



AMERICAN

Manufacturing Company, Inc.

To: Specifiers

Re: Perc-Rite® Septic Drip 60% Nitrogen removal, EPA Chesapeake Bay listed August 2020

American Manufacturing Company has been developing the Perc-Rite® Drip Dispersal since 1990. As part of our continued development of the technology, American has supported dozens of independent research projects studying the ability of drip dispersal to treat and recycle wastewater back into the environment. The most recent studies focused on nitrogen reduction in shallow soils.

In 2014 the final report “Recommendations of the On-Site Wastewater Treatment Systems Nitrogen Reduction Technology Expert Review Panel” was submitted to the “Wastewater Treatment Workgroup Chesapeake Bay Partnership.” This report rated currently applied technologies based on their ability to meet the Chesapeake Bay goal of 50% nitrogen reduction from current practices.

At the time of the 2014 report, the current practice utilized a septic tank and gravity drain field. The design assumption concludes that 5 kg per year of nitrogen is discharged from a single-family dwelling. Conventional septic systems reduce nitrogen by 20%, leaving 4 kg per year to deal with. A 50% reduction will result in 2 kg per year at the property boundary. Drip dispersal was included with “low-pressure pipe” (LPP) or “low-pressure Distribution” (LPD) technology in this report.

Drip Dispersal underwent further review resulting in an additional “Expert Panel Report” published in 2018 and a listing by the EPA of Nitrogen Reduction BMP’s in August of 2020. The report states that: “Advanced In Situ – In situ processes are those occurring after the ex-situ treatment, within the soil treatment unit. This advanced practice includes drip dispersal systems only when designed per the details provided in the 2018 expert panel report to produce a gross 60% TN reduction.” Perc-Rite® Septic Drip systems meet all of the recommendations of the report.

The EPA and the Chesapeake Bay Program goal is to reduce nitrogen across the entire Bay watershed. States such as Virginia have codified this goal in regulation and require on-site wastewater system designs to provide for nitrogen removal for all alternative systems. Many alternatives include “pretreatment with pressure distribution” available to designers to specify that meet these regulations. Perc-Rite® Septic Drip systems are now listed with the EPA to meet the criteria.

Listed below are links to the relative documents:

- FINAL REPORT - Recommendations of the OSWWT Systems Nitrogen Reduction Technology Expert Review Panel Feb 2014,
https://www.chesapeakebay.net/documents/Final_OWTS_Expert_Panel_WQGIT_approved_07_142014.pdf
- Drip Irrigation and Peat Treatment System On-site Wastewater Nutrient Removal BMP Expert Panel Report,
https://www.chesapeakebay.net/channel_files/26340/osww_bmp_report_4-30-18.pdf
- Appendix G (07 18 2018) - Technical Requirements to Enter Advanced On-Site Wastewater Treatment Practices into Scenario Builder and the Phase 6 Watershed Model,
https://www.chesapeakebay.net/channel_files/27557/septic_systems_technical_appendix_07_19_18.pdf

The following is an excerpt from the Drip Irrigation System Expert Panel Report detailing the design recommendations for septic drip system design.” Perc-Rite® Septic Drip systems meet all of the recommendations of the report.

RECOMMENDATIONS

Based on the data analysis previously presented, the Panel concurs that a 50 percent net TN reduction for drip dispersal is warranted when the following conditions are met:

- The drip tubing must be installed in a natural surface horizon (e.g. A or A/B) no deeper than 12 inches from the original soil surface. Pad or bed installations are not included in this BMP.
- BMP credits are not provided for installations where sand or loamy sand soils predominate within 12 inches below effluent dispersal depth.
- There must be a minimum 18 inches of unsaturated soil depth below the infiltrative surface; however, States can require more stringent water table separation depths in accordance with their regulations.
- The site must have stable vegetative cover.
- Landscape position is also a necessary consideration. Systems should not be sited within a closed depression, or where water tends to pond during heavy rainfall events.
- All drip system designs shall incorporate the following:
 - A vibratory plow, static plow, or trencher is most typically used to install the tubing, and soil moisture must be dry enough so that soil compaction does not occur.
 - A filtration system shall be provided to protect the emitters from clogging. Filter size shall be as recommended by the manufacturer (typically 120 to 150 mesh, or 100 to 120 micron).
 - An automatic flush cycle shall provide a minimum flushing velocity at the rate the tubing manufacturer recommends.
 - The effluent is to be equalized and timed-dosed over a 24-hour period to maximize the fluctuation between aerated and non-aerated periods. Minimum dose volume shall be 3.5 times the volume of the drip network or zone as applicable, although 5 times the volume is recommended to ensure that at least 80 percent of the dose volume is applied while the drip network is fully pressurized.
 - The system shall be designed to minimize drain-down effects on the lowest lines in a zone, such as by assuring all drip laterals are hydraulically isolated.
 - Air/vacuum release valves shall be provided at the high points of the feed and return lines to prevent entry of soil particles into emitters.
 - Maximum emitter spacing is 2 feet along the drip tubing and normal tubing separation is 2 feet.
 - Minimum drip tubing length is equal to one-half the dispersal area.
 - Emitter grid spacing should be a maximum of 24 inches (4 square feet per emitter). At least 1 linear foot of drip tubing should be required for each 2 square feet of required drip zone area. For example, if 1500 ft² of dispersal field is required, then a minimum 1250 linear feet of drip tubing is required. The BMP shall apply only to drip irrigation systems utilizing pressure compensation emitters.
 - Maximum emitter flow rates should be established per soil scientist and manufacturer’s recommendations based on site-specific instantaneous soil loading rate capacity.
- The net 50 percent BMP credits will only be provided for systems using loading rates as applicable for STE, regardless of effluent quality. Maximum soil texture-based area loading rates are as follows; however, States can require the use of lower rates at their discretion:
 - TG II 0.27 gpd/sf
 - TG III 0.17 gpd/sf
 - TG IV 0.12 gpd/sf