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(r) Drip Dispersal System -WD

**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 WD 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 WD Perc-Rite(r) & Perc-Rite 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 WD American Perc-Rite(r) & Perc-Rite TNS® Drip Dispersal System is a fluid handling system for dispersal of secondary treated wastewater effluent into the soil. The system requires advanced treatment by a DNREC approved advanced treatment unit, followed by flow equalization, filtration, time and level controlled application with ultra low rate drip distribution.

   Following treatment, the wastewater is to collect in a dosing chamber sized to hold a 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, will provide the required dose to the disposal field. Prior to dosing, the effluent will undergo filtration. The primary filter is automatically back flushed at the beginning cycle. The system is equipped with a state of the art PLC controller that signals visually and audibly if problems arise in the filtration or pumping processes. 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 primary filter. This must be located as a separate unit outside of the dosing chamber.
   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 line manufacturer to be easily recognized as suitable for wastewater dispersal.
   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 exetened 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.

**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 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(r) Drip System Packages**

| Model Number | Descriptions |
|---|---|
| **ABD151C-S121** | **1 Zone 15 gpm WD Skid Mount with PLC Control** |
| **ABD1511C-S5121-S5V2** | **2 Zone 15 gpm WD Skid With Sequencer & PLC Control** |
| **ABD152C-S122** | **2 Zone 15 gpm WD Skid Mount wit PLC Control** |
| **ABD153C-S124** | **3 Zone 15 gpm WD Skid Mount with PLC Control** |
| **ABD154C-S124** | **4 Zone 15 gpm WD Skid Mount with PLC Control** |
| **ABD241C-S124** | **4 Zone 25 gpm WD Skid Mount with PLC 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 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 12" must be maintained from the limiting zone (LZ).
b) At a LZ depth of at least 18" a "full depth" installation can be utilized. In this situation, the drip line is installed 6" below original grade.
c) For LZ 12-17" 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.

***Replacement systems shall follow the same separation requirements as New Construction systems. LZ less than 10" shall be considered on a case by case basis.**

**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 and the manufacturer should be consulted for the appropriate loading rate 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 and must incorporate a thermostat control system.
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 bed dry enough so that soil compaction will not occur.
d) The drip 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.
e) The drip field(s) shall be staked out and kept free from disturbance.

## 9. Operation and Maintenance

a) The American Manufacturing Perc-Rite(r) or 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.