



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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APPROVAL FOR REMEDIAL USE

Pursuant to Title 5, 310 CMR 15.00

Name and Address of Applicant:

Orenco Systems, Inc.
814 Airways Avenue
Sutherlin, OR 97479

Trade name of technology: AdvanTex Treatment System. Models: AX20-RT, AX25-RT, AX20 and AX100 (hereinafter called the "System"). Schematic Drawings illustrating each System, a design and installation manual, an owner's manual, an operation and maintenance manual, and an inspection checklist are part of this Approval.

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Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental, Protection hereby issues this Approval for Remedial Use to: Orenco Systems, Inc., 814 Airways Avenue, Sutherlin, OR (hereinafter "the Company"), approving the System described herein for Remedial Use in the Commonwealth of Massachusetts. The sale, design, installation, and use of the System are conditioned on compliance by the Company, the Designer, the Installer, the Service Contractor, and the System Owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

David Ferris, Director
Wastewater Management Program
Bureau of Resource Protection

April 19, 2013
Date

Technology Description

The System is a Secondary Treatment Unit (STU) that provides an aerobic treatment process. The System is a multi-pass (recirculating), packed bed aerobic wastewater treatment system designed to treat residential strength wastewater from facilities with a design flow of less than 10,000 gpd.

AdvanTex AX-RT Series (AX20-RT and AX25-RT)

The AX-RT consists of an 800 gallon two-chamber fiberglass reinforced polyester (FRP) recirculating treatment tank, preceded by a separate septic tank with effluent filter. The engineered textile media is suspended from the top of the treatment tank with a portion of the media positioned over the first compartment (the recirc/blend chamber). The remainder of the media is positioned over the second compartment (the recirc/filtrate chamber) from which filtrate (treated effluent) is discharged. The two chambers are separated by a baffle wall. A recirculating pump draws water from the first compartment of the recirculating tank, and sprays it onto the top surface of the textile media at regular timed intervals to achieve a recirculation ratio of between 3:1 to 5:1. Filtrate drains from the textile media back into the two chambers. Timer settings can be adjusted if actual flows vary significantly from projected flows.

The baffle wall between the chambers is fitted with a recirc-return valve for equalization during low-flow periods. Under low daily flow conditions, the valve allows 100% of the filtrate to be returned to the recirc/blend chamber for continued recirculation. The recirc-return valve is similar to a check valve in that it allows preferential flow in one direction only — in this case, from the recirc/filtrate chamber to the recirc/blend chamber.

The recirc-return valve closes when the liquid head on the recirc/blend side is equal to or greater than the liquid head on the recirc/filtrate side. When the liquid head on the recirc/filtrate side is higher, the pressure differential pushes the recirc return valve open for filtrate to pass back to the recirc/blend side of the baffle, thus providing for continued recirculation during periods of low or no inflow. Flow from the recirc/blend chamber can pass to the recirc/filtrate chamber only through the treatment media.

AdvanTex AX20 and AX100

The System includes a pre-assembled, UV-protected fiberglass reinforced polyester module (“filter pod”) that contains the textile media. The filter modules are equipped with UV protected, removable fiberglass reinforced polyester lids and contain one inch of insulation on the underside of the lid. Except where separate septic and recirculating tanks are required per Special Condition 4 below, an AX20 filter module is typically installed on top of a two compartment processing tank with a minimum capacity of 1500 gallons. Raw sewage enters the two-compartment Processing Tank through its inlet tee. In the first compartment, the raw sewage separates into three distinct zones: a scum layer, a clear layer, and a sludge layer. Flow-through ports in the tank’s baffle wall allow effluent from the clear layer to flow into the second compartment of the tank. The Biotube Pump Package in the second compartment pumps filtered effluent to a distribution manifold in the filter module. Effluent percolates down through the textile media and is collected in the bottom of the filter pod. The treated effluent flows out of the filter pod through the filtrate return line, which returns the treated effluent to the recirculating

splitter valve (RSV). The RSV automatically splits or diverts the flow between the processing tank and the final discharge. The RSV also controls the liquid level within the processing tank. During extended periods of no flow, 100 percent of the treated filtrate effluent is returned to the processing tank. The recirculating pump vault is equipped with a removable filter cartridge that is equivalent to a septic tank effluent tee filter. In systems with separate septic and recirculating tanks, the pump vault is located in the second tank (the recirculating tank).

The effluent is applied at a preset recirculation ratio of between 3:1 to 5:1, controlled by a timer. Timer settings can be adjusted if actual flows vary significantly from projected flows.

In all AdvanTex systems, the recirculating pump controls are equipped with a high water level override and high water alarm. The alarm and control circuits are connected to an independent power source run from the main power source of the facility.

The System is equipped with a VeriComm control panel (CP) or equal which is connected via a telephone line or internet connection to the VeriComm monitoring system, providing continuous remote monitoring, maintenance information, management and control of each individual system. The CP provides the contracted operation and maintenance (O&M) provider with information to manage incoming alarms 24 hours per day through automatic notification, pre-established alarm protocols, an online list of all active alarms, online diagnostic data and online input and review of alarm responses. The CP also provides for site management through editable online information, an online tabular display of all operating data and provides standard and custom reports. The CP unit transmits report information to the O&M provider/Operator and the manufacturer of the System.

Conditions of Approval

The term “System” refers to the STU in combination with the other components of an on-site treatment and disposal system that may be required to serve a facility in accordance with 310 CMR 15.000.

The term “Approval” refers to the technology-specific Special Conditions, the conditions applicable to all STU’s, the General Conditions of 310 CMR 15.287, and any Attachments.

For Secondary Treatment Units that have been issued Remedial Use Approval for the upgrade or replacement of an existing failed or nonconforming system, the Department authorizes reductions in the effective leaching area (310 CMR 15.242), depth to groundwater (310 CMR 15.212), and/or depth of naturally occurring pervious material (310 CMR 15.240(1)) subject to the Standard Conditions that apply to all Secondary Treatment Units Approved for Remedial Use and subject to the Special Conditions below applicable to this Technology.

Special Conditions

1. The System is a Secondary Treatment Unit Approved for Remedial Use. In addition to the Special Conditions contained in this Approval, the System shall comply with all the “Standard Conditions for Secondary Treatment Units Approved for Remedial Use”, except where stated otherwise in these Special Conditions.

2. The System is approved for facilities where the local approving authority finds that:
 - a) there is no increase in the actual or proposed design flow;
 - b) the System is for the upgrade of a failed, failing or nonconforming system; and
 - c) a conventional system with a reserve area, designed in accordance with the standards of 310 CMR 15.100 through 15.255, cannot feasibly be built on-site.
3. If the design is for six bedrooms or less, a separate septic tank preceding the AX20 processing tank is not required and the Title 5 septic tank requirements are not applicable to the processing tank component of the AX20 treatment system. The processing tank, which has a recirculating pump in the second compartment, must be sized, designed, and installed according to Company requirements.

The record drawings, on file with the local approving authority, shall clearly indicate an area for a septic tank meeting the requirements of Title 5 and the drawings shall indicate that the area is for the sole purpose of installing a Title 5 septic tank in the future, if necessary. The System Owner shall not construct any permanent buildings or structures or disturb the site in any manner that would prevent the installation of a Title 5 septic tank in the future.

4. Multiple AX20 or AX100 filter modules may be used in combination to serve various sized or multiple facilities. Multiple unit systems, systems designed for residential facilities in excess of six bedrooms, and any design using AX100 units, shall require the installation of a separate septic tank constructed in accordance with 310 CMR 15.223 through 15.226. In addition, per Company requirements, the septic tank shall be sized a minimum of 2.2 times the facility design flow and located prior to the System's filter module. These Systems shall also include a separate recirculation tank sized equal to the facility design flow or a minimum of 1000 gallons and shall be designed and installed in accordance with the Company's requirements.
5. The System, including a properly sized septic tank, if required, shall be installed between the building sewer and the effluent pump chamber for disposal to the SAS of a system designed and constructed in accordance with 310 CMR 15.100 - 15.279, subject to the provisions of this Approval.