



State of Delaware
Department of Natural Resources & Environmental Control
Division of Water Resources
Ground Water Discharges Section

Innovative and Alternative System Approval

ISSUED TO: American Manufacturing Company, Inc.
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FOR: American Manufacturing Perc-Rite® & Perc-Rite TNS® Drip Dispersal
System –ASD & TNS

APPROVAL DATE: November 18, 2003
AMENDED DATE: July 12, 2006
June 12, 2007 (Dose Volume)
April 17, 2012 (TN reduction)
November 21, 2018 (updated TN reduction)

In accordance with the Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems (Regulations), an application dated May 16, 2006 was been submitted by American Manufacturing Company, Inc. for the approval of the ASD Perc-Rite(r) drip dispersal system as an Innovative & Alternative On-Site Wastewater Treatment and Disposal System. On July 28, 2011, additional documentation was submitted in support of a Total Nitrogen reduction credit for their drip dispersal system. On November 1st 2018 additional documentation was submitted in support of a greater Total Nitrogen reduction credit for their proprietary pre-engineered Perc-Rite TNS® drip dispersal system.

Based on the information submitted, the Department approves the use of the ASD Perc-Rite® & PercRite TNS® drip dispersal system as an Innovative & Alternative On-Site Wastewater Treatment Unit and Disposal System. The following conditions, limitations, and requirements must be adhered to:

1. Product Description

The American Perc-Rite(r) & Perc-Rite TNS® Drip Dispersal System is a fluid handling system for dispersal of wastewater effluent into the soil. The system incorporates filtration, time and level controlled application with ultra low rate drip distribution.

Following a minimum of the settling process in the treatment tanks (sized in accordance with the Regulations), the wastewater is to collect in a final dosing chamber sized to hold minimum storage for emergency and flow equalization. The effluent will be time dosed via a four float operating system. High head submersible or skid mounted centrifugal pumps as provided as part of the system package are controlled by a state of the art Siemens PLC Controller. Once through filtration, the effluent will be dosed through pressure compensating emitters that are spaced uniformly in the tubing.

The system contains the following:

- a) Filtration: Automatic self cleaning filters that are capable of screening particles larger than or equal to 115 microns.
- b) Air Vents: Air vacuum breakers installed at the high point of each drip field to keep soil from being aspirated into the drip emitters due to back siphoning or back pressure after the pump shuts off.
- c) Field Flushing: Automatic field flushing valve used to enable accumulated debris and sediment to be flushed from the dripline back to the pretreatment units.
- d) Drip Tubing: PC drip line with pressure compensating emitters spaced uniformly in the tubing. The drip line shall be color coded by the drip tube manufacturer to be easily recognized as suitable for wastewater disposal.
- e) Controls: Control/software package controlling all functions including filter flushing, system dosing and flushing and audible/visible alarms.
- f) Pump and Coolguide™: All systems utilizing a high head turbine pump shall be installed in an American Manufacturing Coolguide™ which has been extended into the pump tank riser by the installer. The Coolguide™ will provide laminar flow into the pump, pump motor cooling and a minimum of 12” of storage inside the pump chamber for accumulated solids.
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2. Claim

Approval is based on individual third party data submitted by the Manufacturer indicating the specified system will routinely provide a greater than 50% net

reduction in Total Nitrogen (TN) assuming influent Total Nitrogen (TN) loading does not exceed the treatment capabilities of the units.

A reduction in TN will not be granted in sandy or loamy sand soils. Effluent dispersal must be within 1 foot of the ground surface and more than 1.5 feet above a limiting soil/bedrock condition.

3. Approved Perc-Rite® & Perc-Rite TNS® Drip System Packages

15 and 25 GPM Automatic Perc-Rite(r) Drip Systems

Model Number	Descriptions
ASD152-S122 TNS152-S122	2 Zone Drip 15 gpm, Simplex 2 Filter, 2-Zone Control Panel
ASD153-S124 TNS153-S124	3 Zone Drip 15gpm, Simplex 2 Filter, 4-Zone Control Panel
ASD154-S124 TNS154-S124	4 Zone Drip 15gpm, Simplex 2 Filter, 4 Zone Control Panel
ASD153-D124 TNS153-D124	3 Zone Drip 15gpm Duplex 2 Filter, 4-Zone Control Valve
ASD154-D124 TNS154-D124	4 Zone Drip 15gpm Duplex 2 Filter, 4-Zone Control Panel
ASD151-S124 TNS151-S124	Remote Zone Drip 15gpm Simplex 2 Filter , 4-Zone Control
ASD251-D124 TNS251-D124	Remote Zone Drip 25gpm Duplex 3 Filter, 4 Zone Control

4. Scope of Use

The drip dispersal system may be used for residential, community and commercial applications. This approval is only for systems with flows < 2,500 gpd. For systems >2,500 gpd, the Department along with the manufacturer shall be consulted for the appropriate designation based on site testing data. The system may dispose of primary and secondary treated effluent.

5. Siting Criteria

- a) Loading rates are to be based on the most restrictive texture within the upper 24” of the surface. See the attached Guidelines for Designing Micro-Irrigation “Drip” Treatment and Disposal Systems for loading rate designations.

- b) For at-grade systems, the tillage depths are to be 6-8", although slightly deeper depths may be necessary in the case of shallow thick plow pans or similar restrictive layers within 12" of the surface.
- c) Landscape position is also a necessary consideration. Systems are not to be sited within a closed depression or where water tends to pond during heavy rainfall events.
- d) For at-grade systems on slopes greater than 5%, no sandy fill should be utilized. Tubing should be installed directly onto the scarified surface with 6" of topsoil cover.

6. Separation Requirements

The following separation requirements shall be adhered to for all **new construction** drip dispersal systems:

- a) A separation distance of 18" must be maintained from the limiting zone (LZ).
- b) At a LZ depth of at least 24" a "full depth" installation can be utilized. In this situation, the drip line is installed 6" below original grade.
- c) For LZ 18-22" a surface installation (at-grade system) will be utilized. This requires 3" of sandy fill be added above original grade and the drip line placed 1" into the sandy fill. A 6" topsoil cap shall be added above the sandy fill.
- d) For LZ 12-17" **advanced treatment is required**. A 12" separation distance must be maintained from the LZ. For LZ 12-16", 3" of suitable sandy fill must be added. The drip line is placed 1" into the sandy fill and capped with 6" of topsoil.

The following separation requirements shall be adhered to for all **replacement** drip dispersal systems:

- a) A separation distance of 18" must be maintained to the LZ.
- b) For LZ 12-17", suitable sand fill shall be added to establish a 20" separation to the LZ. The drip line is placed 1" into the sandy fill and capped with 6" of topsoil. **No advanced treatment is required unless site evaluator determines otherwise.**
- c) Less than 12" to LZ **requires advanced treatment**. Suitable sandy fill is added to establish a 13" separation to the LZ. The drip line is placed 1" into the sandy fill and capped with 6" of topsoil.

7. Design Criteria

- a) The drip dispersal system may be designed for new and replacement disposal systems.
- b) Advanced treatment requirements shall be in accordance with the above siting limitations.

- c) An on-site wastewater treatment and disposal system permit application incorporating an American Manufacturing Perc-Rite(r) or Perc-Rite (TNS) Drip Dispersal system must be designed in accordance with the Regulations, and manufacturer's specifications. The design shall be completed by a DNREC Class C Design Engineer. The permit application shall include system specifications, zone layout and calculations.
- d) The design shall utilize an approved package system as outlined above. If any other system or components are to be utilized, they must seek prior approval from the Manufacturer and the Department.
- e) The attached Guidelines for Designing Micro-Irrigation "Drip" Treatment and disposal Systems shall be utilized for sizing the disposal area. For each large system, the Department along with the manufacturer should be consulted for the appropriate designation based on site testing data.
- f) The design shall be in accordance with both the Department's and American Manufacturing's drip design guidelines.
- g) Controls shall provide for delivery of designer specified preprogrammed volumes of effluent to each field zone at the designer specified time intervals; automatic flushing of integral unit filters, initiated by a timer; and automatic flushing of the drip laterals for specified duration.
- h) Control and float levels shall be synchronized to assure the minimum dose is available prior to initiating a dosing cycle to a zone. Minimum dose volume per zone shall be 3.5 times the liquid capacity of the drip laterals or otherwise as approved by the Department.
- i) The drip system shall be designed to provide a minimum flushing velocity of 2 ft per second at the distal end of the pipe network.
- j) The hydraulic unit shall be placed on an aggregate base.
- k) The control panel may not be placed in an enclosed structure for residential applications.
- l) The system shall be designed so that it is installed on contour, on at least two foot centers. Any deviations, must seek approval from the manufacturer.

8. Installation Procedures

- a) The drip dispersal system shall be installed by a DNREC Class E System Contractor under the supervision of a manufacturer's representative, or by a DNREC Class E System Contractor who has been certified for unit installation. Proof of certification shall be provided in writing to the Department.
- b) Start up of the system and initial operational checks shall be conducted by the Class E System Contractor (trained by the manufacturer), Design Engineer, and a Ground Water Discharges Section (Large System Branch) representative. If the Class E System Contractor is not certified, a manufacturer's representative shall perform the operational checks of the system at start up. If the manufacturer's representative can not be on site at the time of start up, they must provide final start up approval to the Department in writing.
- c) The drip field(s) shall be installed in accordance with manufacturer's recommendations for each site. A vibratory plow, static plow or trencher is most

- typically used and soil moisture must be dry enough so that soil compaction will not occur.
- d) The field(s) shall be installed on contour.
 - e) The field(s) shall be finished graded to shed surface water. A vegetative cover shall be established to prevent erosion and to allow for effective system operation.
 - f) The field(s) shall be staked out and kept free from disturbance.

9. Operation and Maintenance

- a) The American Manufacturing Perc-Rite® and Perc-Rite TNS® Drip Dispersal System shall be operated and maintained in accordance with the manufacturer's specifications.
- b) The manufacturer shall comply with all Department mandated requirements as specified in permit conditions. This shall include operation and maintenance requirements.

10. General Conditions

- a) Use of the system for wastes other than residential shall be on a case by case basis.
- b) In the event that the system does not perform as claimed by the applicant, the use of the system for new installations shall cease. Use of the system shall not resume until such time the applicant and the Department have reached an acceptable agreement for resolving the situations.
- c) Any changes that deviate from the specifications as submitted with this approval shall be approved by the Department prior to use.
- d) The manufacturer is responsible in ensuring the Department is aware of all local distributors, representatives and certified contractors. An updated list with contact information shall be provided to the Department annually.