



**Center for Environmental Systems
Stevens Institute of Technology
Castle Point Station
Hoboken, NJ 07030-0000**

February, 15, 2013

Mr. Mark B. Miller, P.G.
AquaShield™, Inc.
2705 Kanasita Dr.
Chattanooga, TN 37343

Re: Aqua-Swirl® Stormwater Treatment System

Mark,

A 27-month field test of an Aqua-Swirl® Model AS-5 has been completed at an urban shopping center in Silver Spring, Montgomery County, Maryland. **Analytical results and performance analysis from 18 storm events and over 15 inches of rainfall demonstrated that 78% of the storms achieved greater than 80% TSS removal efficiency and 83% of the storms achieved greater than 80% SSC removal efficiency for the clay-loam textured sediment influent.**

The TARP requirement that a minimum of six samples be collected from each storm was interpreted by AECOM, independent environmental testing entity, that a minimum of six individual *composite* samples of the influent and effluent were required to be submitted for laboratory analysis. To ensure that sufficient sample volumes were collected for the required analyses, storm durations had to be conservatively predicted which led to varying sampling durations, and consequently event coverage, within the rainfall period. The storm duration coverage for each storm fluctuated from 30 to 80 percent with an overall average sampling duration of 60%. The storm flow coverage (rounded to the nearest 10%) varied between 20 and 100 percent with an overall average storm event coverage of 60%. For all storm events, samples were collected from the first 20% of the total storm event flow.

The relatively high TSS and SSC removal efficiencies for the AS-5 achieved under typical rainfall conditions for the geographic area was largely a result of the resulting storm intensities sampled over the 27-month field performance test. Unfortunately, none of the storms generated a loading rate greater than 75% of the NJDEP certified Water Quality Treatment Flow Rate (WQTFR) of 52.6 gpm/ft², thus limiting the field

verification WQTFR to 41.2 gpm/ft². Further, 10 (55.6%) of the 18 storm events had peak loading rates below 25% of an Aqua-Swirl[®] WQTFR of 41.2 gpm/ft² and another 6 events (33.3%) had peak loading rates between 10- 20 gpm/ft². The Aqua-Swirl[®], having a WQTFR of 41.2 gpm/ft², has demonstrated a suspended sediment removal efficiency in excess of 80% on a net annual basis for a clay-loam textured sediment in this field test.

NJCAT is pleased to provide a copy of the verification report, “NJCAT Technology Verification – Aqua-Swirl[®] Model AS-5 Stormwater Treatment System”, detailing the procedures that evaluated the technology performance. The report documents the final verification of the Aqua-Swirl[®] technology having completed field evaluation in accordance with the TARP Tier II Protocol (TARP, 2003) and New Jersey Tier II Stormwater Test Requirements—Amendments to TARP Tier II Protocol (NJDEP, 2006). The report is available for downloading from the NJCAT website at: http://www.njcat.org/verification/Verifications_detail.cfm?LinkAdvID=103146

Regards,



Richard S. Magee, Sc.D., P.E., BCEE
Technical Director