

**TITLE 18. ENVIRONMENTAL QUALITY**  
**CHAPTER 9. WATER POLLUTION CONTROL**  
**PART E. TYPE 4 GENERAL PERMITS**

**R18-9-E302. 4.02 General Permit: Septic Tank with Disposal by Trench, Bed, Chamber Technology, or Seepage Pit, Less Than 3000 Gallons Per Day Design Flow**

- A.** A 4.02 General Permit allows for the construction and operation of a system with less than 3000 gallons per day design flow consisting of a septic tank dispensing wastewater to an approved means of disposal described in this Section. Only gravity flow of wastewater from the septic tank to the disposal works is authorized by this general permit.
1. The standard septic tank and disposal works design specified in the 4.02 General Permit serves sites where no site limitations are identified by the site investigation conducted under R18-9-A310.
  2. If site conditions allow, this general permit authorizes the discharge of wastewater from a septic tank meeting the requirements of R18-9-A314 to one of the following disposal works:
    - a. Trench,
    - b. Bed,
    - c. Chamber technology, or
    - d. Seepage pit.
- B.** Performance. An applicant shall design a system consisting of a septic tank and one of the disposal works listed in subsection (A)(2) so that treated wastewater released to the native soil meets the following criteria:
1. TSS of 75 milligrams per liter, 30-day arithmetic mean;
  2. BOD<sub>5</sub> of 150 milligrams per liter, 30-day arithmetic mean;
  3. Total nitrogen (as nitrogen) of 53 milligrams per liter, five-month arithmetic mean; and
  4. Total coliform level of 100,000,000 (Log<sub>10</sub> 8) colony forming units per 100 milliliters, 95th percentile.
- C.** Design and installation requirements.
1. General provisions. In addition to the applicable requirements in R18-9-A312, the applicant shall:
    - a. Ensure that the septic tank meets the requirements specified in R18-9-A314;
    - b. Before placing aggregate or disposal pipe in a prepared excavation, remove all smeared or compacted surfaces from trenches by raking to a depth of 1 inch and removing loose material. The applicant shall:
      - i. Place aggregate in the trench to the depth and grade specified in subsection (C)(2);
      - ii. Place the drain pipe on aggregate and cover it with aggregate to the minimum depth specified in subsection (C)(2); and
      - iii. Cover the aggregate with landscape filter material, geotextile, or similar porous material to prevent filling of voids with earth backfill;
    - c. Use a grade board stake placed in the trench to the depth of the aggregate if the disposal pipe is constructed of drain tile or flexible pipe that will not maintain alignment without continuous support;
    - d. Disposal pipe. If two or more disposal pipes are installed, install a distribution box approved by the Department of sufficient size to receive all lateral lines and flows at the head of each disposal works and:
      - i. Ensure that the inverts of all outlets are level and the invert of the inlet is at least 1 inch above the outlets;
      - ii. Design distribution boxes to ensure equal flow and install the boxes on a stable level surface such as a concrete slab or native or compacted soil; and
      - iii. Protect concrete distribution boxes from corrosion by coating them with an appropriate bituminous coating, constructing the boxes with concrete that has a 15 to 18 percent fly ash content, or by using other equivalent means;
    - e. Construct all lateral pipes running from a distribution box to the disposal works with watertight joints and ensure that multiple disposal laterals, wherever practical, are of uniform length;
    - f. Lay pipe connections between the septic tank and a distribution box on natural ground or compact fill and construct the pipe connections with watertight joints;
    - g. Construct steps within distribution line trenches or beds, if necessary, to maintain a level disposal pipe on sloping ground. The applicant shall construct the lines between each horizontal section with watertight joints and install them on natural or unfilled ground; and
    - h. Ensure that a disposal works consisting of trenches, beds, chamber technology, or seepage pits is not paved over or covered by concrete or any material that can reduce or inhibit possible evaporation of wastewater through the soil to the land surface or oxygen transport to the soil absorption surfaces.
  2. Trenches.
    - a. The applicant shall calculate the trench absorption area as the total of the trench bottom area and the sum of both trench sidewall areas to a maximum depth of 48 inches below the bottom of the disposal pipe.
    - b. The applicant shall ensure that trench bottoms and disposal pipe are level. The applicant shall calculate trench sizing from the soil absorption rate specified under R18-9-A312(D) and the design flow established in R18-9-A312(B).
    - c. The following design criteria for trenches apply:

Trenches	Minimum	Maximum
1. Number of trenches	1 (2 are recommended)	No Maximum

2. Length of trench <sup>1</sup>	----	100 feet
3. Bottom width of trench	12 inches	36 inches
4. Trench absorption area (sq. ft. of absorption area per linear foot of trench)	No Minimum	11 sq. ft.
5. Depth of cover over aggregate surrounding disposal pipe	9 inches	24 inches <sup>2</sup>
6. Thickness of aggregate material over disposal pipe	2 inches	2 inches
7. Thickness of aggregate material under disposal pipe	12 inches	No Maximum
8. Slope of disposal pipe	Level	Level
9. Disposal pipe diameter	3 inches	4 inches
10. Spacing of trenches (measured between nearest sidewalls)	2 times effective depth <sup>3</sup> or five feet, whichever is greater	No Maximum
Notes: 1. If unequal trench lengths are used, proportional distribution of wastewater is required. 2. For more than 24 inches, Standard Dimensional Ratio 35 or equivalent strength pipe is required. 3. The effective depth is the distance between the bottom of the disposal pipe and the bottom of the trench bed.		

- d. The applicant may substitute clean, durable, crushed, and washed recycled concrete for aggregate if noted in design documents and the trench absorption area calculation excludes the trench bottom.
3. Beds. An applicant shall:
- a. If a bed is installed, use the soil absorption rate specified in R18-9-A312(D) for "SAR, Bed. The applicant may, in computing the bed bottom absorption area, include the bed bottom and the perimeter sidewall area not more than 36 inches below the disposal pipe;
- b. Comply with the following design criteria for beds:

<b>Gravity Beds</b>	<b>Minimum</b>	<b>Maximum</b>
1. Number of disposal pipes	2	No Maximum
2. Length of bed	No Minimum	100 feet
3. Distance between disposal pipes	4 feet	6 feet
4. Spacing of beds measured between nearest sidewalls	2 times effective depth <sup>1</sup> or 5 feet, whichever is greater	No Maximum
5. Width of bed	10 feet	12 feet
6. Distance from disposal pipe to sidewall	3 feet	3 feet
7. Depth of cover over disposal pipe	9 inches	14 inches
8. Thickness of aggregate material under disposal pipe	12 inches	No Maximum
9. Thickness of aggregate material over disposal pipe	2 inches	2 inches
10. Slope of disposal pipe	Level	Level
11. Disposal pipe diameter	3 inches	4 inches

Note:

1. The effective depth is the distance between the bottom of the disposal pipe and the bottom of the bed.

4. Chamber technology. An applicant shall:
  - a. Calculate an effective chamber absorption area to size the disposal works area and determine the number of chambers needed. The effective absorption area of each chamber is calculated as follows:
$$A = (1.8 \times B \times L) + (2 \times V \times L)$$
    - i. "A" is the effective absorption area of each chamber,
    - ii. "B" is the exterior width of the bottom of the chamber,
    - iii. "V" is the vertical height of the louvered sidewall of the chamber, and
    - iv. "L" is the length of the chamber;
  - b. Calculate the disposal works size and number of chambers from the effective absorption area of each chamber and the soil absorption rates specified in R18-9-A312(D);
  - c. Ensure that the sidewall of the chamber provides at least 35 percent open area for sidewall credit and that the design and construction minimizes the movement of fines into the chamber area. The applicant shall not use filter fabric or geotextile against the sidewall openings.

5. Seepage pits. If allowed by R18-9-A311(B)(1), the applicant shall:
  - a. Design a seepage pit to comply with R18-9-A312(E)(1) for minimum vertical separation distance;
  - b. Ensure that multiple seepage pit installations are served through a distribution box approved by the Department or connected in series with a watertight connection laid on undisturbed or compacted soil. The applicant shall ensure that the outlet from the pit has a sanitary tee with the vertical leg extending at least 12 inches below the inlet;
  - c. Ensure that each seepage pit is circular and has an excavated diameter of 4 to 6 feet. If multiple seepage pits are installed, ensure that the minimum spacing between seepage pit sidewalls is 12 feet or three times the diameter of the seepage pit, whichever is greater. The applicant may use the alternative design procedure specified in R18-9-A312(G) for a proposed seepage pit more than 6 feet in diameter;
  - d. For a gravel filled seepage pit, backfill the entire pit with aggregate. The applicant shall ensure that each pit has a breather conductor pipe that consists of a perforated pipe at least 4 inches in diameter, placed vertically within the backfill of the pit. The pipe shall extend from the bottom of the pit to within 12 inches below ground level;
  - e. For a lined, hollow seepage pit, lay a concrete liner or a liner of a different protective material in the pit on a firm foundation and fill excavation voids behind the liner with at least 9 inches of aggregate;
  - f. For the cover of a lined seepage pit, use an approved one or two piece reinforced concrete slab with a minimum compressive strength of 2500 pounds per square inch. The applicant shall ensure that the cover:
    - i. Is at least 5 inches thick and designed to support an earth load of at least 400 pounds per square foot;
    - ii. Has a 12-inch square or diameter minimum access hole with a plug or cap that is coated on the underside with an protective bituminous seal, constructed of concrete with 15 percent to 18 percent fly ash content, or made of other nonpermeable protective material; and
    - iii. Has a 4 inch or larger inspection pipe placed vertically not more than 6 inches below ground level;
  - g. Ensure that the top of the seepage pit cover is 4 to 18 inches below the surface of the ground;
  - h. Install a vented inlet fitting in every seepage pit to prevent flows into the seepage pit from damaging the sidewall. An applicant may use a 1/4 bend fitting placed through an opening in the top of the slab cover if a one or two piece concrete slab cover inlet is used;
  - i. Bore seepage pits five feet deeper than the proposed pit depth to verify underlying soil characteristics and backfill the five feet of overdrill with low permeability drill cuttings or other suitable material;
  - j. Backfill seepage pits that terminate in gravelly, coarse sand zones five feet above the beginning of the zone with low permeability drill cuttings or other suitable material;
  - k. Determine the minimum sidewall area for a seepage pit from the design flow and the soil absorption rate derived from the testing procedure described in R18-9-A310(G). The effective absorption surface for a seepage pit is the sidewall area only. The sidewall area is calculated using the following formula:

$$A = 3.14 \times D \times H$$

- i. "A" is the minimum sidewall area in square feet needed for the design flow and soil absorption rate for the installation,
- ii. "D" is the diameter of the proposed seepage pit in feet,
- iii. "H" is the vertical height in feet in the seepage pit through which wastewater infiltrates native soil. The applicant shall ensure that H is at least 10 feet for any seepage pit.

- D. Operation and maintenance. The permittee shall follow the applicable operation and maintenance requirements in R18-9-A313.