

Performance of Delaware Sand Filter Assessed

Up to now, our knowledge about the pollutant removal performance of sand filters has been drawn from monitoring data from four filters in Austin, Texas. Some have questioned whether this data is transferable to more humid regions of the country or to other design variations. This gap has been filled by two recent monitoring studies conducted on “Delaware” sand filters in Alexandria, Virginia and Seattle, Washington.

The Delaware sand filter was developed by Shaver and Baldwin (1991) and consists of two parallel trench-like chambers that are installed along the perimeter of a parking lot (Figure 1). Parking lot runoff enters the first chamber, which has a shallow permanent pool of water. The first trench provides pretreatment before the runoff spills into the second trench, which consists of an 18-inch deep sand layer. Runoff is filtered through the sand, and then travels down a gradient to a protected

outflow grate. Runoff in excess of the desired water quality treatment volume bypasses both trenches, and does not receive treatment.

An investigative team consisting of Warren Bell, Larry Gavan, and Lucky Stokes monitored a modified Delaware sand filter that collected runoff from a 0.7 acre section of a newly built parking lot located near National Airport in Alexandria, Virginia (Figure 2). The filter was constructed in 1992, and was about 95 feet long and had a sand filter bed area of 238 square feet (Figure 1). Additional details on its prototype design can be found in City of Alexandria (1995). The pollutant concentration at the inlet and outlet of the filter was monitored over 20 storm events in 1994. An analysis of pollutant concentrations in incoming stormwater indicated that the runoff was within the national ranges established in the National Urban Runoff Program (NURP) study, with two notable exceptions. First, the concentration of

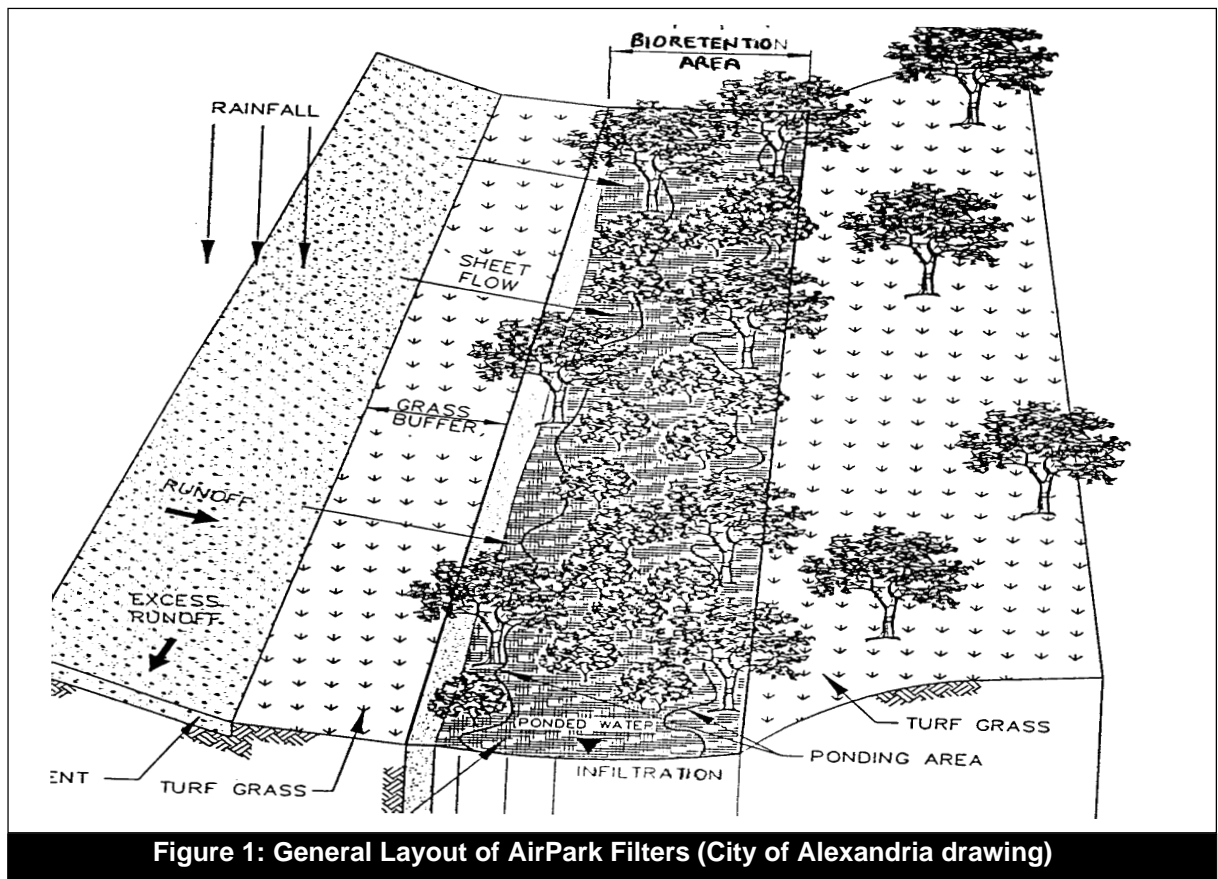


Figure 1: General Layout of AirPark Filters (City of Alexandria drawing)