

**Commonwealth of Pennsylvania**  
**Department of Environmental Protection (DEP)**  
**Bureau of Point and Non-Point Source Management**  
**Harrisburg, PA**

**Issued to:** Generic

**Technology:** Flow Equalization

**Classification Type:** Alternate technology (A2014-0013-0002)

**Classification Date:** February 6, 2004 (ASG)  
February 24, 2014

In accordance with Title 25, Chapter 73, Section 73.72, DEP classifies the flow equalization as a design method for use as a part of an alternate onlot sewage treatment system.

#### I. Technology Description

Facilities with fluctuating flows (alternating high and low flows) may utilize flow equalization to allow for uniform delivery to a subsequent component through time dosing. Flow equalization can include a combination of tanks, controls, and dosing equipment to equalize the peaks flows. The system configuration capitalizes by including sufficient effluent storage capacity to allow for uniform flow to a subsequent component despite the variable flow from the source.

#### II. Design Requirements

- A. The system designer has flexibility regarding where in the treatment process the flow equalization will occur (preceding or following the treatment tank).
  - (1) If flow equalization occurs before the treatment tank, the minimum treatment tank capacity shall be designed on the equalization tank discharge rate.
  - (2) If equalization is to occur following the treatment tank, the minimum absorption area shall be calculated using the discharge rate from the equalization tank. All flows shall be treated in a septic or aerobic tank system that is designed for peak daily flows consistent with Chapter 73.17. No treatment tank size reduction is allowed. The equalization tank must be designed to meet the needs of the proposed facility.
- B. Tank installations must consist of either a two-compartment rectangular tank, two rectangular tanks in series, and otherwise conform to meet the requirements of Section 73.31. Vertically aligned circular (round) tanks are not permitted. Aerobic treatment tanks must be in compliance with Section 73.32.
- C. Flow equalization tanks shall be constructed of sound and durable material not subject to excessive corrosion or decay.
  - (1) Precast concrete tanks shall have a minimum wall thickness of 2 1/2 inches and be adequately reinforced.
  - (2) Precast slabs used as covers shall have a thickness of at least 3 inches and be adequately reinforced.
  - (3) Tanks having a liquid capacity of 5,000 gallons or less may not be constructed of blocks, bricks or similar masonry construction.

(4) Tanks having a capacity in excess of 5,000 gallons may be constructed onsite to meet the standards of the National Concrete Masonry Association for reinforcement and waterproofing. These standards are contained in *Basement Manual, Design and Construction Using Concrete Masonry*, TR 149, National Concrete Masonry Association, 2001, *Concrete Masonry Basement Wall Construction*, TEK 3-11, National Concrete Masonry Association, 2001 and *Preventing Water Penetration in Below-Grade Concrete Masonry Walls*, TEK 19-3A, National Concrete Masonry Association, 2001.

(5) Steel tanks shall meet the requirements of Underwriters Laboratory (UL) standards 1746 or 70.

D. Flow Equalization Flow Data

(1) For an existing facility, proposals must include peak daily water consumption volumes collected over a 1-year period with the highest consecutive 7-day period highlighted. If water consumption data are not available, flows must be calculated using Chapter 73, Section 73.17(b).

(2) For a new facility, proposals must include flow data from an equivalent facility. If flow data from an equivalent facility are not available for a new facility, flows must be calculated using Chapter 73, Section 73.17(b).

(3) Flows shall be presented in the design on a daily basis for the calendar period applicable to the facility.

E. The effluent shall be discharged from the equalization tank using floats and a dose timing device to send out a controlled volume that is lower than the peak flow for the facility but sufficient to balance inflow and outflow over the calendar period applicable to the facility.

F. The equalization tank and discharge rate must be designed and established based upon the flow pattern of the facility. Discharging a stabilized daily rate to the absorption area allows for reduction of the absorption area to match the stabilized rate.

G. The absorption area size must be calculated utilizing the controlled equalized daily flow plus an additional 20 percent absorption area.

H. Installation:

(1) An onsite preconstruction conference attended by the sewage enforcement officer, designer, installer, and the property owner prior to construction is recommended.

(2) The tanks shall be watertight after installation.

(3) The tank shall be installed using a minimum of 4 inches of pea gravel, sand or other suitable aggregate to bed the tank.

(4) Connections of lines to tanks shall be made using water tight mechanical seals or hydraulic grouting. Use of Portland cement grouting material is not permitted.

### III. Minimum Maintenance Standards

- A. The maintenance provider shall inspect the flow equalization tank annually for structural integrity. If the flow equalization tank(s) are installed before the treatment tank(s), solids shall be removed from the flow equalization tank if necessary.
- B. The manufacturer's representative must meet with the property owner within one (1) month of system start-up and/or occupancy of the dwelling and with the local agency's SEO upon request, to explain the operation and maintenance of the system, provide written instructions to the property owner, and to identify the locations of all parts of the system.
- C. The service provider shall inspect at least the following items at an interval frequency recommended by the manufacturer's requirements:
  - (1) Inspect septic tanks, dosing tanks, and lift pump tanks for structural integrity of the tank, inlet and outlet baffles, solids retainer, pumps, siphons, and electrical connections;
  - (2) Inspect aerobic tanks for structural integrity of the tank, inlets, and outlet baffles, buoyed solids retainer, pumps, siphons, and electrical connections.
  - (3) Ensure that the pumping system is operational.
- D. The service provider shall inspect and pump excess solids in accordance with the manufacturer's requirements.

### IV. Permitting Requirements

- A. The Department's regional office must review the proposal prior to permitting by the SEO. If requested by the regional office, central office will also provide comments.
- B. The sewage enforcement officer shall include on both the *Application for An Onlot Sewage Disposal* permit (Part III, Section 1) and the permit, the classification number itemized in the Classification Type of this listing.

### V. Planning Requirements

Existing projects that propose an increase in flows may require Act 537 planning. The DEP regional office should be contacted for any increase in exiting flows.