



Aqua-Filter™ Maintenance

Proper maintenance of the Aqua-Filter™ system is needed for the unit to operate efficiently. Typically, inspection of the Aqua-Swirl™ pretreatment chamber and the filtration chamber should be performed on a quarterly basis. Information gathered during the first year of service can be used to create a maintenance plan appropriate for the site.

Aqua-Swirl™ Pretreatment Chamber

The Aqua-Swirl™ is easily inspected from the surface. Floating debris and free oil can be observed along with the captured stormwater by removing the manhole cover. Sediment depth is determined by lowering a measuring device (e.g. stadia rod) to the top of the sediment pile.



Floatable debris in the Aqua-Swirl™

When the sediment pile is within 30 to 36 inches from the water surface, cleaning is required. Typically, a vacuum truck is used to first remove the captured floating materials from the water's surface before lowering the vac-hose into the accumulated sediment pile for its removal.

For more detail regarding the inspection and maintenance of the pretreatment chamber, please see the previous Section on the Aqua-Swirl™ Inspection and Maintenance.

Aqua-Filter™ Filtration Chamber

The filter media is also easily observed from the surface. Manhole covers are spaced over the entire filtration bed to provide easy access. AquaShield™ provides a customized manhole cover with our logo to make it easy for maintenance crews to locate the system in the field.

Initially, the filter media is light tan or white in color. When the media color turns black, it has become saturated due to pollutant loading and requires replacement. Call toll free (888) 344-9044 to order replacement filters.



A permanent ladder provides access to filter chamber

An entry riser provides direct access into the filtration chamber with a permanent ladder welded into the downstream section of the chamber. This additional access allows for the vacuuming of any standing water and an unobstructed walkway to the downstream side of the filter bed.

Replacement of the filtration media typically requires entry into the filtration chamber by one of a two-member maintenance crew. Confined space entry precautions should be taken by the maintenance crew when removing and replacing the filters.

The spent filter containers are normally retrieved from the filter chamber by a second crewmember at the surface through the multiple 30-inch risers spaced across the top of the filter bed. In addition, the filter containers can be accessed directly from within the filtration chamber via a vertical removable panel at the rear of the filter bed.

The center row of the filtration bed has been fitted with one inch thick removable fiberglass grate panels. This allows for a six-foot tall walkway down the center of the chamber, providing easy access to the full length of the filtration chamber.

Rows of removable side grates are positioned on both sides of the center row. After the center grate panel has been removed, the filter media can be lifted from these side grate panels.

After the removable sides have been loaded with replacement filter containers, the removable center grates are repositioned and locked in place. New filters are installed in a criss-cross manner to prevent short-circuiting.



Grate panels cover the filter media

Filter Media Disposal

The filter media does not allow captured contaminants to be released once absorbed into the material. This is a unique quality of the Aqua-Filter™, allowing superior performance under extreme conditions.

The spent filters and sediment generally do not require any special treatment or handling for disposal. The filtration media can be recycled as fuel material, or sent to a subtitle D landfill. AquaShield™ recommends that all materials removed during the maintenance process be handled and disposed of in accordance with local and state requirements.



Spent filter media can be recycled or sent to a landfill

An "Inspection and Maintenance Manual" is provided with each Aqua-Filter™ system for more detailed maintenance procedures. On the following page, you will find a sample Inspection Data Sheet.

Aqua-Filter™

Inspection and Maintenance Manual for BMP Owners

(Note: Attach certifications for local regulatory authority including any applicable fees.)

Site and Owner Information

Site Name: _____ Change in ownership since last inspection? Y N

Owner Name: _____

Owner Address: _____

Owner Phone Number: _____

Emergency Phone Number: _____

Location: _____

Date: _____

Time: _____

Inspector Name: _____

Maintenance Items

Inspection - Aqua-Swirl™ (pretreatment)

Floatable Debris and Oil

1. Remove manhole lid to expose liquid surface of Aqua-Swirl™.
2. Remove floatable debris with basket or net if any present.
3. If oil is present, measure its depth. Clean liquids from system if 4-6" or more oil is present (see "Cleaning" Figure 5).

Note: Water in an Aqua-Swirl™ can appear black like oil due to the dark body of the surrounding structure. Oil appears darker than water in the system and is usually accompanied by debris (e.g. Styrofoam, etc.) with obvious signs of oil stains. The depth of oil can be measured with an oil/water interface probe, a stadia rod with water phyllic paste, a coliwasa, or by simply collecting a representative sample with a jar attached to a rod.

Sediment Accumulation

Make measurements as follows (see figures 1 and 2):

1. Lower measuring device (i.e. stadia rod) into Aqua-Swirl™ through service access provided. (See Figure 2)
2. Record distance to top of sediment pile (in): _____
3. Record distance to top of water (in): _____
3. Calculate distance to sediment minus distance to water (in): _____
4. Schedule cleaning if value in step 3 is 30" or less. (see Figure 5).

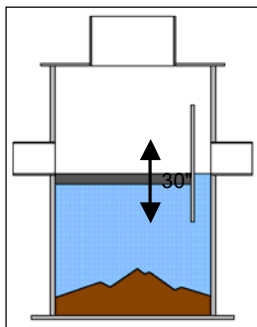


Figure 1



Figure 2

Inspection Aqua-Filter™ (continued)

1. Remove manhole lids to expose filter bed of media and access ladder.
2. Enter filtration chamber through access riser. (note: water will be present at very minimal depths prior to cleanout during the inspection)
3. Remove bulkhead door as shown in Figure 3.
3. Remove filter grate covers and filters through manway risers along the chamber
4. Visually inspect the filter media noting the color and saturation of contaminants (TSS, oils, grease, etc.)
5. If media is dark brown to black, the media is fully spent and should be replaced. See Figure 4
6. Contact AquaShield™ Maintenance Department for replacement bags at 888-344-9044.
7. Schedule cleaning (See "Cleaning" Figure 5.)



Figure 3



Figure 4

Inspection (continued)

Diversion Structures

If a diversion structure is present on the site, this should be inspected for the following items.

1. Inspect weir or other structure for structural decay or damage. Weirs are more susceptible to damage than off-set piping and should be checked to confirm that they are not crumbling, in the case of concrete or brick weirs, or decaying if a steel weir was used.
2. Inspect diversion structure and by-pass piping for signs of structural damage or blockage from debris or sediment accumulation.
3. Measure elevations on diversion weir or piping to ensure it is consistent with site plan design.
4. Inspect downstream structure in diversion system for signs of blockage or structural failure.

Cleaning

Schedule cleaning with local vector company or AquaShield™'s Maintenance Department to remove sediments, oils, and other floatable pollutants with a vector tractor. The spent filters and sediment generally do not require any special treatment or handling for disposal. The filter media can be recycled as fuel material, sent to a subtitle D landfill. AquaShield™ recommends that all materials removed during the maintenance process be handled and disposed of in accordance with local and state requirements.



Figure 5

Maintenance Schedule

During Construction

Inspect the Aqua-Filter™ every three months and clean the system as needed. The AquaSw™ should be inspected and cleaned at the end of construction regardless of whether it has reached its sediment or oil storage capacity.

First Year Post-Construction

Inspect the Aqua-Filter™ every three months and clean the system as needed.
Inspect and clean the system once annually regardless of whether it has reached its sediment or floatable pollutant storage capacity.

Second and Subsequent Years Post-Construction

If the Aqua-Filter™ did not reach full sediment or floatable pollutant capacity in the First Year Post-Construction, the system can be inspected and cleaned once annually.
If the Aqua-Filter™ reached full sediment or floatable pollutant capacity in less than 12 months in the First Year Post-Construction, the system should be inspected once every six months and cleaned as needed. The Aqua-Filter™ should be cleaned annually regardless of whether it reaches its sediment or floatable pollutant capacity.

Bypass Structures

Bypass structures should be inspected whenever the Aqua-Filter™ is inspected and maintained as needed.

Maintenance Company Information

Company Name: _____

Street Address: _____

City, State, Zip: _____

Contact: _____

Office Phone: _____

Mobile Phone: _____

Pager: _____



Activity Log

Date of cleaning: _____ (Next inspection should be 3 months from this date for the first year).

Time of cleaning: _____

Date of next inspection: _____

Floatable debris present (Y/N)? _____

Oil present (Y/N)? _____ Oil depth (inches): _____

Structural Conditions and Comments

Any structural damage? Y N Where? _____

Aqua-Filter™

TABULAR MAINTENANCE SCHEDULE

Date Construction Started: _____

Date Construction Ended: _____

During Construction												
Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as Needed			X			X			X			X
Inspect Bypass Structures (if applicable) and Maintain As Needed			X			X			X			X
Clean System*												X*

* The Aqua-Filter™ should be cleaned once a year regardless of whether it has reached full pollutant storage capacity. In addition, the system should be cleaned at the end of construction regardless of whether it has reach full pollutant storage capacity.

First Year Post-Construction												
Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as Needed			X			X			X			X
Inspect Bypass Structures (if applicable) and Maintain As Needed			X			X			X			X
Clean System*												X*

* The Aqua-Filter™ should be cleaned once a year regardless of whether it has reached full pollutant storage capacity.

Second and Subsequent Years Post-Construction												
Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Inspect and Clean as Needed*												X*
Inspect Bypass Structures (if applicable) and Maintain As Needed												X*
Clean System*												X*

* If the Aqua-Filter™ did not reach full sediment or floatable pollutant capacity in the First Year Post-Construction, the system can be inspected and cleaned once annually.
 If the Aqua-Filter™ reached full sediment or floatable pollutant capacity in less than 12 months in the First Year Post-Construction, the system should be inspected once every six months (more frequently if past history warrants) and cleaned as needed. The Aqua-Filter™ should be cleaned annually regardless of whether it reaches its sediment or floatable pollutant capacity.