

March 20, 2023

Leslie Barber, Customer Representative  
Norweco, Inc.  
220 Republic Street  
Norwalk, OH 44857

RE: Product Registration Renewal #4 – Notice of Proprietary Treatment Product

Listing Description: Sewage Treatment System, Suspended Growth with Filtration  
Manufacturer: Norweco, Inc.

Product Name: Singlair; 960 Model Series (without disinfection) and TNT Model Series (with and without disinfection)

Model Numbers: 960 and TNT (Design Flow of 500, 600, 750, 800, 1000, 1250, and 1500 GPD per unit)

Product Listing: Category A (residential sewage)

Product File No: 2013-005

Dear Leslie Barber:

Thank you for your application for product renewal for the Norweco Singlair 960 and TNT Model Series, which includes the following models: 1) 960-500, 960-750, 960-1000, 960-1250, and 960-1500 [without Ultraviolet (UV) Light Disinfection] and 2) TNT-500, TNT-750, TNT-1000, TNT-1250, and TNT-1500 [with and without UV Light Disinfection].

In accordance with Minn. R. ch. 7080 through 7083, the Minnesota Pollution Control Agency (MPCA) has reviewed your submitted materials for Category A (residential) treatment product listing. Our review of the Singlair Model Series 960 and Model Series TNT in this application (design rated capacity of 500, 600, 750, 800, 1000, 1250, and 1500 gallons per day) indicates it meets the requirement for proprietary treatment product registration.

The Singlair 960 Model Series is considered a Category A (designed to treat residential sewage) treatment product in the state of Minnesota that meet the following treatment levels:

- **Treatment Level A2** (cBOD<sub>5</sub> of 15 mg/L, TSS of 15 mg/L)
- **Treatment Level B2** (cBOD<sub>5</sub> of 25 mg/L, TSS of 30 mg/L)
- **Treatment Level C** (cBOD<sub>5</sub> of 125 mg/L, TSS of 60 mg/L and Oil & Grease of 25mg/L)

The Singlair TNT Model Series is considered a Category A (designed to treat residential sewage) treatment product in the state of Minnesota that meet the following treatment levels:

- **Treatment Level A2** (cBOD<sub>5</sub> of 15 mg/L, TSS of 15 mg/L)
- **Treatment Level B2** (cBOD<sub>5</sub> of 25 mg/L, TSS of 30 mg/L)
- **Treatment Level C** (cBOD<sub>5</sub> of 125 mg/L, TSS of 60 mg/L and Oil & Grease of 25mg/L)
- **Total Nitrogen (20 mg/L)**

The Singulair TNT Model Series with Singulair UV Disinfection, Model AT 1500, is considered a Category A (designed to treat residential sewage) treatment product in the state of Minnesota that meet the following treatment levels:

- **Treatment Level A (cBOD5 of 15 mg/L, TSS of 15 mg/L, and fecal coliform of 1,000 colonies per 100 ml) with UV 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 UV disinfection**
- **Total Nitrogen (20 mg/L)**
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The Singulair Model Series are registered with a design rated capacity of 500, 600, 750, 800, 1000, 1250, and 1500 gallons per day per unit, as shown in Table 1, Table 2, and Table 3.

**Table 1. Singulair Wastewater Treatment System (960 Model Series).**

Product Name Model	Treatment Process	Design Flow (gpd)	BOD <sub>5</sub> Removed (lbs/day)	Highest Treatment Level	Product Information
Singulair Model 960-500	Suspended Growth with Filtration	500/600	1.50	A2	<ul style="list-style-type: none"> <li>• Notice of Product Listing <ul style="list-style-type: none"> <li>○ MPCA Letter</li> <li>○ Conditions of Registration</li> <li>○ Expiration Date</li> </ul> </li> </ul>
Singulair Model 960-750	Suspended Growth with Filtration	750/800	2.25	A2	<ul style="list-style-type: none"> <li>• Singulair Manual for 960 Model Series <ul style="list-style-type: none"> <li>○ Submitted Drawings</li> <li>○ Known Limitations</li> <li>○ Installation</li> <li>○ Operation &amp; Maintenance</li> <li>○ Owners Information</li> <li>○ Regulators Checklist</li> <li>○ Service Contract</li> </ul> </li> </ul>
Singulair Model 960-1000	Suspended Growth with Filtration	1000	3.00	A2	
Singulair Model 960-1250	Suspended Growth with Filtration	1250	3.75	A2	<ul style="list-style-type: none"> <li>• Management Plan for Singulair 960 Model</li> <li>• Operating Permit Template</li> </ul>
Singulair Model 960-1500	Suspended Growth with Filtration	1500	4.50	A2	

**Table 2. Singulair Wastewater Treatment System (TNT Model Series).**

Product Name Model	Treatment Process	Design Flow (gpd)	BOD <sub>5</sub> Removed (lbs/day)	Highest Treatment Level	Nutrient Removal*	Product Information
Singulair Model TNT-500	Suspended Growth with Filtration	500/600	1.50	A2	TN	<ul style="list-style-type: none"> <li>• Notice of Product Listing <ul style="list-style-type: none"> <li>○ MPCA Letter</li> <li>○ Conditions of Registration</li> <li>○ Expiration Date</li> </ul> </li> </ul>
Singulair Model TNT-750	Suspended Growth with Filtration	750/800	2.25	A2	TN	<ul style="list-style-type: none"> <li>• Singulair Manual for TNT Model Series <ul style="list-style-type: none"> <li>○ Submitted Drawings</li> <li>○ Known Limitations</li> <li>○ Installation</li> <li>○ Operation &amp; Maintenance</li> <li>○ Owners Information</li> <li>○ Regulators Checklist</li> <li>○ Service Contract</li> </ul> </li> </ul>
Singulair Model TNT-1000	Suspended Growth with Filtration	1000	3.00	A2	TN	
Singulair Model TNT-1250	Suspended Growth with Filtration	1250	3.75	A2	TN	<ul style="list-style-type: none"> <li>• Management Plan for Singulair TNT</li> </ul>
Singulair Model TNT-1500	Suspended Growth with Filtration	1500	4.50	A2	TN	<ul style="list-style-type: none"> <li>• Operating Permit Template</li> </ul>

\* Third-party testing showed Singulair TNT Model effluent achieved the Total Nitrogen (TN) level of 12 mg/L [mean TN=12 mg/L; median TN=11mg/L with 68% TN removed]; CBOD<sub>5</sub> was 3 mg/L; TSS was 8 mg/L. Total nitrogen removal is highly dependent upon BOD and TKN loading, adequate alkalinity, temperature and toxicity; site specific alkalinity levels in the source water should be evaluated and homeowners should be well educated in order to achieve optimal total nitrogen reduction.

**Table 3. Singulair TNT Model Series with Singulair Model AT 1500 UV Disinfection.**

Product Name Model	Treatment Process	Design Flow (gpd)	BOD <sub>5</sub> Removed (lbs/day)	Highest Treatment Level	Nutrient Removal*	Product Information
Singulair Model TNT-500 with one (1) Singulair UV Disinfection Unit	Suspended Growth with Filtration and UV Disinfection	500	1.50	A	TN	<ul style="list-style-type: none"> <li>• Notice of Product Listing <ul style="list-style-type: none"> <li>○ MPCA Letter</li> <li>○ Conditions of Registration</li> <li>○ Expiration Date</li> </ul> </li> <li>• Singulair Manual for TNT Model Series <ul style="list-style-type: none"> <li>○ Submitted Drawings</li> <li>○ Known Limitations</li> <li>○ Installation</li> <li>○ Operation &amp; Maintenance</li> <li>○ Owners Information</li> <li>○ Regulators Checklist</li> <li>○ Service Contract</li> </ul> </li> <li>• Management Plan for Singulair TNT Model Series</li> <li>• Management Plan for Singulair Model AT 1500 UV Disinfection</li> </ul>
Singulair Model TNT-500 with two (2) Singulair UV Disinfection Units, in parallel	Suspended Growth with Filtration and UV Disinfection	600	1.50	A	TN	
Singulair Model TNT-750 with two (2) Singulair UV Disinfection Unit	Suspended Growth with Filtration and UV Disinfection	750/800	2.25	A	TN	
Singulair Model TNT-1000 with two (2) Singulair UV Disinfection Units, in parallel	Suspended Growth with Filtration and UV Disinfection	1000	3.00	A	TN	
Singulair Model TNT-1250 with three (3) Singulair UV Disinfection Units, in parallel	Suspended Growth with Filtration and UV Disinfection	1250	3.75	A	TN	
Singulair Model TNT-1500 with three (3) Singulair UV Disinfection Units, in parallel	Suspended Growth with Filtration and UV Disinfection	1500	4.50	A	TN	

\* Third-party testing showed Singulair TNT Model effluent achieved the Total Nitrogen (TN) level of 12 mg/L [mean TN=12 mg/L; median TN=11mg/L with 68% TN removed]; CBOD<sub>5</sub> was 3 mg/L; TSS was 8 mg/L. Total nitrogen removal is highly dependent upon BOD and TKN loading, adequate alkalinity, temperature and toxicity; site specific alkalinity levels in the source water should be evaluated and homeowners should be well educated in order to achieve optimal total nitrogen reduction.

Subject to this determination, the Singulair Model Series, including: 1) the 960 Model Series [960-500, 960-750, 960-1000, 960-1250, and 960-1500], without UV Light Disinfection and 2) the TNT Model Series [TNT-500, TNT-750, TNT-1000, TNT-1250, and TNT-1500, with and without UV Light Disinfection], 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 or misrepresented by the manufacturer or any other person without permission by the MPCA.

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, installers, regulators, systems owners, and service providers for the following items: a) product manual, b) design instructions, c) installation instructions, d) operation and maintenance requirements, e) homeowner instructions, and f) list of manufacturer-certified service providers, if any, as required by Minn. R. ch. 7083.4040(H).
3. The design flows for the registered Singulair 960 Model Series are as follows:
  - 500 gallons per day for model 960-500
  - 600 gallons per day for model 960-500
  - 750 gallons per day for model 960-750
  - 800 gallons per day for model 960-750
  - 1000 gallons per day for model 960-1000
  - 1250 gallons per day for model 960-1250
  - 1500 gallons per day for model 960-1500
4. The design flows for the registered Singulair TNT Model Series are as follows:
  - 500 gallons per day for model TNT-500
  - 600 gallons per day for model TNT-500
  - 750 gallons per day for model TNT-750
  - 800 gallons per day for model TNT-750
  - 1000 gallons per day for model TNT-1000
  - 1250 gallons per day for model TNT-1250
  - 1500 gallons per day for model TNT-1500
5. Septic/trash tank capacity for dwellings shall meet the manufacturer's minimum and maximum size requirements as specified in the Application for Registration. The tank(s) shall be designed to withstand the pressures to which it will be subject to. The tank(s) and all pipe penetrations, risers, and other connections to the tank shall be watertight. Singulair Green Models 960-500/600 and TNT-500/600 sewage tanks provided by

Norweco Inc. are authorized for use under this registration. All other sewage tanks used in conjunction with the Singulair 960 Model Series and the Singulair TNT Model Series shall be listed on MPCA's web site as approved for use in Minnesota beginning April 4, 2012.

6. Each system must be delivered with an installation manual and owner's manual for the Singulair 960 Model Series and the Singulair TNT Model Series and for the Singulair UV disinfection unit(s). Each component must be installed in accordance with the manufacturer's installation manual.
7. Norweco, Inc., along with the Intermediate/Advanced Designer and Installer, are responsible to ensure that proper flow splitting devices are used in splitting flows to Singulair UV 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.
8. For the Singulair TNT Model Series (TNT-500, TNT-750, TNT-1000, TNT- 1250, and TNT-1500), each Singulair TNT system shall be equipped with a sufficient number of Singulair Model AT 1500 UV disinfection units to achieve Treatment Level A as follows: 1) TNT-500 will require the use of one (1) Singulair UV disinfection unit for design flows of 500 gallons per day; 2) TNT-500 will require the use of two (2) Singulair UV disinfection units, in parallel, for design flow of 600 gallons per day; 3) TNT-750 will require the use of two (2) Singulair UV disinfection units, in parallel, for design flows of 750-800 gallons per day; 4) TNT-1000 will require the use of two (2) Singulair UV disinfection units, in parallel; 4) TNT-1250 will require the use of three (3) Singulair UV disinfection units, in parallel; and 5) TNT-1500 will require the use of three (3) Singulair UV disinfection units in parallel. Flow to each Singulair UV disinfection unit shall not exceed the rated capacity to ensure adequate disinfection prior to soil dispersal. As specified in the 'Model AT 1500 UV Disinfection System Installation and Operation Manual,' a dedicated circuit of the proper size is needed in the main electrical panel for the UV disinfection system.
9. All systems shall be designed and operated with (a) suitable alarm devices(s) should either, or both, the Singulair 960 Model Series, the Singulair TNT Model Series, or the Singulair disinfection unit(s) malfunctions.
10. The Singulair 960 Model Series is a Minnesota-registered product for Type IV systems. For Treatment Levels A2, 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 Singulair 960 Model Series, is required to be uniformly distributed to the soil for final treatment and dispersal.

11. The Singulair TNT Model Series 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 Singulair TNT Model Series, is required to be uniformly distributed to the soil for final treatment and dispersal.
12. Systems may only be designated as Type IV systems if designed and installed per the drawings submitted with the Application for Product Registration, initially submitted May 17, 2011, with additional documents submitted after May 17, 2011 and through September 29, 2011, and any other subsequent documents submitted prior to this registration.
13. As a Type IV system, the system must be constructed and operated under the required local permits.
14. The level of maintenance required for the Singulair 960 Model Series, the Singulair TNT Model Series, and the Singulair Model AT 1500 UV disinfection components shall be as specified in the products Operation and Maintenance Manual. This includes, but is not limited to, maintenance every six months. Both the Singulair Model Series and Singulair UV disinfection units shall be serviced at six-month intervals. Each Singulair 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.
15. For systems registered as meeting the requirements for Treatment Level A and B, testing for fecal coliform bacteria is required per the local operating permit when reduced vertical soil separation is employed.
16. As specified in the Owner's Manual, limitations of the product are identified, including the backwash from water softeners and other unsuitable wastes, must not be discharged into the system. The manufacturer is responsible to provide a listing of other known limitations, made available on the company's website or other means.
17. Training shall be provided to MPCA-licensed Subsurface Sewage Treatment System practitioners before designing, installing, or providing service to the Singulair 960 Model Series, Singulair TNT Model Series, and Singulair UV disinfection devices registered for use in Minnesota.
18. 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, 2025.** 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.

Leslie Barber  
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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.

If you have any questions, please contact Cody Robinson at 651-757-2724 or by email at [freya.linnett@state.mn.us](mailto:freya.linnett@state.mn.us)

Sincerely,



*This document has been electronically signed.*

Freya Linnett  
Environmental Specialist  
Municipal Division

FL:map

cc: File