



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

Innovative and Alternative System Approval

ISSUED TO: Clearstream Wastewater Systems, Inc.
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FOR: Clearstream Aerobic Treatment units

APPROVAL DATE: 12/15/06

In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated October 13, 2006, has been submitted by Clearstream Wastewater Systems, Inc., for approval of the Clearstream Aerobic Treatment Unit as an Innovative & Alternative On-Site Wastewater Treatment Unit.

Based on the review of the application, the Department hereby grants approval of the use of the following Clearstream Aerobic Treatment Unit models, as Innovative & Alternative On-Site Wastewater Treatment Units: 500N, 500NC, 600N, 600NC, 750N, 750NC, 1000N, and 1000NC. The following conditions, limitations, and requirements must be adhered to:

1. Product Description

The Clearstream Aerobic Treatment Unit utilizes an extended aeration activated sludge method of biological waste reduction. Wastewater enters the trash tank or trash tank compartment where larger solids are settled out before entering the

aeration chamber. Wastewater is then mixed throughout the aeration chamber by compressed air near the bottom of the tank through a fine bubble diffuser. The rising air bubbles transfer oxygen to the wastewater allowing aerobic bacteria to grow and decompose the incoming waste.

The turbulence caused by the rising air bubbles allow the sludge to be kept in suspension. As incoming wastewater enters the aeration chamber, existing “mixed liquor” is displaced into the bottom of the cone-shaped clarifier. The clarifier chamber allows the suspended solids in the “mixed liquor” to settle back into the aeration chamber for further biological breakdown.

The remaining “clear” water in the upper zone of the clarifier chamber is discharged by gravity through a surge control weir and into the pump chamber. The final effluent is discharged by a submersible pump to the disposal area.

Below are the models with their associated treatment capacities:

Model	Capacity (gallons per day - gpd)
500N & 500NC	500
600N & 600NC	600
750N & 750NC	750
1000N & 1000NC	750

2. Claim

Approval is based on information submitted by the Manufacturer indicating the specified model will routinely provide effluent quality not exceeding 30 mg/l of BOD₅, and 30 mg/l of TSS.

This unit has been certified under NSF Standard 40 meeting Class I standards.

3. Use and Design Criteria

- a. The Clearstream Aerobic Treatment Unit 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 a Clearstream Aerobic Treatment Unit shall be designed in accordance with the Regulations, and manufacturer’s specifications. The design shall be completed by a DNREC Class C Design Engineer unless otherwise approved by the Department. The permit application shall include proper unit specifications.
- c. The designer must ensure a pre-treatment tank precedes the Clearstream unit. This tank shall be a volume not less than 50% of the gallon per day rating of the Clearstream unit or sized per the manufacturer’s recommendations.

- d. The designer must assure that all access risers and observation/sampling ports have above grade access. The design also must ensure that the control panel and blower are accessible.
- e. The Clearstream unit shall not be installed within areas subject to traffic loads unless specially designed on a case by case basis in accordance with the Regulations and in accordance with manufacturer's specifications.
- 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.

4. Installation Procedures

- a. The Clearstream 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. The blower must be installed on a factory base and enclosure and located no more than 100 feet from the tank
- c. 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.

5. Operation and Maintenance

- a. The Clearstream unit shall be operated and maintained in accordance with the manufacturer's specifications.
- b. The manufacturer shall comply with all Department mandated requirements as specified in permit conditions. This shall include operation and maintenance requirements.

6. Sampling and Approval

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

7. 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, 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.