

# Drip Irrigation On-lot Sewage Disposal System

The purpose of this fact sheet is to explain the components and function of the **Alternate On-Lot Sewage Disposal System known as Drip Irrigation**.

Pennsylvania has approved the use of drip irrigation as an alternate wastewater disposal method for on-lot sewage. The drip irrigation system was developed and is designed for sites with restrictive soil conditions, where the site's limiting zone is within 20 to 26 inches of the soil surface or deeper.

## Components of the Drip Irrigation System

The drip irrigation system has several components: a septic tank, a hydraulic unit pump tank, a hydraulic unit, and a special drip irrigation system buried within a few inches of the soil surface. Each of these components will be described below. An overall schematic showing the major components of a drip irrigation system is shown in Fig. 1.

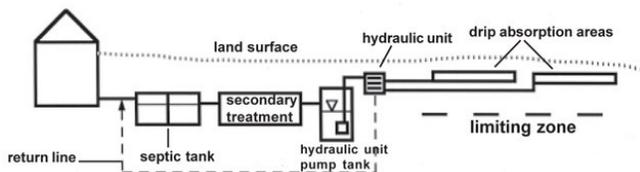


Fig. 1. Schematic of a drip irrigation system.

## Treatment Tank

The raw wastewater flowing from your home is delivered to a two-chamber septic tank, where the solids are separated from the liquid and the organic material is anaerobically decomposed before being passed on to the Hydraulic Unit Pump Tank.

## Hydraulic Unit Pump Tank

The wastewater flowing from the septic tank is piped to and collected in a single-chamber tank known as the hydraulic unit pump tank. The collected wastewater is timed dosed to the drip irrigation distribution system.

## Hydraulic Unit

Before the wastewater is piped to the drip irrigation absorption area, it must first pass through a disk filter to remove all remaining waste particles that might clog the drip irrigation emitters. In addition to final disk filtration, the hydraulic unit also serves as a switching unit that alternates the flow of wastewater to one of two drip irrigation zones. The hydraulic unit also receives flush return wastewater from the drip irrigation zones and transfers this flush water to the septic tank (Fig. 1).

## Drip Irrigation Absorption System

As final disposal, the wastewater is dosed to two or more drip irrigation zones. Each drip irrigation zone consists of a length of supply pipe that carries the wastewater from the hydraulic unit to the drip irrigation lateral and a return pipe that collects undischarged wastewater and returns it to the hydraulic unit. Connecting the supply pipe to the return pipe are two lengths of small-diameter (usually 0.5-in) drip irrigation lateral, which contains small devices, known as emitters, that meter the wastewater flowing in the drip irrigation lateral slowly into the soil. Each zone contains two laterals and each emitter discharges 0.61 gallons of wastewater per hour. The emitters are spaced at 2-foot intervals along the drip irrigation lateral. The length of each lateral is determined by the total system flow rate and the soil's hydraulic characteristics as defined by a licensed soil scientist who must evaluate the soil. The supply, return, and laterals are shown schematically in Fig. 2 for a two zone system.

The drip tubing must be installed so that there is always at least 18 inches between the limiting zone and the emitter tubing. The tubing may be installed to a maximum depth of

12 inches, but is usually installed at a depth of about 6 inches.

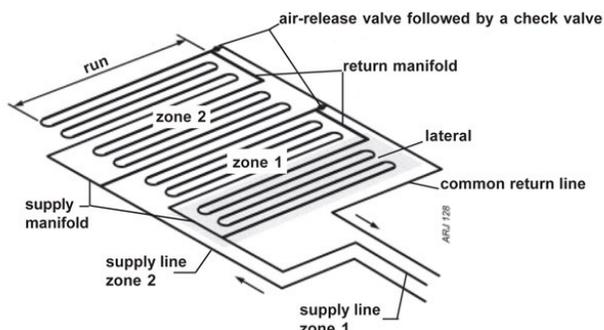


Fig 2. Schematic of drip irrigation zones.

## Summary

The drip irrigation on-lot sewage disposal system was created as an alternative to requiring an elevated sand mound on some sites with limiting zones as close to the soil surface as 24 inches. The primary advantage of the drip irrigation system is that no large mound of soil is required because the drip laterals are inserted into the top 6 to 12 inches of soil. The disadvantage of the drip irrigation system is that you will need a large dose tank after the septic tank to accommodate the timed dose delivery of wastewater to the drip absorption area. The hydraulic unit is an additional cost, and regular maintenance is required.

## More Information

Other Penn State Fact Sheets relating to on-lot sewage treatment systems include the following:

- F-161, Septic Tank Pumping
- F-162, Keeping On-Lot Wastewater Systems Healthy
- F-163, Site Evaluations
- F-164, Elevated Sand Mounds
- F-165, Septic Tank-Soil Absorption Systems
- F-166, On-Lot Wastewater Inspections During Real Estate Transactions
- F-167, Use of Dyes and Tracers to Confirm Septic System Failures
- F-169, Individual Residential Spray Irrigation Systems (IRSIS)
- F-171, At-Grade and Shallow At-Grade On-Lot Systems
- F-173, PSMA On-Lot Wastewater Treatment Inspection vs. A Regulatory Inspection
- F-266, Geotextile Sand Filter (GSF) On-Lot Systems

For additional assistance contact your local Sewage Enforcement Officer or County Extension Agent

## Pennsylvania Association of Sewage Enforcement Officers (PASEO)

4902 Carlisle pike #268 Mechanicsburg, PA 17050  
Telephone: 717-761-8648 Internet: [www.pa-seo.org](http://www.pa-seo.org)

## Pennsylvania Septage Management Association (PSMA)

Box 144 Bethlehem, PA 18016 Phone: 717-763-PSMA  
Internet: [www.pasma.net](http://www.pasma.net)

## Department of Agricultural and Biological Engineering

246 Agricultural Engineering Building University Park, PA 16802 Telephone: 814-865-7685

Revised 4/2014 Prepared by Albert R. Jarrett, Professor Emeritus of Biological Engineering

## Contact Information

**Albert Jarrett, Ph.D.**

Professor Emeritus

[arj@psu.edu](mailto:arj@psu.edu)

814-238-0195

## [extension.psu.edu](http://extension.psu.edu)

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