

Field Test Verification and Certification in New Jersey



AQUA-FILTER™

Aqua-Filter™ Receives NJCAT Field Test Verification and NJDEP Field Certification

AquaShield™, Inc. is pleased to announce that the Aqua-Filter™ Stormwater Filtration System has received independent field test verification by the prestigious New Jersey Corporation for Advanced Technology (NJCAT). Based on this verification, the New Jersey Department of Environmental Protection (NJDEP) has issued Aqua-Filter™ Field Certification in March 2014 for the removal of 80% TSS at a filter loading rate of 16.5 gpm/ft² (0.037 cfs/ft²). NJCAT verifications are confirmation of peer-reviewed performance claims that are widely adopted throughout the stormwater community. NJDEP certifications provide regulatory guidance for verified stormwater treatment technologies.

AQUA-FILTER™ BENEFITS

- Achieves > 80% suspended sediment removal efficiency
- High efficiency at a filter surface area loading rate up to 16.5 gpm/ft² against fine-grained influent sediment
- Uses treatment train design including NJCAT verified pretreatment hydrodynamic separator (Aqua-Swirl®)
- Perlite and other filter media are available to target variety of pollutants
- Custom designs for zero piping elevation drops and low flows up to 1.0 cfs where allowed
- Both NJCAT verification and NJDEP Field Certification provide high level of confidence to support both performance and functionality claims

TEST SUMMARY & PRODUCT INFORMATION ►

FIELD TEST SUMMARY

A 26-month independent field test of an off-line Aqua-Filter™ Model AF-5.3 (five foot diameter swirl chamber and three row filtration chamber) was performed between March 2011 and May 2013 at an urban shopping center in Silver Spring, Maryland following the TARP Tier II field testing protocol. At a filter surface area loading rate of 16.5 gpm/ft² (0.037 cfs/ft²) the Aqua-Filter™ demonstrated suspended sediment removal efficiency in excess of 80% using perlite media for clay-loam textured influent sediment. NJDEP certification includes Aqua-Filter™ sizing methods for both peak inflow and inflow drainage area evaluations based on New Jersey rules.

Analytical results from 21 storms and 15.83 inches of rainfall demonstrated 97% removal efficiency for both Total Suspended Solids (TSS) and Suspended Sediment Concentration (SSC) as calculated by the sum of loads method. Average influent TSS and SSC concentrations were 135 and 157 mg/L, respectively. A low average effluent sediment concentration of 5.0 mg/L was achieved for both for TSS and SSC. Sixty three percent of the influent particles were less than 63 microns in size (silt) as measured by the serial filtration method. Particles larger than 1,000 microns were excluded from all analyses. Average influent particle size was also less than 100 microns as required by the TARP protocol.

One routine annual filter replacement event was performed during the field testing program, and no swirl chamber maintenance was performed. No adverse operating conditions were observed.

PRODUCTION INFORMATION

Aqua-Filter™ technology is designed for sites that require advanced treatment of stormwater runoff, using a treatment train of hydrodynamic separation and filtration technologies for the removal of sediment, debris, metals and phosphorus bound to particulate material, and free-floating oil.

The upstream component uses a hydrodynamic separator pretreatment chamber (Aqua-Swirl®) that also holds NJCAT verification for 86% annual TSS removal. The downstream filtration chamber is designed to refine and enhance the stormwater quality prior to discharge. The filter media are contained in lightweight individual containers with perlite being the most commonly used media; other contaminant-specific filter media are available. Where local jurisdictions allow, upflow filtration chamber models are available for sites needing little or no elevation drop between inlet and outlet pipes; and, low flow designs up to 1.0 cfs can use a single or twin round filtration chamber configuration.

MODE OF OPERATION

Aqua-Filter™ mode of operation is shown in the 3-D rendering below. Operations begin when stormwater enters the pretreatment chamber (Aqua-Swirl®) through a tangential pipe where the dynamic circular (vortex) flow pattern forces sediment to settle to the base of the swirl chamber. Treated flow exits the swirl chamber behind the arched inner baffle. Captured sediment is retained at the base of the swirl chamber where water velocities are the lowest. Pretreated water next enters the filtration chamber where it is evenly distributed across the surface area of the horizontal filter bed. Water is allowed to permeate through the filter media under gravity flow conditions prior to discharge.

