



System Maintenance

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Extremely Manageable



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AquaShield™ Product System Maintenance

The long-term performance of the stormwater treatment structures (including manufactured systems, ponds, swales, etc.), and the effective protection of receiving waters, depends on a consistent maintenance plan. Inspection and maintenance functions are simple and easy for the AquaShield™ Stormwater Treatment Systems allowing all inspections to be performed from the surface. An AquaShield™ field representative will be available as needed to assist local maintenance personnel in the field. Please contact us for a copy of a product-specific "Inspection and Maintenance Manual".



It is important that a routine inspection and maintenance program be established for each unit based on (1) the volume or load of the contaminants of concern, (2) the frequency of releases of contaminants at the facility or location, and (3) the nature of the area being drained.

In order to ensure that our systems are being maintained properly, AquaShield™ offers a maintenance solution to all of our customers. We will arrange to have maintenance performed.





Inspection

All AquaShield™ products can be inspected from the surface, eliminating the need to enter the systems to determine when cleanout should be performed.

In most cases, AquaShield™ recommends a quarterly inspection of the Stormwater Treatment Systems for the first year of operation to develop an appropriate schedule of maintenance.

Based on experience of the system's first year in operation, we recommend that the inspection schedule be revised to reflect the site-specific conditions encountered. Typically, the inspection schedule for subsequent years is reduced to semi-annual inspection.



Aqua-Swirl™ Maintenance

The Aqua-Swirl™ has been designed to minimize and simplify the inspection and maintenance process. The system can be inspected and maintained completely from the surface, thereby eliminating the need for confined space entry.

Furthermore, the entire structure (specifically, the floor) is accessible for visual inspection from the surface. There are no areas of the structure that are blocked from visual inspection or periodic cleaning.

Inspection of any free-floating oil and floatable debris can be directly observed and maintained through the manhole access provided directly over the swirl chamber.

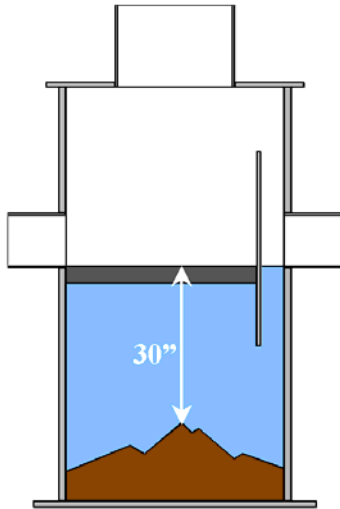
Aqua-Swirl™ Inspection Procedure

To inspect the Aqua-Swirl™, a hook is needed to remove the manhole cover. AquaShield™ provides a customized manhole cover with our logo to make it easy for maintenance crews to locate the system in the field. We also provide a permanent metal information plate attached inside the access riser, which provides our contact information, the Aqua-Swirl™ model size, and serial number.



**Sediment inspection
using a stadia rod**

The only tools needed to inspect the Aqua-Swirl™ system are a flashlight and a measuring device such as a stadia rod or pole. Given the tremendous accessibility provided, floating oil and debris can be observed directly from the surface. Sediment depths can easily be determined by lowering a measuring device to the top of the sediment pile and to the surface of the water. When the sediment pile is within 30 to 36 inches of the water surface, the system should be maintained.



It should be noted that in order to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the *top* of the sediment pile. The finer sediment at the top of the pile, typically offers less resistance to the measuring device than the larger particles.

Aqua-Swirl™ Cleanout Procedure

Clean out of the Aqua-Swirl™ is simple. Free-floating oil and floatable debris can be observed and removed directly through the 30-inch service access provided.

A vacuum truck can be used to remove the accumulated sediment and debris. It is important to note that the entire sediment storage area can be reached with a vacuum hose from the surface (reaching all the sides).

Disposal of the material is typically treated in the same fashion as catch basin cleanouts. AquaShield™ recommends that all materials removed be handled and disposed of in accordance with local and state requirements.



Vacuum truck cleans the Aqua-Swirl™

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



Aqua-Swirl™ Maintenance Data Sheet

Inspector: _____ Date: _____
Location: _____ Time: _____

INSPECTION

General Site Condition

Visible Evidence of Spills/ Releases (oils, grease, fuels, paints, chemicals):

Visible Evidence of Heavy Sediment Deposition:

Swirl

Condition of Swirl: _____

Condition of Baffle: _____

Distance to Sediment: _____

Distance to Water: _____

**Note: If sediment is less than 30 to 36 inches below water surface, sediment should be removed.

CONTAMINATION REMOVAL DATA

Floating Oil and Debris

Approx. Volume: _____

Description: _____

Elapsed Removal Time: _____

Sediment

Approx. Volume: _____

Description: _____

Elapsed Removal Time: _____

Other Comments



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 Data Sheet

Inspector: _____ Date: _____

Location: _____ Time: _____

INSPECTION

General Site Condition

Visible Evidence of Spills/ Releases (oils, grease, fuels, paints, chemicals):

Visible Evidence of Heavy Sediment Deposition:

Swirl

Condition of Swirl: _____

Condition of Baffle: _____

Distance to Sediment: _____

Distance to Water: _____

Note: If sediment is less than 30 inches below water surface, sediment should be removed.

Filtration Chamber

Condition of Filter Trays: _____

Condition of Filtration Chamber: _____

Color of Filter Media: _____

Note: If filter media is dark brown to black, it should be replaced.

CONTAMINATION REMOVAL DATA (if required)

Floating Oil and Debris

Volume: _____

Description: _____

Elapsed Removal Time: _____

Sediment

Volume: _____

Description: _____

Elapsed Removal Time: _____

Filter Media

Volume: _____

Description: _____

Elapsed Removal Time: _____



Aqua-Guardian™ Maintenance

A routine inspection and maintenance program should be established by the customer for each Aqua-Guardian™ unit based on the volume or load of the contaminants of concern, the frequency of releases of contaminants at the facility or location, and the nature of the area being drained. Typically, the Aqua-Guardian™ should be inspected monthly and after significant storm events.



The inside of an Aqua-Guardian™ Catch Basin Insert

The Aqua-Guardian™ insert can be visually inspected from the surface without the need to remove the catch basin grate. Simply use a tape measure to gauge the amount of sediment in the collection area. When sediment level reaches the bottom of the perimeter “filter screen outlets”, the unit should be serviced.

Servicing the Aqua-Guardian™ is simple. First, remove the grate covering the catch basin. Then with a wet/dry shop-vac, remove the sediment and debris accumulated inside the chamber.



A shop vacuum cleans an Aqua-Guardian™ Catch Basin Insert

The locking centerpiece assembly is removed by rotating the assembly with the “T” handle on top of the filter screen standpipe. Once the centerpiece assembly is removed, the filter bag will be visible so that it can be pulled from the Aqua-Guardian™. Clean out any residual sediment in the filter area and place a new filter bag in the unit. Press down on all sides of the newly installed filter to ensure good contact with the outside walls.

The centerpiece assembly is replaced and rotated (or locked) under the fitted guides. The final maintenance step is to replace the surface grate cover to its normal position.