New Jersey Pinelands Commission

Alternate Design Wastewater Treatment Systems Pilot Program

November 5, 2025

Implementation Report

NEW JERSEY PINELANDS ALTERNATE DESIGN WASTEWATER TREATMENT SYSTEMS PILOT PROGRAM

IMPLEMENTATION REPORT

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Background

Water resources are one of the most important attributes of the Pinelands Area, particularly for the sustainability and resiliency of healthy ecosystems. The water quality requirements of N.J.A.C. 7:50-6, Part VIII provide for the protection of water resources by limiting the amount of nitrogen that enters the environment both because nitrogen is a significant pollutant and it also serves as an indicator of changes in overall water quality. For these reasons, the Pinelands Comprehensive Management Plan (CMP) limits the nitrate nitrogen concentration in wastewater such that the overall concentration of nitrate-nitrogen in groundwater exiting the parcel or entering an adjacent waterbody does not exceed to 2 mg/L. Based on the Septic Dilution Model, a single-family dwelling served by a standard septic system must be located on 3.2-acre parcel to meet the 2 mg/L nitrate-nitrogen standard in groundwater. Under specific development standards set in N.J.A.C. 7:50-5, the CMP authorizes residential developments on lots between one and 3.2 acres. This gap between the permitted development of dwellings on parcels comprised of less than 3.2 acres and the inability to allow development on those parcels to be served by onsite septic systems resulted in the need to identify advanced wastewater technologies that could reduce nitrogen in wastewater.

In 2000, the Pinelands Commission formed a special Pinelands Ad Hoc Septic System Committee (Committee) to research alternate septic system technologies that might better meet the water quality requirements of the CMP (N.J.A.C. 7:50-6.84), for residential development on parcels smaller than 3.2 acres. The Committee was comprised of seven Commission members and one representative each from the Pinelands Municipal Council, the Pinelands Preservation Alliance, and the New Jersey Builders Association. In its research efforts, the Committee consulted wastewater engineering professionals, state and regional on-site technology demonstration projects, alternate treatment system technology manufacturers, Pinelands area county health departments, and other state and local agencies. Throughout the process, the Committee coordinated its research and program development efforts with the New Jersey Department of Environmental Protection (NJDEP).

The Committee unanimously recommended that a Pilot Program be established for the approval, installation and monitoring of wastewater treatment technologies and that the program should provide conditions and safeguards to govern their use. The Commission solicited proposals from advanced wastewater technology manufacturers and subsequently identified five technologies to be included in the Pilot Program initially. As part of that initial solicitation, the systems were pre-screened to evaluate the viability of achieving the necessary nitrogen reduction in system effluent. The approved technologies in the earliest phase of the pilot program were Amphidrome, Ashco RFS III, Cromaglass, Bioclere, and FAST treatment systems.

The Pilot Program

The Pinelands Commission adopted a set of amendments to the CMP that authorized the use of the technologies through the Alternate Design Treatment Systems Pilot Program (Pilot Program). These CMP standards are codified at N.J.A.C. 7:50-10, 10.21 et seq. The Pilot Program provides a means to test whether

certain technologies can be maintained and operated to meet the water quality standards of the CMP in a manner that a homeowner can be reasonably expected to follow. The approved alternate design treatment technologies are authorized for use in all municipalities for the duration of the program, whether or not the specific terms of the program are reflected in a municipal ordinance.

When it is necessary to add new advanced technology systems to the Pilot Program, technologies that are expected to meet the Pinelands water quality standards are invited to apply. The Commission most recently invited applications for new technologies to participate in the Pilot Program in 2021. As part of the application process, the manufacturers must provide the Commission with detailed engineering plans and specifications for the technology, a description of an alarm and telephone dialer to alert offsite maintenance personnel of a system malfunction, a monitoring protocol for the sampling and analysis of effluent samples, operation and maintenance manuals for the technology, as well as samples of the following documents: system warranty, maintenance contract, and deed notice.

Implementation of the Pilot Program commenced on August 5, 2002. After that date, applications for residential development to be served by onsite septic system(s) on lots smaller than 3.2 acres were required to use an approved alternate design wastewater treatment system and participate in the Pilot Program. As part of the development approval process, each alternate design treatment system must be covered under a five-year comprehensive parts and labor warranty and a five-year operation and maintenance contract. Quarterly sampling and analysis of treated effluent is required during the initial three years of operation for each residential system installed under the Pilot Program with analytical results submitted to the Commission.

Among the technologies that participated in the initial phase of the Pilot Program, Amphidrome and Bioclere were found to be capable of meeting the Pinelands water quality standards and were allowed to graduate from the Pilot Program in 2010. Both were authorized for residential use on minimum one-acre parcels. The piloted FAST system graduated from the Pilot Program in 2016 and was authorized for residential use on 1.4-acre parcels. Graduating from the Pilot Program means that the quarterly monitoring protocol that is required for each installed system is no longer necessary and the CMP has been amended to authorize the use of that technology in the Pinelands going forward. The other two technologies that participated in the Pilot Program initially, Ashco RFS III and Cromaglass were removed from the Pilot Program in 2006 and 2013, respectively. Ashco A RFS III was removed because of lack of sales, and Cromaglass was removed for not achieving the necessary nitrogen reduction to meet the Pinelands water quality standards.

In 2011, the Commission replaced the systems that graduated or were removed from the Pilot Program with four new pre-screened technologies. These new technologies included BioBarrier, Busse GT, Hoot ANR, and SeptiTech. Subsequently, BioBarrier and Busse GT were removed from the Pilot Program in 2020. SeptiTech on the other hand graduated from the Pilot Program and was authorized for use on one- acre parcels.

In the third and current round of the Pilot Program which began in 2021, there are five technologies that are participating. Fuji Clean CEN Series, Pugo Systems, and Waterloo Biofilter, were admitted into the Pilot Program in 2021. Hoot ANR has been in the Pilot Program since 2011. Busse GT, which was initially removed from the Pilot Program in 2020, applied for readmission and has been included in the third round of the program as well. Table 1 provides a summary of all pilot technologies that have ever participated in the program, along with their status, the basis for recommended actions in the past or in the current report, and the minimum required parcel size to meet the Pinelands water quality standards.

Implementation Report

The CMP requires the Executive Director to report on the Pilot Program no later than November 5, 2025. The report must include findings on nitrogen treatment capabilities, maintenance requirements, costs and problems of maintaining the systems, as well as any recommendations for ongoing evaluation or graduation of any technology from the Pilot Program.

This implementation report focuses specifically on the five treatment technologies currently in the Pilot Program, namely: Hoot ANR, Fuji Clean CEN Series, Waterloo Biofilter Residential Model treatment system, Pugo Residential wastewater treatment system, and Busse Innovative Systeme GmBH Model MF-B-400. While this report briefly discusses various aspects of each of the technologies that have previously participated in the Pilot Program, more detailed information on the program and a more thorough discussion of the permanently approved and eliminated technologies are available in previous reports on the Commission's website.

Per N.J.A.C. 7:50-10.23(c)1-6, this report evaluates the five technologies that are currently being piloted with respect to the following:

1. The level of nitrogen in the effluent from each alternate design Pilot Program treatment technology (Note: 14 mg/L total nitrogen (TN) in treated effluent is required to meet Pinelands water quality standards for residential use on minimum one-acre parcels);

2. The maintenance required for each technology to meet the effluent requirements;

3. The cost of installing and maintaining each treatment technology;

4. The problems associated with the installation, operation and maintenance of each treatment technology, the frequency of the problems, and the measures taken to address and eliminate the problems;

5. The number of systems of each technology that have been authorized under the Pilot Program; and

6. Whether the Pilot Program, when viewed in its entirety, has served to further the purposes and objectives of the Pinelands Protection Act, the Federal Act, and the CMP.

Pilot Technologies Past and Present

Table 1 identifies the current status, staff recommendations, and basis for those recommendations for each of the wastewater treatment technologies that are currently participating or previously participated in the Pilot Program.

Table 1. Status, minimum lot size, and staff recommendations for each treatment technology currently participating or previously participated in the Pilot Program.

Technology	Status	Minimum Parcel Size Required (Acre)	Recommendation in this Report	Basis for Recommendation, Removal, or Graduation Status
Fuji Clean	Pilot phase	Not verified	Additional time for data collection and evaluation	Insufficient data for evaluation
Hoot ANR	Pilot phase	Not verified	Additional time for data collection and evaluation	Insufficient data for evaluation
Busse MF-B-400	Pilot phase (evaluation pending installations)	Not verified	Additional time for potential sales	To allow more opportunity for sales
Pugo Systems	Pilot phase (evaluation pending installations)	Not verified	Additional time for potential sales	To allow more opportunity for sales
Waterloo Biofilter	Pilot phase (evaluation pending installations)	Not verified	Additional time for potential sales	To allow more opportunity for sales
Amphidrome	Graduated from Pilot Program	1.0	No change in status	Achieved water quality standards for 1.0 acres
Bioclere	Graduated from Pilot Program	1.0	No change in status	Achieved water quality standards for 1.0 acres
FAST	Graduated from Pilot Program	1.4	No change in status	Achieved water quality standards for 1.4 acres
Ashco A RFS III	Removed from Pilot Program	3.2	No change in status	Removed due to lack of sales
BioBarrier	Removed from Pilot Program	2.2	No change in status	Did not meet water quality standards
Cromaglass	Removed from Pilot Program	3.2	No change in status	Did not meet water quality standards

Table 2 identifies the type of biological nutrient removal process employed by each technology that has been admitted into the Pilot Program over the duration of the program.

Table 2. Microbiological treatment processes of technologies that are currently participating or previously participated in the Pilot Program.

Technology	Microbiological Treatment Type
Hoot ANR	Activated Sludge (Suspended Growth)
Fuji Clean CEN Series	Contact filtration Fixed-film media (Attached Growth)
Busse MF-B-400	Membrane Bioreactor (Suspended Growth)
Pugo Systems	Stacked Fixed Media (Attached Growth)
Waterloo Biofilter	Fixed-Film Trickling Filter (Attached Media)
Amphidrome	Sequencing Batch Aerated Aggregate Filter (Attached Growth)
Ashco RFS III	Recirculating Sand Filter (Attached Growth)
Bioclere	Trickling Plastic Media Filter (Attached Growth)
BioBarrier	Membrane Bioreactor (Suspended Growth)
Cromaglass	Sequencing Batch Reactor (Suspended Growth)
FAST	Fixed-Film (Attached and Suspended Growth)
SeptiTech (STAAR)	Fixed-Film Trickling Filter (Attached Growth)

Pilot Program Technologies Currently Under Evaluation

In November 2021, four new pre-screened treatment technologies were admitted into the Pilot Program. Eligibility was limited to technologies that had attained NSF Standard 245 certification and/or U.S. Environmental Protection Agency (USEPA) Environmental Technology Verification (ETV). Both the NSF Standard 245 and the USEPA Verification certification programs evaluate a technology's ability to reduce nitrogen in wastewater.

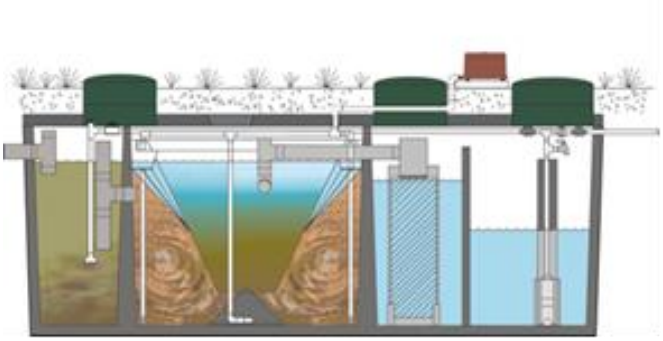
Vendors of NSF Standard 245 and/or USEPA ETV certified technologies were invited to apply for participation in the Pilot Program. The Commission received applications from the vendors of Pugo Systems, Fuji Clean CEN Series, Busse Innovative Systeme GmBH Model MF-B-400, and Waterloo Biofilter residential wastewater treatment systems. Based on the evaluation of the performance data, Pugo System was expected to produce a final effluent TN concentration of 17 mg/L; Fuji Clean, Busse MF-B-400, and Waterloo Biofilter were expected to produce final effluent TN concentrations of 14 mg/L. Using the Pinelands septic dilution model, the Pugo systems could be allowed to serve single family dwellings on 1.26-acre parcels, and the other three technologies could serve single family dwellings on 1.0-acre parcels to meet the 2 mg/L nitrate-nitrogen standard in the CMP.

Upon reviewing NSF's reported performance and cost data, the Pinelands Commission authorized the use of these four technologies for participation through the Pilot Program. Along with Hoot ANR, which has been in the program since 2011, there are currently five technologies participating in the Pilot Program. Subsequently, the NJDEP issued a generic Treatment Works Approval (TWA) to authorize Pinelands Area Health Departments to approve the four newly piloted treatment systems as well as those that were previously admitted into the Pilot Program, such as Hoot ANR.

The following sections provide details on the processes used in each technology to reduce nitrogen in wastewater effluent. In addition, these sections on each technology offer recommendations on continued inclusion in the Pilot Program.

Hoot ANR

The Hoot ANR treatment system is an extended aeration/activated sludge treatment process coupled with anaerobic denitrification. The unit is comprised of five principal components: a Pretreatment Tank, Aeration Chamber, Clarifier, Media Tank, and Final Clarifier/Pump Tank.



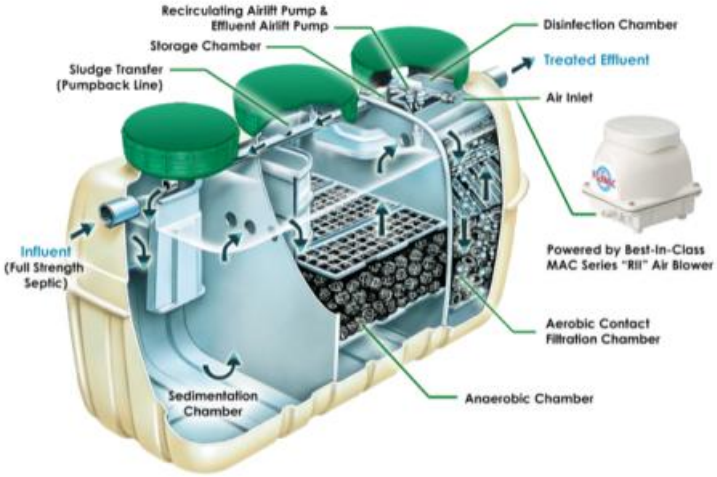
The Pre-Treatment tank provides separation and anaerobic digestion of influent solids and functions much like a septic tank by reducing up to 50% Total Settable Solids (TSS) and approximately 25% of Biochemical Oxygen Demand (BOD5). Liquid waste flows out of the pretreatment tank through a baffled outlet and into the aeration chamber. The activated sludge treatment process occurs in the aeration chamber through the introduction of oxygen into the mixed liquor to enable the conversion of soluble material into biomass. In addition, oxygen enables nitrifying bacteria to convert ammonia-nitrogen to nitrate-nitrogen. Wastewater then flows to a clarifier for additional solids settling. From the clarifier, wastewater is transferred to a media tank where an attached growth treatment process occurs. Here, a proprietary carbon source is added. In the presence of the supplemental carbon source, denitrifying bacteria release free nitrogen into the atmosphere. A final clarifier/pump tank constitutes the last treatment component before discharge to the soil absorption field. A portion of the daily

flow of the system is recirculated from this chamber to the pre-treatment tank where it is reprocessed through the system.

Hoot ANR was admitted into the Pilot Program in 2011 and was initially recommended for removal in the 2019 implementation report due to a lack of installations, however, with their first installation in 2020, they were allowed to remain in the Pilot Program. There have been four systems of Hoot ANR installed and approved in the Pinelands Area and a total of 34 samples collected from three of the systems at present. Two of the systems have completed the CMP's 3-year quarterly sampling requirement for alternate septic systems in the Pilot Program. The grand median of the total nitrogen concentration from the sampling results is currently 8.9 mg/L. The sampling results so far are very promising as they tend to be less than the 14 mg/L post-treatment target for 1.0-acre parcels. However, at this time, there have not been enough systems installed, or enough samples taken to draw a definitive conclusion about the performance of this technology. It is therefore recommended that Hoot ANR remains in the Pilot Program to allow time for additional installations and sampling to ascertain its continued effectiveness.

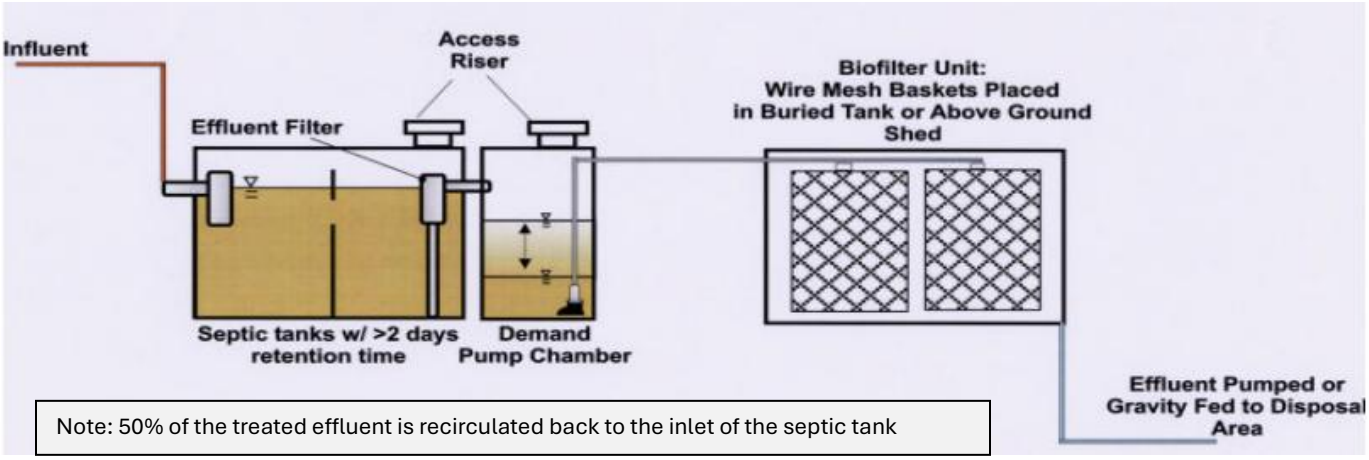
Fuji Clean CEN Series

The Fuji Clean wastewater treatment system uses a contact filtration method with various chambers that utilize both aerobic and anaerobic treatment processes to remove pollutants from wastewater. Fuji Clean is designed to remove pathogenic organisms, organic materials, solids, and nutrients using a combination of biological and physical treatment methods. Nitrogen removal is accomplished through the biodegradation of the waste stream as it is recirculated several times through aerobic and anaerobic chambers. The first step involves separation of solids and grease in the Sedimentation Chamber along with the decomposition of protein and amino acids to form ammonium nitrogen. The second process occurs in the Aerobic Chamber where more suspended solids are filtered, and microbial organisms oxidize nitrites to ammonia and then to nitrates. In the third step, a Recirculating Airlift Pump returns the wastewater and sludge to the Sedimentation Chamber and then to the Anaerobic Chamber. This chamber consists of a spherical filter media where microbial organisms reduce nitrate to nitrogen gas (denitrification) thereby removing nitrogen from the system. After this, the wastewater moves to the Storage Zone, which allows for more settling to occur, and then to the Disinfection Zone, which provides the option of chlorination. A second air lift pump, the Effluent Air Lift Pump ensures flow equalization and discharge of treated effluent.



Fuji Clean has a total of 13 installed and approved systems in the Pinelands Area. There have been 34 samples taken from seven systems so far. None of the systems have completed the required quarterly sampling for the mandatory three-year period. The current grand median for the TN sampling results is 10.8 mg/L, which is below the 14 mg/L post-treatment target for 1.0-acre parcels. The results here are also promising, but just like Hoot ANR, sufficient data is not available to make a final recommendation on its performance. It is recommended that Fuji Clean be allowed to stay in the Pilot Program to allow time to confirm the technology's continued TN removal efficiency.

Waterloo Biofilter



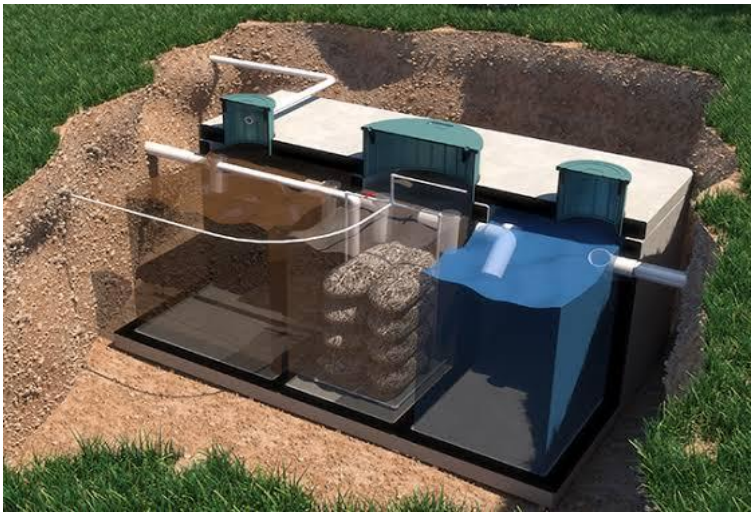
The Waterloo Biofilter® Model 4-Bedroom system is a two-stage treatment technology, based on a fixed film trickling filter, using patented foam cubes to achieve treatment. The foam filter consists of 2-3 inches of shredded foam in mesh bags that absorb wastewater as it trickles down. Naturally occurring microbes stay on the interior surfaces of the filter media where they can expand in the large open pores and break down the contents of the wastewater without limiting the flow of water and air. The first stage of treatment occurs in the primary septic tank (typically 1,000-1,500-gallon) in which the solids are settled and partially digested. The Biofilter® unit, is a separate system that provides aerobic treatment of wastewater. Here, ammonia nitrogen is converted to nitrite and then to nitrate. As the wastewater trickles through the foam cubes, capillary action allows the filter media to hold onto the wastewater long enough to allow the microbes to break down the organic material and nitrify ammonium.

The system does not require air compressors and diffusers but relies on passive aeration provided by openings and the characteristics of the foam material itself. Recirculation of the wastewater back to the first chamber of the septic tank is an important aspect of the treatment process as that allows for denitrification (conversion of nitrate to nitrogen gas) and therefore nitrogen removal to occur. Generally, there is a 50% dispersal and 50% recirculation rate. Recirculation helps to regulate flows for better dispersal, remove more organic matter to increase nitrification, and increase denitrification to enhance nitrogen removal. The manufacturers assert that the treatment system can remove about 90-95% of carbonaceous biochemical

oxygen demands (cBOD) and total dissolved solids. The technology has two systems: the single pass and the recirculating system. They assert that the single-pass system is able to achieve a 25-30% total nitrogen reduction, and the recirculating system is able to achieve a 50-65% total nitrogen reduction.

There have been no Waterloo Biofilter systems installed in the Pinelands Area. Therefore, there is no performance data to be reported. However, it is recommended that the technology remains in the Pilot Program to allow additional time for systems to be installed and evaluated.

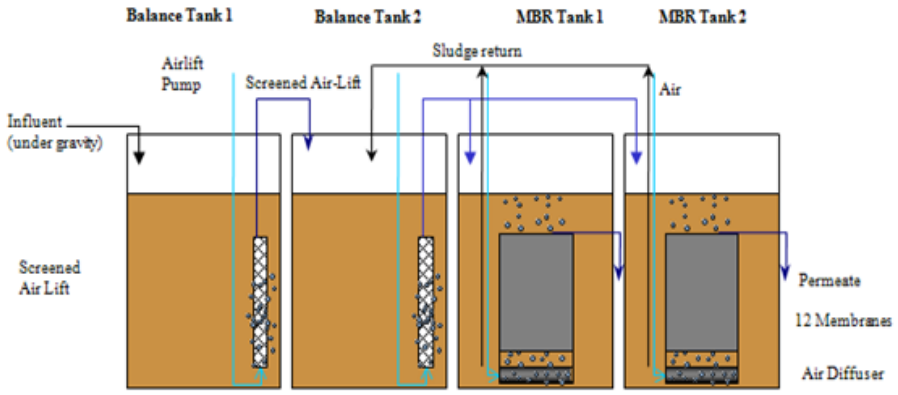
Pugo Systems



The Pugo Systems consist of 3 chambers: Primary Chamber, Aerobic (Aeration) Chamber, and the Clarifying Chamber. The Primary Chamber is where solids and grease are separated from the wastewater. There is a baffle in this chamber that captures the floatable solids, while the settled solids at the bottom of the chamber undergo anaerobic treatment. Sludge and scum are periodically removed from this chamber through vacuuming in the same manner as with a conventional septic tank. The second chamber, the Aerobic Chamber, is made up of stacked media beds, where microbial organisms decompose contents of the wastewater, which helps to remove nitrogen and other pollutants from the water. There is a pump below the media that transfers oxygen for the aerobic treatment process to allow microbes to oxidize organic nitrogen to nitrate. The wastewater either recirculates back to the Primary Chamber with an air lift pump controlled by a needle valve after aeration or flows to the Clarification Chamber. Recirculation serves two purposes. First, recirculation creates a constant flow of wastewater through the treatment unit, thereby creating more stable operating conditions. Second, recirculation of nitrified effluent from the aeration chamber to the first chamber allows removal of nitrogen from wastewater by biological denitrification due to the anoxic conditions that exist in that chamber. The third chamber, the Clarifying Chamber, settles out residual solids from the effluent that flows out of the aerobic treatment.

There have been no Pugo systems installed in the Pinelands Area. Therefore, there is no performance data to be reported. However, it is recommended that the technology remains in the Pilot Program to allow additional time for systems to be installed and evaluated.

Busse Model MF-B-400



The Busse Model MF-B-400 wastewater treatment system is a small-scale membrane bioreactor (MBR). The system provides treatment in a three-stage, four-tank process. Wastewater enters an intermittently aerated first tank and is then transferred by an airlift through a mesh filter to an identical second tank. Wastewater in the second tank is divided evenly between two membrane tanks, again with a screened airlift transfer. The membrane units are submerged in activated sludge within the reactor tanks. The tanks are aerated by coarse and fine bubbles that provide a cross flow of liquid over the surface of the membrane panels. Cross flow circulation reduces membrane fouling and provides oxygen for microbial degradation of wastewater organics. The liquid head above the membrane drives permeate from the wastewater mixture through the membrane, where it flows via a manifold through the tank wall and is discharged. A third air pump provides aeration to the airlifts in the first two tanks. The bioreactor provides an aerobic environment where microorganisms present in the wastewater remove soluble contaminants, using them as a source of energy for growth and production of new microorganisms. The membranes also provide a barrier that retains the microorganisms, allowing them to remain in the treatment process for long periods of time. The long residence time in the treatment system allows for the organisms to consume themselves, reducing the total amount of solids produced by the treatment process.

The organisms flocculate and form aggregations that further physically entrap particulate organic matter. The organic matter is attacked by extracellular enzymes that solubilize the solids to make them available to microorganisms as a food source. The conversion of organic matter from soluble to biological solids allows for removal of the organic matter by settling and filtration of the solids in the treatment process.

The Busse system was initially added to the Pilot Program in 2011 but was removed in 2020 due to lack of installations. They reapplied to the Pilot Program and was later reinstated in 2021.

There have been no Busse Innovative Systeme GmBH Model MF-B-400 systems installed in the Pinelands Area. Therefore, there is no performance data to be reported. However, it is recommended that the

technology remains in the Pilot Program to allow additional time for systems to be installed and evaluated. Further explanation is provided later in the report under "Recommendations and Conclusions."

Pilot Program Evaluation

1. Level of nitrogen in the effluent in each alternate design Pilot Program treatment system based on the evaluation of all monitoring results for that technology under the Pilot Program

The CMP requires that each technology manufacturer arrange for the collection and analysis of treated effluent on a quarterly basis for the first three years that each system is in use (for a total of twelve samples per system). All samples must be analyzed by NJDEP certified laboratories employing analytical procedures approved by NJDEP's Office of Quality Assurance. Additionally, sample collection, transport, and analysis must conform to the latest NJDEP Field Sampling Procedures Manual to ensure quality assurance and quality control in the collection and transport of samples (i.e. chain of custody, sample preservation, etc.). All effluent samples are collected between the treatment unit and the soil dispersal field prior to the effluent being discharged to the soil absorption system. To permit the establishment of microbiological cultures necessary for the treatment process to develop and stabilize, sampling is not required during the first ninety days following system start-up.

The tables below show the running median of TN concentration for Hoot ANR (Table 3) and Fuji Clean (Table 4). Sufficient data is not available for either technology at present to complete an evaluation and make a final recommendation about their continued use in the Pinelands Area. However, the grand median TN concentration in the effluent for each technology thus far is below 14 mg/L. This initial data that has been collected indicates that for use by single family dwellings on 1.0-acre parcels, they are meeting the Pinelands water quality standards as determined by the Septic Dilution Model. Since there have not been any installations of the Busse Innovative Systeme MF-B-400, Waterloo Biofilter, or Pugo Systems in the Pinelands Area, there is no data to report for these technologies at this time.

Table 3, below, shows the analytical results for total nitrogen in treated effluent from installed Hoot ANR systems serving residential development through the Pilot Program.

Table 3. Hoot ANR running median [TN] (mg/L) by number of sampling events for each wastewater treatment system. The grand median, 25th percentile, 75th percentile, and number of systems sampled (n) per event are provided. The total number of samples is 34.

Total Nitrogen Running Median		Number of Sampling Events													
Technology	System	1	2	3	4	5	6	7	8	9	10	11	12	13	Grand Median
Hoot ANR	1	6.8	7.7	8.6	7.7	8.6	8.8	8.6	8.8	8.6	8.8	8.9	9.1	9.3	8.6
Hoot ANR	2	9.6	7.6	8.9	9.3	8.9	8.0	8.9	8.8	8.7	8.8	8.9	9.1		8.9
Hoot ANR	3	5.9	8.0	10.0	12.1	10.0	9.1	10.0	10.3	10.0					10.0
Sample # Median		6.8	7.7	8.9	9.3	8.9	8.8	8.9	8.8	8.7	8.8	8.9	9.1	9.3	**8.9**
25th Percentile		6.4	7.7	8.8	8.5	8.8	8.4	8.8	8.8	8.7	8.8	8.9	9.1	9.3	8.8
75th Percentile		8.2	7.8	9.5	10.7	9.5	8.9	9.5	9.5	9.4	8.8	8.9	9.1	9.3	9.3
n		3	3	3	3	3	3	3	3	3	2	2	2	1	

Table 4, below, shows the analytical results for total nitrogen in treated effluent from installed Fuji Clean systems serving residential development through the Pilot Program.

Table 4. Fuji Clean running median [TN] (mg/L) by number of sampling events for each wastewater treatment system. The grand median, 25th percentile, 75th percentile, and number of systems sampled (n) per event are provided. The total number of samples is 34.

Total Nitrogen Running Median		Number of Sampling Events												
Technology	System	1	2	3	4	5	6	7	8	9	10	11	12	Grand Median
Fuji Clean	1	7.2	7.9	7.2	6.7	7.2	7.9	7.2	7.3	7.4	7.9			7.2
Fuji Clean	2	11.2	9.0	11.2	10.7	11.2	10.7	11.2	10.7	10.2				10.7
Fuji Clean	3	22.4	17.2	12.9	12.4	11.9	12.4	12.9						12.9
Fuji Clean	4	13.0	11.7	12.0	11.3	12.0								12.0
Fuji Clean	5	6.9												6.9
Fuji Clean	6	14.3												14.3
Fuji Clean	7	8.7												8.7
Sample # Median		11.2	10.4	11.6	11.0	11.5	10.7	11.2	9.0	8.8	7.9			**10.8**
25th Percentile		7.9	8.7	10.2	9.7	10.2	9.3	9.2	8.1	8.1	7.9			8.9
75th Percentile		13.6	13.1	12.3	11.6	12.0	11.5	12.0	9.8	9.5	7.9			11.8
n		7	4	4	4	4	3	3	2	2	1			

Tables 5A and 5B provide a summary of the effluent TN concentration for all technologies that are participating or previously participated in the Pilot Program, the number of systems providing data, the total number of samples used for the evaluation, and the minimum parcel size needed to achieve the Pinelands water quality standards. The minimum parcel sizes required for pilot technologies are based on the pre-screening process described previously in this report. The minimum parcel size required for the other technologies in Table 5B is based on the evaluation that has already been completed in previous reports.

Table 5A. Summary Table of the effluent total nitrogen concentration, number of systems, number of samples, minimum lot size required to meet pinelands water quality standards and status on technologies currently in the Pilot Program.

Technology	Median Effluent TN (mg/L)	No. of Systems	No. of Samples	Minimum Parcel Size Authorized (Acres)	Status
Hoot ANR	8.9	3	34	1.0	Pilot Phase
Fuji Clean	10.8	7	34	1.0	Pilot Phase
Busse MF-B-400	Not tested	0	0	1.0	Pilot Phase
Waterloo Biofilter	Not tested	0	0	1.0	Pilot Phase
Pugo Systems	Not tested	0	0	1.26	Pilot Phase

Table 5B. Summary Table of the effluent total nitrogen concentration, number of systems and number of samples, minimum lot size required to meet pinelands water quality standards and status on technologies that previously participated in the Pilot Program.

Technology	Median Effluent TN (mg/L)	No. of Systems	No. of Samples	Minimum Parcel Size Required (Acres)	Status
Amphidrome	11.9	68	603	1.0	Graduated
Ashco RFS III	Not tested	0	0	3.2	Removed
Bioclere	11.2	38	268	1.0	Graduated
BioBarrier	29.3	13	195	2.2	Removed
Busse GT	Not tested	0	0	3.2	Removed
Cromaglass	31.3	59	556	3.2	Removed
FAST	18.2	25	429	1.4	Graduated
SeptiTech	11.6	35	304	1.0	Graduated

2. The maintenance required for each alternate design Pilot Program treatment system technology to meet the required nitrogen targets

The Pilot Program requires that a representative of the system manufacturer with expertise in the system be onsite to inspect all system components and to correct any construction, installation or operational problems that might be experienced during system startup. In addition, a representative of the design engineer must be onsite to inspect the system at startup. After conducting onsite inspections, both the manufacturer and the design engineer must provide the Pinelands Commission with written certifications attesting that the installation of the system was properly completed. Once each system is operating, an onsite audible and visual alarm and a remote telemetric alarm system monitor the treatment system's electrical and mechanical components to alert both the residents and the contracted service provider of any operational problems in real time. Each system is sold with a pre-paid, five-year maintenance contract that provides for the manufacturer's servicing agent to inspect the system at least once per year and to undertake any maintenance or repairs determined to be necessary. Homeowners are given an operation and maintenance manual that outlines procedures for the proper use and care of the treatment system. Typical homeowner-required maintenance involves pumping out septic tank solids at a recommended average frequency of once every three years, similar to the recommended pump out frequency for a conventional septic system. The required startup inspections and the annual operation and monitoring inspection by the service provider have been largely successful in minimizing anything other than routine system maintenance (periodic pumping of solids). The five-year warranty on each treatment system provides homeowners with protection from costs associated with unanticipated service calls and repairs during the warranty period. All of these features of the Pilot Program have kept the need for system maintenance to reasonable levels. Pursuant to NJDEP's regulations, homeowners are required to maintain operation and maintenance contracts on the treatment systems in perpetuity.

Beyond the initial startup procedures, the specific maintenance required for the two technologies, Hoot and Fuji Clean, seem comparable to other advanced treatment technologies. Similar to standard septic systems, the maintenance manuals for these two technologies require homeowners to avoid using materials and chemicals that interfere with the living microbial organisms like plastics, rubbers, paper products, excessive food waste, medicinal and personal care products, and excessive use of detergents. Additional requirements for Hoot ANR include maintaining a chlorine residual of 1 mg/L in the system. This is achieved by adding tablets designed for wastewater use to the system's dispenser. Intermittent use is also not recommended for Hoot systems, which means that homes that are unoccupied may experience less efficiency in the Hoot system. All solids must be pumped out in situations where the system will not be in use for a particular period of time. Conversely, Fuji Clean systems can be used on a seasonal basis if additional measures are followed to start-up the system that has been unused for some time. Start-up procedures like microbial seeding (adding partially treated wastewater from a functioning system) can be used to restart the system, which provides it with a plethora of microbial organisms that can break down the components of the wastewater. Overall, the maintenance required for these two technologies is not significantly different from that of the technologies that have already graduated from the Pilot Program, but more time is needed to confirm this.

3. The cost of installing and maintaining each alternate design Pilot Program treatment system technology.

The CMP does not regulate the price of alternate design septic systems; however, it does require the cost of each Pilot Program technology's treatment systems to be reported. The total reported cost typically includes the technology's treatment unit, septic tank (if applicable), warranty, maintenance, absorption field, engineering, electrical connections, and other miscellaneous items. Table 6 below summarizes the different cost items that are reported to the Commission for the technologies that are currently in the Pilot program (Fuji Clean and Hoot ANR) and the technologies that have graduated from the Pilot Program (Amphidrome, Bioclere, FAST, and SeptiTech). The values represent the actual cost and have not been adjusted for inflation.

Table 6 provides the average cost information of technologies currently in the Pilot Program along with cost information of the graduated technologies for comparison purposes.

Table 6. Average total reported cost of the Pilot Program systems, including the cost of the treatment units, disposal fields, permitting, engineering and associated construction costs, from June 2019 through June 2025. Cost information is derived from a variety of sources and should therefore be considered to be approximate.

Technology	System Unit +Tank + Warranty	Engineering + Absorption Field + Electrical Connections + Other Costs. (1)	Average Reported Total Cost	Current Reported Total Cost	Current Reported System Cost	No. of Systems Included in Cost Analysis
Fuji Clean	$22,200	$14,614	$40,202	$38,954	$21,900	13
Hoot ANR	$13,181	$17,500	$30,666	NA	NA	3
Amphidrome	$18,165	$11,700	$29,865	$42,957 (2)	$28,957 (2)	15
Bioclere	$18,850	$13,973	$32,823	$37,500	$22,000	13
FAST	$11,009	$11,786	$22,795	$28,798	$15,298	17
SeptiTech	$19,065	$10,208	$29,273	$35,219	$21,136	112

(1) Reported engineering and construction costs including soil and site suitability investigations (soil logs and "perc"/permeability tests), preparation of engineering plans, completion of NJDEP application forms, excavation for soil absorption system and tank placement, soil absorption system materials (suitable "K4" replacement soil, stone filter materials and lateral piping, or gravel free chambers, geotextile fabric), installation of all components, electrical connections, surveyor services, as-built plans, engineering inspections and as-built certifications. (2) The most current reported cost for Amphidrome is from 2024 for the 1 installation in the 2025 reporting period. Reporting periods are from June through June of the following year.

Figure 1A. Average cost of wastewater treatment equipment (and 5-year service contract) for each of the pilot technologies from 2019 through 2025 (as applicable). This figure presents the nominal change; the values have not been adjusted to inflation.

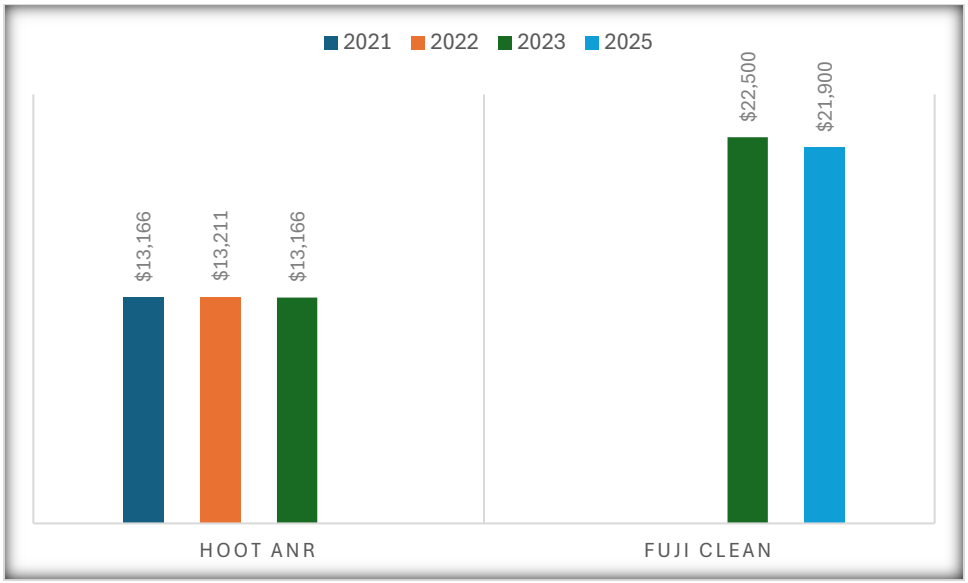
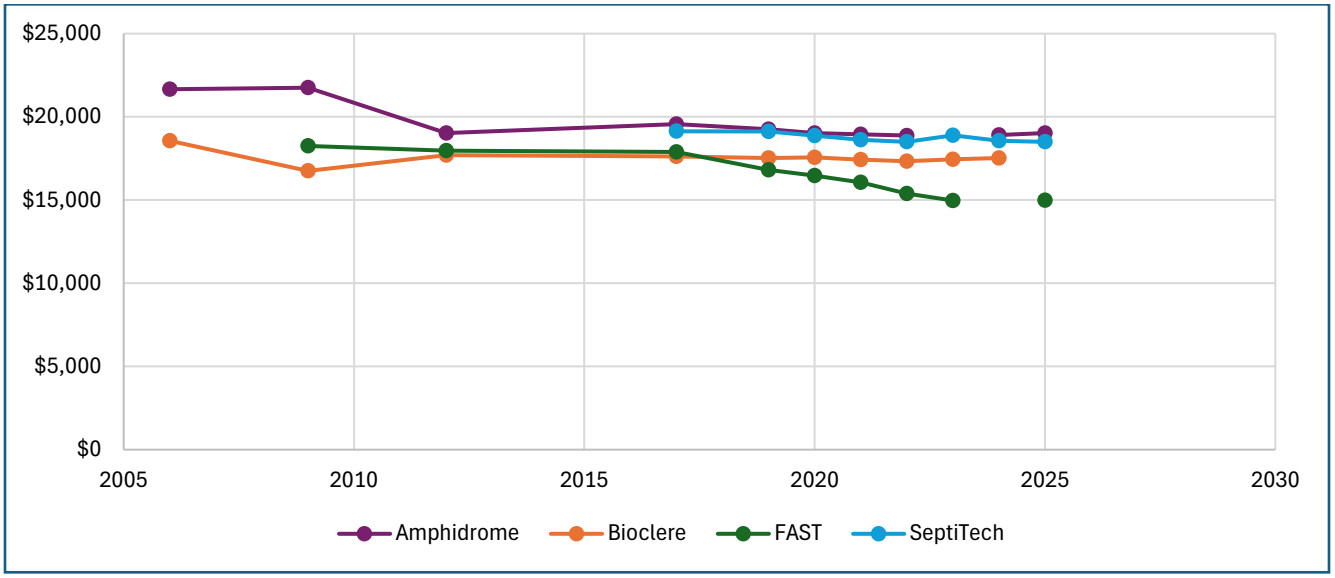


Figure 1B. Average cost of wastewater treatment equipment (and 5-year service contract) for each of the permanently approved technologies from 2006 through June 2025 (as applicable). This chart shows the change in cost through the years; the values are not adjusted for inflation.



The total average cost of alternate design treatment technologies is approximately two times that of the average cost of a conventional septic system. The purchase of a conventional system would not, however, include a five-year operation and maintenance contract, 5-year warranty, and quarterly effluent sampling.

Also, the conventional system does not provide enhanced wastewater treatment, which can shorten the lifespan of the soil absorption field and result in higher long-term cost. Additionally, since advanced treatment systems typically remove up to 98% of total suspended solids (TSS) and biochemical oxygen demand (BOD), the frequency of effluent disposal field repair or replacement is expected to be reduced when properly maintained. By providing enhanced removal of nitrogen, TSS and BOD, the Pilot Program systems may be used on parcels that are significantly smaller than 3.2 acres. It is noteworthy that conventional septic systems may only be used for dwellings on parcels of at least 3.2-acres to meet Pinelands water quality standards. The larger lot size needed for the conventional system carries additional cost.

The cost of the initial five-year warranty and operation and maintenance (O&M) contract is also included in the total reported costs of the advanced treatment units. Upon expiration of the original five-year O&M contract, contract renewal is required pursuant to NJDEP's regulations (N.J.A.C 7:9A-12.3 (a)). Those regulations state that the owner of an advanced wastewater treatment system must maintain a service contract with an authorized service provider throughout the life of the system. The cost to renew an O&M contract ranges between $440 and $700 per year, with some firms offering a discount for multi-year contract renewals. These fees do not include septic tank pumping, which costs an average of $225 to $500 per 1000 gallons. Septic tank pumping is generally recommended at a frequency of once every three years. Therefore, the total annualized cost for O&M services and pumping ranges anywhere from $515 to $870 per year or approximately $43 to $73 per month. The advantages of improved water quality, professional system maintenance, and the ability to meet water quality standards in areas currently zoned for one-acre residential development support the continuation of the Pinelands Alternate Design Wastewater Treatment Systems Pilot Program.

4. The problems associated with the installation, operation and maintenance of each alternate design Pilot Program treatment system technology and the frequency with which each such problem occurs, the measures taken to eliminate any such problem and the success of those measures.

Currently there are five technologies approved for use in the Pilot Program. The CMP requires that problems associated with installation, operation, and maintenance be reported by all five treatment technologies. However, since there have been no systems installed for Waterloo Biofilter, Pugo Systems, and Busse Innovative Systeme MF-B-400, there is no available information on their installation, operation, and maintenance as they pertain to the Pinelands Area. Hoot ANR and Fuji Clean, however, have documented the installation and operational issues encountered so far in their semi-annual reports, and they are described below. In general, the requirement that a manufacturer's representative and an inspector from the design engineer's office be present during system startup has virtually eliminated construction installation problems.

Installations of Hoot ANR systems began in 2020 and there have been two issues reported so far on installation and operation. In October 2023, there was a problem with the field dosing and recirculation valves for one system which caused a high-level alarm in the Pump Tank. Hoot replaced the valves and resolved the issue. At a different site, Hoot reported that a critical component from a unit was missing, and it caused short-circuiting of the flow through the system. This inhibited the proper development of the biology that is required for the reduction of biochemical oxygen demand (BOD), total suspended solids (TSS), as well as the nitrifiers needed for nitrification and denitrification. They repaired this system on June 8, 2021, and monitored it with weekly visits until the issue was resolved. The water quality data from this system indicates that it is functioning to reduce total nitrogen and there have been no further operational issues reported for that system.

Fuji Clean began installing systems in 2022 with no reported installation issues or alarm events. However, one operational issue occurred in July 2023, that seems to be related to the homeowner's use of the system and not with the function of the system itself. The service provider discovered excessive paint in one of the tanks, which they resolved by pumping and cleaning it out. No other issues have been reported at present.

Based on the semi-annual reports received so far from these two technologies, the systems have been running smoothly with minimal problems. There have not been any reported maintenance issues or problems that have required extensive repairs as of June 2025. In general, the Pilot Program alternate design systems have not exhibited breakdowns at a frequency that is any greater than is typical of onsite systems that incorporate effluent pumps (such as pressure dosing or gravity dosing), which are often used to overcome shallow water table conditions or grade limitations. Nevertheless, the systems have not been operating long enough to draw definitive conclusions about long-term operation and maintenance problems. More time is needed to evaluate the systems for this criterion.

5. The number of systems of each technology that have been authorized under the Pilot Program

There has been a total of 497 installed and approved alternate design septic systems for residential developments from 2006 to June 2025. For the purpose of this report, number of installations refers to installed systems that have received final approval from the Commission to receive a Certificate of Compliance from the County Health Department. Installed systems that are still in the process of obtaining this authorization are not included. Installations are counted annually from June 6 through June 5 of the following year. The number of systems installed has been updated based on the information from the Commission's tracking system after the 2022 report was published. Among the current pilot technologies, Hoot ANR has a total of four systems installed, which are all located in Ocean County; Fuji Clean has a total of 13 systems installed in four counties: Ocean, Camden, Burlington, and Atlantic.

The number of installations of the pilot technologies and all other technologies that have participated in the Pilot Program are provided in Tables 7A and 7B. Tables 8 and 9, as well as Figures 2 and 3, are intended to provide a summary of the distribution of all 497 alternate septic systems that have been installed in the

Pinelands area by county and management area. These tables and figures are included for information purposes only. The largest percentage of installations has occurred in the Regional Growth Area (RGA), and the lowest percentage has occurred in the Agricultural Production Area and Infill Development Area. The percentages are a reflection of the number of residential developments that occur in the growth-oriented management areas relative to more ecologically sensitive areas of the Pinelands. The RGA is designated for growth and has smaller lot sizes, which allows development of residential dwellings on parcels less than 3.2 acres. These smaller parcels require the use of alternate septic systems to comply with the Pinelands water quality standards. Residential development opportunities are much more limited in the Agricultural Production Area, and larger parcels are required to permit development of dwellings. Therefore, nitrogen-reducing technologies are infrequently needed to address the water quality standards of the CMP. Infill Areas are small zones designated for residential development within the Preservation Area District of four municipalities. Development of dwellings on existing lots as small as one acre may be permitted in Infill Areas. However, Infill Areas are limited in extent and contain little vacant land; therefore, the opportunity for new development is limited in those areas. Regarding the distribution of installed systems across Pinelands counties, the highest percentage of installations have occurred in Burlington and Ocean Counties. These counties have larger areas in the Pinelands Area, including Regional Growth Areas, served by onsite septic systems. In contrast, Cape May and Gloucester Counties have the lowest installations due to their limited land area within the Pinelands Area.

Tables 7A and 7B provide the number of installations of each treatment technology that has ever participated in the Pilot Program. Table 7A shows the installations for current technologies in the Pilot Program and Table 6B shows the installations of all other technologies. Table 7B is for information purposes only as those technologies have already been evaluated.

Table 7A. Total number of pilot program wastewater treatment system installations by year of installation (through June 2025)

Technology	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**
Hoot ANR		1	2	1			4
Fuji Clean				3		10	13
Busse MF-B-400							
Pugo Systems							
Waterloo Biofilter							
Total	0	1	2	4	0	10	**17**

Note that even though Hoot ANR began installing systems in 2020, that system is counted in the 2021 reporting period.

Table 7B. Total number of installations of each treatment technology that is no longer in the Pilot Program by year of installation (through June 2025)

Technology	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	June 2025	Total Installed
Amphidrome	7	10	10	27	12	7	5	8	4	5	1	1	4	2	5	6	5	3	2	0	1	1	126
Bioclere	0	2	11	9	7	9	6	5	5	5	8	4	4	1	1	3	1	2	2	2	1	1	89
FAST	0	0	0	0	2	5	3	3	3	5	2	2	0	0	3	1	1	2	8	3		2	45
Ashco A RFS	0	0	0	Removed from Pilot Program																			0
Cromaglass	0	19	24	3	6	4	3	0	0	0	Removed from Pilot Program												59
BioBarrier	Admitted into Pilot Program in 2011								0	0	5	7	0	0	1	0	Removed from Pilot Program						13
SeptiTech	Admitted into Pilot Program in 2011								0	0	3	9	11	7	5	1	9	28	57	4	2	12	148
Busse GT	Admitted into Pilot Program in 2011 and Readmitted in 2021																		0	0	0	0	0
Total	7	31	45	39	27	25	17	16	12	15	19	23	19	10	15	11	16	35	69	9	4	16	**480**

Tables 8 and 9 show the total number of alternate septic systems that have been installed by county and management area in the Pinelands Area from 2004-June 2025. Figures 2 and 3 show the percentage distribution of these installations by county and management area.

Table 8: Number of installations of all alternate septic systems per County

County	**No. of Installations**
Atlantic	102
Burlington	172
Camden	49
Cape May	8
Gloucester	8
Ocean	158
Total systems through June 2025	**497**

Figure 2. Percentage distribution of all installed alternate design septic systems by County

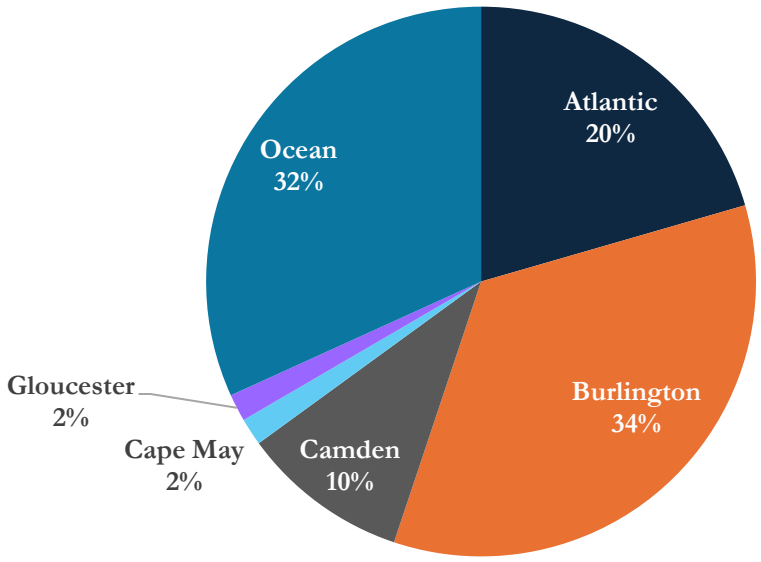
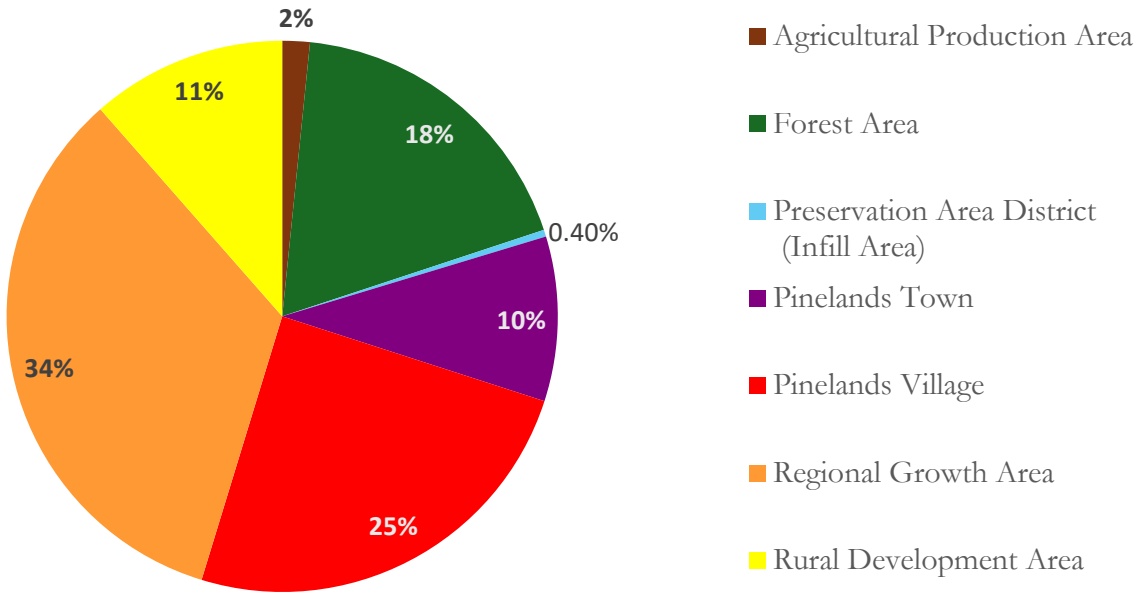


Table 9. Numerical distribution of alternate septic systems by Pinelands Management Area

Pinelands Management Areas	**No. of Installations**
Agricultural Production Area	8
Forest Area	91
Preservation Area District (Infill Area)	2
Pinelands Town	48
Pinelands Village	123
Regional Growth Area	168
Rural Development Area	57
Total Systems through June 2025	**497**

Figure 3. Percentage distribution of all alternate design systems by Pinelands Management Area



6. Whether the Pilot Program, when viewed in its entirety, has served to further the purposes and objectives of the Pinelands Protection Act, the Federal Act and the CMP.

The technologies that have been approved for permanent status through the pilot program have demonstrated their efficiency in removing total nitrogen to the level needed to meet the Pinelands water quality standards. The Pilot Program has facilitated residential development at appropriate and permitted densities as established through the Pinelands Septic Dilution Model and certified municipal land use ordinances. This success of the Pilot Program has played a significant role in the protection of water resources and the ecology of the Pinelands, which advances the purposes of the Pinelands Protection Act, the Federal Act, and the CMP.

The Pilot Program has demonstrated that reliable small-scale advanced wastewater treatment technologies are available for residential use which, with proper installation, operation and maintenance, can achieve substantial compliance with the purposes and objectives of the Pinelands Protection Act, the Federal Act and the CMP.

The expansion of the Pilot Program has been important in making more technologies available to Pinelands Area property owners that will be capable of achieving the rigorous Pinelands water quality standards.

Currently there are 17 installed systems representing two treatment technologies that are in the Pilot Program, namely Hoot ANR and Fuji Clean. These two technologies, although still in the early stages of evaluation, have shown the potential to meet the Pinelands water quality standards. This further enhances and supports the continued protection of water resources in the Pinelands, as required by the Federal Pinelands Act, Pinelands Protection Act, and the CMP.

The Pilot Program as a whole has provided the Commission with the ability to identify technologies that are capable of meeting the Pinelands water quality standards and to calculate the minimum parcel size required when these technologies are relied upon to meet the standards. The Pilot Program has demonstrated that three of the technologies, Amphidrome, Bioclere, and SeptiTech, are capable of meeting the Pinelands water quality standards when used on 1.0-acre parcels and one technology was demonstrated to meet the water quality standard when used on 1.4-acre parcels. The Pilot Program has also revealed that two of the piloted treatment technologies, Cromaglass and BioBarrier, are incapable of achieving compliance with the Pinelands water quality standards.

By identifying wholly compliant technologies, partially compliant, and noncompliant technologies, the Pilot Program has fulfilled one of its original objectives, which was to independently evaluate nitrogen removal capabilities under real world conditions. While some jurisdictions nationwide have opted to approve nitrogen attenuating onsite wastewater treatment technologies based on third party certifications alone (e.g. NSF Standard 245), the Commission's decision to evaluate technologies on the basis of their performance in the Pilot Program has proven to be a more prudent approach, with some technologies meeting or exceeding expectations and others not living up to the results reported by third party certifying organizations.

Important Regulatory Update

The NJDEP adopted a rule in April 2025 that enables the Department to accept certifications of advanced wastewater pretreatment systems from all American National Standards Institute- (ANSI) accredited organizations, not just the National Sanitation Foundation International (NSF), provided that they are certified to Standard 40 and /or Standard 245 by those ANSI-accredited organizations. Prior to this amendment to N.J.A.C. 7:9A-2.1 and 8.3, only advanced wastewater pretreatment systems certified by NSF/ANSI standard 40 and/or Standard 245 could be permitted to operate in New Jersey and in the Pinelands (the Pinelands only accepts Standard 245 certifications because of its requirements for a certain level of nitrogen reduction). The ANSI issues accreditations to certifying bodies like the NSF through its Product Certification Accreditation Program. Organizations with this accreditation can certify advanced wastewater pretreatment technologies to Standard 40 and/or Standard 245. There are several organizations with this ANSI accreditation, however, prior to this amendment, New Jersey only permitted technologies with NSF/ANSI certification to operate in the state. This amendment will therefore allow technologies with certifications from all third-party certifiers to operate in New Jersey, which will increase competition and reduce costs, while improving human and environmental health. Because the Pinelands Pilot Program only accepts technologies with the NSF/ANSI Standard 245 certification or from the EPA ETV verification program, the Commission may wish to consider amendments to the CMP in the future to allow

technologies with certifications from other third-party certifiers with ANSI accreditation to participate in the Pilot Program, in line with NJDEP's rule change. This will increase the number of eligible technologies for the Pilot Program and allow the Commission to evaluate more technologies that will be able to meet the Pinelands water quality standards. This will provide more options, increase competition, and potentially reduce costs.

Recommendations and Conclusions

There are currently five technologies in the Pilot Program: Hoot ANR, Fuji Clean, Busse Innovative Systeme GmBH Model MF-B-400, Pugo Systems, and Waterloo Biofilter. Among these, Hoot ANR and Fuji Clean are the only technologies with installed systems in the Pinelands. There are no technologies recommended for permanent approval in this report because there have not been enough systems installed, or sufficient samples taken for either Hoot ANR or Fuji Clean to determine their efficiency at removing total nitrogen. Nevertheless, their results up to this point have been compliant with the Pinelands water quality standards for 1-acre parcels. As such, both Hoot ANR and Fuji Clean are recommended to remain in the Pilot Program to allow for more installations and sampling to ascertain their TN removal efficiency.

While there have been no installations of Busse Innovative Systeme GmBH Model MF-B-400, Pugo Systems, and Waterloo Biofilter in the Pinelands so far, it is recommended to have them continue to be eligible for installation through the Pilot Program at present. All three technologies were admitted into the program in November 2021. Considering the competition from other established technologies in the Pinelands, and the time needed to complete applications and obtain local approvals before installing systems, we recommend allowing those technologies to remain in the Pilot Program.

In accordance with N.J.A.C. 7:50-10.23(d), an additional review of the five Pilot Program technologies will be completed no later than August 5, 2027.

At that time, consideration of retaining all five technologies enrolled in the Pilot Program may be needed, given the new NJDEP rule amendments which may create opportunities for new technologies. At the same time, the CMP only allows six technologies to participate in the Pilot Program at any time. Given this, if new technologies become available due to the recently adopted NJDEP rules, future consideration of their inclusion in the Pilot Program may be warranted.

The Pilot Program has provided a means to test whether select onsite wastewater technologies can be maintained and operated to meet the water quality standards of the CMP in a manner that a homeowner can reasonably be expected to follow. The program has been successful in identifying several advanced treatment technologies (Amphidrome, Bioclere, FAST, and SeptiTech) that can be expected to achieve compliance with Pinelands water quality standards when used at appropriate densities as established through the Pinelands septic dilution model and land use zoning requirements. Each of these systems has been demonstrated to be reliable and effective when maintained in accordance with NJDEP's operation and maintenance requirements and has been permanently approved through amendments to the CMP for use in

the Pinelands Area.

Several technologies from were removed from the Pilot Program because no systems were installed in the Pinelands following their admission into the pilot program. Those systems included the Ashco RFS III and Busse GT (readmitted and currently the Pilot Program).

The CMP also provides for a technology to be removed from the Pilot Program if it's determined that the technology has been unsuccessful at meeting the Pinelands water quality standards. BioBarrier and Cromaglass were removed from the Pilot Program for this reason. The total nitrogen levels in the effluent were significantly high during the evaluation period. While the manufacturers instituted retrofits and sought to correct the poor performance issues, they were not successful at improving the technologies' nitrogen removal capabilities. Therefore, the Commission removed BioBarrier and Cromaglass from the Pilot Program.

The continued use of advanced onsite treatment technologies is essential to the efficient use and orderly development of designated growth areas of the Pinelands Area as well as other areas in which residential development is permitted on lots that are smaller than 3.2 acres. At the same time, continuation of the Pilot Program to assess the technologies currently enrolled and to potentially evaluate new technologies in the future remains an important component in assuring that the water quality standards of the CMP are maintained while also contributing to success of the growth strategies implemented in the Pinelands Area.

Readers are invited to direct all inquiries related to the Pinelands Alternate Design Treatment Systems Pilot Program to Claire Osei, Resource Planner, at claire.osei@pinelands.nj.gov. or 609-894-7300.