

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

**INNOVATIVE WASTEWATER
SYSTEM APPROVAL**

INNOVATIVE WASTEWATER SYSTEM NO: IWWS 2004-3-R1

ISSUED TO: Sam Carter, Government Relations Manager
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FOR: AdvanTex[®] Treatment Systems

APPROVAL DATE: April 6, 2005
June 29, 2007

In accordance with General Statute 130A-343, 15A NCAC 18A .1969 and .1970, a proposal by Orenco Systems, Inc., for an updated approval of subsurface wastewater systems utilizing the AdvanTex systems has been reviewed, and found to meet the standards of an Innovative system when all of the following conditions are met:

A. GENERAL

1. Scope of this Innovative Approval includes:
 - a. Use, design and construction requirements for the specified models of AdvanTex pretreatment systems to meet TS-I or TS-II effluent quality standards pursuant to Rule 15A NCAC 18A .1970.
 - b. Special operation, maintenance and monitoring of the AdvanTex pretreatment systems and associated subsurface systems to ensure the treatment performance standards shall be met.
 - c. Criteria for design and use of AdvanTex pretreatment systems followed by a subsurface drip dispersal system used conjunctively. This does not preclude the use of AdvanTex pretreatment systems with other approved innovative drip systems, as long as the pretreatment system requirements set forth in this approval are met.

2. This Innovative System Approval is applicable to domestic strength sewage systems (non-industrial wastewater) utilizing AdvanTex Treatment Systems that have a design flow not exceeding 3000 gallons per day.
3. Influent waste strength to the AdvanTex Treatment System as permitted with this approval shall not exceed domestic septic tank quality effluent standards pursuant to Rule 15A NCAC 18A .1970.

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.

4. Use of AdvanTex pretreatment systems that have a design flow exceeding 3000 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-I AND TS-II)*

AdvanTex pretreatment systems have been approved for TS-I and TS-II (see Design Criteria, Section D). Refer to Rule .1970(a) Table VII - Effluent Quality Standards for Advanced Pretreatment Systems for treatment performance levels.

C. SITING CRITERIA

The AdvanTex pretreatment systems and associated drainfields shall be sited and sized in accordance with Rule .1970.

When additional design, installation and watertightness requirements set forth in Section E(6) are met, the reductions in horizontal setbacks as allowed pursuant to Rule .1970(e) Table XII for TS-I systems, are also applicable to the AdvanTex pretreatment system, including the septic tank, AdvanTex Pod(s), and final dosing tank.

D. DESIGN CRITERIA

1. The system consists of a septic tank, a recirculation tank, AdvanTex fixed-film media pod(s) as specified in Table 1 below. See Attachment A for example drawings of unit configurations.

Table 1			
Design Flow (gallons per day)	Minimum Septic Tank Size* (gallons)	Minimum Recirculation Tank Size (gallons)	Minimum AdvanTex Units**
≤ 500	1000	1000	1 AX20
501 - 600	1500	1000	2 AX20
601 - 750	2000	1000	2 AX20
751 - 1000	2500	1500	2 AX20
1001 - 1500	3750	2000	3 AX20
1501 - 2000	5000	2500	1 AX100 Dual Bulb UV
2001 - 2500	6250	3000	2 AX100 Dual Bulb UV
2501 - 3000	7500	3500	2 AX100 Dual Bulb UV

* Multiple tanks, in series, may be used for systems larger than 600 GPD.

**Single-Bulb UV system shall be provided after the AX20 units for TS-I and TS-II systems with flows of 1500 GPD or less.

- a. The septic tanks shall be approved by the state and Orenco Systems, Inc. specifically for the use with AdvanTex systems. As part of this approval, the septic tanks will have an inlet sanitary tee and a state approved, appropriately sized Orenco effluent filter on the outlet end.
- b. The recirculation tank will contain the recirculating splitter valve and the Biotube screened pump vault. The recirculation tanks shall be approved by the state and Orenco Systems, Inc. The recirculation tank shall have an inlet sanitary tee. The sanitary tee shall be visible and reachable from the riser opening to serve the influent sampling point.
- c. A drainback configuration without a pump check valve is required for the forcemain.

- d. The pumps that accompany the different configurations are:

Single AX20	P3005	Orenco High Head Pump
Dual AX20	P5005	Orenco High Head Pump
Triple AX20	PJ7515	Orenco High Head Pump
Single AX100	P5007	Orenco High Head Pump
Dual AX100	P5007	Orenco High Head Pump (Duplex)

- e. The AdvanTex pod is equipped with a set of vertical geotextile sheets, with low pressure pipe wastewater distribution above the sheets. The low pressure pipe distribution operates at 3 to 5 feet of pressure head. The pods may be placed above the tanks, but shall not obstruct the tank accesses. Two air vents for the pod are required, one is located on the pod and the other is located on the discharge cleanout.
- f. Filtrate from the AdvanTex pod flows by gravity into either the recirculation tank or the ultraviolet (UV) disinfection system dependent upon the recirculation tank level. The UV system shall be rated for the appropriate discharge rate from the AdvanTex unit. Audible and visible alarm for bulb failure will be provided.
- g. The UV disinfection system will be one of the following:
(1) 0-1500 gpd: International Waterguard Model #WG-1-LV-WW or "UV The Disinfectors[®]" or the Salcor 3G.
(2) 1501-3000 gpd: Dual Bulb "UV The Disinfectors[®]"

Other UV systems may be specifically approved by the State.

- h. AdvanTex Systems will utilize the TCOM or VeriComm[®] telemetry control panel. The control panel is in a NEMA 4X enclosure, and shall be located within 30 feet of the recirculation tank. Separate control and alarm circuits will be provided. The Telemetry Control Panel shall be connected to an active phone line capable of dialing a "1-800" number. 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 in the event a direct connection is necessary.
- i. All access riser hatches shall be secured by approved tamper-resistant stainless steel bolts supplied by the manufacturer. Riser construction, attachment to tanks and security systems shall be pre-approved by the State in accordance with the Orenco's approvals for septic tank and pump tank risers, as applicable.
- j. Buoyancy calculations shall be completed by a N.C. professional engineer for an AdvanTex AX100 Modules, associated tankage, and/or the UV basin if they intersect the seasonal high water table, and additional concrete ballast may be required. In addition the instructions for anti-floatation in the AdvanTex Treatment System Installation Manuals shall be followed.

- k. Control panels controlling drainfield dosing pumps shall provide for timer-controlled dosing, shall have pump cycle and run timer recording capability, and shall meet the requirements of .1952. The panel shall be provided by the manufacturer and meet the daily, 7-day and 30-day monitoring requirements of Rule .1970, unless the drainfield panel is provided by a distribution system manufacturer other than Orenco Systems, Inc. If so, the other manufacturer's panel shall meet these same monitoring requirements.
 - l. Geotextile fabric shall be used between the rock layer and backfill material
 - m. A 3 foot setback shall be maintained between the dispersal field and tanks.
 - n. Influent samples shall be taken from the inlet sanitary tee into the recirculation tank. Effluent samples shall be taken from a spigot or sampling port that is placed on the force main from the final dosing tank.
 - o. The 7-day and 30-day readings will be stored in the VeriComm control panel records. The ORC will be able to access this information when they are at the site. The VeriComm panel can be used for pressure manifold and LPP systems.
2. Drip Dispersal Systems following AdvanTex: As part of this approval, an AdvanTex pretreatment system with integrated subsurface drip dispersal is approved, when the conditions specified herein are met. This portion of the approval does not preclude use of AdvanTex Pretreatment followed by other subsurface drip dispersal systems utilized in compliance with separate approvals for such systems.
- a. All requirements for the AdvanTex Pretreatment System specified herein shall be met.
 - b. System siting and sizing shall comply with the requirements of Rule .1970 and requirements for Aerobic Drip sizing in the Innovative Approvals for American Perc-Rite and Geoflow Subsurface Drip systems (IWWS-93-1-R4, IWWS-2000-2, respectively). However, when any reductions are taken in vertical separations or horizontal setbacks pursuant to the use of a TS-I or TS-II system as allowed under Rule .1970, the long-term acceptance rate shall not exceed 0.6, 0.4, 0.15 and 0.10 gallons per day per square foot for Soil Groups I, II, III or IV, respectively.
 - c. Drip tubing may be either Netafim (BioLine) or Geoflow (Wasteflow PC) with pressure-compensating emitters. Drip tubing and field appurtenances shall be designed and installed in compliance with the American Perc-Rite and Geoflow Subsurface Drip system Innovative approvals (IWWS-93-1-R4, IWWS-2000-2, respectively). The hydraulic design of the dosing and flush systems shall likewise comply with the Innovative approval applicable to the tubing used.

- d. Multiple zones (up to 4) shall be used whenever the total length of dripline exceeds 5000 linear feet, or as otherwise needed to meet irrigation and/or flushing requirements. If multiple zones are required, an Orenco Automatic Distributing Valve (cam-irrigation) in conjunction with the Vericomm panel can be used to split effluent between the equally-sized zones. When utilizing the Automatic Distributing Valve the minimum pump flow rate is 10 gallons per minute and all designs and installations shall be in accordance with the latest version of the document "Orenco Automatic Distributing Valve Assemblies". Should equally sized zones or this minimum flow rate is not be able to be designed, multiple zones can be used in conjunction with a TCOMM panel designed on a project-specific basis. An alternative control and distribution system may be approved by the State on a case-by-case basis. This also does not preclude the possibility of using AdvanTex Pretreatment followed by Perc-Rite or Geoflow subsurface drip dispersal systems in compliance with their separate innovative approvals.
- e. Pumps shall be high head submersible pumps(s) manufactured by Orenco Systems, Inc. Pumps, controls, intake pipe and screen, as applicable, shall be easily accessible by the system operator for routine operation, maintenance, monitoring and servicing. Valving, disconnect and control float access shall be no deeper than 18-inches below the lid of the riser.

Duplex pump dosing system shall be provided whenever the design flow rate exceeds 3000 gallons per day or when the total length of drip lines exceeds 10,000 feet.

- f. A headworks box (Geoflow Ultra, or approved equal) shall be used for the headworks assembly as part of this approval. The headworks shall feature easy to read meters that show pressure in the field, pressure before the filter and pressure after the filter. Self-cleaning screen filter(s) capable of screening particles larger than or equal to that recommended by the tube manufacturer, typically 100 microns, shall be used. Self-cleaning process shall be automatic. Agriculture Products, Inc. screen filters, or approved equal, shall be used. Filter flushing residuals shall be pumped into the upstream end of the pretreatment system (septic tank) with provisions made to minimize disturbance of any solids in the tank. Filter number and size shall be at least as necessary to have flow rate during both irrigation and flushing conditions to be within filter manufacturer-specified acceptable operating range. Duplex filters shall be required whenever duplex pumps are required.
- g. The entire system, including the AdvanTex Pretreatment system and Drip system pump(s) shall be controlled with a common VeriComm or TCOMM Telemetry control panel, or approved equal. The web-based panel controls recirculation timers, field and filter flushing, dosing timers, and monitors the UV status. Controls shall provide for delivery of designer-specified preprogrammed volumes of effluent to each field zone (adjustable) at designer-specified time intervals (flow equalization); automatic flushing of integral unit filters (filter flushing) at the end of each scheduled field dose cycle, with adjustable duration; automatic flushing (at least weekly) of the

drip laterals (field flushing) with filtered effluent for designer-specified duration; and monitor pump cycles and run times (for each pump) and flow (with totalizing flow meter, or equal).

Should the daily flow as measured by a drawdown and run timers to the field(s) exceed the daily design flow by more than 20%, an alarm shall activate that also shall notify the operator remotely. For systems designed for over 3000 gallons per day, controls shall also monitor flow volume to each zone and flow variance indication when flow is + or - 20% of design.

- h. Controls and float levels shall be synchronized to assure the minimum dose is available prior to initiating a dosing cycle to the field or zone. Minimum dose volume per zone shall be five times the liquid capacity of the drip laterals plus the liquid capacity of the supply and return lines (only the portions which drain between doses), unless a smaller volume is field determined to meet this performance criteria. Minimum automatic field flushing volume per zone shall be two times the liquid capacity of the drip laterals plus the liquid capacity of the supply and return manifold lines that drain between doses.
3. AdvanTex systems shall be designed by an Orenco Systems, Inc. certified designer or a North Carolina Professional Engineer. Systems over 1000 gallons per day and any AdvanTex Drip Dispersal System, regardless of size, shall be designed by a North Carolina Professional Engineer.

E. INSTALLATION AND TESTING PROCEDURES

1. A preconstruction conference shall be required to be attended by the system designer, Orenco certified installer, and local health department (LHD), prior to beginning construction of the AdvanTex Treatment System and associated ground absorption system.
2. The AdvanTex System shall be located in compliance with the horizontal setback requirements of Rule .1950(a) and shall be located to prevent surface/subsurface water inflow/infiltration. The drainfield horizontal setback requirements are in accordance with Rule .1970 for a TS-I or TS-II system.
3. All AdvanTex systems shall be installed according to directions provided in the "Installation Manual" and instructions found on Orenco Systems, Inc. CAD drawings of each system. Additionally, all AdvanTex systems and components used with, but not manufactured by Orenco Systems, Inc., shall be installed in accordance with all applicable regulations and manufacturer instructions.
4. All companies installing AdvanTex 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/adaptor seam.
6. Reduced Setbacks: Reduced horizontal setbacks as allowed in Rule .1970(e), Table XII for a TS-I system may also be applicable to the AdvanTex Pretreatment systems components, when the manufacturer or the manufacturer's authorized installer uses tanks and tank appurtenances that have been verified to meet the following design, construction and installation criteria:
 - a. The tank pipe inlet and outlet shall be through a resilient, watertight, sealed, non-corrosive, flexible connective sleeve and secured in place with a stainless steel strap (as is currently required for all septic tank outlet pipe penetrations). For pre-cast concrete tanks, pipe penetrations shall be precast to be compatible with the connective sleeve. Inlet and outlet penetrations of the AdvanTex Pods shall utilize bulk-head type watertight fittings.
 - b. When plastic risers are used, they shall be pre-approved, and connected to the tank top in accordance with the riser approval requirements. For concrete tanks, the riser or riser adaptor shall be precast into the tank top.
 - c. Adequacy of tanks to be used shall be verified after construction and prior to transport from the manufacturing facility to the job site. All tanks shall have been documented to pass a leakage test as indicated in paragraph e prior to transport from the manufacturing facility to the job site, and again after installation
 - d. Approved risers shall be provided over any pump and over each septic tank compartment, unless the septic tank top is to be installed 6 or more inches above finished grade. Riser tops shall extend at least 3 inches above finished grade for septic tanks and 6 inches above finished grade for pump tanks. Risers shall be sealed to the tank tops in accordance with their approval requirements. Risers shall be capable of withstanding vacuum testing.
 - e. Tanks and pods shall be verified to be watertight during installation in accordance with the Improvement Permit and Authorization to Construct by leakage testing, as follows:
 - i) Leakage Test: A 24-hour leakage test shall be conducted. Water shall be brought into the riser up to 2 inches above the tank top and to the top of the AdvanTex pod, and allowed to stand for 24 hours. The tank/pod shall remain uncovered during the watertightness testing. After 24 hours, the tank shall be refilled to the initial starting water level. The tank is approved if there are no visible signs of leakage

(not to include wet spots which may occur on the exterior of the tank) and the water level is held for 1 hour. If the tank fails the integrity test, it shall be repaired or replaced and successfully retested prior to the issuance of an operation permit.

- f. Any penetrations of the riser such as for wire conduit, pump discharge pipe, or vent pipe less than 6 inches above finished grade shall be through pre-manufactured knock-outs, cored openings or bulk-head type fittings, with any annular spaces between conduit or pipe exterior and the riser sealed with appropriate waterproofing materials (hydrocrete for concrete riser, grommet with adhesive, etc.).
7. The Orenco Systems, Inc. certified System Operator shall commission the AdvanTex unit for each installation and shall provide an acceptance letter to the LHD prior to issuance of the operation permit.
8. 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.
9. Prior to Operation Permit issuance, the final Health Department construction inspection shall include at least the following checks:
 - a. The health department shall observe the watertightness testing.
 - b. The health department staff shall press the "Push to Silence" button for 15 seconds to enable test mode. Then the health department shall test the pump float alarm.
 - c. Record the pump model.
 - d. Check to ensure both vents are installed.
 - e. Check the pressure head on the pod wastewater distribution system.
 - f. Check that the riser hatches have tamperproof bolts, and/or riser lock ring.

F. OPERATION, MAINTENANCE AND TESTING

1. System classification, management and inspection shall be in accordance with Rules .1961 and .1970.
2. All Orenco AdvanTex Treatment Systems require operation and maintenance. An operation and maintenance agreement between the system owner and Orenco Systems, Inc., or its authorized representative is required, as per Rule .1970. The system shall be inspected by a certified Subsurface Operator. The Certified Operator shall be either an employee of Orenco Systems, Inc. or authorized in writing by Orenco Systems, Inc. to operator and maintain the system. The operator must have proper equipment and training to access and program VeriComm Control panels on site.

3. AdvanTex Treatment Systems shall be classified at a minimum as a Type Va system according to Table V(a) of Rule. 1961(b). The maximum inspection interval for AdvanTex Drip Dispersal systems up to 1500 gallons per day shall be quarterly for the first year of operation, after which the inspection interval for such systems may be increased to semi-annually. In the event any system is found out of compliance, Orenco Systems, Inc. will assist in the development of an action plan to bring the system back into compliance. The maximum inspection/maintenance/inspection frequency shall revert to quarterly for a period of one year after a system found to be out of compliance is repaired.
4. All AdvanTex Treatment Systems shall be maintained according to the latest revision of the AdvanTex Operation and Maintenance Manual as published by Orenco Systems, Inc.
5. At each AdvanTex Treatment System inspection the Operator in Responsible Charge (ORC) shall, at a minimum, observe, monitor, and record:
 - a. wastewater level in the tanks,
 - b. the processing tank Biotube® (effluent filter) 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 AdvanTex Treatment 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 AdvanTex Treatment System effluent collected from the sampling point to check for effluent clarity and odor, and,
 - g. the pump cycle and run time meters and any water meter readings.
 - h. System operating conditions, from review of VeriComm or TCOMM stored data for indication of flow variances, clogging of filter distribution system, or other abnormal conditions.
6. At least once 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. drainfield pump delivery rate (drawdown test), and
 - d. drainfield dosing volume and measure or calculate average pump run time.
 - e. All observations, readings, and measurements recorded in Section F(5), above
7. For Advantex Drip Dispersal Systems, the ORC's monitoring reports shall include a log of all malfunction incidences/notifications, maintenance activities and wastewater volume delivered to each zone between each required monitoring period. Minimum maintenance during each required inspection shall include visual observation of the dripfield(s), checking/cleaning filter screen(s), measured dosing flow rate to each zone,

and recording of flow meter reading, pump run times and cycle counts, flushing flow rates and pressure head measurements during flushing at the inlet and outlet of each field zone shall be taken at least once per year. The ORC shall report inspection findings and measurements on report form and spread sheet provided by Orenco and Appended to this Innovative Approval.

8. 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.

9. Sampling and Testing

a. All sampling shall be done in accordance with Rule .1970(n)(3) and (5).

b. All systems shall be tested for effluent CBOD₅, TSS, NH₄-N, and fecal coliforms. Systems specified to meet TS-II shall also sample the effluent for TN. Influent shall be tested for BOD₅ and TKN.

c. Effluent 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.

d. Influent samples shall be taken from the inlet sanitary tee into the recirculation tank.

10. 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 Orenco 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 and in accordance with the AdvanTex Treatment System 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 indicated. All maintenance activities shall also be recorded in the ORC reports provided to the local health department.

11. Reporting

- a. 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 shall specify:
 - (1) the date and time of inspection,
 - (2) system operating conditions observed according to F.5, above,
 - (3) system operating conditions measured according to F.6 and F.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,
 - (7) a list of any improvements or maintenance needed; and,
 - (8) a determination of whether the system is malfunctioning, and the specific nature of the malfunction.
- (9) Summary report of data retrieved from VeriCOmm or TCOMM panel verifying actual flow and operating conditions.

H. RESPONSIBILITIES AND PERMITTING PROCEDURES

1. Prior to the installation of an AdvanTex Treatment System at a site, the owner or owner's 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 the proposed Innovative Systems upon a finding that all provisions of this Approval and all other applicable rules are 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. **Notification of the issuance of all Operation Permits by the local health department pursuant to this Innovative Approval shall be submitted to the On-Site Wastewater Section.**
2. Prior to the issuance of the Improvement Permit, an evaluation shall be provided to the local health department on behalf of the owner and a written, sealed report provided to the local health department, as required pursuant to Rule .1970. The local health department may request the assistance of their Regional Soil Specialist in evaluating this report prior to Improvement Permit issuance.

3. When a special site evaluation is required pursuant to Rule .1970(p)(1), the report shall contain the information as specified in Rule .1970(p)(2).
4. Design responsibility: Prior to the issuance of an Authorization to Construct for an Orenco Systems, Inc. AdvanTex Treatment System, a submission prepared by an Orenco Systems, Inc. certified designer or North Carolina Professional Engineer (N.C. P.E. required for all systems exceeding 1000 gpd and all AdvanTex Drip Dispersal systems), and a Licensed Soil Scientist, 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 AdvanTex 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 Orenco Systems Inc. or its North Carolina authorized representative. See attachment E.
5. It is recommended that local authorized environmental health practitioners attend a design training session offered by the manufacturer/authorized representative prior to permitting the system. Also, at the request of the local health department, the State's Regional Engineer will review the design.
6. The AdvanTex Treatment System shall be installed by a contractor authorized in writing by the manufacturer. The Orenco Systems, Inc. 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 H.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 AdvanTex Treatment System Operator.
8. On an annual basis, Orenco Systems Inc., shall provide a report to the On-Site Water Protection Section including the number and location of new system installations during the previous year, and effluent data and operator reports for each operational AdvanTex system installed in North Carolina under this Innovative Approval. These reports shall provide information to the Department based upon the monitoring data and observations

made from the Innovative 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.

I. REPAIR OF SYSTEMS

The provisions of 15A NCAC 18A .1961 (c) shall govern the use of the AdvanTex Treatment System for repairs to existing malfunctioning wastewater systems.

Approved By: _____ Date: _____