

## MEMORANDUM

TO: Class C Design Engineers  
Class D Soil Scientists  
Class E System Contractors

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SUBJECT: Peat Biofilter Design Criteria

DATE: August 8, 2005

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This document was developed to aid in the siting and design of peat biofilters. The manufacturers of Bord Na Mona Puraflo Peat Biofilters, and Premier Tech Ecoflo Peat Biofilters were consulted during this process.

Effective September 1, 2005, persons siting, designing, and constructing peat biofilter treatment and disposal systems in Delaware must adhere to the requirements outlined below.

*\*\* Some design considerations and the subsequent approval will be determined on a case by case basis.*

### **Scope of Use**

- The guideline is intended for facilities generating residential strength wastewater with flows  $\leq$  2,500 gpd.

### **Siting Criteria:**

- Peat biofilter systems are not the cure all remedy for problem sites, **do not prescribe as such.**
- Percolation rates are to be based on the most restrictive texture within the upper 60" of soil. See chart below for loading rate associated with a percolation rate.

- For **at-grade systems**, the tillage depths are to be 6-8", although slightly deeper depths may be necessary in the case of shallow thin plow pans or similar restrictive layers within 12" of the surface.
- Landscape position is also a necessary consideration; do not site within a closed depression or where water tends to pond during heavy rainfall events.

### **New Construction and Replacement Systems**

#### **Separation requirements;**

- 12" from limiting zone
  - Standard installation = 18-22" limiting zone, 6-8" pad \*(bed)depth / 10" trench depth
  - Surface installation (At-grade systems) = 12" limiting zone, **pads \*only**  
(*See Design and Construction Notes for Site Preparation*)

### **Design and Construction Notes for Site Preparation**

- Rope off proposed disposal area.
- Prepare disposal area when soil moisture is within a satisfactory range.
- Remove vegetation - sod, topsoil or rock.
  - Grass, shrubs, and trees must be cut as close to the ground surface as possible and removed, preferably by hand from the site.
  - For wooded lots, with excess litter, we recommend that it be raked from site.
  - Chisel plow disposal area 6-8" deep, or as prescribed by soil scientist.
    - Preferred methods
      - Chisel teeth mounted on a backhoe bucket and pulled through surface
      - Chisel plow pulled behind a tractor
- To maintain positive drainage, additional cover on top may be necessary.

*If in doubt, please call the GWDS at 739-9948, prior to beginning any construction procedures.*

### **Design Considerations**

- A septic tank must precede a peat biofilter system. All septic tanks must incorporate an effluent filter as specified by each individual manufacturer.
- The loading rates within this memo shall be utilized to determine disposal pad/trench size required.
- No additional area reductions shall be granted for the use of water saving fixtures or for the use of gravelless chambers.
- The use of a pad or trench for disposal shall be based on site characteristics and the individual design engineer.

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- All pads and trenches shall be installed on contour.
- All pad areas underneath the open bottom units shall be designed such that the bottom pad area is level.
- Peat biofilter systems may be fed by gravity or timed dosed, depending upon site characteristics. System shall be designed to provide equal flow throughout.
- **All other design considerations shall utilize individual manufacturer's guidelines.**

\* A pad system is synonymous with a bed system

### **Installation**

- The installer shall be trained by the manufacturer or their designee to install the peat biofilter.

## Delaware Residential Peat Biofilter Design Criteria

Soil Type	Permeability Rate (mpi)	Hydraulic Loading Rate (gpd/ft <sup>2</sup> ) Trench	Hydraulic Loading Rate (gpd/ft <sup>2</sup> ) Bed
S	5	2.033	1.597
LS	10	1.437	1.129
	15	1.174	.922
SL	20	1.016	.799
	25	.909	.714
SCL, L	30	.803	.652
	35	.768	.604
	40	.719	.565
	45	.678	.532
Si, SiL	50	.643	.505
	55	.613	.482
	60	.587	.461
	65	.564	.443
	70	.543	.427
CL, SiCL	75	.525	.412
	80	.508	.399
	85	.493	.387
	90	.479	.376
	95	.466	.366
	100	.455	.357
	105	.444	.349
	110	.433	.341
	115	.424	.333
SC, SiC, C	120	.415	.326

Notes:

1. For commercial and/or large systems, please contact the GWDS and the manufacturers for additional siting criteria.