

**R18-9-E307. 4.07 General Permit: Lined Evapotranspiration Bed, Less Than 3000 Gallons Per Day Design Flow**

- A. A 4.07 General Permit allows a lined evapotranspiration bed receiving wastewater treated to a level equal to or better than that provided by a 4.02 General Permit septic tank. This general permit authorizes the discharge of wastewater from a septic tank that meets the requirements of R18-9-E314 to the general permitted disposal feature described in this Section.
  - 1. Definition. For purposes of this Section, a “lined evapotranspiration bed” means a disposal technology characterized by a bed of sand or other durable media with an internal wastewater distribution system contained on the bottom and sidewalls by an impervious synthetic liner.
  - 2. An applicant may use a lined evapotranspiration bed if site conditions restrict soil infiltration or require reduction or elimination of the volume or nitrogen content of wastewater discharged to the native soil.
- B. Restrictions. Unless a person provides design documentation to show that a lined evapotranspiration bed will properly function, the person shall not install this technology if:
  - 1. Average minimum temperature in any month is 20E° F or less,
  - 2. Over 1/3 of average annual precipitation falls in a 30-day period, or
  - 3. Design flow exceeds net evaporation.
- C. Performance. An applicant shall ensure that a lined evapotranspiration bed:
  - 1. Prevents discharge to the native soil by a synthetic liner,
  - 2. Attains full disposal of wastewater to the atmosphere by evapotranspiration, and
  - 3. Prevents ponding of wastewater on the bed surface and maintains an interval of unsaturated media directly beneath the bed surface.
- D. Notice of Intent to Discharge. In addition to the Notice of Intent to Discharge requirements specified in R18-9-A301(B) and R18-9-A309(B), an applicant shall submit:
  - 1. Capillary rise potential test results for the media used to fill the evapotranspiration bed, unless sand meeting a D50 of 0.1 millimeter (50% by weight of grains equal to or smaller than 0.1 millimeter in size) is used; and
  - 2. Water mass balance calculations used to size the evapotranspiration bed.
- E. Design requirements. An applicant shall:
  - 1. Ensure that the evapotranspiration bed is from 18 to 36 inches deep and calculate the bed design on the basis of the capillary rise of the bed media, according to the “Standard Test Method for Capillary-Moisture Relationships for Coarse- and Medium-Textured by Porous-Plate Apparatus,” published by the American Society for Testing and Materials, (D 2325-68), reapproved 1994E1, and the anticipated maximum frost depth. This material is incorporated by reference and does not include any later amendments or editions of the incorporated matter. Copies of the incorporated material are available for inspection at the Department of Environmental Quality and the Office of the Secretary of State, or may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, Conshohocken, PA 19428-2959;
  - 2. Base design area calculations on a water mass balance for the winter months;
  - 3. Ensure that the evapotranspiration bed liner is a low hydraulic conductivity synthetic liner that has a calculated seepage rate of less than 550 gallons per acre per day;
  - 4. If a surfacing layer is used, use topsoil, dark cinders, decomposed granite, or similar landscaping material placed to a maximum depth of two inches. The applicant shall ensure that:
    - a. The topsoil is a fertile, friable soil obtained from well-drained arable land, and is free of nut grass, refuse, roots, heavy clay, clods, noxious weeds, or any other material toxic to plant growth; and
    - b. The pH factor does not exceed 8.0 or fall lower than 5.5, soluble salts do not exceed 1500 milligrams per liter, the plasticity index is in the range of three and 15 inclusive, and the soil contains approximately 1 1/2% organic matter, by dry weight, either natural or added. The applicant shall ensure that material used for the surfacing layer meets the following gradation:

Sieve Size	Percent Passing
1"	100
1/2"	95-100
No. 4	90-100
No. 10	70-100
No. 200	15-70

- 5. Use shallow-rooted, non-invasive, salt and drought tolerant evergreens if vegetation is planted on the evapotranspiration bed;

6. Install at least one observation port to allow determination of the depth to the liquid surface of wastewater within the evapotranspiration bed;
  7. Design the bed to pump out the saturated zone if accumulated salts or a similar condition impairs bed performance. Provision of a reserve area is not required for a lined evapotranspiration bed; and
  8. Instead of the minimum vertical separation required under R18-9-A312(E), ensure that the minimum vertical separation from the bottom of the evapotranspiration bed liner to the surface of the water table or impervious layer or formation is at least 12 inches.
- F. Installation requirements. An applicant shall ensure that:
1. All liner seams are factory fabricated or field welded according to manufacturer's specifications not inconsistent with this Chapter. The applicant shall ensure that:
    - a. The liner covers the bottom and all sidewalls of the bed and is cushioned on the top and bottom with layers of sand at least two inches thick or other equivalently protective material, and
    - b. If the inlet pipe passes through the liner, the joint is tightly sealed.
  2. The liner is leak tested under the supervision of an Arizona-registered professional engineer,
  3. A two- to four-inch layer of 1/2 to one inch gravel or crushed stone is placed around the distribution pipes within the bed. The applicant shall place filter cloth on top of the gravel or crushed stone to prevent sand from settling into the crushed stone or gravel.
- G. Additional Verification of General Permit Conformance requirements. An applicant shall submit the sealed results of the liner test to the Department before issuance of the Verification of General Permit Conformance.
- H. Operation and maintenance requirements.
1. Irrigation of an evapotranspiration bed is not allowed.
  2. A permittee shall protect the bed from vehicle loads and other damaging activities.

**Historical Note**

New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4).