

January 5, 2024

Mr. Joseph Soulia
Orenco Systems Inc.
814 Airway Avenue
Sutherlin, OR 97479

RE: Product Registration Renewal– Notice of Proprietary Treatment Product Listing

Description: Sewage Treatment System, Attached Growth
Manufacturer: Orenco Systems, Inc.
Product Name: AdvanTex™ Treatment Systems (With and Without Disinfection)
Model Number: AX20 Series (Max Design Flow up to 600 GPD per pod)
Model Number: AXRT Series (Max Design Flow 600 and 750 GPD per pod)
Model Number: AX100 Series (Average Daily Flow 2500 GPD per pod, Design Peak Flow 3000 GPD per pod)
Product Listing: Category A (Residential Sewage)

Dear Joseph Soulia:

Thank you for your application for product renewal for the AdvanTex Wastewater Treatment Systems, which includes the following models:

- 1) AX20 Model Series (AX20, AX20-2, AX20-3, AX-4, and AX-5), with and without Ultraviolet Light Disinfection
- 2) AXRT Model Series (AX20RT and AX25RT), with and without Ultraviolet Light Disinfection
- 3) AX100 Model Series (AX100), with and without Ultraviolet Light Disinfection

In accordance with Minn. R. ch. 7080 through 7083, the Minnesota Pollution Control Agency (MPCA) has reviewed Orenco System's submitted materials requesting registration for Category A (residential) treatment product listing of the AdvanTex AX20 Model Series, AXRT Model Series, and the AX100 Model Series. Based on the submitted documentation, the MPCA finds that the AdvanTex Model AX20 Series, Model AXRT Series, and the Model AX100 Series are eligible to be registered per Minn. R. ch. 7083.4030 as meeting the following treatment levels:

- **Treatment Level A** (cBOD₅ of 15 mg/L, TSS of 15 mg/L, and fecal coliform of 1000 colonies per 100 ml) with disinfection
- **Treatment Level B** (cBOD₅ of 25 mg/L, TSS of 30 mg/L, and fecal coliform of 10,000 colonies per 100 ml) with disinfection
- **Treatment Level A2** (cBOD₅ of 15 mg/L, TSS of 15 mg/L) without disinfection
- **Treatment Level B2** (cBOD₅ of 25 mg/L, TSS of 30 mg/L) without disinfection
- **Treatment Level C** (cBOD₅ of 125 mg/L, TSS of 60 mg/L, Oil and Grease of 25 mg/L) without disinfection
- **Total Nitrogen** (TN of less than or equal to 20 mg/L)

The AdvanTex Model AX20 Series is registered with a design rated capacity of 600 gallons per day per pod, as shown in Table 1 and Table 2. The AdvanTex Model AX20RT is registered with a design-rate capacity of 600 gallons per day; the Model AX25RT is registered with a design rated capacity of 750 gallons per day. The AdvanTex Model AX100 Series is registered with an average daily flow of 2500 gallons per day per pod and a design peak flow of 3000 gallons per day per pod, as shown in Table 1 and Table 2.

Subject to this determination, the AdvanTex Model Series, including the AX20, AX20-2, AX20-3, AX20-4, AX20-5, AX20RT, AX25RT, and AX100 will be placed on the List of Registered Subsurface Sewage Treatment System (SSTS) Products. The product information listed in this Notice of Proprietary Product Listing will be maintained on the MPCA website and may not be altered by the manufacturer without permission by the MPCA.

Table 1. AdvanTex System, Model AX20 and AXRT Series with Orenco AXUV Ultraviolet (UV) Disinfection

Product Name Model	Treatment Process	Design Flow (gpd)	BOD ₅ Removed (lbs/day)	Highest Treatment Level	Nutrient Removal*	Important Product Use Information
AdvanTex System with one (1) AXUV Disinfection Unit AX20	Attached Growth Recirculating Filter	600	0.65	A	TN	<ul style="list-style-type: none"> • Notice Product Listing <ul style="list-style-type: none"> ○ MPCA Letter ○ Conditions of Registration ○ Expiration Date • AdvanTex Manual <ul style="list-style-type: none"> ○ Submitted Drawings ○ Flow Splitting ○ Known Limitations ○ Installation ○ Operation and Maintenance ○ Owners Information ○ Regulators Checklist ○ Service Contract • Management Plan • Operating Permit Template
AdvanTex System with one (1) AXUV Disinfection Unit AX20RT	Attached Growth Recirculating Filter	600	0.65	A	TN	
AdvanTex System with one (1) AXUV Disinfection Unit AX25RT	Attached Growth Recirculating Filter	750	1.59	A	TN	
AdvanTex System with two (2) AXUV Disinfection Units AX20-2**	Attached Growth Recirculating Filter	1000	1.3	A	TN	
AdvanTex System with three (3) AXUV Disinfection Units AX20-3**	Attached Growth Recirculating Filter	1500	1.9	A	TN	
AdvanTex System with four (4) AXUV Disinfection Units AX20-4**	Attached Growth Recirculating Filter	2000	2.6	A	TN	
AdvanTex System with five (5) AXUV Disinfection Units AX20-5**	Attached Growth Recirculating Filter	2500	3.2	A	TN	
AdvanTex System with five (5) AXUV Disinfection Units AX100**	Attached Growth Recirculating Filter	2500 Average 3000 Peak	4	A	TN	

* Third-party testing showed AdvanTex effluent achieved Total Nitrogen [TN] level less than or equal to 20 mg/L [mean TN = 17 mg/L TN with 61 percent removed]; CBOD₅ was less than 10 mg/L; TSS was less than 10 mg/L; Fecal coliform bacteria was less than 1,000 cfu/100mL with the use of UV disinfection device. Total nitrogen removal is highly dependent upon BOD and TKN loading, adequate alkalinity, temperature, and toxicity; site specific alkalinity levels in the water supply should be evaluated and homeowners should be well educated in order to achieve optimal total nitrogen reduction.

** System applications greater than (six) 6 bedrooms and other applications other than single family residences require a design review by Orenco Systems, Inc.

Table 2. AdvanTex System, Model AX20 and AXRT Series

Product Name Model	Treatment Process	Design Flow (gpd)	BOD ₅ Removed (lbs/day)	Highest Treatment Level	Nutrient Removal*	Important Product Use Information
AdvanTex System AX20	Attached Growth Recirculating Filter	600	0.65	A2	TN	<ul style="list-style-type: none"> • Notice Product Listing <ul style="list-style-type: none"> ○ MPCA Letter ○ Conditions of Registration ○ Expiration Date • AdvanTex Manual <ul style="list-style-type: none"> ○ Submitted Drawings ○ Flow Splitting ○ Known Limitations ○ Installation ○ Operation and Maintenance ○ Owners Information ○ Regulators Checklist ○ Service Contract • Management Plan • Operating Permit Template
AdvanTex System AX20RT	Attached Growth Recirculating Filter	600	0.65	A2	TN	
AdvanTex System AX25RT	Attached Growth Recirculating Filter	750	1.59	A2	TN	
AdvanTex System AX20-2**	Attached Growth Recirculating Filter	1000	1.3	A2	TN	
AdvanTex System AX20-3**	Attached Growth Recirculating Filter	1500	1.9	A2	TN	
AdvanTex System AX20-4**	Attached Growth Recirculating Filter	2000	2.6	A2	TN	
AdvanTex System AX20-5**	Attached Growth Recirculating Filter	2500	3.2	A2	TN	
AdvanTex System AX100**	Attached Growth Recirculating Filter	2500 Average 3000 Peak	4	A2	TN	

*Third-party testing showed AdvanTex effluent achieved Total Nitrogen [TN] level less than or equal to 20 mg/L [mean TN = 17 mg/L TN with 61 percent removed]; CBOD₅ was less than 10 mg/L; TSS was less than 10 mg/L; Fecal coliform bacteria was greater than 10,000 cfu/100mL without the use of the UV disinfection device. Total nitrogen removal is highly dependent upon BOD and TKN loading, adequate alkalinity, temperature, and toxicity; site specific alkalinity levels in the source water supply should be evaluated and homeowners should be well educated in order to achieve the optimal total nitrogen reduction. ** System applications greater than 6 bedrooms and other applications other than single family residences require a design review by Orenco Systems, Inc.

The registration of products in Minnesota is contingent upon compliance with the following conditions:

1. Products must be used in compliance with the MPCA rules and the plans and design specifications provided. Any deviation from the plans and specifications shall not be permitted unless authorized by the National Sanitation Foundation (NSF) and, in writing, by the MPCA for registered use.
2. The manufacturer shall have readily accessible information, specific to a product's registered use in Minnesota, for designers, regulators, installers, system owners, service providers and other interested parties for the following items: a) product manual; b) design instructions; c) installation instructions; d) information regarding operation and maintenance; e) homeowner instructions; and f) list of representatives and manufacturer-certified service providers, if any, as required by Minn. R. ch. 7083.4040 (H).
3. The design flows for the registered products per pod for the AdvanTex Model AX20 and Model AXRT Series are as follows:
 - 600 gallons per day for AX20
 - 600 gallons per day for AX20RT
 - 750 gallons per day for AX25RT
 - 1000 gallons per day for AX20-2
 - 1500 gallons per day for AX20-3
 - 2000 gallons per day for AX20-4
 - 2500 gallons per day for AX20-5
 - 2500 gallons per day Average Daily flow and 3000 gallons per day Design Peak Flow for AX100
4. Septic tank capacity for dwellings shall meet the manufacturer's size requirements consistent with Standard 40 National Sanitation Foundation testing of the product and sewage tank requirements contained in Minn. R. ch. 7080.1900 through 7080.2020. Sewage tank(s) shall be designed to withstand the pressures to which it will be subject to. Tanks and all pipe penetrations, risers, and other connections to tanks shall be watertight.
5. Systems installed using the AdvanTex Model AX20 Series (AX20, AX20-2, AX20-3, AX20-4, and AX20-5), the AXRT Series (AX20RT and AX25RT), and the AX100 Series shall be timed-dosed. Adequate storage capacity shall be provided in the pump tank to prevent nuisance high-water conditions from occurring. An alarm device is required on all pump tanks in the event the pump malfunctions.
6. Systems installed using the AdvanTex Model AX20 Series (AX20, AX20-2, AX20-3, AX20-4, and AX20-5), AXRT Series (AX20RT and AX25RT), and the AX100 Series shall be equipped with a commercial effluent screen, consistent with the type used during the Standard 40 National Sanitation Foundation (NSF) test of the product. An alarm device is required in the event the effluent screen malfunctions.

7. Each system must be delivered with an installation manual and owner's manual for the AdvanTex Model AX20 Series (AX20, AX20-2, AX20-3, AX20-4, and AX20-5), AXRT Series (AX20RT and AX25RT), the AX100 Series, and for AXUV disinfection unit(s) used in the system. Each component must be installed in accordance with the manufacturer's installation manual.
8. Orenco Systems, Inc., along with the Intermediate Designer/Advanced Designer and Installer, are responsible to ensure that proper flow-splitting devices are used in splitting flows to multiple AdvanTex Model AX20 Series (AX20, AX20-2, AX20-3, AX20-4, and AX20-5) and to multiple AXUV disinfection units. Flow-splitting devices must meet the following criteria: a) designed specifically and reliably to split wastewater flows; b) accessible for on-going operation and maintenance; c) monitored to determine flow rates; d) adjustable after construction should settlement occur; and e) have infinite or continuous adjustment features.
9. For the AdvanTex Model AX20 Series (AX20, AX20-2, AX20-3, AX20-4, and AX20-5), each AdvanTex AX20 pod shall be equipped with a sufficient number of AXUV disinfection units to achieve Treatment Levels A and B as follows: 1) AX20 will require the use of one AXUV disinfection unit; 2) AX20-2 will require the use of two AXUV disinfection units; 3) AX20-3 will require the use of three AXUV disinfection units; 4) AX20-4 will require the use of four AXUV disinfection units; and; 5) AX20-5 will require the use of five AXUV disinfection units. Flow to each AXUV disinfection unit shall not exceed the rated capacity to ensure adequate disinfection prior to soil dispersal.
10. The AdvanTex Model AX100 Series shall be equipped with a sufficient number of AXUV disinfection units to achieve Treatment Levels A and B. The AX100 will require the use of five AXUV disinfection units. Flow to each AXUV disinfection unit shall not exceed the rated capacity to ensure adequate disinfection prior to soil dispersal.
11. All systems shall be designed and operated with (a) suitable alarm device(s) should the AdvanTex Model AX20 Series (AX20, AX20-2, AX20-3, AX20-4, and AX20-5), the AXRT Series (AX20RT and AX25RT), the AX100 Series, or AXUV disinfection unit(s) malfunction.
12. This treatment product is a Minnesota-registered product for Type IV systems. For Treatment Levels A, A2, B, B2 and C, effluent loading rates to the soil, method of distribution, and vertical separation requirements shall meet the minimum requirements contained in Minn. R. ch. 7080.2150 thru 7080.2350. The effluent, following treatment in the AdvanTex Model Series, is required to be uniformly distributed to the soil for final treatment and dispersal.
13. Systems may only be designated as Type IV systems when designed and installed per the drawings submitted as part of the initial Application for Registration, dated July 2, 2008, and subsequent documents submitted prior to this registration.
14. As a Type IV system, the system must be constructed and operated under the required local permits.

15. The level of maintenance required for the AdvanTex Model AX20 Series, AXRT Series, AX100 Series and Orenco's AXUV disinfection components shall be as specified in the products Operation and Maintenance Manual. This includes, but is not limited to:
1) initial maintenance three to six months after system start-up; and 2) annual inspections and maintenance. The AXUV disinfection units shall be serviced at six month intervals. The UV lamp shall be replaced at least once every two (2) years to ensure proper disinfection or more often as needed, to achieve the required fecal coliform bacteria treatment level.
16. For systems registered as meeting the requirements for Treatment Levels A or B, testing for fecal coliform bacteria is required per the local operating permits when reduced vertical soil separation is employed.
17. As specified in the Owner's Manual, backwash from water softeners and other unsuitable wastes must not be discharged to the AdvanTex Wastewater Treatment Systems. The manufacturer is responsible to provide a listing of other known limitations, made available on the company's website or other means.
18. Training shall be provided to MPCA-licensed Subsurface Sewage Treatment System practitioners before designing, installing, or providing service to AdvanTex Wastewater Treatment Systems and AXUV disinfection devices registered for use in Minnesota.
19. During the period of product registration and as part of the renewal process, systems using registered treatment products are subject to an audit by the MPCA.

Please be advised that this registration expires December 31, 2026. Manufacturers desiring to continue product registration beyond this date must obtain MPCA renewal according to the requirements in Minn. R. ch. 7083.4040 (E). If the product has changed or is retested according to the protocol required for registration, renewal shall be based on the most recent test results. If the MPCA finds the product has changed in any way that may affect performance, it may not be renewed and must meet the requirements for initial registration.

The MPCA is in no way endorsing these products or any advertising, and is not responsible for any situation which may result from its use or misuse. The MPCA is not liable for any product failure and these statements are not intended and cannot be relied upon to establish any substantive or procedural rights with the state of Minnesota or the MPCA, either express or implied, that can be enforced in litigation or any administrative proceeding.

Mr. Joseph Soulia

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If you have any questions, please contact Wendy Chirpich at 507-344-5248 or by email at wendy.chirpich@state.mn.us.

Sincerely,

Wendy Chirpich

This document has been electronically signed.

Wendy Chirpich
Environmental Specialist
Municipal Division

cc: File