

**NORTH CAROLINA DEPARTMENT
OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WATER PROTECTION SECTION**

INNOVATIVE WASTEWATER SYSTEM APPROVAL
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INNOVATIVE WASTEWATER SYSTEM NO: IWWS-2000-3-R4

ISSUED TO: Marie-Christine Bélanger, Technological Development Director
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FOR: Ecoflo® Peat Biofilter System (Models ST-650, STB-650, STB-650(H1), ST-500 and STB-500)

APPROVAL DATES: December 4, 2000
January 29, 2001 (minor revision November 5, 2001)
April 8, 2003 (revised siting, sizing, design, installation and monitoring criteria)
September 2, 2003 (Addition of Models ST-500 and STB-500)
November 16, 2007 (Rule .1970 Revisions, concrete tank Model STB-650B (H1), and revised design and monitoring criteria)

In accordance with 15A NCAC 18A.1969, an application by Premier Tech Environment Inc., Rivière-du-Loup, Canada, for an updated approval of subsurface wastewater systems utilizing the Ecoflo® Peat Biofilter has been reviewed and the system has been found to meet the standards of an innovative system when all of the following conditions are met:

A. GENERAL

1. Scope of this Innovative Wastewater System Approval:
 - a. Use, design and construction requirements for the specified models of Ecoflo® Peat Biofilter Systems to meet TS-I effluent quality standards pursuant to Rule 15A NCAC 18A .1970.
 - b. Design and installation of the Ecoflo® Peat Biofilter and associated subsurface wastewater systems.
 - c. Operation, maintenance and monitoring requirements for the Ecoflo® Peat Biofilter and associated subsurface wastewater systems to ensure the treatment performance standard shall continue to be met.

2. This Innovative System Approval is applicable to domestic sewage systems (non-industrial wastewater) utilizing specialized fibrous peat treatment media used exclusively in the Ecoflo® Peat Biofilter that have a design flow not exceeding 3000 gallons per day, except as noted. Influent waste strength to the Ecoflo® Peat Biofilter shall not exceed 350 (BOD₅), 200 (TSS), 100 (TKN) or 30 (FOG) mg/l, as specified in Rule .1970(b). Use of Ecoflo® Peat Biofilters in systems that have a design flow exceeding 3000 gallons per day or with a higher influent waste strength may be proposed for consideration by the State on a case-by-case basis in accordance with the Large Systems State Review/Approval Process (Rule 15A NCAC 18A .1938). In addition, any facility or dwelling utilizing these systems shall have sufficient alkalinity to perform the proper amount of nitrification. The influent also shall not have a pH, or toxins that significantly inhibit microbial growth.

B. TREATMENT PERFORMANCE STANDARDS (TS-1): Tertiary treatment without nitrogen reduction.

The Ecoflo® Peat Biofilter Systems are designed, installed, operated and maintained to meet TS-I Standards. Refer to Rule .1970(a) Table VII – Effluent Quality Standards for Advanced Pretreatment A systems for treatment performance levels.

C. APPROVED ECOFLO® PEAT BIOFILTER SYSTEMS

1. Type A: Ecoflo® Peat Biofilter, Models ST-650 and ST-500, utilizing a (bed) subsurface gravity final treatment and pad disposal system.
2. Type B: Ecoflo® Peat Biofilter, Models STB-650, STB-650B(H1), and STB-500, used as a stand alone pretreatment system in conjunction with other gravity or pressure dosed subsurface final treatment and disposal systems.
3. Other types of Ecoflo® Peat Biofilter systems that are designed and operated to meet Performance Standard TS-I may be subsequently proposed for consideration by the State and as appropriate shall be appended to this approval.

D. SITING CRITERIA

The Ecoflo® Peat Biofilter systems and associated drainfields shall be sited and sized in accordance with Rule .1970 for a TS-I system

E. DESIGN CRITERIA

1. Pretreatment: A septic tank with effluent filter as required in Rule .1952 shall be provided. An access riser with access manhole extending at least to finished grade shall be provided over the outlet and be designed and maintained to prevent surface/water inflow.
2. Pumping System - Pump Tank (If needed):
 - a. Requirements for pump dosing systems in Rule .1952(c), except as provided for herein, shall be met.
 - b. A State-approved pump tank shall be provided with a liquid capacity at least equal to the required septic tank liquid capacity.
 - c. If a pumping unit is required because of site constraints, the effluent pumped onto the peat biofilter media shall be regulated by a time dosing control panel with programmable timer, elapsed time meter, event counter and alarm system. Dosing frequencies shall range from 15 to 48 doses per day.
 - d. When a pumping unit is required, the pumping system shall be designed to deliver a net dosing volume of 5 to 15 gallons per unit per dosing cycle, at a pumping rate of 5 to 10 gpm per module. Drainback volumes shall be factored in the design where applicable (e.g. by increasing dosing volume accordingly).
 - e. For Type B system installations with a pump tank after the Biofilter, the void space in the bottom of the modules beneath the peat (approximately 500 gallons per module for Model STB-650 and 400 gallons per module for Model STB-500), when utilizing two Standard Infiltrator Chambers, or equivalent, and gravel in bottom of module) may be included to meet emergency storage capacity requirements. The emergency storage capacity requirement shall be met without the liquid level in the pump tank exceeding three inches below the bottom of the peat in the adjacent Biofilter modules.

3. Ecoflo® Peat Filter Containment modules:

- a. Fiberglass containment modules are made of pre-assembled, UV-protected fiberglass and polyester resin composite material, with approximate dimensions of: 650 Models: 13 feet 8 inches long by 7 feet 7 inches wide by 4 feet 4 inches deep; 500 Models: 11 feet long by 7 feet 7 inches wide by 5 feet 4 inches deep. The modules are fitted with UV-protected, removable polyethylene lids, which contain ventilation. Each unit is installed level, with effluent flow uniformly split between both sides of the filter bed.
- b. Pre-cast concrete containment modules are made of pre-assembled, reinforced concrete, with approximate dimensions of: Model STB-650B(H1): 12 feet 7 inches long by 6 feet 9 inches wide by 6 feet deep. The modules are fitted with UV-protected, removable polyethylene main access lids, which contain ventilation. The modules contain a funnel access allowing air circulation between top and bottom of the filtering media, access to effluent outlet, and for sampling of treated effluent. A secondary access lid made with UV-protected polyethylene is provided over the funnel access. Each unit is installed level, with effluent flow uniformly split between both sides of the filter bed.

4. Components Common to all Ecoflo® Peat Biofilter Systems:

- a. The Ecoflo® Peat Biofilter is a pre-engineered proprietary treatment system.

The fibrous peat treatment media is residues of Sphagnum peat plants, extracted from raised bog peats (other natural fibrous materials and peat fines are also present). The following statement should be included on all permits and authorizations to construct: **“The estimated life of the peat media is currently 8 years. The media may need to be replaced, in part or in full, in order to maintain specified treatment standards.”** Normal peat replacement after 8 or more years is routine maintenance of the Ecoflo® PeatBiofilter and shall not be considered a repair or require the issuance of a repair permit. However, the Local Health Department shall receive prior written notification from the ORC which states the details of when and where a routine peat replacement will occur.

The peat biofilter media shall be designed in accordance with the following parameters:

Media thickness in inches:.....	31
Maximum hydraulic loading rate in gpd per square foot:....	6.9
Design flow rate per module (gpd):	
Models ST 650, STB-650, STB-650B(H1):	480 gpd
(For systems with design flows exceeding 1000 gpd, use 400 gpd/module, maximum)	
Models ST-500 and STB-500:	330 gpd
(For systems with design flows exceeding 1000 gpd, use 275 gpd/module, maximum)	

- b. Distribution in the peat biofilter modules is achieved by a tipping device and distribution plates. The effluent received either directly from the septic tank or from a pumping unit is sent from the inlet pipe to the tipping device. The tipping device then tips from side to side, by way of weight and gravity, spreading the water over the distribution plates that have channels with holes at various intervals allowing the water to be spread evenly over the total surface of the peat media. The distribution plates are placed over the peat media without touching them allowing for air circulation.

When the design flow rate of an Ecoflo® installation is greater than 480 gallons per day, more than one peat biofilter module must be used and the effluent shall be evenly split between the Biofilters. When the installation requires two units that can be gravity fed, a gravity flow divider shall be used to split flow uniformly between the two units. Whenever a pumping unit is required or whenever the installation requires more than two units, a pressurized flow divider shall be used, as specified by Premier Tech. The system designer shall specify the elevations for all relevant system components and set relative to a site-specific vertical benchmark.

- c. The treated effluent exits from the base of the module under gravity through the open base or through solid piping depending on the type of Ecoflo® Peat Biofilter system utilized. The system designer shall specify which type of unit is required for a specific design.
 - d. Ventilation/Insulation: The lid on the peat biofilter unit contains a vent hole and insulation panel which accommodates the passive diffusion of oxygen into the unit. The vent hole shall not be covered.
 - e. Flow Monitoring: Each system shall incorporate a system for flow monitoring. This shall be accomplished either by using the gravity distribution tipper, or in conjunction with the dosing system for a drip or other pressurized dispersal system. When used for flow monitoring, the “tipper” shall include a manufacturer-provided event counter and data logger capable of recording the daily flow from the tipper “counts” for at least 30 days. This way the 7 and 30 day flow rate may be determined during each monitoring visit.
5. Components Specific to Type A Ecoflo® Peat Biofilter Systems.
- a. Each unit shall be centered on contiguous level rock beds each sized according to LTAR but shall extend a minimum of one (1) foot on each side of the unit and have a minimum depth of eight (8) inches. Rock used shall be in accordance with Rule .1955(h).
 - b. Effluent after passing through the peat media is distributed over the rock bed through the open base of the unit.
 - c. For effluent sampling, a sampler made of a collection plate and a sample collection chamber, is placed at the base of the peat media enabling the water to be collected and diverted towards the sampling port located in the central support. This sampling port must be accessed through the lid of the system and provides easy access to the sample collection chamber. A hole at the bottom of the sample chamber allows seepage of uncollected effluent into the underlying rock pad
6. Components Specific to Type B Ecoflo® Peat Biofilter Systems.
- a. The unit must be installed on a bed of gravel for stabilization. The gravel shall be clean, crushed No. 5 or No. 57 stone or fine sand with a minimum depth of six inches. Alternative bedding designs may be specified by the designer which provide for the unit to be adequately supported and level.
 - b. Effluent after passing through the peat media is collected and piped from the base of the sealed bottom of the unit either directly to subsurface trenches or conveyed by gravity or pumped to a conventional, modified, alternative or innovative system in accordance with Rules .1900 et seq. Subsurface trenches shall be set back horizontally at least two feet from the gravel bed beneath the modules.
 - c. For effluent sampling for Ecoflo® Models STB-650 and STB-500, a sampler made of a collection plate and a sample collection chamber, is placed at the base of the peat media enabling the water to be collected and diverted towards the sampling port located in the central support. This sampling port must be accessed through the lid of the system and provides easy access to the sample collection chamber. A hole at the bottom of the sample chamber allows seepage of uncollected effluent into the underlying rock pad. A distribution box or drop box may be used for the sampling access point, located in the effluent discharge line from the peat unit prior to the drainfield. The box must be constructed to facilitate at-grade access.
 - d. For effluent sampling for Ecoflo® Model STB-650B(H1), the access funnel is used for the effluent sampling. This sampling port must be accessed through the secondary lid of the system.

F. INSTALLATION AND TESTING PROCEDURES

1. An on-site preconstruction conference shall be required to be attended by the Ecoflo® Peat Biofilter system designer, installer, local health department, licensed soil scientist (as applicable), and property owner or owner's representative prior to beginning construction of the Ecoflo® Peat Biofilter and associated ground absorption system.
2. The septic tank, pump tank and peat biofilter unit shall be located to prevent surface/subsurface water inflow/infiltration, and shall meet the horizontal setback requirements of Rule .1950(a) or .1951, as applicable.
3. The Peat biofilter shall be installed level on a rock bed (see Sections F.4. and F.5., above). Elevation shall be high enough to meet constraints established for the site by the final treatment and disposal system. When sited in accordance with the appropriate sections of this approval, the bottom of the rock bed for Type A Ecoflo® Peat Biofilter systems may be installed up to but no deeper than 5 feet below finished grade, provided that the vertical separation requirements in Section D of this approval are increased by 6 inches when the bed depth exceeds 3 feet.
4. For Type A Ecoflo® Peat Biofilter Systems, the bed shall be constructed as an elongated berm, with the long axis parallel to the ground elevation contours of the slope. The bottom of the bed shall be excavated level ($\pm 1/4"$) in all directions. The gravel bed shall be immediately installed without allowing machinery to traverse the excavated/exposed bed bottom. Exposed portions of the rock bed (portions not under the unit) shall be covered by a geotextile fabric prior to back filling capable of preventing the downward movement of silt-sized particles while allowing the movement of moisture and gases.
5. For Type B Ecoflo® Peat Biofilter Systems, the gravel or sand bed shall be installed level ($\pm 1/4"$) in all directions, with configuration of the unit installed as directed by the system designer for each site. The gravel bed or sand bed must extend a least six inches beyond the ends of the unit in all directions.
6. Backfill shall be installed over the gravel bed along the sides of the unit, with the unit lid remaining at least two inches above finished grade. Minimum backfill depth shall be six inches. Backfill shall be installed with a side slope not to exceed a rise to run ratio of 1:3, unless a dry stacked interlocking block retaining wall is constructed adjacent to the gravel bed. Any other type of retaining wall shall be designed by a professional engineer and approved by the local health department. (Note: use of a retaining wall for supporting backfill does not supercede side slope requirements for fill systems, which still must be met, where applicable)
7. All tankage, including risers, shall be demonstrated to be watertight by a 24-hour hydrostatic leakage test conducted at the installation site prior to system startup. A water level change of $\pm 1/2$ -inch or more over 24 hours, or visual observation of leakage shall be cause for failure of the watertightness test.
8. Pump delivery rate shall be measured and determined to be in accordance with design parameters. The initial settings shall be made to pump floats and/or timer controls in the Biofilter pumping tank based upon the field measurements prior to system start-up. The system's Operator in Responsible Charge (ORC) shall be present during these determinations.
9. Specified site preparation steps and construction specifications for the ground absorption system shall be strictly adhered to, including specified depth of trenches in relation to site limiting conditions.

G. OPERATION AND MAINTENANCE

1. System classification, management and inspection shall be in accordance with Rule .1961 and Rule .1970. Ecoflo® Peat Biofilter Systems shall be classified at a minimum as a Type Va system according to Table V(a) of Rule .1961(b). The system shall be inspected by a certified Subsurface Operator who shall be either an employee of Premier Tech or authorized in writing by Premier Tech to operate and maintain the system. The operator must have proper equipment and training to access and program the control panels on site, as applicable.

2. System Inspections: Both the local health department and the Operator-in-Responsible Charge (ORC) must conduct monitoring inspections of Ecoflo® Peat Biofilter Systems at a minimum frequency as specified in Table V of Rule .1961 (b) and the Operation Permit, and as specified in Clause 1 of the Ecoflo® Maintenance Agreement and in the Ecoflo® Owner's Manual, Section "Annual Maintenance".

3. At each Ecoflo® Peat Biofilter inspection the ORC shall, at a minimum, observe and monitor:

- a. wastewater level in the tanks,
- b. the septic tank outlet filter or screened pump vault for clogging,
- c. watertightness of tanks, risers and pipe connections at tanks,
- d. operation of pumps, floats, valves, electrical controls and alarms,
- e. pumping frequency from pump impulse counters and elapsed run time meters,
- f. The peat unit and the earthen mound and/or landscape retaining wall for any structural damage, accessibility, adequate ventilation, excess odors, insect infestations,
- g. vegetative growth over the drainfield,
- h. the drainfield area for surfacing the effluent, and
- i. a sample of peat biofilter effluent collected from the sampling point to check for effluent clarity and odor (note: peat biofilter effluent may have a brackish to straw color from the humic and fulvic acids naturally present in the peat media).

4. At least twice per year the ORC shall, at a minimum, measure and report to the health department:

- a. sludge and scum levels in the septic tank,
- b. sludge level and grease presence in the pump tank,
- c. pump delivery rate (drawdown test), and
- d. dosing volume and measure or calculate average pump run time.

5. An annual visual inspection of each Ecoflo® module shall be made by the ORC, in accordance with the Ecoflo Visual Inspection Protocol, pursuant to Rule .1970, attached as Appendix A. For systems serving Vacation Rentals, this visit shall be scheduled during the seasonal high use period, and shall be coincident with any required water quality sampling. This inspection will typically also be coincident with Premier Tech's annual maintenance of the unit. The need for any additional maintenance, inspections or repairs will also be assessed by the ORC during this inspection.

6. Effluent Sampling and Analysis:

- a. All sampling and re-sampling shall be done in accordance with Rule .1970(n)(3) and (5). In 2006, Premier Tech began to participate in a system performance audit following an evaluation protocol approved pursuant to Rule .1969(h)(8) as a precursor to applying for approval as an Accepted System. During the 2007 monitoring season, follow-up inspections will be performed on some of the systems initially visited in 2006, with the expectation that the protocol will be adjusted and proposed to be fully implemented during the 2008 monitoring season. For 2007, influent and effluent sampling for all systems shall continue in accordance with the sampling procedures set forth in "Modifications to Peat Filter Innovative Approvals' Performance and Monitoring Requirements Effective 5-30-05", as delineated in the Memorandum from Terry Pierce, DEH Director, dated May 16, 2005.

7. Notification and Performance of Maintenance and Repairs

- a. The ORC shall alert the system owner in a timely fashion of needed maintenance or repair activities including, but not limited to, landscaping, tank sealing, tank pumping, pipe or control system repairs, media replacement, and adjustments to any other system component. The ORC shall notify the system owner and local health department whenever the pump delivery rate efficiency or average pump run time are not within 25% of initial measurements conducted prior to system startup.

- b. The ORC shall keep the septic tank outlet effluent filter or screened pump vault cleaned and in proper operating condition, as per manufacturer's recommendations.
 - c. System troubleshooting and needed maintenance must be provided to maintain the pump delivery rate and average pump run time within 25% of initial measurements conducted prior to system startup.
 - d. The septic tank will be pumped as needed upon recommendation of the ORC. However, at a minimum, the septic tank will be pumped whenever the solids level exceeds 25% of the tank's total liquid working capacity or the scum layer is more than 4 inches thick.
 - e. The ORC shall notify the local Health Department and system owner in writing whenever repairs are required, including the need to replace the media. (Note: media replacement shall require the issuance of a repair permit by the Health Department). All maintenance activities shall also be logged and recorded in the ORC reports provided to the local health department. Waste media shall be disposed in accordance with requirements of the Division of Waste Management for this specific waste.
- 8 The ORC shall also conduct other additional observations, measurements, monitoring, and maintenance activities for any system component (septic tank, pump tank, controls, pretreatment unit, drainfield, etc.), as specified in the Operation Permit and as recommended by the manufacturer.

9. Reporting

- a. After each required ORC system inspection, the ORC shall provide a completed written report to the system owner and the local health department within 30 days. At a minimum this report must specify:
 - (1) the date and time of inspection,
 - (2) system operating conditions observed according to H.3, above,
 - (3) system operating conditions measured and observed according to H.4 and H.5 above,
 - (4) results from any laboratory analysis of any influent and effluent samples,
 - (5) maintenance activities performed since the last inspection report,
 - (6) an assessment of overall system performance, and
 - (7) a determination of whether the system is malfunctioning, and the specific nature of the malfunction.
- b. After each required health department system inspection, the local health department shall provide a completed inspection report to the system owner, Premier Tech Environment and the State within 30 days. The local health department shall also provide an annual summary each January to the State including:
 - (1) the name of the environmental health specialist in the health department with primary responsibility for the Ecoflo® Peat Biofilter program in the county/district,
 - (2) the number of improvement permits, construction authorizations, and operation permits issued for Ecoflo® Peat Biofilter systems the prior year in the county/district,
 - (3) the total cumulative number of Ecoflo® Peat Biofilter systems installed under this Approval in the county/district,
 - (4) the percentage of ORC reports due to the health department that have been received from the ORC's,
 - (5) an assessment of overall performance of Ecoflo® Peat Biofilter systems in the county/district, and
 - (6) the percentage of Ecoflo® Peat Biofilter systems which malfunctioned during the prior year, the nature of the malfunctions, and any remedies implemented or needed.

10. Effluent Quality, System and Site Compliance: Compliance of each site and the system shall be in accordance with requirements set forth in Rule .1970(o)

H. RESPONSIBILITIES AND PERMITTING PROCEDURES

1. Prior to the installation of a Ecoflo® Peat Biofilter system at a site, the owner or owner's legal representative shall notify the local health department of their proposed use of such a system. The local health department shall issue an Improvement Permit or Authorization to Construct or amend a previously issued Improvement Permit or Authorization to Construct allowing for the use of the proposed Innovative System upon a finding that all provisions of this approval and all other applicable rules shall be met. Use of the proposed Innovative System and any conditions shall be described in the Improvement Permit and Authorization to Construct or amended Improvement Permit and Authorization to Construct, as well as described on the Operation Permit to be issued upon the acceptable completion of the system installation.

2. Where required by Rule 1970(p)(1), a Licensed Soil Scientist (or Professional Geologist where appropriate), shall conduct a detailed assessment of the site conditions and provide to the local health department a written, signed and sealed report that includes the information as specified in Rule .1970(p)(2).

The local health department may request the assistance of the State in evaluating this report prior to Improvement Permit issuance.

3. Design responsibility: Prior to the issuance of an Authorization to Construct for a Ecoflo® Peat Biofilter System, site-specific plans and specifications shall be submitted for review and approval by the local health department. Site specific plans and specifications shall be prepared by individuals authorized in writing by the manufacturer (which may include an authorized agent in a local health department), or by a professional engineer. Approval shall be contingent upon the specific Ecoflo® Peat Biofilter System proposed being found to be in accordance with all provisions of this approval as applicable to the proposed facility and site.

4. The system shall be installed by a contractor authorized in writing by the manufacturer, who shall coordinate the installation with the designer and manufacturer's field representative. The manufacturer's field representative shall provide written confirmation of their acceptance of the Ecoflo® Peat Biofilter installation and designer shall provide written confirmation of their acceptance of the complete system installation prior to Operation Permit issuance.

5. For sites required to be evaluated by a Licensed Soil Scientist or Professional Geologist (see Section I.2, above), the health department may specify as a condition on the Improvement Permit and Authorization to Construct that a Licensed Soil Scientist or Professional Geologist oversee critical phases of the ground absorption system installation and certify in writing that the installation was in accordance with their specified site/installation requirements prior to the Operation Permit issuance.

6. The operator requirements of Rule .1961(b) and Rule .1970 shall be met, including the requirement for a contract for operation and maintenance to have been executed between the system owner and Premier Tech or with a Public or Private Management Entity with a Certified Operator. The Certified Operator shall be authorized in writing by Premier Tech Environment to operate and maintain the system. The ORC shall be present during initial system setup in accordance with Section G.8, above, prior to issuance of the Operation Permit.

I. REPAIR OF SYSTEMS

The provisions of 15A NCAC 18A .1961(l) shall govern the use of Ecoflo® Peat Biofilter Systems for repairs to existing malfunctioning wastewater systems.

Approved by: _____ Date: _____

APPENDIX A – VISUAL INSPECTION PROTOCOL

An annual visual inspection of each Ecoflo module shall be made by the ORC. For systems serving Vacation rentals, this visit shall be scheduled during the seasonal high use period, and shall be coincident with any required water quality sampling.

- a. Notice to Local Health Department: the LHD shall be notified at least 48 hours prior to this inspection and may be present as an observer while the inspection is conducted.
- b. Water Usage and Occupancy: For systems containing a flow monitoring device and data logger, the 7-day and 30-day wastewater flow from the facility to the system prior to this inspection shall be determined and recorded, or an alternate approved means utilized. For existing systems where it is not feasible to directly obtain the past 7-day and 30-day flow, water usage during the previous 7 to 30 day period shall be estimated by using the best available information, including water meter readings, elapsed time clock readings when an effluent pump is present, and occupancy information.
- c. Distribution System: Effluent flow between multiple modules and operation of the tipper bucket(s) and distribution plates shall be observed to be uniform and unimpeded and all associated components found to be functioning properly. If any problems with the distribution system are found, such problems shall be documented with one or more digital pictures, as well as field notes describing the specific issues(s), so that any necessary repairs can be made.
- d. Internal Inspection and Maintenance: The distribution plates shall be removed, and the peat surface and infiltration zone inspected for ponding, excessive settlement or scouring beneath the distribution orifices, uniformity of effluent distribution to the peat, and peat condition:
 - i. Infiltration Zone (Type A Systems): The presence and depth of any saturated zone above the trench/bed bottom shall be noted. Any saturated zone shall be no more than 6-inches above the bottom of the gravel bed, as determined by measuring the depth to the gravel bed ponding surface in the filter sampling chamber. If ponding is observed, the ORC shall evaluate whether this is an intermittent or ongoing condition. The “site” shall be considered to be malfunctioning if the effluent surface is observed to remain more than 6-inches above the bottom of the gravel bed for two or more observations made not less than 48 hours apart and not less than 48 hours after a rainfall event.
 - ii. Peat Condition and Surface Observation: Peat and surface condition shall be observed and visually described prior to any raking or addition of peat. A digital (“before”) picture shall be taken of both sides of the module(s), and the peat appearance compared with manufacturer-standards of “good”, “partially-degraded” and “degraded” peat. Compaction of the peat bed shall be recorded by measuring depth of peat moss level from the top of the central support.
 - iii. Ponding: where liquid ponding of 1” or more is observed over more than 50% of the total peat bed surface area prior to raking, the ORC shall:
 1. determine whether the system is receiving excessive flows by utilizing flow data from an existing flow monitoring device or by installing a flow monitor device and returning to the site within 15 to 30 days to collect the data. Where flow data indicates flows to the system which exceed the design capacity, the ORC shall notify the Homeowner in writing immediately, with a copy to the LHD, that the system is not being operated in compliance with the Operation Permit, and include a description of all relevant details;
 2. where flow monitoring indicates normal usage, utilize influent sampling to determine whether influent concentrations exceed the criteria set forth in Rule 1970 (including fats, oils and grease) or other harmful influent characteristics are present which could be causing premature peat deterioration or otherwise contributing to ponding problems. Where chemical analysis indicates such a problem with influent characteristics, the ORC shall notify the Homeowner in writing

immediately, with a copy to the LHD, that the system is not being operated in compliance with the Operation Permit, and include a description of all relevant details;

3. determine whether ponding is persistent by performing routine maintenance raking of the system and then returning in 15 to 45 days to observe whether ponding of 1" or more over 50% of the total peat bed surface area is present. Where the ORC issues a notice to the Homeowner for either high flows or influent problems, the ORC shall wait 10 business days after sending such notice before returning to the system to observe whether ponding is persistent. Where ponding (as defined herein) is observed on not less than 2 separate observations made not less than 15 days and not more than 45 days apart, and despite routine maintenance, the ORC shall notify the Homeowner in writing immediately, with a copy to the LHD, that the system is non-compliant, and include a description of all relevant details.
 - iv. Raking: The peat surface shall be raked, and adjustments shall be made, as needed, to assure effluent distribution uniformity. A digital ("after") picture shall be taken of the peat surface documenting its condition after annual servicing.
 - e. Notification of Non-Compliance: where the site, facility, dwelling or system is out of compliance, as described above, the LHD and the homeowner shall be notified and further investigation might be required before undertaking any corrective actions. Any further modifications to the peat surface or adjustments to internal components shall be made only as prescribed by the manufacturer and approved by the LHD.