Pinelands Pilot Program for Alternate Design Wastewater Treatment Systems

April 23, 2003

New Jersey Septage Management Association
“In general, aquifers will return small quantities of untreated sewage to clean, pristine water fairly quickly. As long as the amount of sewage did not exceed the “assimilative capacity” of the underlying aquifer...”

Municipal Report of the City of Charleston, South Carolina, 1881 as reported by Chapelle, 1997, p. 157
“But as the habitations were gradually built up and the population increased, it was noticed that the water in the wells, especially in the more populous portions, was rapidly losing its pristine purity, and was becoming hard, impotable and injurious to health...”

Municipal Report of the City of Charleston, South Carolina, 1881 as reported by Chapelle, 1997, p. 157
History of On-site Wastewater Regulation in the State of New Jersey

• **1938** NJSA 26:3-83 Municipal and regional boards of health defined in Title 26 of State Statutes.

• **1939** NJSA 26:2-64 Sanitation at public toilets regulated to prevent insect vector transmission and to prohibit discharges to any waters of the state.

• **1945** NJSA 26:3B State law regulates privies, privy vaults, cesspools, septic tanks, tile disposal fields or other means of disposal to prevent spread of disease and pollution of any well or spring used as a potable water supply.
History of On-site Wastewater Regulation in the State of New Jersey

• **1953** Public Health and Sanitation Codes include *Individual Sewage Disposal System Code of New Jersey* (model code) adoptable by local Boards of Health. Provides perc test, design flows, setbacks, field and tank sizing. [source of many of today’s design standards]
1954  NJSA 58:11-27  State wide adoption of the Realty Improvement Sewage and Facilities Act (commonly referred to as Chapter 199)  Law provides local boards of health the power to review plans and certify construction of new septic systems.  Also gives power to the State Department of Health to review proposed septic systems in subdivisions of 50 or more housing units.
History of On-site Wastewater Regulation in the State of New Jersey

• **1966** Legislature adopts “Regulations Governing Installation of Sewerage Facilities in Critical Areas” to give the State Health Department the power to set special regulations for septic system construction in “problem areas” and to restrict septic system use in any area that is judged critical because of soil conditions, ground water levels and population densities.

• Targets areas between tidal water and Elev. + 10

• Includes large areas of Monmouth, Ocean, Burlington, Atlantic & Cape May Counties

• In large part in response to degradation of the Metedeconk River

• Credited with protecting Southern Barnegat Bay & the Mullica River
History of On-site Wastewater Regulation in the State of New Jersey

• **1978** Central Pine Barrens Critical Area - Standards adopted which regulate proposed wastewater discharges based upon nitrogen model. 10 ppm is the groundwater standard and 2 ppm is the surface water standard. Establishes minimum lot size for septic systems based upon NJDEP nitrate modeling.

Landmark regulation-first use of nitrate modeling
History of On-site Wastewater Regulation in the New Jersey Pinelands

• **1979** Governor Byrne signed executive order to create the Pinelands Development Review Board. Pinelands Protection Act NJSA 13:18A-1 et seq. signed into law. Interim rules are based upon the Critical Area standards.

• **1981** Pinelands Comprehensive Management Plan adopted. These regulations require compliance with 2 ppm groundwater quality standard and impose limitations on development of septic systems where seasonal high water table is less than five feet.
History of On-site Wastewater Regulation in the New Jersey Pinelands

• **1981** (con’t) Waterless toilets permitted on minimum 1 acre lots. Pressure dosing septic systems allowed on minimum 1.6 acre lots based upon studies crediting pressure dosing with 44% nitrogen reduction over conventional systems.

• **1985** Ruck septic system permitted on an experimental basis initially on minimum one acre lots. Study concludes minimum 1.5 acres is required to meet nitrogen dilution requirements. Maintenance and cost issues limit use of the system with the last of the RUCK systems installed in the early 1990’s. The pressure dosing system proves to have an economic advantage.
History of On-site Wastewater Regulation In the New Jersey Pinelands

- **1990** Pinelands Commission and Rutgers University, Division of Pinelands Research initiate study to compare nitrogen removal capability of pressure dosing and conventional septic systems.

- **1996** Pinelands Commission reports that there is no significant difference in nitrogen removal between pressure dosing and conventional septic systems.

- **2000** Pinelands Ad Hoc Committee on Alternative Septic Systems formed to study alternative onsite wastewater treatment systems as a possible replacement for pressure dosing systems.
History of On-site Wastewater Regulation In the New Jersey Pinelands

• **2002** Pinelands Commission adopts the Pinelands Pilot Program for Alternate Design Wastewater Treatment Systems allowing the use of five advanced denitrification systems.
Pinelands Alternate Design
Wastewater Treatment System Pilot Program
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

• Pilot program was developed by an Ad Hoc Septic System Committee to investigate viable nitrogen attenuation systems as a substitute for pressure dosing systems.

• Ad Hoc Committee comprised of Pinelands Commissioners, Pinelands Municipal Council, Pinelands Preservation Alliance, and New Jersey Builders Association.

• Close consultation with NJDEP, various academic institutions, other state regulators (MD, MA, RI, and PA), Pinelands county health departments, and other nationally renowned onsite wastewater experts.

• Two year process to research systems and develop rules.
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

• Group reached unanimous consensus in its findings.

• Treatment technologies are based upon principles of biological nitrogen reduction which are well studied and documented in engineering texts with recommended design standards.

• Program fits with the current NJDEP initiatives to allow “innovative and alternative” technologies to receive local AA approval.
Pinelands Alternate Design Wastewater Treatment System Pilot Program

• Applies to residential development on less than 3.2 acres
• Design plans must be signed and sealed by NJPE
• Design plan must be reviewed by and certified by vendor
• Both NJPE and vendor representative must perform final inspection and sign-off on “as built” construction
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

• All systems covered under a 5 year parts & labor warranty
• All systems covered under a 5 year O & M prepaid service contract
• O & M shall include at least one service call annually
  - with sludge removal included
• All systems shall be equipped with automatic dialer
• Quarterly effluent sampling by NJ certified lab for 3 years
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

• Laboratories will report monitoring results, within 5 days of completion, to Pinelands Commission and system manufacturer

• Data will be made available to interested parties and included in a database developed jointly with NJDEP

• Commission staff will issue annual reports on the installation, maintenance and performance of each technology

• Manufacturers must submit semi-annual reports to the Commission on number of systems installed, analysis of monitoring results, and information on any installation, maintenance and operational problems.
Pinelands Alternate Design Wastewater Treatment System Pilot Program

- The rule requires interim reports in the event of significant problems with one or more of the technologies
- Rule establishes a hearing process to give the manufacturer an opportunity to refute Commission conclusions and/or propose remedial response
- Commission could allow continued use of technology with modifications, increase the minimum lot size to meet 2ppm nitrogen requirement, or could stop future installations of a problem plagued system
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

- System owners will not be held liable for a system not meeting nitrogen discharge expectation if the system has been properly operated and maintained.
- Pilot program applies only to residential development.
- Rules do not increase permitted residential densities or lessen minimum lot size requirements.
- They merely allow for the use of advanced treatment technologies to meet groundwater quality standards in areas which are already zoned to permit unsewered development on lots <3.2 acres in size
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

• Pilot program limits the number of like-brand systems in a single development to no more than ten units

• Aims to minimize localized degradation of water quality if a technology fails to meet nitrogen removal expectations

• Also encourages the use of community systems in these circumstances for cost and maintenance - economy of scale reasons
Manufacturer Submission Requirements

1. Detailed specifications and engineering design to Commission for review by staff and NJDEP
2. Description of automatic dialer and how it will operate
3. Effluent monitoring protocol (quarterly sampling) including sample collection details
4. Owners (and operators) operation and maintenance manual
5. Sample warranty
6. Sample maintenance contract
7. Sample deed notice
Pinelands Alternate Design
Wastewater Treatment System Pilot
Program

Municipal And County Health Department Role

• Each pinelands municipality must adopt a local implementing ordinance (model ordinances distributed)
• County Health Officials will witness site evaluations, review designs and applications, and inspect system construction
• County Health Officials will enforce public health aspects of system operation (overflows, etc.) but not nitrogen attenuation
• Both municipal and county officials will be asked to play a role in the long term management of the systems
Pinelands Alternate Design
Wastewater Treatment System Pilot Program

Pilot Program Evaluation Criteria

1. The level of nitrogen in effluent based upon all monitoring
2. The maintenance required to keep systems performing
3. The cost of installing and maintaining each technology
4. The extent and frequency of installation, operation and maintenance problems
5. The number of individual systems evaluated from each manufacturer
6. Does the continued use of the systems further the purposes and objectives of the Pinelands Protection Act, The Federal Act and the Comprehensive Management Plan
EPA Onsite/Decentralized Management Guidelines
Water Quality Problems
on a National Scale

- 10-30% of systems failing annually
- Over 50% of systems >30 yrs. old
- Not meeting Clean Water Act goals

Management is the answer
Management’s Advantages
What is a Management Program?

• A series of processes that address:
  – Public awareness and acceptance
  – Ground and surface water protection requirements
  – Siting, sizing, design and installation
  – Operation and maintenance
  – Residuals management
  – Monitoring and reporting
  – Enforcement (if needed)
Management Requires Patience
Management Guidelines

• Progressive series of 5 levels
  – As resource sensitivity and technology increases, so does the management level
• Do not supercede existing laws
• Surface and subsurface discharges
• For existing, new and all sized systems
Model Program #1
System Inventory and Awareness of Maintenance Needs

• Covers conventional septic systems
• Local agency is aware of system locations
• Properly sited and installed
• Periodic operation and maintenance reminders
Model Program #2
Management through Maintenance Contracts

• Certain systems given more attention

• Allows for more complex options
  – e.g., aerobic systems, package plants

• Maintenance contracts with trained service providers
Model Program #3
Management through Operating Permits

- Performance requirements
- Renewable operating permits
- Regular reporting and monitoring
  - e.g., commercial systems, large dischargers
Model Program #4
Responsible Management Entity Operation and Maintenance

- Management entity (public or private)
- Responsible for operation and maintenance
- Ensures consistent performance
- Routine inspections
Model Program #5
Responsible Management Entity
Ownership and Management

• Professional management of all activities
  – Comparable to centrally sewered management

• Allows area-wide management

• Reduces oversight by regulatory agency
Decentralized Web Site

http://www.epa.gov/owm/decent/index.htm
# Pinelands Alternate Design
## Wastewater Treatment System Pilot Program

### Five Pilot Program Authorized Systems

<table>
<thead>
<tr>
<th>System Name</th>
<th>System Vendor</th>
<th>Treatment Process</th>
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<tbody>
<tr>
<td>Amphidrome</td>
<td>F.R. Mahony &amp; Assoc</td>
<td>Fixed Film Sequencing Batch Reactor</td>
</tr>
<tr>
<td>Bioclere</td>
<td>Aquapoint, Inc.</td>
<td>Modified Trickling Filter</td>
</tr>
<tr>
<td>Cromaglass</td>
<td>Cromaglass Corp.</td>
<td>Sequencing Batch Reactor</td>
</tr>
<tr>
<td>FAST</td>
<td>Bio-Microbics, Inc.</td>
<td>Fixed Activated Sludge Treatment</td>
</tr>
<tr>
<td>RFS III</td>
<td>Ashco-A-Corp.</td>
<td>Recirculating Sand Filter</td>
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Wastewater Treatment System
Pilot Program