

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

**CONTROLLED DEMONSTRATION  
WASTEWATER SYSTEM APPROVAL**

**CONTROLLED DEMONSTRATION NO: CDWS-2006-01**

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**FOR:** SeptiTech Pretreatment Systems

**APPROVAL DATE:** January 19, 2006

In accordance with General Statute 130A-343 as amended by Session Law 2001-505 (House Bill 1019) and NCAC 18A.1969, a proposal by SeptiTech, Inc., for approval of subsurface wastewater systems utilizing the SeptiTech systems have been reviewed, and systems have been found to meet the standards of a controlled demonstration system when all of the following conditions are met:

**A. GENERAL**

1. Scope of this Controlled Demonstration Approval includes:
  - a. Performance standards for advanced onsite pretreatment system.
  - b. Use, design and construction requirements for the specified models of SeptiTech pretreatment systems.
  - c. Sizing and siting specifications for SeptiTech pretreatment systems and associated subsurface wastewater systems that meet these performance standards.
  - d. Operation, maintenance and monitoring of these SeptiTech pretreatment systems and associated subsurface systems to ensure the treatment performance shall continue to be met.
  - e. Proposal for evaluation of this Controlled Demonstration system.

2. This Controlled Demonstration Approval is applicable to domestic strength sewage systems (non-industrial wastewater) utilizing SeptiTech Pre-treatment Systems that have a design flow not exceeding 3000 gallons per day. Influent waste strength to the SeptiTech Pre-treatment System shall not exceed domestic septic tank quality effluent, and be in accordance with the following parameters:

Table 1

Influent Characteristics, SeptiTech Pretreatment systems.	
	Not to Exceed mg/l
Biochemical Oxygen Demand (BOD)	350
Total Suspended Solids (TSS)	200
Total Kjeldahl Nitrogen (TKN)	100
Grease plus Oil	30

In addition, any site 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.

3. This controlled demonstration is initially limited to 200 systems with design flows of up to 3,000 gallons per day. Prior to the approval of any individual system under the controlled demonstration approval, the manufacturer of all proposed tanks must be identified and tank construction details must be State-approved, as typically required for generically approved Residential Wastewater Treatment Units (previously termed "ATUs").
4. Use of SeptiTech pretreatment systems where the overall system has a design flow exceeding 3,000 gallons per day may be permitted after approval by the State on a case-by-case basis in accordance with the Large Systems State Review/Approval Process (Rule 15A NCAC 18A.1938).

**B. ADVANCED TREATMENT PERFORMANCE STANDARDS (TS-II)\***

1. Treatment Standard II (TS-II): Tertiary treatment with nitrogen-reduction.

Pretreatment systems meeting TS-II are designed, installed and operated to meet the following standards:

- a. Carbonaceous Biochemical oxygen Demand, 5-day (CBOD<sub>5</sub>) <15 mg/l.
  - b. Total suspended solids < 15 mg/l.
  - c. Ammonia-nitrogen < 10 mg/l
  - d. Total nitrogen (Total Kjeldahl Nitrogen +NO<sub>x</sub>-N) standard shall be met through one of the following methods:
    - (1) Total nitrogen concentration in the SeptiTech effluent ≤ 15 mg/l, or
    - (2) Total nitrogen reduction of 50%. Measured as the difference between the septic tank effluent (TKN) and SeptiTech effluent (TKN+NO<sub>x</sub>-N), or
    - (3) Calculated as a maximum daily load (this criteria shall only be applicable when the average daily flow for the past 30 days is below 25 percent of the design flow and when the effluent CBOD<sub>5</sub> is less than 5 mg/l): Nitrogen reduction may be measured in terms of pounds of total nitrogen actually delivered to the field per day. Up to .004 lbs per day for every 60 gallons of daily design flow is allowed. See Attachment C for guidance on calculating this for compliance determination.
  - e. Fecal coliform bacteria densities < 10,000 colonies/100ml.  
Standards are arithmetic means, except fecal coliform is a geometric mean.
2. When the disposal system is designed according to section D.4 below, the treatment system shall, in addition to c. and d. above, meet the following standards:

- |                      |                         |
|----------------------|-------------------------|
| a. CBOD <sub>5</sub> | ≤ 10 mg/L               |
| b. TSS               | ≤ 10 mg/L               |
| c. Fecal Coliform    | ≤ 1,000 colonies/100ml. |

\*Note: SeptiTech TS-II systems may be used for sites approved/permitted for TS-I treatment systems

### C. SITING CRITERIA

Approved Controlled Demonstration Systems may be installed on sites that are suitable for a conventional wastewater system and that have a repair area of sufficient size to allow installation of a conventional, modified or alternative wastewater system, an approved innovative wastewater system, or an accepted wastewater system if the controlled demonstration wastewater system fails to perform properly. All repair systems for TS-II Septi-Tech pretreatment systems shall be approved innovative TS-II treatment systems.

Ground absorption systems receiving effluent from approved SeptiTech TS-II Pretreatment Systems may also be used on sites classified as Provisionally Suitable for conventional, modified, alternative or innovative systems in accordance with 15A NCAC 18A .1900 et seq. The following modifications to siting criteria, vertical or horizontal separation distance requirements shall be acceptable:

1. Minimum initial vertical separation siting criteria and minimum vertical separation distances for trench bottoms specified in Rules .1955 (m), .1956, and .1957 may be reduced for systems with design flows of up to 3,000 gallons per day as follows:
  - by a maximum of 25 percent for gravity dosed drainfields, and,
  - by a maximum of 50 percent for pressure dosed drainfields (LPP or DRIP distribution),

**When all of the following conditions are met:**

- a. the initial vertical separation siting criteria shall **not** be reduced to less than 12 inches from the soil surface to rock or any unsuitable soil horizon, and
  - b. the trench bottom vertical separation distance shall **not** be reduced to less than 12 inches to rock, groundwater, or tidal water, and shall not be reduced to less than 6 inches from any other soil wetness condition,, and
  - c. the site shall be evaluated by a Licensed Soil Scientist as provided in section H below, and
  - d. with the exception of horizontal setback reductions from Drainage Systems, **no other reductions in horizontal setbacks or increases in Long Term Acceptance Rates**, as provided for in Sections C.5 and D.2, below, shall be used when any reductions in initial vertical separation siting criteria or trench bottom vertical separation distances are utilized. Furthermore, no reduction in trench area shall be allowed for alternative drainfield materials to include PPBPS.
2. Drainage Systems: When a SeptiTech Pretreatment System is to be utilized for systems with design flows of up to 1,000 gallons per day, drainage may be used on sites with Group III Soil Texture, and soils with Provisionally Suitable (or Suitable) structure are allowed within the vertical separation zone. A groundwater lowering system may also be used to meet the siting criteria or vertical separation requirements for soil wetness conditions for fill systems specified in Rule .1957(b)(1), provided the conditions of C.1.A. are met. Site evaluation by a Licensed Soil Scientist shall be required, and the drainage system shall be designed by a person with demonstrated knowledge of drainage systems (see Section H, below).
  3. Saprolite Systems: When an SeptiTech TS-I or TS-II Pretreatment System is to be utilized for systems with design flows of up to 1,000 gallons per day, saprolite with sandy clay loam texture may be used. The maximum LTAR for sandy clay loam saprolite texture shall be 0.2 gpd/ft<sup>2</sup> for conventional trenches and 0.10 gpd/ft<sup>2</sup> for LPP trenches. Nitrification trenches in saprolite may be installed up to **five** feet deep. Site evaluation by a Licensed Soil Scientist or Professional Geologist shall be required (see Section H, below).
  4. Minimum horizontal setbacks shall be as specified in Rule .1950, except as provided for in Table 2 for system with a design flow of up to 1000 gallons per day.

**Table 2**

<b>Minimum horizontal setbacks for ground absorption systems SeptiTech TS-II Pretreatment System are used*</b>		
<b>Land Feature or Component</b>	<b>Existing Rules [.1950 (a)]</b>	<b>TSII SeptiTech</b>
<b>Any private water supply source</b>	100	50
<b>Any public water supply source</b>	100	100
<b>Streams classified as WS-I</b>	100	50
<b>Waters classified as S.A</b>	100	50
<b>Other coastal waters</b>	50	25
<b>Any other stream, canal, marsh or other surface waters</b>	50	25
<b>Any Class I or Class II reservoir</b>	100	50
<b>Any permanent storm water retention pond</b>	50	25
<b>Any other lake or pond</b>	50	25
<b>Any building foundation</b>	5	5
<b>Any basement</b>	15	15
<b>Any property line</b>	10	10
<b>Top of slope of embankments or cuts of 2 feet or more vertical height</b>	15	15
<b>Any water line</b>	10	10
<b>Upslope Interceptor drains</b>	10	7
<b>Sideslope Interceptor drain</b>	15	10
<b>Downslope Interceptor drain</b>	25	15
<b>Groundwater Lowering Ditch</b>	25	15
<b>Any swimming pool</b>	15	15
<b>Any other nitrification field (except repair area)</b>	20	10

**\*- Note: With the exception of the Drainage Systems horizontal setback reductions, the reductions in horizontal setbacks in Table 2, above, shall not be allowed when reductions in initial conditions or vertical separation distances are used in accordance with Section C.1, above, or when any increase in Long Term Acceptance Rate (LTAR) is used in accordance with Section D2, below. These reductions also do not apply to systems with a design flow in excess of 1000 gallons per day.**

5. Bed systems on sites that have a design flow not to exceed 3000 gallons per day may be used (see additional requirements for bed systems from 1000 - 3000 gpd in d. below):
  - a. on sites classified as Suitable or Provisionally Suitable and where the soil is classified based on texture as Soil Group I or II, in accordance with 15A NCAC 18A .1900 et seq., and at least 24-inches of Group I or II Soil shall be present beneath the gravel bed bottom, and/or
  - b. on sites where at least the first 36 inches below the naturally occurring soil surface consist of Soil Group I (sand or loamy sand), and no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface. The requirement for 36 inches of Soil Group I may be reduced to 18 inches when hydraulic analysis by a

licensed soil scientist demonstrates that effluent will not come to the ground surface and the required separation to soil wetness can be maintained. The site shall have a uniform slope not exceeding two (2) percent, unless hydraulic analysis by a licensed soil scientist demonstrates that effluent will not come to the ground surface and the required separation to soil wetness can be maintained. In no case shall slope exceed ten (10) percent. Fill material, if needed, shall be sand or loamy sand, containing not more than 10-percent debris, and/or

- c. on existing fill sites which meet the requirements of 15A NCAC 18A .1957(b)(2)(A, B and C), and only when the design flow shall not exceed 480 gallons per day.

All applicable vertical separation requirements shall be met except that the gravel bed bottom may have a minimum separation distance of only 12 inches from any soil wetness condition for systems installed on sites which meet Sections C.5.a or b, above, 18 inches for systems installed on sites which meet Section C.5.c, and 24 inches for systems installed which meet Section C.5.d requirements (unless the groundwater mounding analysis substantiates a greater or lesser separation is necessary), above. The vertical separation requirement may be met by adding Group I soil, but shall not be met with the use of a groundwater lowering system. The system shall be considered to be a fill system only if the LPP bed bottom is installed less than six inches below the naturally occurring soil surface. [Note: for fill systems, the requirements in Rule .1957(b) for the side slope of the fill shall be met, as determined beginning at a point six-inches above the top edge of the gravel bed].

#### **D. SIZING CRITERIA**

1. The system sizing criteria shall be based upon the Long Term Acceptance Rate (LTAR) specified in the appropriate portion of the Rules for the type of ground absorption system to be used.
2. The LTAR may be increased up to a factor of two when all of the following conditions are met:
  - a. initial vertical separation siting criteria or vertical separation distances for trench bottoms specified in Rules .1955(m), .1956 or .1957 have not been reduced.
  - b. sandy clay loam saprolite is not proposed to be used,
  - c. horizontal separation distances specified in Rule .1950 have not been reduced,
  - d. for systems to be installed in fill, a pressure dosed drainfield (LPP or DRIP distribution) is to be used.
  - e. for systems to be installed on sites with Group III or IV soils within three feet of the trench bottom or on sites requiring drainage of Group II or III soils, the site has been evaluated by a Licensed Soil Scientist (see Section H, below).

- f. for any system larger than 1000 gallons per day, the site shall be evaluated by a Licensed Soil Scientist (see Section H, below).
3. For ground absorption systems utilizing modified, graveless or other types of nitrification trenches separately approved in accordance with Rules .1956 or .1969, no reductions in linear footage of nitrification trench or system area shall be applied when the LTAR has been increased in accordance with section D.2, above.
  4. For bed disposal systems, the minimum number of square feet of bottom area which is determined by dividing the design daily sewage flow by the LTAR may be reduced by up to 25 percent as long as the following conditions can be met:
    - a. All beds shall utilize pressure distribution (LPP or Drip)
      - (1) LPP laterals, when used, shall be placed on maximum of three-foot centers. Orifices shall be spaced on three foot centers, maximum and sized at 1/8" diameter, minimum.
      - (2) Drip tubing, when used, shall be placed on two-foot centers, maximum, with maximum emitter spacing of 24-inches.
    - b. Beds shall have a gravel depth of 12-inches, minimum.
    - c. A minimum of two equally sized beds shall be used for systems greater than 1500 gpd. The beds shall be separated by a minimum of 20 feet.
    - d. Flow to bed fields shall be equalized over a 24-hour period by time dosing and utilize telemetry controls. Pump tanks are sized per rule .1952 (c).
    - e. No such reduction in bottom area shall be allowed for bed disposal systems in existing fill (Section C,5.c, above).
    - f. Horizontal separation distances specified in Rule .1950 may not be reduced.

**E. DESIGN CRITERIA**

1. The system consists of a septic tank, and a process tank as specified in Table 3 below.

Table 3			
Design Flow (gallons per day)	Minimum Septic Tank Size* (gallons)	Process Tank Size (gallons)	SeptiTech Unit

≤ 500	1000	1000	M400(D) (UV)(DUV)
501 - 600	1500	1500	M550(D) (UV)(DUV)
601 - 750	2000	1500	M750(D) (UV)(DUV)
751 - 1200	2500	2000	M1200(D) (UV)(DUV)
1201 - 1500	3750	4000	M1500(D) (UV)(DUV)
1501 - 4500	8000	8000	M3000H(D) (UV)(DUV)

\*SeptiTech systems can receive effluent from any two compartment septic tank with filter (or combination thereof) that meets state sizing requirements.

- a. The septic tanks shall be approved by the state and SeptiTech, Inc. As part of this approval, the septic tanks will have an inlet sanitary tee and a state approved, appropriately sized effluent filter on the outlet end.
- b. The process tank will be configured as per the drawings provided for the appropriate model.
- c. Pump specifications are as follows:

Residential units: Recirculation pump is generally the Tsurumi 50PU2.15; Pump back pump is always the Goulds LSP-03; Discharge is as applicable from the pumps provided..

Commercial units: Recirculation pump(s) can be either the 50PU2.15 or Tsurumi 50PU2.75; Pump back pump(s) are generally the Goulds LSP-03; Discharge is as applicable from the pumps provided or as necessary.

- d. The SeptiTech bead media are encapsulated in textile mesh bags that withstand 150 PSI tensile strength minimum. The media is suspended on a racking of Sch 40 pipe above the designed bottom reservoir. Effluent is recirculated by low pressure pipe above the media and open design spray nozzles diffuse the effluent in circular patterns.
- e. Filtrate from the SeptiTech media flows by gravity into the bottom reservoir of the process tank where it makes it's way into the decant chamber. All SeptiTech systems shall be discharged via pump which may or may not include an in-line UV disinfection unit.



- f. The UV disinfection system will be one of the following:
  - (1) Residential models use the” Pondmaster 40” UV model #02940 (or equally rated if necessary). Specifications provided.
  - (2) Commercial models depend upon size, volume, and desired result.

Other UV systems may be specifically approved by the State.

- g. SeptiTech Systems will utilize a standard control panel. The control panel is in a NEMA 4X enclosure, and shall be located inside or outside with provisions to keep the PLC warm (panel heater). Separate control and alarm circuits will be provided. SeptiTech does offer telemetry as an option on all control panels and telemetry is standard on all commercial systems. The Telemetry Control Panel shall be connected to an active phone line. The operator of the system must be able to access the panel directly on site and shall be available with a 24-hour notice to the county if required.
  - h. Tamper resistant screws shall be used in the covers of residential systems and locks provided on commercial systems.
  - i. Buoyancy calculations shall be completed by a N.C. professional engineer for plastic tanks that may intersect the water table.
  - j. The control panel, which will control drainfield dosing pumps, shall have pump cycle and run timer recording capability and shall meet the requirements of .1952.
  - k. Geotextile fabric shall be used between the rock layer and backfill material
  - l. A 3 foot setback shall be maintained between the dispersal field and concrete tanks. When a plastic tank is used the setback shall be increased to ten feet minimum due to hydrostatic loading when the tank is installed at or in the slope of a leachfield.
  - m. Timed dosing shall be provided to the disposal field.
2. SeptiTech systems shall be designed by a SeptiTech, Inc. certified designer or a North Carolina Professional Engineer working within the scope of their professional license.

## **F. INSTALLATION AND TESTING PROCEDURES**

- 1. A preconstruction conference shall be required to be attended by the system designer, SeptiTech certified installer, and local health department (LHD), prior to beginning construction of the SeptiTech Pre-treatment System and associated ground absorption system.
- 2. The SeptiTech System shall be located in compliance with the horizontal setback requirements of Rule .1950(a) (or Rule .1951, if applicable) and shall be located to prevent surface/subsurface water inflow/infiltration.

3. All SeptiTech systems shall be installed according to directions provided in the "Installation Manual" and instructions found on CAD drawings of each system. Additionally, all SeptiTech systems and components used with, but not manufactured by SeptiTech Inc., shall be installed in accordance with all applicable regulations and manufacturer instructions.
4. All companies installing SeptiTech systems shall be in possession of all necessary permits and licenses before attempting any portion of an installation.
5. Watertightness of the tanks and any dosing tanks shall be demonstrated by a 24-hour leakage test conducted at the installation site. A water level change of 1/2 inch or more, within a 24" riser, over 24 hours, or visual observation of leakage shall be cause for failure of the watertightness test. Initial water level shall be to 2" above the riser/adapter seam.
6. The SeptiTech distributor or his/her representative shall inspect each installation and shall provide an acceptance letter to the LHD prior to issuance of the operation permit.
7. 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.
8. Prior to operation permit issuance, the local health department shall inspect at least the following:
  - a. The health department shall observe the watertightness testing.
  - b. The health department staff shall witness the system test mode. Then the health department shall witness the test of pumps and alarm.
  - c. Record the pump models.
  - d. Check to ensure the air intake manifold is installed.
  - e. Check that the riser hatches have tamperproof bolts, and/or riser lock ring.
9. Each SeptiTech Control Panel shall have a label as shown in Attachment A.

## **G. OPERATION, MAINTENANCE AND TESTING**

1. All SeptiTech Pretreatment Systems shall be maintained according to the latest revision of the SeptiTech Operation and Maintenance Manual as published by SeptiTech, Inc.

2. All SeptiTech pretreatment systems require operation and maintenance. An operation and maintenance agreement with a North Carolina certified Subsurface Operator shall be in place. The operator shall be authorized by SeptiTech Inc. to operate the SeptiTech Pretreatment System. The operator must have proper equipment and training to access, and disseminate information from control panels on site. As well, the operator must be able to make field adjustments to the panel as necessary for proper function of the system.
3. System classification, management and inspection shall be in accordance with Rule. 1961. SeptiTech Pretreatment Systems shall be classified at a minimum as a Type Va system according to Table V(a) of Rule. 1961(b).
4. System Inspections: Both the local health department and the Operator-in-Responsible Charge (ORC) shall conduct monitoring inspections and sampling of SeptiTech Pretreatment Systems at a minimum frequency as specified Table V of Rule .1961(b) and the Operation Permit, and as specified in the SeptiTech Operation & Maintenance Manual titled “Maintenance Checklist”, whichever is most restrictive.
5. At each SeptiTech System inspection the ORC shall, at a minimum, observe, monitor, and record:
  - a. wastewater level in the tanks,
  - b. the effluent filter in the septic tank 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 PLC in control panel
  - f. the SeptiTech Pretreatment System for any structural damage, accessibility, adequate ventilation, excess odors, ponding of effluent, insect infestations, vegetative growth over the drainfield, the drainfield area for surfacing the effluent, and a sample of SeptiTech Pretreatment System effluent collected from the discharge chamber to check for effluent clarity and odor, and,
  - g. the pump cycle and run time information from the PLC and any water meter readings.
6. At least once per year the ORC shall, at a minimum, measure and report to the health department:
  - a. Any accumulation of sludge or grease presence in the decant chamber,
  - b. drainfield pump delivery rate (pressure test), and
  - c. drainfield dosing volume
7. The ORC shall also conduct other additional observations, measurements, monitoring, and maintenance activities as specified in the Operation Permit and as recommended by the manufacturer.
8. Effluent Sampling and Test Protocol:

SeptiTech Pre-treatment System effluent samples shall be collected by the ORC. These samples shall be taken for at least an 18-month period or until Innovative Approval for the system is granted by the State, in which case sampling for these systems shall follow the Innovative Approval requirements. After the initial 18 month monitoring period, the necessary monitoring frequency shall be evaluated by the State.

- a. Samples for drip disposal systems or other pressurized dispersal systems shall be collected from a tap on the drainfield forcemain (prior to spin filters for drip systems). The preferred location of the tap is in the pump tank discharge assembly. The sample shall not commence until at least 30 seconds of continuous discharge through the sample tap has been completed.
- b. A SeptiTech representative and a DENR Authorized On-Site Wastewater Agent shall supervise at least the initial sampling event.
- c. All systems shall be tested for effluent CBOD<sub>5</sub>, TSS, NH<sub>3</sub>-N, TKN, NO<sub>x</sub>-N, and fecal coliform bacteria.
- d. Reporting shall be done quarterly (April 1<sup>st</sup>, July 1<sup>st</sup>, October 1<sup>st</sup>, January 1<sup>st</sup>) for all data.
- e. All samples shall be obtained, preserved, and analyzed in accordance with 40 CFR 136. A state certified wastewater laboratory shall analyze samples for the treatment performance standards specified in Section B and complete chain of custodies shall be maintained. It is noted however that septic tank effluent samples can be highly diluted due to the recirculation of effluent in SeptiTech denite systems.
- f. When samples do not meet treatment standards specified in Section B, the system shall be resampled two more times within the next 60 days with samples collected no less than 48 hours apart. The average system performance shall then be calculated as the arithmetic mean (geometric mean for fecal coliforms) of results from the three samples. System maintenance or repair shall be required whenever the average system performance as calculated above does not meet the applicable treatment standards specified in Section B.
- g. All samples must be taken using the USEPA's Good Laboratory Practices standards (40 CFR 160). All samples must be analyzed using a state certified water quality laboratory, and complete chain of custodies must be maintained.
- h. All samples must be preserved, transported and tested while strictly adhering to USEPA approved "Standard Methods for the Examination of Water and Wastewater", APHA, 19<sup>th</sup> ed. In addition, regardless of transport time, all CBOD samples must submerged in water with a temperature  $\leq 4^{\circ}$  C immediately, and all nitrogen samples must immediately be preserved with enough sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) to reduce the pH to 4 standard units or less. Special care to prevent contamination for samples collected for fecal analysis shall be practiced.

- i. All costs of sampling during the initial 18-month monitoring period shall be the responsibility of SeptiTech Pre-treatment Systems.

## 9. 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, the SeptiTech North Carolina authorized representative (see attachment E), and the 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. System troubleshooting and needed maintenance shall be provided to maintain the pump delivery rate and average pump run time within 25% of initial measurements conducted during system startup.
- c. The septic tank will be pumped as needed upon recommendation of the ORC or as necessary. Please refer to the SeptiTech Operation & Maintenance Manual for preferred pumping intervals. 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.
- d. The ORC shall notify the local Health Department and system owner in writing whenever repairs are required. Applicable permits must be obtained from the local health department prior to any wastewater system repairs. All maintenance activities shall also be recorded in the ORC reports provided to the local health department.

## 10. 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 G.5, above,
  - (3) system operating conditions measured according to G.6 and G.7 above,
  - (4) results from any laboratory analysis of any 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. Reporting. On a Semi-Annual Basis, the designated testing organization (see Section H) and SeptiTech, Inc. shall provide a report to the local health department and the Onsite

Wastewater Section of effluent data and operator reports for each system installed in North Carolina under this Controlled Demonstration Approval. This report shall be in electronic format and may be published on the On-Site Wastewater Sections website without confidentiality. The contents of this report shall not be altered from the original document without approval from SeptiTech, Inc.

## H. RESPONSIBILITIES AND PERMITTING PROCEDURES

1. Prior to the installation of a SeptiTech Pretreatment System at a site, the owner or owners agent 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 up to 200 of the proposed Controlled Demonstration Systems upon a finding that all provisions of this Approval and all other applicable rules shall be met. Use of the proposed Controlled Demonstration 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. **Notification of the issuance of all permits/Authorizations by the local health department pursuant to this Controlled Demonstration Approval shall be submitted to the On-Site Wastewater Section.**
2. Prior to the issuance of the Improvement Permit, the site shall be evaluated by a Licensed Soil Scientist, whenever the following conditions are applicable:
  - a. initial vertical separation siting criteria or vertical separation distances for trench bottoms are proposed to be reduced in accordance with Section C.1, above,
  - b. drainage is proposed for Group III soils or a groundwater lowering system is proposed to be used in conjunction with a fill system (the drainage system shall be designed by someone with demonstrated knowledge of drainage systems),
  - c. sandy clay loam texture saprolite is proposed to be used (this evaluation could be performed by a Professional Geologist or a Licensed Soil Scientist),
  - d. the LTAR is proposed to be increased on sites with Group III or IV soils within 3 feet of the trench bottoms or on sites where drainage of Group II or III soils is proposed, in accordance with Section D.2, above, or
  - e. The system design flowrate is greater than 1000 gpd and any reductions are being taken.
3. Where required, the 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, sealed report that includes:
  - a. detailed descriptions of landscape position and soil morphological conditions to a depth

- of at least three feet below the trench bottom in the drainfield and repair area,
- b. field estimates of the depth and thickness of each of the soil horizons,
  - c. recommended depth for placement of the trench bottoms and the recommended LTAR,
  - d. a hydraulic assessment, based on site-specific information, substantiating the projected effectiveness of system performance. This shall include documentation that indicates the treated sewage effluent at the proposed LTAR will not discharge to the surface of the ground when the system is installed and operated within design parameters, and justification for any proposed drainage systems, and,
  - e. other site-specific requirements for system design, installation, site preparation, modifications and final landscaping.

The local health department may request the assistance of their Regional Soil Scientist in evaluating this report prior to Improvement Permit issuance.

4. Design responsibility: Prior to the issuance of an Authorization to Construct for a SeptiTech System, a submission prepared by a SeptiTech certified designer or North Carolina Professional Engineer (N.C. P.E. required for all systems exceeding 1,000 gpd), and a Licensed Soil Scientist or Professional Geologist, as applicable, shall be submitted for review and approval by the local health department. Approval shall be contingent upon the following:
  - a. Site-specific design for the pretreatment system including the SeptiTech unit with approved tankage, and sampling point.
  - b. Site-specific soils report is provided as applicable.
  - c. The drainfield dosing tank and drainfield layout may be completed by either the local health department or the Certified Designer/Professional Engineer.
  - d. All design submittals shall be accompanied by a letter from SeptiTech, Inc. or its North Carolina authorized representative.
5. It is recommended that local authorized environmental health practitioners attend a design training session offered by the manufacturer prior to permitting the system. Also, at the request of the local health department, your Regional Engineer will review the design.
6. The SeptiTech Pretreatment System shall be installed by a competent professional contractor authorized in writing by the manufacturer to perform such work. The SeptiTech authorized designer shall certify in writing that the system was installed in accordance with the approved design prior to Operation Permit issuance. A Professional Engineer shall certify in writing that a system required to be designed by an engineer was installed in accordance

with the approved plans and specifications prior to Operation Permit issuance. 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 drainfield installation and certify in writing that the installation was in accordance with their specified site/installation requirements prior to the Operation Permit issuance.

7. The operator shall be present during initial system commissioning. The ORC shall be certified both as a NC Subsurface Operator and an authorized SeptiTech Inc. Pretreatment System Operator. The operator shall submit a letter to the LHD that the system has been accepted and has been found to be satisfactory prior to issuance of the operation permit.
  
8. Within 60 days of this Controlled Demonstration Approval, the manufacturer shall enter into a contract for an evaluation of the performance of the controlled demonstration wastewater system with an independent laboratory, consultant, or other entity that has expertise in the evaluation of wastewater systems and that is approved by the Department. A semi-annual report shall be submitted to the Department beginning 6 months after the effective date of this Approval, and a final report submitted 18 months after the first system installed pursuant to this approval is operational. These reports shall provide information to the Department based upon the monitoring data and observations made from the Controlled Demonstration systems installed pursuant to this Approval. This should include an assessment of system performance in relation to the established treatment performance standards; an assessment of physical and chemical properties of the materials used to construct the system, in terms of strength, durability, and chemical resistance to loads and conditions experienced; recommended areas of applicability for the system; and any conditions and limitations related to the use of the system. The report shall be in electronic format and may be published on the On-Site Wastewater Sections website without confidentiality. The contents of this report shall not be altered from the original document without approval from SeptiTech, Inc.

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



**Attachment A**

Label is 4.75" long by 1.5" tall.

**NON-TYPICAL SEPTIC SYSTEM  
SEPTITECH CONTROLLED  
DEMONSTRATION.  
SUBSURFACE WW OPERATOR**