AquaShield™ | TECH REPORT

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AQUA-SWIRL®

Stormwater Treatment System Receives Field Test Verification from New Jersey Corporation for Advanced Technology

AquaShield™, Inc. is pleased to announce that the New Jersey Corporation for Advanced Technology (NJCAT) has verified the results of an independent 27-month field testing program for the AQUA-SWIRL® Stormwater Treatment System to achieve greater than 80% annual suspended sediment removal from stormwater runoff. NJCAT is a non-profit corporation whose mission is to promote the growth of technology-based businesses in emerging fields including environmental technologies. Prestigious NJCAT verifications provide peer-reviewed confirmation of performance claims that are widely adopted throughout the stormwater community.

AQUA-SWIRL® BENEFITS

- Achieves >80% net annual suspended sediment removal efficiency as a standalone system
- Provides high performance efficiency at a loading rate up to 41.2 gpm/ft² against fine-grained influent sediment
- Proven long term functionality
- Easy maintenance and accessibility from the surface
- Independent NJCAT verification provides high level of confidence to support both performance and functionality claim

TEST SUMMARY & PRODUCT INFORMATION ▶

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FIELD TEST SUMMARY

A 27-month independent field test of an off-line AQUA-SWIRL® Model AS-5 (five foot diameter swirl chamber) was performed between March 2009 and June 2011 at an urban shopping center in Silver Spring, Maryland following the TARP Tier II field testing protocol. The AQUA-SWIRL®, having a water quality treatment flow rate of 41.2 gpm/ft², demonstrated suspended sediment removal efficiency in excess of 80% on a net annual basis for clay-loam textured influent sediment.

Analytical results from 18 storms and 15.16 inches of rainfall from the 1.19 acre drainage area demonstrated 86% Total Suspended Solids (TSS) and 87% Suspended Sediment Concentration (SSC) removal efficiency. Average influent TSS and SSC concentrations were 132 and 145 mg/L, respectively. Average effluent sediment concentrations were low, 12 mg/L for TSS and 13 mg/L for SSC. Sum of loads calculations demonstrated an average annual removal efficiency of 84% for both TSS and SSC.

Seventy two percent of the influent particles were less than 63 microns (µm) in size as measured by the serial filtration method. Particles larger than 1,000 µm were excluded from all analyses. Average influent particle size was also less than 100 µm as required by the TARP protocol.

One regularly scheduled maintenance event was performed by the County stormwater department as part of their routine maintenance program. No adverse operating conditions were observed for the Aqua-Swirl® during the testing period.

PRODUCTION INFORMATION

AQUA-SWIRL® is a single chamber hydrodynamic separator designed to target the removal of sediment, debris and free-floating oil. The single swirl chamber allows easy maintenance and direct accessibility to the captured materials from the surface.

Autosampler collected flow-proportional composite samples.

MODE OF OPERATION

Operations begin when stormwater enters the AQUA-SWIRL® through a tangential pipe where the dynamic circular (or vortex) flow pattern forces sediment to settle to the base of the swirl chamber. Quiescent particle settling occurs between storm events. Treated flow exits the AQUA-SWIRL® behind the arched inner baffle, the top of which is sealed across the treatment channel to prevent floatable pollutants from escaping the system. A vent pipe prevents a siphon from forming at the bottom of the baffle. Captured sediment is retained at the base of the swirl chamber where water velocities are the lowest.

An innovation by AquaShield