



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

Innovative and Alternative System Approval

ISSUED TO: Lombardo Associates, Inc.
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FROM: Ronald E. Graeber, Program Manager
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FOR: Nitrex Filter (300, 450 and 600
gallons per day design flow)

APPROVAL DATE: October 16, 2006

In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated October 17, 2005 and September 12, 2006, has been submitted by Lombardo Associates, Inc., for approval of the Nitrex Filter nitrate removal system 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 Nitrex Filter as an Innovative & Alternative On-Site Wastewater Treatment System component subject to the conditions, limitations, and requirements set forth herein:

1. Product Description

The Nitrex Filter consists of nitrate-reactive media, formulated from wood by-products, contained in a concrete tank. Pretreatment of the wastewater is required to nitrify the wastewater prior to discharge to the Nitrex Filter. The nitrified wastewater then percolates through the reactive media in the Nitrex Filter tank before discharging to the disposal system.

The various models have the treatment capacities shown in the following table:

MODEL	Design Flow (gallons per day) gpd
300-20-R	300
300-30-R	300
300-40-R	300
300-50-R	300
450-20-R	450
450-30-R	450
450-40-R	450
450-50-R	450
600-20-R	600
600-30-R	600
600-40-R	600
600-50-R	600

2. Claim

Approval is based on information submitted by Lombardo Associates, Inc., indicating the specified models will routinely reduce the Total Nitrogen (TN = TKN + NO₃ + NO₂) concentration in the effluent to below 10 mg/l, providing the Nitrex Filter is preceded by a nitrifying pretreatment unit.

The Nitrex Filter has been evaluated in the following four independent testing programs:

- a. LaPine Oregon National Decentralized Wastewater Treatment and Disposal Project**
- b. Montana Department of Natural Resources' Polson Project**
- c. Massachusetts Septic System Test Center**
- d. University of Rhode Island Testing Program**

3. Use and Design Criteria

- a. The Nitrex Filter may be installed for new and replacement systems with conventional and innovative and/or alternative disposal systems, providing it is preceded by a nitrifying pretreatment unit approved by Lombardo Associates, Inc.

- b. An on-site wastewater treatment and disposal system permit application incorporating a Nitrex Filter shall be designed in accordance with the Regulations, and Lombardo Associates, Inc., 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 assure that the Nitrex Filter and the nitrifying pretreatment units have above grade access. The septic tank shall also have above grade access. The design also must ensure that all control panels and blowers are accessible.
- d. The Nitrex Filter shall not be installed within areas subject to traffic loads unless specially designed on a case by case basis in accordance with the Regulations.
- e. Lombardo Associates, Inc. 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 Nitrex Filter shall be installed by a DNREC Class E System Contractor under the supervision of a Lombardo Associates, Inc. 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. A dedicated phone line shall be installed to the control panel.
- c. Start up of the system and initial operational checks shall be conducted by the Class E System Contractor (trained by Lombardo Associates), Design Engineer, and a Ground Water Discharges Section (Large System Branch) representative. If the Class E System Contractor is not certified, a Lombardo Associates representative shall perform the operational checks of the system at start up. If a Lombardo Associates 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 Nitrex Filter shall be operated and maintained in accordance with Lombardo Associates specifications. Lombardo Associates is responsible for maintaining this certification.
- b. Lombardo Associates or their representative 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 Nitrex Filter fails to perform as claimed by Lombardo Associates, and it is found that the Nitrex Filter is installed and working as designed, and there is no toxicity in the waste; the use of the Nitrex Filter for new installations shall cease. Use of the Nitrex Filter 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.