



State of Delaware
Department of Natural Resources & Environmental Control
Division of Water Resources
Ground Water Discharges Section

Innovative and Alternative System Approval

ISSUED TO: Orenco Systems, Inc.
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FOR: AdvanTex Treatment System, AX-20

APPROVAL DATE: **April 21, 2008**

In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated March 18, 2008, has been submitted by Orenco Systems Inc., for approval of the AdvanTex AX20 treatment system as Innovative & Alternative On-Site Wastewater Treatment Unit.

Based on the review of the application, the Department hereby grants approval of the use of the AdvanTex AX20 treatment system as Innovative & Alternative On-Site Wastewater Advanced Treatment Unit. Approval is subject to the conditions, limitations, and requirements set forth herein:

1. Product Description and Components

The AdvanTex AX20 is a recirculating packed bed filter. The treatment media is an engineered textile, with high void capacity, moisture holding capacity and surface area per unit volume. Raw sewage enters the first compartment of the two-compartment septic tank. This compartment provides primary treatment. Effluent from the clear layer flows into the second compartment of the tank which provides 24 hours of retention. A pump located in a screened pump vault in the second compartment, transfers effluent at a predetermined frequency to a manifold that distributes the liquid over the textile media inside a filter pod.

Effluent then percolates down through the media and is collected at the bottom of the filter pod. The treated effluent flows out through a pipe to an automated splitter valve. During periods of no flow, all of the treated effluent is returned to the second compartment. Otherwise part of the treated effluent is discharged, and the balance is returned to the second compartment. Aeration is provided by the sprinkling action of the effluent over the media, as the effluent moves down through the media.

The system may consist of a septic tank, a recirculation tank, AdvanTex fixed film media pod(s) as specified in Table 1 below or, the system may consist of a single processing tank per Table 2 below.

Table 1: Required Tankage and Number of Filter Units: Systems Using Separate Septic/Recirc Tanks

Design flow (gallons per day)	Minimum Septic Tank Size (gallons)	Minimum Recirculation Tank Size (gallons)	Minimum AdvanTex Units
≤ 500	1000	1000	1 AX 20
501-600	1500	1000	2 AX 20
601-720	2000	1000	2 AX20

Design flow (gallons per day)	Processing Tank (gallons)	Minimum AdvanTex Units
≤ 500	1,500	1 AX 20
501-600	2,500	2 AX 20
601-720	3,000	2 AX20

- a. The septic tank, recirculation tank, and processing tank shall be approved by the DNREC and Orenco, specifically for the use of the AdanTex systems. All tanks must be equipped with risers to grade.
- b. The AdvanTex treatment unit is equipped with vertical geotextile sheets, with low pressure pipe wastewater distribution above the sheets. The pipe distribution operates at 3 to 5 feet of pressure head. The pods may be placed above the tanks, but shall not obstruct tank accesses.
- c. VeriComm telemetry control panel with web based monitoring shall be utilized. Separate control and alarm circuits shall be provided.

2. Claim

Approval is based on information submitted by the Manufacturer indicating the specified models will routinely provide effluent quality not exceeding: 30 mg/l of BOD₅; 30 mg/l of TSS; and 10 mg/L TN or a 60% reduction (assuming influent loading does not exceed the treatment capabilities of the units).

3. Flow

The approval is based on flows not exceeding 720 gallons per day. Flows greater than 720 gallons per day but less than 2500 gallons per day may be permitted on a case by case basis in accordance with the manufacturer's recommendations.

Approval is applicable for domestic strength effluent only. All commercial applications must seek prior Department and Orenco approval.

4. Use and Design Criteria

- a. The AdvanTex system may be installed for new and replacement systems with conventional and innovative and alternative disposal systems.
- b. An on-site wastewater treatment and disposal system permit application incorporating an AdvanTex system shall be designed in accordance with the Regulations, and manufacturer's specifications. The design shall be completed by a DNREC Class C Design Engineer
- c. The designer must assure that the unit has above grade access. The design also must ensure that the control panel is not located in an enclosed structure and is accessible.
- d. The AdvanTex unit shall not be installed within areas subject to traffic loads unless specifically designed on a case by case basis in accordance with the Regulations.
- e. The AdvanTex treatment system's initial timer settings should be established based on the expected average daily flow and a 4:1 recirculation ration. Should flows vary, the authorized service provider will adjust timer settings per manufacturer's recommendations.
- f. The manufacturer is responsible for providing the Department a list of all local distributors and their associated contact information. This list must be kept current and shall be submitted to the Department on a yearly basis.

5. Installation Procedures

- a. The AdvanTex unit shall be installed by a DNREC Class E System Contractor under the supervision of a manufacturer's representative, or by a DNREC Class E System Contractor who has been certified for unit installation. Proof of certification shall be provided in writing to the Department.
- b. Start up of the system and initial operational checks shall be conducted by the Class E System Contractor (trained by the manufacturer), Design

Engineer, and a Ground Water Discharges Section (Large System Branch) representative. If the Class E System Contractor is not certified, a manufacturer's representative shall perform the operational checks of the system at start up. If the manufacturer's representative can not be on site at the time of start up, they must provide final start up approval to the Department in writing.

6. Operation and Maintenance

- a. The AdvanTex treatment system shall be operated and maintained in accordance with the manufacturer's specifications.
 - i. The treatment system can be configured to operate in two Modes depending on nitrogen removal.
 1. Mode 1, the filtrate recirculates through the second compartment of the processing tank.
 2. Mode 3, apportion or all of the filtrate may be recirculated through the primary chamber of the tank to enhance nutrient removal.
- b. The manufacturer or manufacturer's representative shall comply with all Department mandated requirements as specified in permit conditions. This shall include operation and maintenance requirements.
- c. The AdvanTex treatment system shall be inspected at a minimum of once every 6 months by a certified service provider.
- d. The service provider shall be a Class E System Contractor, or Class H System Inspector who has been certified by the manufacturer on the AdvanTex unit.
- e. The AdvanTex treatment system shall be maintained according to the AdvanTex Operation and Maintenance Manual as published by Orenco Systems.

7. Sampling and Approval

The Department reserves the right to sample any unit at any time.

8. General Conditions

- a. Use of the system for wastes other than residential shall be on a case by case basis.
- b. In the event that the product fails to perform as claimed by the applicant, and it is found that the system is installed and working as designed, and there is no toxicity in the waste; the use of the units for new installations

shall cease. Use of the units shall not resume until such time the applicant and the Department have reached an acceptable agreement for resolving the situations.

- c. Any changes that deviate from the specifications as submitted with this approval shall be approved by the Department prior to use.