Septic Sludge Removal Operator
- E. Septic Sludge Removal Permit

SECTION TWELVE. VIOLATIONS AND PENALTIES

A. A person who violates any provision of this article, or any term or condition of any certificate or license issued hereunder, shall be liable for one or more of the following penalties [N.J.S.A. 40:69A-29(b)].

- 1. A fine of not less than one hundred dollars (\$100.00) nor more than \$1,000.
- 2. A period of community service not to exceed 90 days.

B. Each separate day and each violation of any provision or this article, any term or condition of any certificate or license or any notice or order issued by the Board of Health shall constitute a separate and distinct violation under this ordinance.

C. Nothing in this section shall be construed as limiting the remedies of the Board of Health for violation of this article. The Board of Health may proceed under any other remedy available at law or in equity for any violation of this article or any term or condition of any certificate or license issued by the Board or Health or for any failure to comply with any notice or order issued by the Board of Health or its enforcement official under this ordinance.

SECTION THIRTEEN. REPEAL OF INCONSISTENT ORDINANCES.

All ordinances, codes or parts of same inconsistent with any of the provisions of this ordinance are hereby repealed to the extent of such inconsistency.

SECTION FOURTEEN. EFFECTIVE DATE

This ordinance shall take effect thirty (30) days after adoption and publication of a Notice of Adoption in accordance with New Jersey law.

SECTION FIFTEEN. SEVERABILITY

In the event that any provision of this Ordinance or its application to any person is held invalid for any reason, such invalidity shall not affect any other provision of this Ordinance and to this end, the provisions of this Ordinance are severable.

The model ordinance above is part of the publication *Septic System Management for Clean Water*, which was made possible by a grant from the Environmental Endowment for New Jersey. The publication is available online at http://www.anjec.org/pdfs/RP_Septic.pdf, last accessed July 2008.

C.2. Montgomery Township, New Jersey On-Site Waste Water Disposal Management District Code

Board of Health Code of the Township of Montgomery

County of Somerset

State of New Jersey

1984; Amended through March 1, 2003.

CHAPTER BH:XIII ON-SITE WASTE WATER DISPOSAL MANAGEMENT DISTRICT*

BH:13-1 SHORT TITLE.

This chapter shall be known and cited as the "On-Site Waste Water Disposal Management District Ordinance of the Board of Health of the Township of Montgomery." (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-2 FINDINGS OF BOARD.

It is found and declared that:

- a. On-site subsurface waste water disposal systems are in widespread use within the Township.
- b. Such systems constitute a potential source of pollution of ground and surface waters, contamination of potable water supplies, foul odors, nuisance problems and other hazards to public health.
- c. It is determined to be in the interest of public health, safety and welfare to establish a Management District to regulate the maintenance of such systems to protect the public against system failures and resultant pollution.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-3 DEFINITIONS.

Definitions, words and terms as used in this chapter shall have the meanings as set forth in N.J.A.C. 7:9A-2.1, adopted by reference in Chapter BH:VI of the Montgomery Township Board of Health Code. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-4 SCOPE.

The owner and/or occupant of any realty improvement serviced by an on-site subsurface waste water disposal system located in the Management District shall be a member of the Management District and subject to all of the requirements of this chapter. The Management District shall be comprised of all on-site subsurface waste water disposal systems that had been licensed by the Board of Health prior to the effective date of this chapter, and all on-site subsurface waste water disposal systems which shall be installed, altered or repaired subsequent to the effective date of this chapter. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-5 LICENSE TO OPERATE.

a. The Board of Health or its designee shall issue a license to operate and a copy of the Board of Health's operation and maintenance manual to the owner/occupant at the time that a certificate of compliance is issued. The licenses shall be issued on forms provided by the Board of Health. Licenses shall be transferable upon change of ownership or occupancy of the premises with respect to which the license has been issued. Each application for a license or renewal thereof shall be accompanied by a fee of fifteen (\$15.00) dollars plus an administrative fee of forty-five (\$45.00) dollars shall also accompany the license or renewal fee.

b. The license to operate shall expire three (3) years after issuance. The applicant shall be notified by the Board of Health or its designee before the license expires and shall be directed to apply for a renewal of the license. The Board of Health or its designee shall not renew the license unless the licensee has submitted the following to the Board of Health or its designee:

1. Evidence that the septic tank has been pumped as prescribed in this chapter; or a septic tank inspection report on a MTHD approved form, prepared by a registered septic installer, NJDEP registered waste hauler licensed professional engineer, or other person acceptable to the Board of Health or its designee, indicating that the system has been maintained, is not in need of pumping, and is functioning in conformance with the requirements of this chapter; and

2. Payment of any fees that are required herein or in Chapter BH:XV of this Code.

c. The Board of Health or its designee may suspend or revoke the license to operate in the following circumstances:

1. It has been determined that the system is malfunctioning based upon criteria outlined in N.J.A.C. 7:9A-3.4(a) and the licensee fails to take steps to correct said malfunction as directed by the Board of Health or its designee;

2. The owner or occupant of the premises served by the system violates any provision of this chapter with respect to operation and maintenance of the system; or

3. The owner or occupant of the premises served by the system denies right of entry to the Board of Health or its designee, or the New Jersey Department of Environmental Protection (NJDEP), as required in N.J.A.C. 7:9A-3.19, or in any way interferes with the administration or enforcement of this chapter.

(Ord. #92-2, S 1; Ord. #99-02, S 1; Ord. #2002-04, S 1)

BH:13-6 APPEAL TO BOARD OF HEALTH.

Any person aggrieved by any decision of the Board of Health or its designee made pursuant to this chapter shall have the right to appeal that decision to the Board of Health in accordance with the

procedures set forth in Section BH:1-3. These decisions do not include determinations made by the Board of Health or its designee based on N.J.A.C.7:9A. (Ord. #99-01, S 1; Ord. #99-02, S 5)

BH:13-7 SYSTEM USE.

- a. The subsurface waste water disposal system shall be used only for the disposal of wastes of the type and origin provided for in the approved engineering design. No permanent or temporary connection shall be made to any source of wastes, waste water or clean water other than those plumbing fixtures which are normally present within the type of facility indicated in the approved engineering design.
- b. Drainage from basement floors, footings or roofs shall not enter the waste water disposal system and shall be diverted away from the area of the disposal field. Backwash from water softeners shall be discharged away from the area of the disposal field by means not conflicting with other Township ordinances.
- c. As set forth in N.J.S.A. 58:10A-17, no person shall use or introduce or cause any other person to use or introduce into any waste water disposal system any sewage system cleaner containing any restricted chemical material.
- d. Disposal of materials containing toxic substances into a subsurface waste water disposal system is prohibited. Materials containing toxic substances include, but are not limited to, waste oil (other than cooking oil), oil based or acrylic paints, varnishes, photographic solutions, pesticides, insecticides, paint thinners, organic solvents or degreasers and drain openers.
- e. Inert or non-biodegradable substances shall not be disposed of in the subsurface waste water disposal system. Such substances include, but are not limited to, disposable diapers containing plastic, cat box litter, coffee grounds, cigarette filters, sanitary napkins, facial tissues and wet-strength paper towels.
- f. Large quantities of cooking greases or fats shall not be discharged into systems not equipped with a grease trap designed and constructed as prescribed in N.J.A.C. 7:9A-8.1.
- g. Major plumbing leaks shall be repaired promptly to prevent hydraulic overloading of the system.
(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-8 SYSTEM INSPECTION REQUIREMENTS.

- a. In accordance with section BH:13-15, but subject to section BH:13-10, inspection of the system shall be required once every three (3) years following its installation, alteration or repair. Inspection or walk-over of the system shall begin or resume three (3) years after installation. Based on the results of these inspections, the frequency may be reduced if prior satisfactory inspections are noted.
- b. During each inspection, information shall include but is not limited to the following:
 1. A complete walkover of the septic field.
 2. Measurement of effluent in inspection ports, and a reading of the groundwater monitoring port when such ports were included in the original septic design.
- c. In the following cases, the Board of Health or its designee may require inspection of the system once every year regardless of whether the septic tank has been pumped out:
 1. The system is malfunctioning or has malfunctioned in the past;
 2. The size or capacity of one (1) or more components of the system does not meet the current requirements of the standards set forth in N.J.A.C. 7:9A-1.1 et seq.;
 3. When actual measured water usage is greater than the design capacity of one or more system components;

4. In residential facilities, when the estimated water usage based upon the actual number of residents is greater than the design capacity of one or more system components. For the purpose of making this determination, the design flow shall be estimated by multiplying the number of persons living in the residence by a factor of one hundred (100) gallons per day; or
5. Facilities in which a grease trap is required.
- d. When applicable, the results of system inspections shall be reported on standard forms provided by the Board of Health, or on equivalent forms which are acceptable to the Board of Health or its designee.
- e. Any problems or malfunctions noticed during the inspection shall be corrected in a manner and within a time frame acceptable to the Board of Health or its designee.

(Ord. # 92-2, S 1; Ord. #99-02, S 1)

BH:13-9 SEPTIC TANK MAINTENANCE.

- a. The contents of the septic tank shall be pumped out within three (3) years after the tank has been installed. The tank may be pumped at more frequent intervals. A septic tank inspection report may be submitted in lieu of pumping if the scum/sludge levels are not within the parameters listed in paragraphs 1. and 2. below:
 1. The bottom of the scum layer is within three (3) inches of the bottom of the outlet baffle.
 2. The top of the sludge layer is within eight (8) inches of the bottom of the outlet baffle when noted during an inspection.
- b. Pumping of septic tanks shall be performed by a solid waste hauler registered with the NJDEP in accordance with the requirements of N.J.A.C. 7:26-3.1.
- c. Equipment used in the pumping of septic tanks shall meet the following requirements:
 1. Mobile tanks shall be securely mounted on trucks or trailers, shall be water-tight and provided with a leak-proof cover and shall be vented to permit the escape of gases but not the liquid or solid contents of the tank.
 2. Pumps and hoses shall be maintained and operated in a condition that will prevent the leakage of sewage.
 3. Equipment shall be available to permit accurate measurement of the sludge and scum levels in relation to the bottom of the outlet baffle.
- d. Pumping of septic tanks shall be conducted in such a manner that the entire contents of the septic tank including both liquids and solids are removed.
- e. Pumping shall be carried out in a manner that will prevent spillage of sewage onto the ground. If any spillage occurs, the solid portion shall be immediately removed and disposed of in a sanitary manner and the area of the spill shall be disinfected using a suitable chlorine-bearing compound.
- f. Septage shall be disposed of at a sewage treatment plant designated in accordance with District and/or State Solid Waste Management Plans pursuant to the Statewide Sludge Management Plan adopted pursuant to N.J.S.A. 13:1E-1 et seq. and N.J.S.A. 58:11A-1 et seq.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-10 ADDITIONAL INSPECTION AND MAINTENANCE REQUIREMENTS FOR GREASE TRAPS.

- a. Grease traps shall be inspected and cleaned out at a frequency adequate to prevent the volume of grease from exceeding the grease retention capacity. Grease shall be removed whenever seventy-five

(75%) percent of the grease retention capacity has been reached. Grease traps serving restaurants may require pumping as frequently as once a week to once every two to three (2-3) months.

- b. Pumping of grease traps shall be performed by a solid waste hauler registered with the NJDEP in accordance with the requirements of N.J.A.C. 7:26-3.1.
- c. Equipment used in the pumping of grease traps shall meet the following requirements:
 1. Mobile tanks shall be securely mounted on trucks or trailers, shall be water-tight and provided with a leak-proof cover and shall be vented to permit the escape of gases but not the liquid or solid contents of the tank.
 2. Pumps and hoses shall be maintained and operated in a condition that will prevent the leakage of sewage.
 3. Equipment shall be available to permit accurate measurement of the volume of grease in relation to the grease retention capacity of the grease trap.
- d. Pumping of grease traps shall be conducted in such a manner that the entire contents of the grease trap including both liquids and solids are removed.
- e. Pumping shall be carried out in a manner that will prevent spillage of sewage onto the ground. If any spillage occurs, the solid portion shall be immediately removed and disposed of in a sanitary manner and the area of the spill shall be disinfected using a suitable chlorine-bearing compound.
- f. Grease and other waste materials removed from grease traps shall be disposed of in accordance with the requirements of the Statewide Sludge Management Plan adopted pursuant to N.J.S.A. 13:1E-1 et seq. and N.J.S.A. 58:11A-1 et seq., as well as any other applicable State or local rules, regulations, ordinances or directives.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-11 MAINTENANCE OF DOSING TANKS.

- a. Dosing tanks and associated pumps, siphons, switches, alarms, electrical connections and wiring shall be maintained in proper working order.
- b. Any solids which accumulate in the dosing tank shall be removed and disposed of in a sanitary manner.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-12 DISPOSAL FIELD MAINTENANCE.

- a. (Ref. N.J.A.C. 7:9A-Table 4.3) The area of the disposal field shall be kept free of encroachments from decks, pools, sprinkler systems, driveways, patios, accessory buildings, additions to the main building and trees or shrubbery whose roots may cause clogging of any part of the system.
- b. Grading shall be maintained in a condition that will promote run-off of rainwater and prevent ponding.
- c. Drainage from roofs, footing drains, ditches or swales shall be diverted away from the disposal field.
- d. Vegetation shall be maintained to prevent soil erosion.
- e. Vehicle traffic shall be kept away from the area of the disposal field.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-13 CLASSIFICATION OF ON-SITE SUBSURFACE WASTE WATER DISPOSAL SYSTEMS.

Every licensed on-site subsurface waste water disposal system shall be assigned one (1) principal classification. The principal class shall be determined according to the residential or non-residential nature of the system's use and configuration. The assigned principal classification designations shall be from one of the following classes:

CLASS R.I. denotes a system which is an individual on-site subsurface waste water disposal system serving one (1) single family home on one (1) individual lot.

CLASS N.R.I. denotes a system which is an individual on-site subsurface waste water disposal system serving one (1) non-residential realty improvement on one (1) individual lot.

CLASS R.C. denotes an on-site subsurface waste water disposal system which in whole or component part serves more than one (1) residential property and/or more than one (1) residential realty improvement.

CLASS N.R.C. denotes an on-site subsurface waste water disposal system which in whole or component part serves more than one (1) non-residential property and/or more than one (1) non-residential realty improvement.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-14 SUBCLASSIFICATIONS OF ON-SITE SUBSURFACE WASTE WATER DISPOSAL SYSTEMS.

Dependent upon a system's design components, its use and configuration, none, all, or combinations of the following subclassifications shall be assigned to licensed systems:

SUBCLASS A denotes that a system has two (2) or more disposal fields designed to be alternated from the receipt of effluent flow from time to time. Alternation intervals shall be determined by the Board of Health or its designee.

SUBCLASS E denotes that the system, by virtue of a Board of Health condition of approval and/or by virtue of the requirements of other state or local codes, shall be operated and/or inspected under the direct supervision of a licensed New Jersey Professional Engineer and/or a licensed New Jersey Sewer Plant Operator.

SUBCLASS F denotes that a system receives wastes in total, or in part, from food preparation or food handling operations.

SUBCLASS G denotes that a system has an outside grease collection trap/tank as one of its components.

SUBCLASS M denotes that there are groundwater monitoring wells located on the property.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-15 SYSTEM INSPECTION, MAINTENANCE AND MONITORING TIMEFRAMES ACCORDING TO SYSTEM CLASS.

For the purposes of system inspections, maintenance, and monitoring, the following management parameters shall prevail, notwithstanding BH:13-8 et seq., BH:13-9 et seq., and BH:13-10 et seq., to the contrary:

CLASS RI AND NRI licensed systems shall be maintained and inspected a minimum of once every three (3) years or at a time interval deemed appropriate by the Board of Health or its designee, or any other qualified or licensed person, partnership, corporation, or public agency delegated to function within specific limits as an agent of the Board of Health to carry out provisions of this chapter. If these systems are covered under a New Jersey Pollution Discharge Elimination System (NJPDES) permit, than those requirements may be considered instead/or in addition to the ones listed above.

CLASS RC AND NRC licensed systems shall be inspected a minimum of once every year or at a frequency as determined by the Board of Health or its designee, or any other qualified or licensed person, partnership, corporation, or public agency delegated to function within specific limits as an agent of the Board of Health or its designee to carry out provisions of this chapter. If these systems are covered under a New Jersey Pollution Discharge Elimination System (NJPDES) permit, then those requirements may be considered instead/or in addition to the ones listed above.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-16 ADDITIONAL SYSTEM INSPECTION, MAINTENANCE AND MONITORING TIMEFRAMES ACCORDING TO SYSTEM SUBCLASS.

In addition to the requirements of section BH:13-15, any licensed system which has been assigned a subclassification or a combination of subclassifications, shall be subject to the following management parameters:

- a. The owner of every licensed system assigned a subclass A designation shall have disposal fields alternated semi-annually, or as determined by the Administrative Authority, unless otherwise specified by State requirements under a NJPDES permit. The alternation event shall be reported to the Board of Health on appropriate forms provided by the Board of Health.
- b. The owner of every licensed system assigned a subclass E designation shall be inspected semi-annually by a licensed New Jersey Professional Engineer who shall report the results of the semi-annual inspection to the Board of Health on appropriate forms provided by the Board of Health, unless otherwise specified by State requirements under a NJPDES permit.
- c. The owner of every licensed system assigned a sub-class F designation shall have septic tanks pumped and cleaned a minimum of once annually, and the pumping occurrence shall be reported to the Board of Health, unless otherwise specified by State requirements under a NJPDES permit.
- d. The owner of every licensed system assigned a subclass G designation shall have the outside grease tank(s)/trap(s) emptied by a licensed pumper as frequently as needed, but in no case any less frequently than once every three (3) months (quarterly). Proof of all grease tank(s)/trap(s) pumping occurrences shall be furnished to the Board of Health within five (5) days following the pumping event on forms provided by the Board of Health.
- e. The owner of every licensed system assigned a subclass M designation shall have groundwater monitored by samples derived from each monitoring well located on the property a minimum of once a year. The monitoring well's sample water shall be analyzed for nitrates and volatile organic chemicals in accordance with accepted practices and performance standards established by the NJDEP. The method and techniques of obtaining the samples shall be to the satisfaction of a certifying licensed New Jersey Professional Engineer. The samples shall be analyzed by a New Jersey NJDEP certified water laboratory.
- f. All systems covered by a NJPDES permit must submit copies of all NJPDES reports to the Health Department on a semi-annual basis.

(Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-17 OTHER MAINTENANCE.

The Board of Health or its designee shall require the owner or occupant to conduct other necessary maintenance activity during regularly scheduled pump out of the on-site waste water disposal system such as cleaning and unclogging of lines, cleaning of the distribution box and mechanical equipment. The owner or occupant shall, in each case, be responsible to pay for the cost of such other maintenance. In the event that the owner or occupant shall refuse to conduct such additional maintenance, the Board of Health or its designee may revoke the license in question. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-18 NUISANCES TO BE CORRECTED.

Any on-site waste water disposal system or component thereof which is found to be malfunctioning (as defined in N.J.A.C. 7:9A-2.1) shall constitute a nuisance and shall be repaired, modified or replaced pursuant to an order of the Board of Health or its designee to correct the condition caused by the malfunction. Alterations shall be performed in accordance with "Standards for the Construction of Individual Subsurface Sewage Disposal Systems" as adopted and implemented by the Board of Health of the Township by virtue of this Code and any amendments thereto. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-19 DECLARATION AND ABATEMENT OF NUISANCES.

The Board of Health hereby retains its authority to abate any nuisance in the Management District in accordance with the provisions of N.J.S.A. 26:3-45 et seq. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-20 RIGHT OF ENTRY.

In furtherance of the rights granted to the Board of Health in N.J.S.A. 26:3-45 et seq., the Health Officer or his designee, upon presentation of identification, shall have the right to enter upon property of members of the Management District for the purpose of observation, inspection, monitoring and/or sampling of the on-site waste water disposal system. This authority is exercised by virtue of N.J.S.A. 26:3-31 as a necessary and reasonable method of furthering the duties of the Board of Health as enumerated therein. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-21 SYSTEM TESTING.

No person shall test an individual subsurface sewage disposal system in a manner that will adversely affect the functioning of the system. Hydraulic loading shall not be applied in excess of the design flow capacity. All solids shall have been removed from the septic tank and/or grease trap prior to testing unless the hydraulic loading is applied at a point that will bypass the septic tank and/or grease trap. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-22 ABANDONED SYSTEMS.

- a. When it is necessary to abandon a system or components of a system, all septic tanks, dosing tanks, seepage pits, dry wells and cesspools which are to be abandoned shall be emptied of wastes and removed or filled completely with sand, gravel, stones or soil material in a manner which is acceptable to the Board of Health or its designee.
- b. Except when done as part of, or in conjunction with a repair, a permit must be obtained prior to abandoning a septic system or component of a septic system. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-23 RULES AND REGULATIONS.

The Board of Health may adopt and promulgate procedural rules and regulations in furtherance of the goals of this chapter. (Ord. #92-2, S 1; Ord. #99-02, S 1)

BH:13-24 PENALTY AND ENFORCEMENT.

Any person violating any of the provisions of this chapter or any order promulgated under this chapter shall, upon conviction thereof, pay a penalty of not less than one hundred (\$100.00) dollars nor more than five hundred (\$500.00) dollars for each violation. Each day a particular violation continues shall constitute a separate offense.

A late charge of fifteen (\$15.00) dollars per month will be assessed to persons who do not comply with any part of the licensing requirements, unless the system owner/operator has applied for, and received, a waiver of such requirement from the Board of Health Administrative Authority or his designated representative. (Ord. #92-2, S 1; Ord. #99-02, S 1; Ord. #2002-04; S 1)

*Editor's Note: Prior ordinances codified herein include portions of Ordinance Nos. 64-82, 99-89 and 100-89.

Hyperlink to original code, last accessed June 2008:

http://70.168.205.112/montgomery_nj/lpext.dll?f=templates&fn=site_main-j.htm&2.0

C.3. Byram Township, New Jersey Sewage Disposal Systems Code

Code of the Township of Byram, New Jersey

Part III, Board of Health Legislation

Chapter 272: SEWAGE DISPOSAL SYSTEMS

[HISTORY: Adopted by the Board of Health of the Township of Byram as indicated in article histories. Amendments noted where applicable.]

GENERAL REFERENCES

Violations and penalties—See Ch. 245, § 245-14.

Excavations—See Ch. 125.

Soil removal—See Ch. 208.

ARTICLE I General Provisions [Adopted 8-17-1971 by Ch. BH-IX of the Revised General Ordinances]

§ 272-1. Adoption of standards.

A code regulating the location, construction, use, maintenance and method of emptying or cleaning individual sewage disposal systems and the issuance of permits to locate, construct, empty or clean the systems and fixing penalties for the violation thereof is hereby adopted pursuant to N.J.S.A. 26:3-69.1 et seq. A copy of the code is annexed to this article and made a part hereof without inclusion of the text.

§ 272-2. Title. [Amended 8-21-1979]

The code established and adopted by this article is described and commonly known as "Standards for the Construction of Individual Subsurface Sewage Disposal Systems," promulgated by the New Jersey State Department of Environmental Protection, and such amendments thereto and revisions thereof as may be hereafter promulgated.

§ 272-3. Copies on file.

Three copies of the Standards for the Construction of Individual Subsurface Sewage Disposal Systems have been placed on file in the offices of the Secretary of the Board of Health and the Township Clerk for the use and examination of the public.

§ 272-4. Permits.

A. Permit required. No person shall locate, construct or alter any individual sewage disposal system until a permit for the location, construction or alteration of the sewage disposal system shall have been issued by the Board of Health. Any permit to locate, construct or alter any individual sewage disposal system issued by the Board of Health shall expire one year after the date of issuance. All existing permits for the location, construction or alteration of any individual sewage disposal system heretofore issued by the Board of Health shall expire one year from the date of the adoption of this section. [Amended 11-16-1982]

B. Approval of plans and specifications. Application for the approval of plans and specifications for an individual sewage disposal system shall be prepared by a registered professional engineer licensed to practice in the State of New Jersey and shall bear his seal. [Amended 10-3-1988 by Ord. No. 6-1988; 3-5-1990 by Ord. No. 4-1990]

C. Temporary facilities. No person shall locate, erect or use any temporary privy, portable facility or sanitary toilet facility until a permit for the location of the temporary privy has been issued by the Byram Township Board of Health. Every temporary privy, portable facility or toilet facility shall be properly enclosed, screened, ventilated, kept in repair and maintained at all times in a clean and sanitary condition. No such facility shall be located or maintained within 10 feet of any property line or within 25 feet of any door or window of any building used for human occupancy, and no such facility shall be constructed under or within any building or structure used for human occupancy. The contents of such facility shall be completely covered with inert material or otherwise effectively treated or removed at the end of each shift or working day.

§ 272-5. Operation of new systems.

A. Certificate required. New individual disposal systems shall not be placed in operation, nor shall new dwellings or buildings or additions thereto be sold or occupied which must rely on such a system for sewage disposal, until the Board of Health has issued a certificate indicating that the disposal system has been located and constructed in compliance with the terms of the permit issued and the requirements of the aforesaid code. Issuance of such certificate shall not be required for alterations to an existing individual sewage disposal system.

B. Issuance of certificate. The Board of Health may issue such certificate if an engineer licensed to practice professional engineering in New Jersey submits a written statement, signed by him, to the Board of Health stating that the disposal system has been located and constructed in accordance with the terms of the permit issued and the requirements of the code.

§ 272-6. (Reserved) Editor's Note: Former § 278-6, Emptying or cleaning septic tanks, was repealed 2-11-1997 by Ord. No. BH1-1996.

§ 272-7. Hearing on denial of license or permit.

If a license or permit or certification required by this article is denied by the Board of Health, a hearing shall be held thereon before the Board within 15 days after request is made by the applicant, and the Board of Health shall affirm, alter or rescind its previous determination and take action accordingly within 15 days after the hearing.

§ 272-8. Stop-work orders.

The Board of Health may order all further work in and about any individual sewage disposal system which is being erected or installed in violation of the code to be stopped forthwith, except such work as shall be necessary to remedy the violation and, thereafter, the work continued without any violation of any of the provisions of the code. After issuance of such order and the service of a copy upon the person connected with or working in and about the erection or installation of the disposal system or any part thereof, no further work shall be done except as aforesaid.

§ 272-9. Fees and charges. [Amended 6-20-1978; 4-26-1983; 10-3-1988 by Ord. No. 6-1988; 11-7-1988 by Ord. No. 7-1988; 3-5-1990 by Ord. No. 4-1990]

The following fees and charges shall be established:

A. For the filing of an application and plans for a permit to locate and construct an individual sewage disposal system: \$150. This fee shall only include the cost of initial site inspection.

B. For the filing of an application and plans for a permit to alter an existing individual sewage disposal system: \$75. This fee shall only include the cost of site inspection. "Alteration" means any change in the physical configuration of an existing individual subsurface sewage disposal system or any of its component parts, including replacement, modification, addition or removal of system components such that there will be a change in the location, design, construction, installation, size, capacity, type or number of one or more components. The term "alter" shall be construed accordingly. [Amended 8-13-1991 by Ord. No. BH1-1991]

C. An applicant shall apply for the review of a proposed septic design by an authorized agent of the Board of Health to either construct a new system or alter an existing system prior to or simultaneously with the application for said permit. A fee of \$25 shall be charged for the initial review of each proposed design. This fee shall not be credited to the cost of any fee to install a new system or alter an existing system.

D. A fee of \$25 shall be charged for each plan review after the initial review, referenced in Subsection C above, which is caused by the applicant's failure to submit an application and plans which conform to the requirements of state law and these ordinances. For each reinspection of an individual sewage disposal system or part thereof caused by the failure of the permittee to locate, construct or alter the same in accordance with the terms of the permit issued or the terms of the aforesaid code, a reinspection fee of \$25 shall be charged.

E. A fee of \$25 plus \$5 for each hole shall be charged for the observation, inspection and recording of any soil log or percolation test by the authorized agent of the Board of Health.

F. Where an application is before the Board for waiver of any health standard and the Board feels that a review and report by one or more of the Township's professional staff is necessary, an escrow of \$250 shall be paid. The appropriate staff individuals will charge against this escrow for time spent outside the Board meetings preparing a report on the subject application. Should the charges exceed the \$250 initially deposited, additional funds shall be paid by the applicant upon request. Should there be a surplus of funds in the escrow account following resolution of the application, the excess shall be returned to the applicant.

G. For the filing of an application and plans for a permit to repair an existing individual sewage disposal system: \$25. This fee shall only include the cost of site inspection. "Repair" means to fix, refurbish or replace one or more components of an individual subsurface sewage disposal system in a manner that will restore, preserve and not change the original location, design, construction and installation, size, capacity, type or number of the components of the system. [Added 8-13-1991 by Ord. No. BH1-1991]

§ 272-10. Minimum standards. [Amended 7-18-1978; 2-19-1980; 10-3-1988 by Ord. No. 6-1988; 2-11-1997 by Ord. No. BH1-1996]

Notwithstanding the requirements of the code established and adopted pursuant to § 272-1 of this article, the following minimum requirements shall apply within the Township of Byram with respect to the location, design, construction, alteration, use and supervision of individual subsurface sewage disposal systems:

A. Septic tanks serving single-family dwelling units with four or fewer bedrooms shall have a minimum capacity of 1,500 gallons. Septic tanks serving single-family dwelling units with five or more bedrooms shall have an additional capacity of at least 250 gallons per bedroom.

B. All septic systems must have either a single tank with two compartments or two tanks providing the required capacity. The septic tank must be provided with a manhole frame and cover for septic tank access on each compartment and installed at the finished grade of the property. The manhole and frame must be equivalent to Campbell Foundry Pattern No. 1302A and constructed with a bituminous seal

where the casting meets the top of the septic tank. The finished grading must divert surface water away from the manhole cover, which shall be left exposed.

C. There shall be a minimum distance of 100 feet between all water wells and the disposal field.

§ 272-11. (Reserved) Editor's Note: Former § 272-11, Aerobic wastewater treatment units, added 10-17-1972, as amended 8-13-1991, was repealed 2-11-1997 by Ord. No. BH1-1996.

ARTICLE II Septic Management Program [Adopted 4-26-2005 by Ord. No. BH1-2005 Editor's Note: This ordinance also superseded former Art. II, Septic Management Pilot Study Program, adopted 5-12-1998 by Ord. No. BH1-1998.]

§ 272-12. Purpose.

In addition to the purposes set forth in N.J.A.C. 7:9A-1.1, it is the purpose of this article to:

A. Regulate individual subsurface sewage disposal systems in the program areas to protect public health and welfare and the environment, and to provide for a means of educating owners/operators, as defined herein, in the characteristics of such systems and the proper procedures for altering, operating and maintaining them.

B. Maintain records and help prevent the future malfunction of septic systems in the program areas.

§ 272-13. Scope.

This article prescribes maintenance of new and existing individual subsurface sewage disposal systems in the program areas.

§ 272-14. Definitions.

All definitions in Subchapter 2 of the Department of Environmental Protection (DEP) Standards for the Construction of Individual Subsurface Sewage Disposal Systems, N.J.A.C. 7:9A- 1.1 et seq., and any amendments thereto ("DEP Regulations") are hereby incorporated into this article, with the following additions:

CRANBERRY LAKE PROGRAM AREA — That section of the Township defined in the document entitled "Program Development and Implementation Report, Byram Township Septic System Management Pilot Project, Cranberry Lake, NJ," dated August 1989, revised January 1990, prepared by the Sussex County Planning Department. That document defines the septic management district as "developed land immediately surrounding Cranberry Lake, bordered on three sides by the Allamuchy State Park and by Route 206 on the fourth." Township Tax Maps show that this definition overlooks a small area at the beginning of South Shore Road, where the management district boundary is defined neither by the park boundary nor Route 206. In this area, the small stream flowing from Johnson Lake to Dragon Brook and paralleling this section of South Shore Road will provide the boundary. The district boundary is shown on an official map on file with the Township Clerk.

EDUCATION PROGRAM — An educational program prepared and administered by the Township regarding the fundamentals of individual subsurface sewage disposal systems and the proper procedures for the operation and maintenance of such systems.

LAKE LACKAWANNA PROGRAM AREA — That section of the Township consisting of developed land immediately surrounding Lake Lackawanna, bounded on the southeast by the large wooded parcel owned by Lake Lackawanna Investment Company; on the northeast by the Lackawanna Cut-off right-of-way; on the northwest, west and southwest by the undeveloped ridges above the lake; and on the south by the state-preserved parcel managed by New Jersey Natural Lands Trust. The district boundary is shown on an official map on file with the Township Clerk.

OWNER — The person or entity that owns or leases the realty upon which an individual subsurface sewage disposal system is located and who is liable for the obligations imposed by this article.

PLOT PLAN — A sketch drawn by the owner or operator, or agent on behalf of the owner, showing the type (if known) and location (both the tank and the leaching area) of the individual subsurface sewage disposal system servicing the property, as well as the location and type of any on-site water supply. All plots shall be drawn to scale and list the dimensions used. Alternatively, "plot plan" means a copy of an existing survey that delineates the individual subsurface sewage disposal system.

TOWNSHIP — The Township of Byram and its authorized agents, including, but not limited to the Byram Township Board of Health, the Byram Township or Sussex County Health Department and health officer.

VERIFICATION OF EXEMPTION — Verification by a septic pumper or licensed engineer that the individual subsurface sewage disposal system servicing a property does not need to be pumped. Written verification must be submitted on the pumper's or engineer's letterhead and include a brief explanation of why pumping should not be required. The verification must further state that it is based on a physical inspection, and it must be dated and signed by the pumper or engineer.

§ 272-15. Septic management requirements.

A. Septic management materials. The Township shall forward a copy of the NJDEP or Sussex County septic management manual or other educational program materials to each owner of property within the program areas.

B. Initial registration. The Township will also supply the owner with a registration form when the educational materials are forwarded. Within six months the owner must submit the completed form to the Township, together with:

- (1) A plot plan;
- (2) Proof that the system has been pumped out or request for exemption; and
- (3) The program fee.

C. Exemptions.

- (1) The Township may exempt a system from the pumping requirement based on verification of exemption and/or other information submitted by the owner.
- (2) Requests for exemption must be approved by the Board of Health.
- (3) The Township retains the right to have a registered environmental health specialist inspect the system with the charges to be paid by the owner.

D. Minimum pumping requirements.

- (1) Each individual subsurface sewage disposal system in the program areas must be pumped at least every three years.
- (2) The Township may require pumping on a two- or one-year schedule where there is evidence that a system is substandard or functioning poorly.
- (3) Where an exemption is granted, the system must be pumped at least once every six years unless the property owner proves that the dwelling has not been occupied during that period or that other extenuating circumstances exist.

E. Subsequent compliance.

(1) The Township will issue a notice that the septic system must be pumped to each property owner at least 60 days prior to the due date, which shall be the anniversary of the most recent pumping or grant of an exemption.

(2) On or before the due date, the owner shall submit proof that the system has been pumped out, a statement of any modifications to the system, and the fifteen-dollar program fee.

§ 272-16. Violations and penalties.

A. In addition to complying with the requirements of this article, an owner convicted of a violation shall be punished by a fine of \$100 for each violation.

B. Upon conviction, an owner shall pay an additional penalty of \$25 per week for each week that the violation continues after notice of the violation was issued by the Township.

C. Nothing in this section shall be construed as limiting the remedies of the Township for violation of this article. The Township may proceed under any other remedy available at law or in equity for any violation of this article or any term or condition of any failure to comply with any notice or order issued by the Township under this article.

§ 272-17. (Reserved)

§ 272-18. (Reserved)

ARTICLE III Lake Mohawk Septic Management District [Adopted 2-9-1999 by Ord. No. BH1-1999]

§ 272-19. Title.

This article shall be known as the "Individual Subsurface Sewage Disposal Systems Maintenance Ordinance of Byram Township, Lake Mohawk Septic Management District."

§ 272-20. Purpose and intent.

The purpose and intent of this article is to establish a management program for the pumping of the individual subsurface sewage disposal systems in Byram Township, Lake Mohawk Septic Management District, the metes and bounds of which are recorded in the office of the Clerk of Sussex County in Book 372, Pages 24 and c. This article requires existing, new and proposed individual subsurface sewage disposal systems to be pumped out at least once every three years in order to minimize future malfunctions of such systems.

§ 272-21. Definitions.

All definitions in Subchapter 2 of the DEP standards for the construction of individual subsurface sewage disposal system, N.J.A.C. 7:9A-1.1, et seq. and all amendments are hereby incorporated into this article with the following additions:

NOTICE OF REQUIREMENTS FOR PERMIT RENEWAL — A notice issued by the Township to an owner/operator that the permit to operate the individual subsurface sewage disposal system will expire on a given date and that proof is required to be furnished to the Township that either pumpout has occurred within the effective period of the permit or that the homeowner has voluntarily had the individual subsurface sewage disposal system inspected by a licensed professional who certified that pumping is not required before the permit may be renewed.

OPERATOR PERMIT — A permit issued pursuant to this article and the DEP regulations for the operation of an individual subsurface sewage disposal system.

OWNER/OPERATOR — The person, corporation or partnership who owns or leases the realty on which the individual subsurface sewage disposal system is located and this entity is a property owner

within the Lake Mohawk Country Club. The owner of the dwelling is liable for the obligations imposed by this article.

PLOT PLAN — A sketch drawn by the homeowner or agent on the homeowner's behalf, showing the type (if known) and location of the individual subsurface sewage disposal system servicing the property, as well as the location and type of any on-site water supply servicing the property. All plots should be drawn to scale listing the dimensions used. Alternatively, "plot plan" means a copy of an existing survey which delineates the system.

SYSTEM — An individual subsurface sewage disposal system, as defined by law, including all of the component parts of the system.

TOWNSHIP — Byram Township and its authorized agents, including but not limited to, the Township Board of Health and Health Officer.

§ 272-22. Requirements for permit to operate an individual subsurface sewage disposal system: application procedure; permit term; automatic transfer of permit.

A. Requirement for permit. On and after November 1, 1998, no owner or occupant of a property in the Lake Mohawk Septic Management District upon which an individual subsurface sewage disposal system is located shall use or operate the system unless a currently valid permit to operate the system has been issued by the Township in accordance with the provision of this article.

B. Application. Every application for a permit to operate a system and every renewal of such a permit shall be made on a form provided by the Township. The date for the initial application for permit will be provided to each affected property owner.

(1) Every application for an initial permit shall be accompanied by documentation establishing that the entire contents of the septic tank for the system (both liquids and solids) have been pumped and removed by a solid waste hauler registered with the New Jersey State DEP. A permit will be issued which will expire three years from the date of the documented pumpout or from the approval date of a new septic system installation.

(2) Every application for an initial permit shall be accompanied by a plot plan.

C. Initial permit. The initial permit, issued by the Township in accordance with this article, shall include a copy of this article and a copy of the DEP's Operation and Maintenance Manual for each owner/operator within the Lake Mohawk Septic Management District.

(1) The initial operator's permit shall expire three years after issuance or three years from the date of the documented pumpout, whichever comes first. The Township shall notify the owner/operator that the permit is about to expire and direct the owner/operator to apply for renewal.

D. Renewal. The Township shall not renew the permit unless the owner/operator has submitted to the Township proof that the system has been pumped out or proof that a waiver has been granted by the Township.

E. Waiver. A waiver shall be granted upon submission of certification by a licensed professional certifying that pumping is not required. Such certification will be renewed annually until pumping is required and performed, at which time the three-year permitting period recommences.

F. Automatic transfer of permit. In the event of a change in the ownership of a property to which a permit to operate a system has been issued, the permit shall be considered transferred to the new owner.

§ 272-23. Violations and penalties.

A. Any persons who shall willfully violate any provision of this article or any person who shall use or operate a system within the Lake Mohawk Septic Management District without a currently valid operator's permit to operate such system or any person who shall violate any part of this article shall be

subject to a fine not exceeding \$100 for each violation and an additional penalty of \$25 a day for each particular violation that continues after notice of the violation issued by the Township.

B. Nothing in this article shall be construed as limiting the remedies of the Township for violations of this article. The Township may proceed under any other remedy available at law or equity for any violation of this article or any term or condition of any permit issued by the Township or for any failure to comply with any notice or order issued by the Township pursuant to this article.

Hyperlink to original code, last accessed June 2008:

<http://byramtwp.org/upclose/govmnt/Township%20Codebook/Township%20Code%20Book%20Links.htm>

Appendix D: Potential Alternate OWTS Management Ordinance Outline

1. Introduction
2. Notice of Amendment of Land Development Ordinance
3. Addition of Definition of Alternative OWTS systems (including technologies approved)
4. Amendments
 - a. Land use limitations (e.g. residential)
 - b. Reference to Pinelands nitrate/nitrogen dilution model
 - c. Limitation of dilution model to contiguous lands
 - d. Required depth to seasonal high groundwater
 - e. Relevant construction requirements for drilled wells
 - f. Number of systems of similar technologies allowed in one development
 - g. Requirement for remote monitoring
 - h. Requirement to include provision for effluent sampling in design and installation
 - i. Requirement for maintenance manual
 - j. Requirement for multi-year warrantee and maintenance contract
 - k. Requirement for deed recording
 - l. Requirements for documenting operation and maintenance
 - m. Requirements for renewal of operating permit at multi-year intervals
 - n. Reference to local OWTS management ordinance for applicable OWTS management and enforcement conditions
5. Repeal of inconsistent ordinances or parts of ordinances
6. Final review, approval, and adoption provisions for ordinance.

Appendix E: USEPA OWTS Management Models

E.1. Model 1 – The Homeowner Awareness Model

- Regulatory authority oversees siting, design, and construction of OWTS
- Regulatory authority sends maintenance reminders and seeks to raise homeowner awareness of OWTS O&M
- Homeowners self-regulate OWTS Operation and Maintenance (O&M)
- Homeowner remedies system deficiencies and protects public health and the environment

This model describes the minimum level of OWTS management recommended by the USEPA. In this model, the regulatory authority ensures that all systems are designed and installed properly according to existing rules. The regulatory authority maintains a system inventory and sends system owners reminders for the regular maintenance needs of the system. Model 1 relies on individual system owners to take responsibility for the management of each system and to resolve deficiencies that threaten public health and the environment.

The Homeowner Awareness Model is suited to areas with low environmental sensitivity that do not have restricting site or soil conditions. This model addresses situations where traditional systems can provide an adequate level of treatment without regular maintenance. It is not recommend for areas where advanced treatment technologies are necessary.

E.2. Model 2 – The Maintenance Contract Model

- Builds on the Homeowner Awareness Model
- Homeowners must maintain a service contract for advanced treatment or cluster systems
- Regulatory authority tracks contracts

In the Maintenance Contract model, trained and qualified system operators perform the necessary O&M on advanced treatment and cluster systems. The regulatory authority, in addition to inventorying and tracking all systems, tracks the maintenance contracts of these systems.

The regulatory authority does not require monitoring reports or performance standards in this model. Regulators also encounter some difficulty in tracking lapses in service or other breaches of the maintenance contract.

The Maintenance Contract model is recommended for areas of low to moderate environmental sensitivity with few challenging site conditions.

E.3. Model 3 – The Operating Permit Model

- Focused on sustained system performance in meeting treatment standards
- Limited-term operating permits are issued to system owners

- Operating permit renewal is based on continued compliance with permit terms and conditions
- The regulatory authority provides continuous oversight of systems
- Lowest level of management that is recommended for large systems or sensitive environments

Operating permits provide a mechanism to vary the level of oversight and management, based on the complexity of the system or sensitivity of the environment in specific areas. For example, owners of traditional systems in favorable site conditions might be required to have regular maintenance and occasional system inspections performed.

More complex systems or site conditions may necessitate continuous oversight through maintenance contracts, required monitoring reports, and system inspections. Meeting performance standards set forth in the operating permit would be a condition of permit renewal. If permit terms and conditions are not met, the regulatory authority may require corrective actions or levy penalties.

The Operating Permit model is the lowest level of management to be recommended by the USEPA for large systems and sensitive environments. It describes a more active and performance based setting for OWTS management. However, this model places the responsibility of system oversight directly in the hands of the regulatory authority. This may burden the authority if it lacks the expertise or resources to implement the increased oversight. In addition, the regulatory authority would have to be granted the appropriate enforcement powers to maintain permit compliance.

E.4. Model 4 - The Responsible Management Entity (RME) Operation and Maintenance Model

- System operating permits are issued to an RME
- O&M is performed by the RME, with a focus on preventative maintenance
- Individual property owners still own their systems

The RME Operation and Maintenance Model builds on the Operating Permit model by creating an RME to oversee the continued performance of OWTS. Operating permits are issued directly to a public or private RME, instead of the system owners. The RME is responsible for monitoring system function and performance standards. The RME provides all O&M services for the system, replacing the service contract method in models 2 and 3.

The creation of an RME supports a high level of compliance without burdening the regulatory authority or requiring expanded enforcement powers. Some oversight of the RME would still be necessary, and the regulatory authority may still have to enforce needed repairs, which would still be the responsibility of the system owner.

The RME O&M Model is recommended for moderate to high sensitivity environments.

E.5. Model 5 – The Responsible Management Entity (RME) Ownership Model

- OWTS are owned, operated, maintained, and repaired by the RME

- The RME acts as a utility, much like centralized sewer systems
- The highest level of OWTS oversight and management

This model increases the level of RME responsibility by providing for direct ownership of individual and cluster systems by the RME itself. The RME can replace older, existing systems with more complex systems that meet performance standards, without requiring action or funding by the homeowner. In this way, the RME can make strategic decisions regarding individual systems that most effectively further the goals of watershed-wide management and planning.

In this case, the RME manages, owns, and controls all aspects of the OWTS life-cycle. Therefore, oversight by the regulatory authority is essential to the success and acceptance of the program. Legislation enabling the RME to own and control private systems and possibly to form management districts would be necessary to implement this model. In addition, significant funding would be necessary, both to start the program, and to sustain the RME's mission of operating, maintaining, and upgrading OWTS.

The USEPA recommends the RME ownership management scenario for cluster systems that serve multiple properties. It provides the highest level of management, potentially benefiting the most sensitive environments.

Appendix F: OWTS Management Information Resources and References

Association of New Jersey Environmental Commissions (ANJEC). 2003. *Septic System Management for Clean Water*. Accessed online at http://www.anjec.org/pdfs/RP_Septic.pdf on October 15, 2007.

Costa, J.E., G. Heufelder, S. Foss, N.P. Milham, and B. Howes, 2002. Nitrogen removal efficiencies of three alternative septic system technologies and a traditional septic system. *Environment Cape Cod* 5(1):15-24.

Environmental Technology Verification Program, April 2003. ETV Joint Verification Statement for the Waterloo Biofilter® Model 4-Bedroom System. Accessed online at http://www.epa.gov/etv/pubs/09_vs_waterloo.pdf on August 7, 2008.

Hoover, M. T., A. Arenovski, D. Daly, D. L., Lindbo. 1998. A risk-based approach to on-site system siting, design, and management. In D. M. Sievers (ed.) *On-Site Wastewater Treatment. Proceedings of the Eighth National Symposium on Individual and Small Community Sewage Systems*. March 8-10, 1998, Orlando, FL. ASAE, St. Joseph, MI p. 66-78.

La Pine National Demonstration Project Website. n.d. Innovative Onsite Wastewater Treatment Systems Page. Accessed online at <http://www.deschutes.org/deq/innovative.htm> on January 28, 2008.

New Jersey Administrative Code, Title 7, Chapter 9A. *Standards for Individual Subsurface Sewage Disposal Systems*. R.2005 d.79, effective January 26, 2005. Accessed online at <http://www.state.nj.us/dep/dwq/pdf/njac79a.pdf> on August 7, 2008.

New Jersey Administrative Code, Title 7, Chapter 14A. Pollutant Discharge Elimination System. R.1997 d.107, effective February 5, 1997. Accessed online at <http://www.state.nj.us/dep/dwq/714a.htm> on August 7, 2008.

New Jersey Administrative Code, Title 7, Chapter 15. Statewide Water Quality Management Planning. Accessed online at http://www.nj.gov/dep/watershedmgt/DOCS/WQMP/wqmp_rule_0708.pdf on August 7, 2008.

New Jersey Administrative Code, Title 7, Chapter 50. Pinelands Comprehensive Management Plan. R.1981 d.13, effective January 14, 1981. Accessed online at http://www.state.nj.us/pinelands/images/pdf%20files/12_10_07_CMP.pdf on January 12, 2008.

New Jersey Department of Environmental Protection, Bureau of Nonpoint Pollution Control. 2003. Technical Guidance for Inspections of Onsite Wastewater Treatment and Disposal Systems. Accessed at http://www.state.nj.us/dep/dwq/pdf/inspection_guidance.pdf on August 14, 2007.

New Jersey Department of Environmental Protection, Bureau of Nonpoint Source Pollution Control. 2003. NJPDES Master General Permit Program, Permit No. NJ0130281, T1 - Sanitary Subsurface Disposal General Permit. Accessed online at http://www.state.nj.us/dep/dwq/pdf/t1_finalpermit.pdf on June 8, 2007.

New Jersey Department of Environmental Protection, Bureau of Nonpoint Source Pollution Control. 2007. Sanitary Subsurface Disposal General Permit (T1) Information. Accessed online at <http://www.state.nj.us/dep/dwq/t1.htm> on June 8, 2007 (page last updated February 27, 2008).

New Jersey Department of Environmental Protection, Bureau of Nonpoint Source Pollution Control. 2007a. Homeowner Information. Accessed online at http://www.nj.gov/dep/dwq/owm_home.htm on October 15, 2007 (page updated February 6, 2008).

New Jersey Department of Environmental Protection, Bureau of Nonpoint Source Pollution Control. 2007b. Regulator Assistance. Accessed online at http://www.nj.gov/dep/dwq/owm_regulate.htm on October 15, 2007 (page updated February 5, 2008).

New Jersey Department of Environmental Protection, Bureau of Nonpoint Pollution Control. 2008. Septic System Management Tips. Accessed at http://www.state.nj.us/dep/dwq/owm_regulate.htm on June 18, 2008.

New Jersey Department of Environmental Protection, Division of Water Quality. 2007. Municipal Finance and Construction Element website. Accessed online at <http://www.state.nj.us/dep/dwq/mface.htm> on August 30, 2007 (page updated June 24, 2008).

New Jersey DEP, Division of Watershed Management. 2005. Clean Water Act Section 604(b) Water Quality Planning Grant Program. Accessed online at http://www.state.nj.us/dep/watershedmgt/nps_program.htm on November 4, 2007.

New Jersey DEP, Division of Watershed Management. 2006. State of New Jersey Nonpoint Source Report 2004-2006. Accessed online at <http://www.state.nj.us/dep/watershedmgt/DOCS/NJ%20NPS%20Report%202004-2006%208-24-06.pdf> on August 7, 2008.

New Jersey DEP, Division of Watershed Management. 2007. Water Quality Management Plans. Accessed online at <http://www.nj.gov/dep/watershedmgt/wqmpps.htm> on August 15, 2007 (page updated July 15, 2008).

New Jersey DEP, Division of Watershed Management. June 2007. Water Quality Management Planning Rules, Proposed Readoption with Amendments (N.J.A.C. 7:15). Accessed online at <http://www.nj.gov/dep/rules/proposals/052107a.pdf> on July 2, 2007.

New Jersey DEP, Office of Planning and Sustainable Communities. 2007. A Guide to State Grants and Loans that Support Sustainability Initiatives. Accessed at http://www.nj.gov/dep/opsc/docs/grants_loans_for_sustainability_initiatives.pdf on December 17, 2007.

New Jersey Department of Health and Senior Services. 2006. New Jersey Local Information Network and Communications System. Accessed online at <http://www.state.nj.us/health/lh/lincs/> on August 17, 2007 (page updated March 14, 2008).

New Jersey Environmental Infrastructure Trust. 2007. Smart Growth Financing Program. Accessed online at <http://www.njeit.org/smartgrowth.htm> on November 4, 2007 (page updated August 7, 2008).

New Jersey Pinelands Commission. 1995. The Pinelands National Reserve. Accessed online at <http://www.state.nj.us/pinelands/reserve/> on August 16, 2007.

New Jersey Pinelands Commission. 1995. The Comprehensive Management Plan. Accessed online at <http://www.state.nj.us/pinelands/cmp/> on May 7, 2007.

New Jersey Pinelands Commission. 2004. Long-term economic monitoring program - Pinelands population reference guide. Accessed online at <http://www.state.nj.us/pinelands/infor/broch/LTEM04Summary.pdf> on August 7, 2008.

NSF International. n.d. Executive Summary of NSF Standard 40 Certification for Hoot System. Received by Stone Environmental, Inc. staff from Ron Suchecki (Hoot Systems, Inc), March 2008.

Obropta, C.C., and Berry D. 2005, Onsite Wastewater Treatment Systems: Five Levels of Protection, Rutgers Cooperative Research & Extension, N.J. Agricultural Experiment Station, Rutgers, The State University. Accessed online at http://water.rutgers.edu/Fact_Sheets/fs531.pdf on August 7, 2008.

Rhode Island Department of Environmental Management. Office of Water Resources, April 2008. Summary of Rhode Island Municipal Onsite Wastewater Programs. Accessed online at <http://www.dem.ri.gov/programs/benviron/water/finance/non/pdfs/munisep.pdf> on August 7, 2008.

Rutgers Cooperative Extension, Water Resources Program .2007. Onsite Wastewater Treatment System Management. Accessed at <http://www.water.rutgers.edu/Onsite/default.htm> on October 15, 2007 (page updated April 1, 2008).

Stone Environmental, Inc. 2008. Legal Basis and Regulatory Framework of Onsite Wastewater Management in the New Jersey Pinelands Area. Report to the Pinelands Commission, project 061750-W. May 13, 2008.

Tisbury, Town of, Massachusetts. 2007. Tisbury Board of Health – Frequently Asked Questions. Accessed at <http://tisburygov.org/content/126/544/700/62.aspx> on November 4, 2007.

United States Environmental Protection Agency. 1997. Response to Congress on Use of Decentralized Wastewater Treatment Systems. EPA No. 832-R-97-001b. Accessed online at <http://nepis.epa.gov/> on May 12, 2008.

United States Environmental Protection Agency. 2002. 2000 National Water Quality Inventory Report. EPA No. EPA-841-R-02-001. Accessed at <http://www.epa.gov/305b/2000report/> on June 11, 2008.

United States Environmental Protection Agency. 2003. Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems. EPA No. 832-B-03-001. Accessed online at http://www.epa.gov/owm/septic/pubs/septic_guidelines.pdf on May 12, 2008.

United States Environmental Protection Agency. 2005. Handbook for Managing Onsite and Clustered (Decentralized) Wastewater Treatment Systems. EPA No. 832-B-05-001. Accessed online at http://www.epa.gov/owm/septic/pubs/onsite_handbook.pdf on May 12, 2008.

Yeager, Tom; Ehrhard, Ray; and Murphy, John. 2006. Business Attributes Of Successful Responsible Management Entities. Community Environmental Center at Washington University. Accessed online at <http://www.ndwrcdp.org/userfiles/04DEC4SG.pdf> on May 12, 2008.