



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

Innovative and Alternative System Approval

ISSUED TO: ANUA
P.O. Box 77457
Greensboro, NC 27417

Phone (336) 547-9338
Fax (336) 547-8559

FROM: Jason Baumgartner – Environmental Scientist
Ground Water Discharges Section

FOR: Puraflo Peat Biofilter Denitrification System

APPROVAL DATE: June 30, 2015

In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated June 2, 2014 was submitted by ANUA for approval of the Puraflo Peat Biofilter Denitrification System as an Innovative & Alternative On-Site Wastewater Treatment Unit

Based on the review of the application, the Department hereby grants approval for use of the Puraflo Peat Biofilter Denitrification system as an Innovative & Alternative On-Site Wastewater Treatment Unit subject to the conditions, limitations, and requirements set forth herein:

1. Product Description

The Puraflo Peat Biofilter is an attached growth packed bed filter, which utilizes organic peat fiber as its filtering media. Prior to entering a peat module, sewage first enters into a DNREC approved septic tank equipped with an effluent filter. Effluent

from the septic tank is then distributed by timed dosing to the peat module(s) where a pre-installed rectangular grid with large diameter openings distributes the effluent over the peat. Effluent then percolates down through the media. Timed dosing to the modules allows passive diffusion of oxygen within the media and nitrification is achieved. Recirculation of 50% of the forward flow back to the anoxic environment of the septic tank results in denitrification of the effluent. The denitrified effluent can be collected and sent to a disposal system or directly infiltrate into an aggregate bed.

2. Claim

Approval is based on information submitted by the Manufacturer indicating the specified model will routinely provide effluent quality not exceeding 15mg/l of BOD₅, 15 mg/l of TSS, 50% reduction in TN, and <10,000 colonies/100 ml of fecal coliform bacteria.

3. Approved Puraflo Peat Biofilter Denitrification Systems (For purpose of this document, a pad shall be synonymous with a bed disposal system)

- a. The Puraflo module(s) may contain weep holes at the bottom of the module(s) to allow for gravity dispersal directly to a subsurface disposal pad below the module(s).
- b. The Puraflo module(s) may be used as a stand-alone advanced treatment unit in conjunction with a trench disposal system or drip irrigation system.
- c. Other modules may be approved by the Department on a case by case basis.

4. Scope of Use

The system may be used for residential waste with flows <2,500 gallons per day. Seek manufacturer's guidance on module requirements.

5. Siting Criteria

- a. Percolation rates are to be based on the most restrictive texture within the upper 60" of soil. See the attached chart for loading rate associated with a percolation rate.
- b. For at-grade systems, the tillage depths are to be 6-8", although slightly deeper depths may be necessary in the case of shallow thick plow pans or similar restrictive layers within 12" of the surface.
- c. Landscape position is also a necessary consideration. Systems are not to be sited within a closed depression or where water tends to pond during heavy rainfall events.

6. Separation Requirements

- a. A 12” separation distance must be maintained from the limiting zone.
- b. Standard installation = 18-22” limiting zone, 6-8” pad (bed) depth, 10” trench depth.
- c. Surface installation (at-grade systems) = 12” limiting zone, pads only.

7. Design Criteria

- a. The Puraflo Peat Biofilter Denitrification system may be installed for new and replacement systems as disposal systems, or as an advanced treatment unit followed by a trench disposal system or drip irrigation disposal system.
- b. A septic tank must precede the Puraflo Peat Biofilter Denitrification system. The septic tank must incorporate an effluent filter as specified by the manufacturer.
- c. An on-site wastewater treatment and disposal system permit application incorporating a Puraflo Peat Biofilter Denitrification 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 unless otherwise approved by the Department. The permit application shall include proper unit specifications.
- d. A sample unit must be included with the design.
- e. The attached loading rates shall be utilized to determine the pad or trench disposal system size.
- f. If a drip irrigation system is to follow the Puraflo Peat Biofilter Denitrification system, their associated loading rates shall be used for disposal system sizing.
- g. The use of a pad or trench for disposal shall be based on site characteristics and the preference of the Design Engineer.
- h. No additional area reductions shall be granted for the use of water saving fixtures or for the use of graveless chambers.
- i. 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.

8. Installation Procedures

- a. The Puraflo Peat Biofilter Denitrification system 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 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 cannot be on site at the time of start up, they must provide final start up approval to the Department in writing.

9. Operation and Maintenance

- d. The Puraflo Peat Biofilter Denitrification system shall be operated and maintained in accordance with the manufacturer's specifications.
- e. 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.

10. Sampling and Approval

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

11. 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 to the standards as claimed by the applicant, and it is found that the system is installed and working as designed, and there is not toxicity in the waste entering the system; 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.