



## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
Bureau of Nonpoint Pollution Control  
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CHRIS CHRISTIE  
*Governor*

KIM GUADAGNO  
*Lt. Governor*

BOB MARTIN  
*Commissioner*

June 13, 2014

Mark B. Miller, P.G.  
AquaShield, Inc.  
2733 Kanasita Drive  
Suite 111  
Hixson, TN 37343

Re: **Revision to Remove Typographical Error  
From March 17, 2014 Certification Letter**  
MTD Field Certification for the  
Aqua-Filter™ Stormwater Filtration System  
by AquaShield™, Inc.

**Expiration Date: December 1, 2016**  
**TSS Removal Rate: 80%**

Dear Mr. Miller:

This letter supersedes the previous certification letter dated March 17, 2014, which incorrectly cited the *2009 NJDEP Field Testing Protocols* as being applicable. Rather, a reference to the *2006 New Jersey Tier II Stormwater Test Requirements – Amendments to TARP Tier II Protocol* should have been cited and is the only change noted below in comparison to the March 17<sup>th</sup> certification letter.

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). AquaShield™, Inc. has requested a Final Certification for the Aqua-Filter™ Stormwater Filtration System.

This project falls under the “Transition for Manufactured Treatment Devices” dated July 15, 2011. The Aqua-Filter™ Stormwater Filtration System by AquaShield™, Inc. qualified under Category C. *Manufactured Treatment Devices Seeking Final Certifications - In Process* which are MTDs that have commenced field testing on or before August 1, 2011.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the 2006 New Jersey Tier II Stormwater Test Requirements – Amendments to TARP Tier II Protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan.

**The NJDEP certifies the use of the Aqua-Filter™ Stormwater Filtration System by AquaShield™, Inc. at a TSS removal rate of 80%, subject to the following conditions:**

1. The Aqua-Filter™ Stormwater Filtration System is designed according to the NJ Water Quality Design Storm in N.J.A.C. 7:8-5.5.
2. The Aqua-Filter™ Stormwater Filtration System is certified as an off-line system only. Any flow above the New Jersey Water Quality Design Storm must be bypassed around the system.
3. The Aqua-Filter™ Stormwater Filtration System is comprised of two parts, both of which must be present. The upstream pretreatment component must be an Aqua-Swirl<sup>®</sup> hydrodynamic separator sized to provide a minimum TSS Removal Rate of 50%. The downstream component must be an Aqua-Filter™ filtration chamber sized with the correct number of rows of filter media bags to provide the required surface area of filter media. The Aqua-Filter™ Stormwater Filtration System is designated AF-Y.X where AF-Y designates the hydrodynamic pretreatment chamber and X designates the number of filter rows. Additional information on sizing is provided below.

The first step for sizing an Aqua-Filter™ system is to size the hydrodynamic pretreatment chamber according to the water quality treatment flow rate (WQTFR) requirement of the site. Table 1 lists the pretreatment chamber designations. For example, a WQTFR of 2.8 cfs from a contributing 2.7 acre drainage area is greater than the 2.2 cfs maximum WQTFR in the fourth row of the table but less than 3.2 cfs maximum WQTFR in the fifth row of the table. Therefore this WQTFR would require the use of an AF-6.X hydrodynamic pretreatment chamber.

**Table 1 Hydrodynamic Pretreatment Chamber Sizing Chart**

Hydro-dynamic Pretreatment Chamber	Swirl Chamber Diameter (ft)	Maximum Stub-Out Off-line Pipe Outer Diameter (in)	Maximum Water Quality Treatment Flow (WQTFR) (cfs)	Oil/Debris Storage Capacity (gal)	Sediment Storage Capacity (ft <sup>3</sup> )
AF-2.X	2.50	8	0.6	37	10
AF-3.X	3.25	10	0.9	110	20
AF-4.X	4.25	12	1.6	190	32
AF-5.X	5.00	12	2.2	270	45
AF-6.X	6.00	14	3.2	390	65
AF-7.X	7.00	16	4.3	540	90
AF-8.X	8.00	18	5.6	710	115
AF-9.X	9.00	20	7.1	910	145
AF-10.X	10.0	22	8.8	1,130	180
AF-11.X	11.0	24	10.6	1,422	222
AF-12.X	12.0	24	12.6	1,698	270
AF-13.X	13.0	30	14.8	1,986	310
AF-X.X*	Custom/Multiple		>14.8		

The downstream filtration chamber is then sized to provide the appropriate media surface area. The peak inflow WQTFR for the filtration chamber is limited to the field test verified peak filter loading rate of 16.5 gpm/ft<sup>2</sup> (0.037 cfs/ft<sup>2</sup>) of filter area. The maximum inflow impervious drainage area per square foot of filter area is limited to 0.033 acres/ft<sup>2</sup> based on the verified field test. Using these verified performance results along with the Aqua-Filter™ filter chamber design of 12 square foot of filter media per row, the appropriate number of Filter Bed Rows can be calculated as follows:

**Peak Inflow Evaluation:**

$$\begin{aligned}
 \text{Number of Rows} &= \frac{\text{WQTFR}}{\text{Filter Loading Rate}} * \frac{1 \text{ Row}}{\text{Filter Media Surface Area}} \\
 &= \frac{\text{WQTFR (cfs)}}{0.037 \text{ cfs/sf}} * \frac{1 \text{ Row}}{12 \text{ sf}} \\
 &= \frac{\text{WQTFR}}{0.444} \\
 &= 2.25 * \text{WQTFR}
 \end{aligned}$$

For the above example, a WQTFR of 2.8 cfs would require 6.3 rows, which is rounded up to 7 rows.

**Inflow Drainage Area Evaluation:**

$$\begin{aligned}
 \text{Number of Rows} &= \frac{\text{Site Inflow Drainage Area}}{\text{Filter Drainage Rate}} * \frac{1 \text{ Row}}{\text{Filter Media Surface Area}} \\
 &= \frac{\text{Site Inflow Drainage Area (ac)}}{0.033 \text{ ac/sf}} * \frac{1 \text{ Row}}{12 \text{ sf}} \\
 &= \frac{\text{Site Inflow Drainage Area}}{0.396} \\
 &= 2.53 * \text{Site Inflow Drainage Area}
 \end{aligned}$$

For the 2.7 ac contributing drainage area in this example, the number of rows required is 6.8, which is rounded up to 7. Therefore, the resulting unit applicable for this example is an AF-6.7.

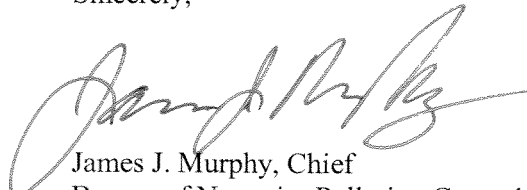
4. The Aqua-Filter™ Stormwater Filtration System cannot be used in series with a settling chamber (such as a hydrodynamic separator) or a media filter (such as a sand filter), to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
5. The maintenance plan for sites using this device shall incorporate, at a minimum, the maintenance requirements for the Aqua-Filter™ Stormwater Filtration System shown in the attached document.

In addition to the attached, any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8, must include a detailed maintenance plan. The detailed maintenance plan must

include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Manual.

If you have any questions regarding the above information, please contact Ms. Lisa Schaefer of my office at (609) 633-7021.

Sincerely,



James J. Murphy, Chief  
Bureau of Nonpoint Pollution Control

C: Chron File  
Richard Magee, NJCAT  
Madhu Guru, DLUR  
Elizabeth Dragon, BNPC  
Lisa Schaefer, BNPC