



## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Water Quality

Bureau of Nonpoint Pollution Control

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[http://www.state.nj.us/dep/dwq/bnpc\\_home.htm](http://www.state.nj.us/dep/dwq/bnpc_home.htm)

CHRIS CHRISTIE  
*Governor*

KIM GUADAGNO  
*Lt. Governor*

BOB MARTIN  
*Commissioner*

January 22, 2015

Lisa Lemont, CPSWQ  
Hydro International  
94 Hutchins Drive  
Portland, ME 04102

Re: Field Test Certification for the Up-Flo<sup>®</sup> Filter by Hydro International

**Expiration Date: December 1, 2016**

**TSS Removal Rate: 80%**

Dear Ms. Lemont:

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). Hydro International has requested a Field Test Certification for the Up-Flo<sup>®</sup> Filter stormwater filtration system.

This project falls under the July 15, 2011 "Transition for Manufactured Treatment Devices," under *C. Manufactured Treatment Devices Seeking Final Certification – In Process* which are MTDs that have commenced field testing on or before August 1, 2011.

NJDEP received the required information and signed statements by the NJCAT Technical Director and the manufacturer indicating that the requirements of the Field Testing Protocols in place at the initiation of testing have been met or exceeded. The NJCAT letter also includes a recommended certified TSS removal rate and the required maintenance plan.

**The NJDEP certifies the use of the Up-Flo<sup>®</sup> Filter stormwater filtration system at a TSS removal rate of 80%, subject to the following conditions:**

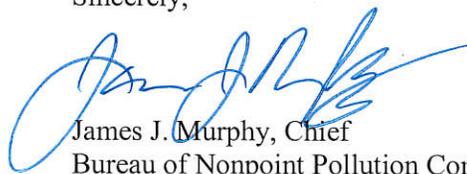
1. The various models and associated water quality flow capacities shall be sized for the peak flow of the New Jersey Water Quality Design Storm per N.J.A.C. 7:8-5.

2. The peak inflow of the Water Quality Design Storm is limited to 25 gpm (0.0557 cfs) per filter module (22.7 gpm /ft<sup>2</sup> with a filter module surface area of 1.1 ft<sup>2</sup>). The maximum inflow area per filter model is limited to 0.66 acres per Up-Flo<sup>®</sup> Filter Module.
3. Sufficient draindown must be placed in any system to ensure that the draindown time for the Water Quality Design Storm does not exceed thirty-six (36) hours.
4. The Up-Flo Filter must provide a minimum of 2.8 cf of sediment storage volume for each filter module. If the Water Quality Design Storm is controlled by upstream detention/attenuation for 12 hours or more the minimum settling area does not apply.
5. The Up-Flo Filter is certified as an off-line system. Any flow above the New Jersey Water Quality Design Storm must be bypassed around the system.
6. This certification does not extend to the enhanced removal rates under N.J.A.C. 7:8-5.5 through the addition of settling chambers (such as hydrodynamic separators) or media filtration practices (such as a sand filter).
7. The maintenance plan for the sites using this device shall incorporate at a minimum, the maintenance requirements for the Up-Flo Filter shown attached.

In addition to the attached, the detailed maintenance plan must include all of the items identified in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual. 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.

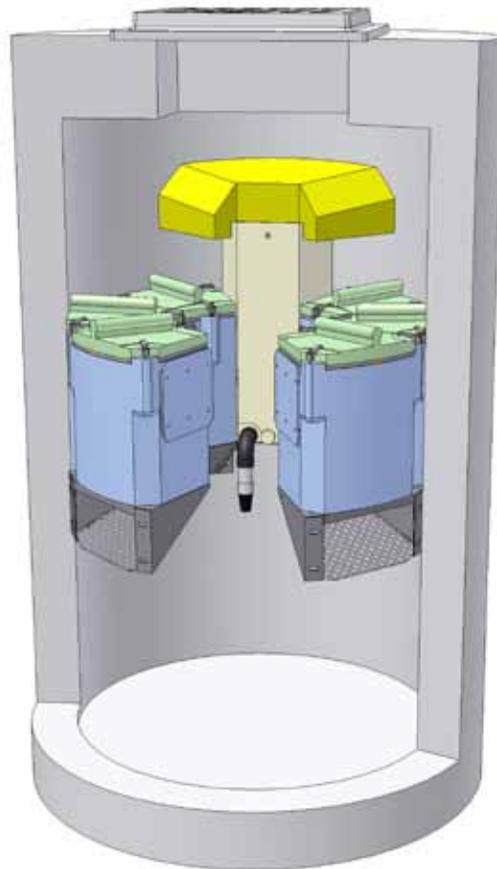
Additional information regarding the implementation of the Stormwater Management rules N.J.A.C. 7:8 are available at [www.njstormwater.org](http://www.njstormwater.org). Please contact Titus Magnanao of my office at (609) 633-7021 if you have any questions.

Sincerely,



James J. Murphy, Chief  
Bureau of Nonpoint Pollution Control

c: Chron File  
Richard Magee, NJCAT  
Madhu Guru, DLUR  
Ravi Patraju, NJDEP  
Elizabeth Dragon, BNPC  
Titus Magnanao, BNPC



## Operation and Maintenance Manual

Up-Flo® Filter

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Filtration System for Stormwater Treatment

Stormwater Solutions  
Turning Water Around ...®

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### **IMPORTANT - ORDER REPLACEMENT PARTS FOR MAINTENANCE - IMPORTANT**

Annual maintenance requires replacement of the Media Packs and the Drain Down Filter. Contact Hydro International to order replacements. Allow 2-4 weeks for delivery.

Office hours Monday thru Friday 8:00 A.M. to 5:00 P.M. EST  
 Toll free: 1-800-848-2706  
 Phone: 207-756-6200  
 Fax: 207-756-6212  
 Email: [stormwaterinquiry@hydro-int.com](mailto:stormwaterinquiry@hydro-int.com)

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**DISCLAIMER:** Information and data contained in this manual is exclusively for the purpose of assisting in the operation and maintenance of Hydro International plc's Up-Flo® Filter. No warranty is given nor can liability be accepted for use of this information for any other purpose. Hydro International plc have a policy of continuous product development and reserve the right to amend specifications without notice.



## Product Overview

The Up-Flo® Filter is a modular high-rate stormwater filtration device. As shown below, it is typically installed into a 4-ft diameter catch basin structure. Each Filter Module has a screen and support bracket that is attached to the concrete manhole and each contains a Media Pack that includes Flow Distribution Media and two Media Bags (Fig.1). Modules can attach to each other to form a “ring” of up to six modules. Up to two of the modules are attached to an Outlet Module that has a Bypass Hood and Drain Down Filter. The modular design can be supplied in different configurations depending on the application as shown in the following illustrations.

An upward flow path through the Filter Modules allows stormwater to be screened and filtered. In addition to the screening and filtering processes, gross pollutants will also settle into the sump or float to the surface of the water held within the manhole. The standard units are supplied with a 3-ft (0.9m) sump to allow for sediment and gross pollutant accumulations between maintenance intervals.

The following manual describes the operation of the Up-Flo® Filter and provides general maintenance requirements that will ensure the filter will continue to operate and perform as intended. In general, a minimum of two inspections are required per year to monitor sediment and gross pollutant accumulations. In order to achieve an annual TSS removal rate of 80% for the Up-Flo® Filter, the minimum maintenance frequency specified in the maintenance section for replacement of the Media Pack and removal of accumulated sediment from the sump is mandatory.

Hydro International offers recommendations for certified maintenance contractors. It is hoped that owners will take advantage of this service as these contractors have been trained and certified to ensure that maintenance will be performed properly. Should the owner choose to conduct maintenance procedures themselves, it is recommended that Hydro International be contacted to discuss the following procedures and consider contracting a representative from Hydro International for the first maintenance cycle.

See page 17 for more about Hydro International’s Stormwater BMP Maintenance Contractor Certification Program.

### Up-Flo® Filter Components

1. Inlet Grate
2. Siphonic Bypass Hood with Floatables Baffle
3. Filter Module
4. Outlet Module
5. Media Pack
6. Angled Screen
7. Drain Down Filter Assembly (*refer to Fig.10 for closer view*)
8. Sump

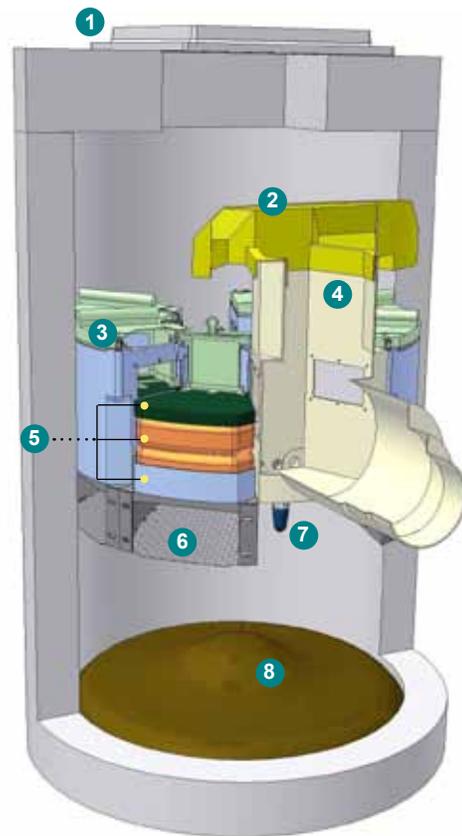


Fig.1 The components of the Up-Flo® Filter.

## Operation

### Introduction

The Up-Flo® Filter operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirements and is fabricated with durable non-corrosive components. Personnel are not required to operate the unit and maintenance is limited to periodic inspections, sediment and floatables removal, Media Pack replacement and Drain Down Filter replacement.

### Pollutant Capture

The Up-Flo® Filter is designed to operate as a “treatment train” by incorporating multiple treatment technologies into a single device. Trash and gross debris are removed by sedimentation and screening before they are introduced to the filtration media, preventing surface blinding of the filter media. The Up-Flo® Filter is a wet-sump device. Between storm events, oil and floatables are stored on the water surface separate from the sediment storage volume in the sump (see Fig.2). The high-capacity bypass siphon acts as a floatables baffle to prevent washout of captured floatable pollutants during high intensity events.

### Reduced Clogging

The Up-Flo® Filter has been designed to minimize the occurrence of clogging and blinding. The Up-Flo® Filter employs a unique Drain

Down Filter that allows the water level in the chamber to drop below the filter media between events. The Drain Down Filter mechanism creates a reverse flow that flushes captured pollutants off the surface of the Media Bag, helping to prevent blinding. By allowing the water to drain out, the Drain Down Filter also reduces the weight of the Media Bags. This makes the bags easier and safer to remove during maintenance operations.

### Overflow Protection

The Angled Screens are designed to prevent ragging and blinding. The Angled Screens are situated below the Filter Modules, sheltering them from the direct path of the influent. Coarse debris settles in the sump before the runoff flows up through the screens, protecting them from blinding. In the unlikely event of a blockage, the high capacity siphonic Bypass Hood is designed to convey high enough flow to minimize the risk of large storm creating upstream flooding.

### Good Housekeeping & Best Practices

Good housekeeping practices upstream of the Up-Flo® Filter can significantly extend Media Bag life. For example, sweeping paved surfaces, collecting leaves and grass trimmings, and protecting bare ground from erosion will reduce loading to the system. Media Packs should not be installed in the Filter Modules until construction activities are complete and site stabilization is effective.

### Damage Due to Lack of Maintenance

Delayed maintenance would result in clogged Media Bags and/or blinded Angled Screens. In that situation, the Up-Flo® Filter would go into bypass and there would be no treatment of the incoming stormwater. Because the Bypass Weir can easily convey all of the flow to the Outlet Module, there would be no lasting damage to the system. Replacement of the Media Bags and removal of sediment from the sump would restore the Up-Flo® Filter to its original treatment efficiency. Establishing and adhering to a regular maintenance schedule ensures optimal performance of the system.

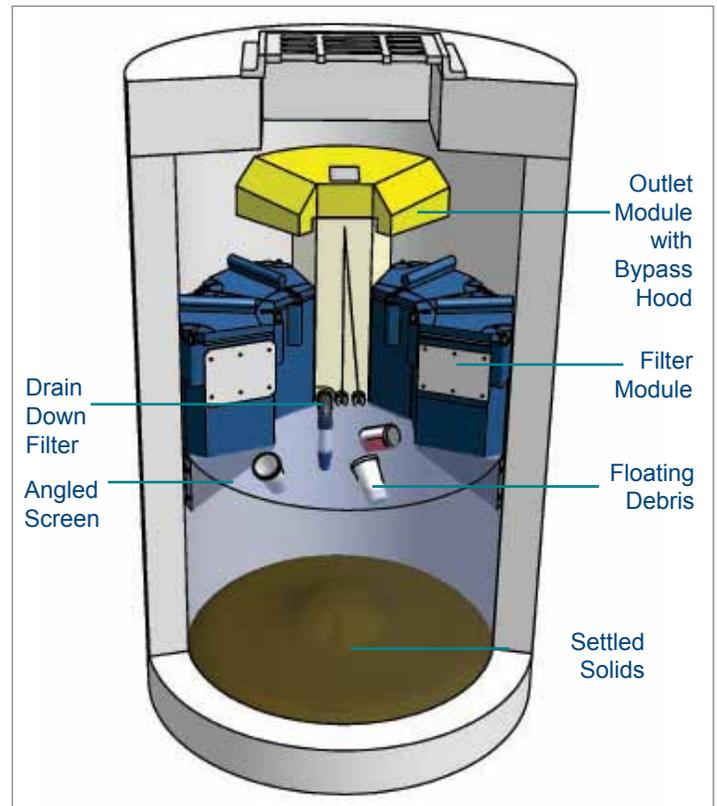


Fig.2 Pollutants captured in the Up-Flo® Filter.

## Inspection & Maintenance

### Overview

The Up-Flo® Filter protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the proper functioning of the Up-Flo® Filter.

Maintenance activities can be categorized as those that may be performed from outside the Up-Flo® vessel and those that are performed inside the vessel. Maintenance performed from outside the vessel includes removal of floatables and oils that have accumulated on the water surface and removal of sediment from the sump. Maintenance performed inside the vessel includes removal and replacement of Media Bags, Flow Distribution Media and the Drain Down Filter. A vactor truck is required for removal of oils, water, sediment, and to completely pump out the vessel to allow for maintenance inside. OSHA Confined Space Entry procedures must be followed when entering the Up-Flo® vessel.

The Up-Flo® Filter design allows for easy and safe inspection, monitoring and clean-out procedures. It has a wide central opening between the Filter Modules for easy and comfortable access to all of the components (see Fig.3). Completion of all the maintenance activities for a typical manhole Up-Flo® Filter takes less than one hour. In the case of inspection and floatables removal, a vactor truck is not required. Otherwise, a vactor truck is normally required for oil removal, removal of sediment from the sump, and replacement of the Media Packs and Drain Down Filter. In most cases, entry into the Up-Flo® Filter vessel is required for replacement of the Media Packs and Drain Down Filter, and OSHA Confined Space Entry procedures will have to be followed.

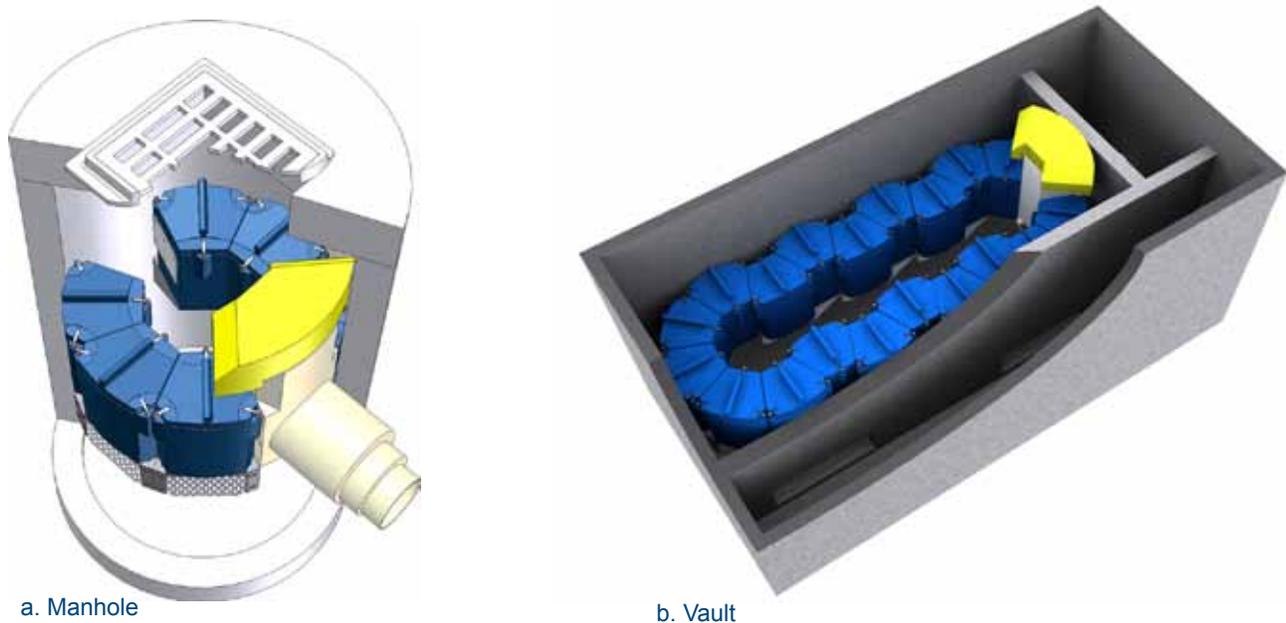


Fig.3 The Up-Flo® Filter is installed in a) 4-ft (1.2m) round manholes or b) in rectangular precast vaults. Both configurations have a wide central opening in the Up-Flo® Filter.

Maintenance activities include inspection, floatables removal, oil removal, sediment removal, Media Pack replacement, and Drain Down Filter replacement. The minimum required frequency for replacement of the Media Pack is annually, whereas the minimum required frequency for removal of accumulated sediment from the sump is dependent on the Up-Flo® Filter configuration. Configurations with a larger sediment storage volume per module will require less frequent removal of accumulated sediment. Regardless, whenever sediment depth in the sump is found to be greater than 16 inches, sediment removal is required.

## First Year Inspection and Maintenance

The frequency of inspection and maintenance can be determined in the field after installation. The frequency of ongoing maintenance needs is based on site characteristics such as contributing area, types of surfaces (e.g., paved and/or landscaped), site activities (e.g., short-term or long-term parking), and other site maintenance (e.g., sanding and sweeping). At a minimum, inspection and maintenance should be conducted at intervals of no more than six months during the first year of operation. Maintenance personnel should observe and record pollutant accumulations during the first year of service in order to benchmark the maintenance intervals that will later be established for the site. Pollutant accumulations should be measured or monitored using the following procedures:

- Measurement of sediment depth in the sump: A minimum of 8 inches (20 cm) should separate the Drain Down Filter inlet from stored sediment in the sump in order to minimize sediment migration into the Drain Down Filter. A simple probe, such as the Sludge-Judge®, can be used to determine the depth of the solids in the sump. In a typical 4-ft (1.2m) diameter manhole installation, the sediment depth should be no more than 16 inches (41 cm).
- Maintenance personnel should then enter the structure, remove the Media Pack from one of the Filter Modules, and weigh the Media Bags. Media Bags with a wet weight of approximately 40 lbs (18 kg) or more are an indication that the filter media has become full and that the Media Packs in all of the Filter Modules will require replacement (Fig.4). Minimum filtration rate is generally reached when the Media Bags have accumulated approximately 20 lbs (9 kg) of sediment. Determining the amount of accumulated sediment will be accomplished by removing both of the Media Bags from one of the Media Packs and weighing the bags separately. Since a new Media Bag weighs approximately 30 lbs (14 kg) wet, the difference in weight will approximately equal the weight of solids that have accumulated in the bag. A spent Media Bag weighs approximately 50 lbs (23 kg) wet.
- Measurement of oil layer on water surface: Since water in the Up-Flo® vessel drains down to an elevation below the bottom of the Filter Modules when the system is idle, the amount of accumulated oil must be minimized so that oil is not entrained in the Media Pack when stormwater begins to fill the vessel at the start of a storm event. Oil accumulation should be limited to 1.5 inches (4 cm) or less. Probes can be used to measure oil thickness.
- Monitoring for Drain Down Filter clogging: The water level in the Up-Flo® Filter should be monitored to ensure that the Drain Down Filter is operating properly. The Drain Down Filter is designed to lower the water level in the Up-Flo® vessel to an elevation below the bottom of the Filter Modules between storm events. Periodically conduct an inspection one to two days after a storm event during the first year of operation. Approximately 36 hours after a 1-in (2.5-cm) rainfall, the water level inside the vessel should have dropped to a point where it is equal with the base of the Filter Modules. If the water level has not reached that point, then the Drain Down Filter has either become clogged or blinded by trash or debris (Fig.5 a and b). If there is no evidence of trash or debris around the Drain Down Filter inlet, then it has likely become clogged with particles.
- Monitoring for slime and debris covering the Flow Distribution Media or Angled Screens: After removal of the Media Bags, the bottom Flow Distribution Media should be removed and inspected to determine if it is coated with slime or debris. Similarly, the Angled Screen should be inspected for blockages and ragging.



Fig.4 a) A new Media Bag of Hydro Filter Sand. b) A spent media bag of Hydro Filter Sand.

- Monitoring for floatables on the water surface: Similar to oil, the amount of accumulated floatables must be minimized to prevent trash and loose debris from becoming trapped on the Angled Screens when stormwater begins to fill the Up-Flo® vessel at the start of a storm event. Visual inspection is adequate to determine the amount of floatables. Floatables should be removed before they form a mat on the surface of the water.

The solids loading rate in the sump will be calculated by measuring the sediment depth in the sump and dividing the depth by the correlating interval of time since the sump was last cleaned. Similarly, starting with fresh Media Bags, the solids loading rate in the Media Packs will be calculated by weighing the Media Bags and dividing the weights by the correlating interval of time since they were installed. The wet weight of the heaviest bag will be used to determine the loading rate. As previously mentioned, a spent Media Bag weighs approximately 50 lbs (23 kg) wet. The spent Media Bag weight estimate was based on calculations of sediment loading in an Up-Flo® Filter that was run to exhaustion during laboratory testing.

The rate of oil accumulation will be calculated by measuring the thickness of the oil layer and dividing the thickness by the correlating interval of time since the sump was last cleaned. Ordinarily, oil thickness will not be measurable unless a spill has occurred. Consequently, any oil will typically be removed along with water when cleaning the sump.

Monitoring the Drain Down Filter for clogging, monitoring the Flow Distribution Media and Angled Screens for slime and debris, and monitoring the accumulation of floatables will provide an estimate of how long the Up-Flo® Filter can operate before its performance can become impaired by one of these factors.



Fig.5 a) The water level in a properly functioning Up-Flo® Filter will drain down to the base of the Filter Modules. b) When the Drain Down Filter becomes clogged, the base of the Filter Modules will be submerged in standing water. Note, above right, that the Drain Down Filter is submerged in standing water.

### Routine Inspection and Maintenance

After completion of the first year of operation, determining and then following the established inspection and maintenance intervals will keep pollutant loadings within their respective limits. Removal of oils and floatables, replacement of the Drain Down Filter, replacement of Flow Distribution Media (see Fig.9, pg 11), and cleaning of Angled Screens will occur at the same frequency as cleaning of the sump and replacement of Media Bags unless the first year of operation indicates otherwise. Keeping to the established maintenance intervals will keep treatment flow rates at, or above, the design flow rate. Typically, annual maintenance is adequate.

In addition to scheduled maintenance, occasional checks for Up-Flo® Filter clogging can be performed by removing the manhole cover during a storm, monitoring the water level in the manhole or vault, and determining whether the filter is in bypass. A properly-sized filter (on-line or off-line) that is in bypass during a storm that is producing runoff at, or below, the filter's design filtration rate needs maintenance.

## Routine Inspection

Inspection is a simple process that requires monitoring pollutant accumulations. Maintenance crews should be familiar with the Up-Flo® Filter and its components prior to inspection.

### Scheduling

- Inspection may be conducted during any season of the year but should occur shortly after a predicted rainfall to ensure components are operating properly.

### Recommended Equipment

- Safety Equipment and Personal Protective Equipment (traffic cones, work gloves, etc.)
- Scale to measure the weight of the Media Bags
- Crow bar to remove grate or lid
- Pole with skimmer or net
- Sediment probe (such as a Sludge-Judge®)
- Hydro International Up-Flo® Filter Maintenance Log
- Trash bags for removed floatables

### Routine Inspection Procedures

1. Set up any necessary safety equipment (such as traffic cones) to provide access to the Up-Flo® Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside and to determine whether the high-water level indicator has been activated. Make note of any irregularities. See Fig.6 for a typical Inspection View.
4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the chamber.
5. Using a sediment probe such as a Sludge-Judge®, measure the depth of sediment that has collected in the sump of the vessel.  
Maximum sediment depth is 16 inches (41 cm).
6. If the high-water level indicator has been activated after two consecutive storms, remove the Filter Module lid by turning the cam latch and remove the Filter Media Pack (*refer to page 11 Replacement Procedures*). Weigh the Media Bags from one or two modules. Media Bags should be replaced if the wet weight exceeds 40 lbs (18 kg).
7. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or a high standing water level (see Fig.6 for the standard standing water level).
8. Securely replace the grate or lid.
9. Remove safety equipment.
10. Contact Hydro International at (800) 848-2706 to discuss any irregularities noted during inspection.



Fig.6 Inspection view of the Up-Flo® Filter.

## Routine Maintenance

Maintenance activities are grouped into two categories:

- **Activities *Not Requiring Man Entry Into the Up-Flo® Filter***  
These activities include floatables removal, oil removal and removal of sediment from the sump.
- **Activities *Requiring Man Entry Into the Up-Flo® Filter***  
Media Pack replacement and Drain Down Filter replacement.

Maintenance intervals are determined from monitoring the Up-Flo® Filter during its first year of operation. Depending on the site, some maintenance activities may have to be performed on a more frequent basis than others. In the case of floatables removal, a vactor truck is not required. Floatables and loose debris can be netted with a skimmer and pole.

A vactor truck is normally required for oil removal, removal of sediment from the sump, and to dewater the vessel for replacement of the Media Packs and Drain Down Filter (Fig.7). All inspection and maintenance activities would be recorded in an Inspection and Maintenance Log.

Completion of all the maintenance activities for a typical 4-ft (1.2m) diameter manhole installation takes less than one hour. Approximately 360 gallons of water and up to 0.6 yd<sup>3</sup> (0.5 m<sup>3</sup>) of sediment may be removed in the process. In an installation equipped with six Filter Modules, 12 Media Bags (2 bags per module) would be removed and replaced. Assuming a spent Media Bag weight of 50 lbs (23 kg), up to 600 lbs (272 kg) of spent Media Bags would be removed. All consumables, including Media Bags, Flow Distribution Media, and replacement Drain Down Filters are supplied by Hydro International.

The access port located at the top of the manhole provides unobstructed access for a vactor hose and/or skimmer pole to be lowered to the base of the sump.



Fig.7 Sediment is removed from the sump with a vactor hose. Man entry is not required for this step.

## Maintenance Activities Not Requiring Man Entry

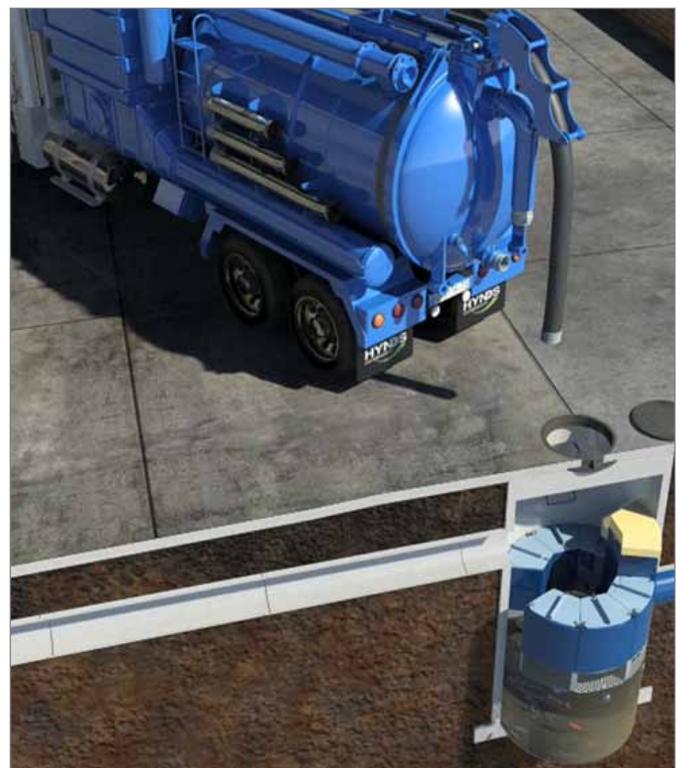
These activities include floatables removal, oil removal and removal of sediment from the sump.

### Scheduling

- Floatables and sump cleanout may typically be done during any season of the year - before and after rainy season
- Floatables and sump cleanout should occur as soon as possible following a contaminated spill in the contributing drainage area

### Recommended Equipment

- Safety Equipment (traffic cones, etc)
- Crow bar to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge-Judge®)
- Vactor truck (flexible hose preferred)
- Pressure nozzle attachment or other screen-cleaning device
- Hydro International Up-Flo® Filter Maintenance Log



### *Maintenance Procedures Not Requiring Man Entry: Floatables, Oil and Sediment Clean Out*

1. Set up any necessary safety equipment (such as traffic cones) around the access of the Up-Flo® Filter. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole or vault.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. If the standing water level in the sump is above the base of the Filter Modules (see Fig.8), tug the Pull Chain(s) to release the Drain Down Filter plug(s). Allow the excess water to drain out of the chamber.
5. Use the skimmer pole to fit the Drain Down Filter plug back into the open port.
6. Once all floatables and oil have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris from the sump floor. Up to 0.3 yd<sup>3</sup> (0.2 m<sup>3</sup>) of sediment and 360 gallons (1,363 L) of water will be removed from a typical manhole Up-Flo® Filter during this process.
7. Retract the vactor hose from the vessel.
8. Inspect the Angled Screens for blockages and ragging. If present, remove the obstruction or ragging materials from the surface using a hose or other screen-cleaning device.
9. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables, oils, and gross debris removed, and the depth of sediment measured. Note any apparent irregularities such as damaged components or blockages.
10. Securely replace the grate or lid. Remove safety equipment.
11. Dispose of sediment and gross debris following local regulations.
12. Dispose of oil and sump water at a licensed water treatment facility or following local regulations.
13. Contact Hydro International at (800) 848-2706 to discuss any irregularities noted during cleanout.

### **Maintenance Activities Requiring Man Entry**

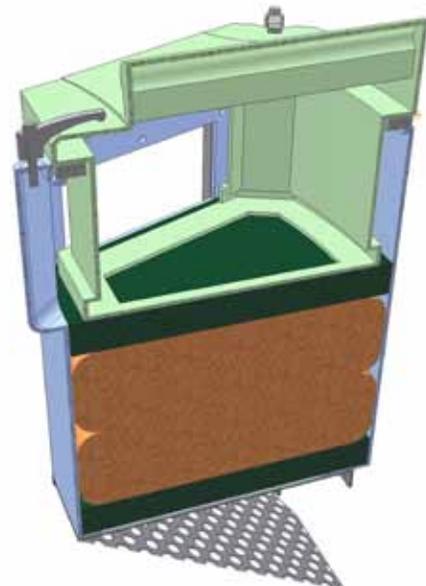
These activities include replacement of the Media Packs and Drain Down Filter.

Unless the Up-Flo® Filter has been installed as a very shallow unit, it is necessary to have an OSHA-confined space entry trained person enter the vessel to replace Media Packs.

The access port located at the top of the manhole or vault provides access to the Up-Flo® vessel for maintenance personnel to enter the vessel and remove and replace Media Packs. The same access would be used for maintenance personnel working from the surface to net or skim debris and floatables or to vactor out sediment, oil, and water. Unless the Up-Flo® Filter has been installed in a very shallow configuration, it is necessary to have personnel with OSHA Confined Space Entry training performing the maintenance that occurs inside the vessel.

### *Scheduling*

- Call Hydro International to order replacement Media Packs and Drain Down Filter prior to scheduling maintenance.
- Because Media Pack replacement requires entry into the Up-Flo® chamber, maintenance events should be scheduled during dry weather.
- Media Pack replacement should occur immediately after a contaminated spill in the contributing drainage area.



*Fig.8 Cutaway view of the Filter Module*

### Recommended Equipment

- Safety Equipment (traffic cones, etc.)
- Crow bar to remove grate or lid
- Pole with skimmer or net (if floatables removal is not to be done with vacator hose)
- Sediment probe (such as a Sludge-Judge®)
- Vacator truck (flexible hose preferred)
- OSHA Confined Space Entry Equipment
- Up-Flo® Filter Replacement Media Packs (available from Hydro International)
- Hydro International Up-Flo® Filter Maintenance Log
- Screwdriver (flat head)
- Replacement Drain Down Filter components supplied by Hydro International

### Maintenance Procedures Requiring Man Entry:

#### Media Pack and Drain Down Filter Replacement Procedures

1. Follow Floatables and Sump Cleanout Procedures, 1 – 13.

2. Following OSHA Confined Space Entry procedures, enter the Up-Flo® Filter Chamber.
3. Open the Filter Module by turning the three cam latches on the front and sides of the module. Remove the lid ① to gain access to the Media Pack (Fig.9).
4. Remove and discard the spent Media Pack. The Media Pack contents include:
  - A top layer of green ② Flow Distributing Media.
  - Two (2) Media Bags ③ equipped with nylon handles.
  - A bottom layer of green ② Flow Distributing Media.
5. Insert a new Media Pack, supplied by Hydro International.
  - First, insert a bottom layer of green Flow Distributing Media. Be sure that the media sits snugly and level at the bottom of the Filter Module.
  - Next, insert the first of two (2) replacement Media Bags. Smooth the bag out with your hands to make sure that the bag extends snugly to the walls and corners of the Filter Module.
  - Insert the second Media Bag, following the same procedure.

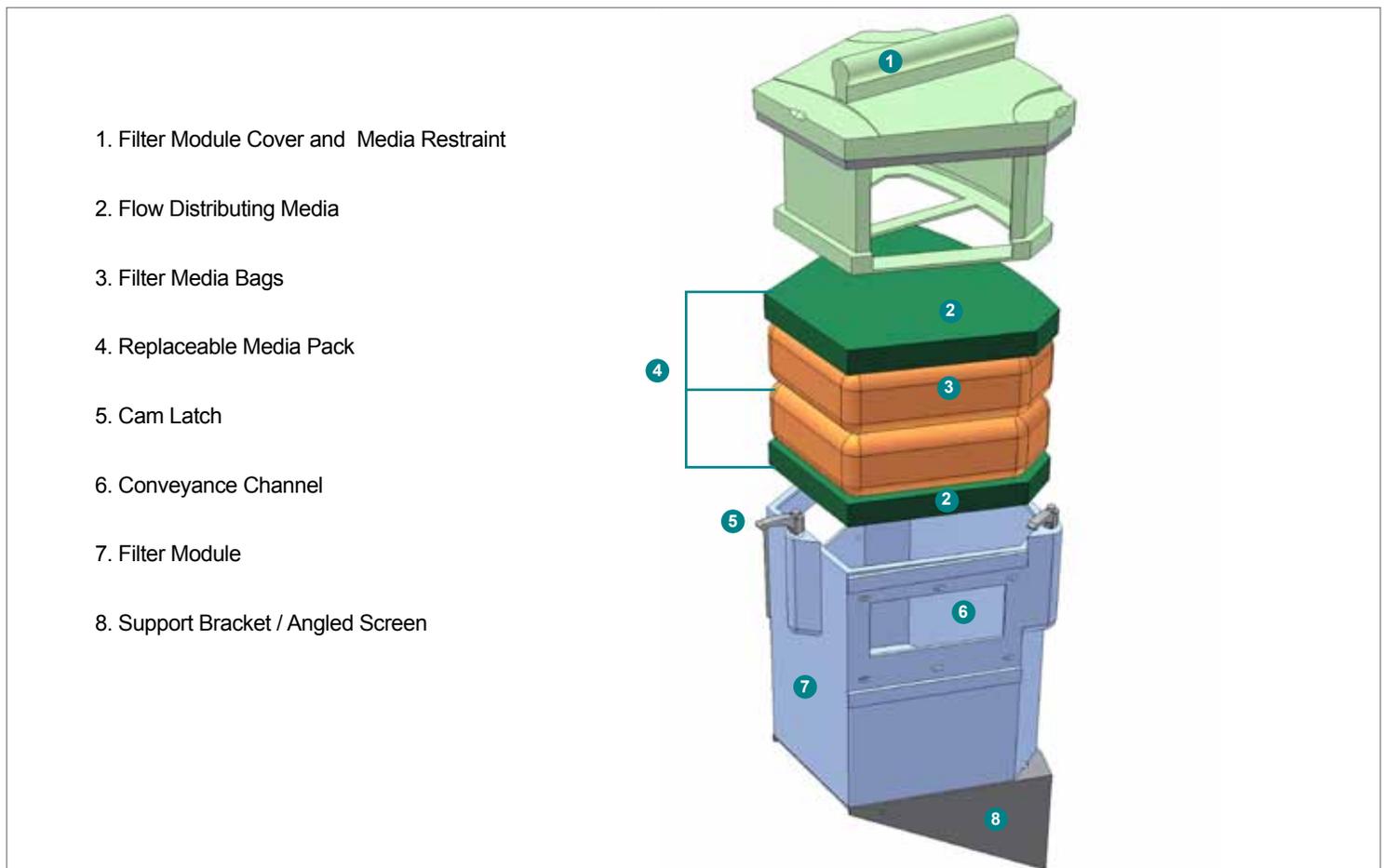


Fig.9 The Filter Module houses the Media Restraint and the Media Pack.

- Insert the top layer of green Flow Distributing Media. Be sure that the piece fits snugly against the walls and corners of the Filter Module.
  - Put the lid on and secure the three latches. Check to make sure that the latches are closed properly.
6. Use a screwdriver to unscrew the Drain Down Filter from the face of the Outlet Module (see Fig.10). **DO NOT DISCARD THIS PIECE.**
  7. Install new Drain Down Filter supplied by Hydro International.
  8. Exit the Up-Flo® Filter chamber and securely replace the grate or lid.
  9. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables, oil and gross debris removed, and the depth of sediment measured. Note the number of Media Packs replaced. Note any irregularities such as damaged components or blockages.

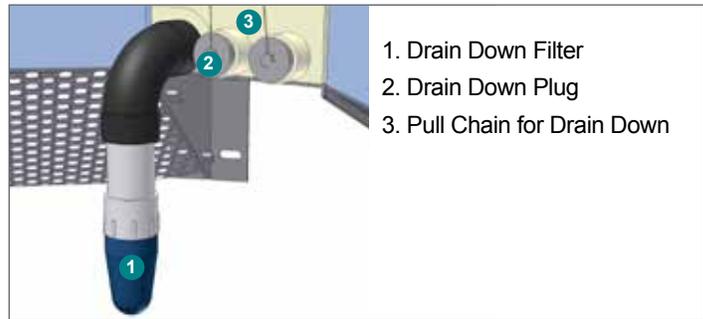


Fig.10 The Drain Down Filter.

10. Remove safety equipment.
11. Dispose of spent media packs at your local landfill, following local regulations.
12. Return the spent Drain Down Filter to Hydro International.
13. Contact Hydro International to discuss any irregularities noted during annual maintenance.

### Solids Disposal

Sediment, floatables, gross debris, and spent Media Bags can generally be disposed of at the local landfill in accordance with local regulations. The toxicity of the residues captured will depend on the activities in the contributing drainage area, and testing of the residues may be required if they are considered potentially hazardous.

Sump water can generally be disposed of at a licensed water treatment facility but the local sewer authority should be contacted for permission prior to discharging the liquid. Significant accumulations of oil removed separately from sump water should be transported to a licensed hazardous waste treatment facility for treatment or disposal. **In all cases, local regulators should be contacted about disposal requirements.**

## Maintenance at a Glance

Activity	Frequency
Inspection	- Regularly during first year of installation - Every 6 months after the first year of installation
Floatables/Oils Removal	- Twice per year or as needed - Following a contaminated spill in the drainage area
Sediment Removal	- Every six to 12 months, depending on the Up-Flo® Filter Configuration - The maximum allowable sediment depth in any Up-Flo Filter configuration is 16 inches (41 cm) - Following a contaminated spill in the drainage area
Media Pack Replacement	- Once per year - Replacement is required anytime inspection reveals that the high-water level indicator has been activated after two consecutive storms and the subsequent weighing of the Media Bags shows a wet weight greater than 40 lbs - Following a contaminated spill in the drainage area
Drain Down Filter Replacement	- Once per year with Media Pack replacement - Replacement is required anytime inspection reveals that the water level inside the vessel has not reached a level equal with the base of the Filter Modules approximately 36 hours after a 1-inch (2.5 cm) rainfall - As needed, in the event of continuous base flow conditions

# Up-Flo® Filter Installation Log



<b>SITE REFERENCE NAME OR NUMBER FOR THIS UP-FLO® FILTER LOCATION:</b>	
<b>SITE NAME:</b>	
<b>SITE LOCATION:</b>	
<b>OWNER:</b>	<b>SITE CONTRACTOR:</b>
<b>CONTACT NAME:</b>	<b>CONTACT NAME:</b>
<b>COMPANY NAME:</b>	<b>COMPANY NAME:</b>
<b>ADDRESS:</b>	<b>ADDRESS:</b>
<b>TELEPHONE:</b>	<b>TELEPHONE:</b>
<b>FAX:</b>	<b>FAX:</b>

**INSTALLATION DATE:**    /    /

**CONFIGURATION (CIRCLE ONE):**            **MANHOLE**    **VAULT SYSTEM**

**TOTAL NUMBER OF UP-FLO® FILTER MODULES:** \_\_\_\_\_





# Up-Flo® Filter Inspection Log

Site Name: \_\_\_\_\_ Owner Change since last inspection? Y N

Location: \_\_\_\_\_

Owner Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Site Status: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Site conditions\*: \_\_\_\_\_  
 \*(Stable, Under Construction, Needing Maintenance, etc.)

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
<b>Debris Removal</b>				
Adjacent area free of debris?	M			
Inlets and Outlets free of debris?	M			
Facility (internally) free of debris?	M			
<b>Vegetation</b>				
Surrounding area fully stabilized? (no evidence of eroding material into Up-Flo® Filter)	A			
Grass mowed?	M			
<b>Water retention where required</b>				
Water holding chamber(s) at normal pool?	A			
Evidence of erosion?	A			
<b>Sediment Deposition</b>				
Filtration Chamber free of sediments?	A			
Sedimentation sump not more than 50% full?	A			
<b>Structural Components</b>				
Any evidence of structural deterioration?	A			
Grates in good condition?	A			
Spalling or cracking of structural parts?	A			
Outlet/Overflow Spillway	A			
<b>Other</b>				
Noticeable odors?	A			
Any evidence of filter(s) clogging?	M			
Evidence of flow bypassing facility?	A			





Inspector Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Overall Condition of Up-Flo® Filter\*\*:  Acceptable  Unacceptable

\*\*"Acceptable" would mean properly functioning; "unacceptable" would mean damaged or required further maintenance.

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed", list Maintenance actions and their completion dates below or on the Maintenance Log provided on page 15 of the Up-Flo® Filter Operation & Maintenance Manual:

Maintenance Action Needed	Due Date

The next routine inspection is schedule for approximately: (date) \_\_\_\_\_

Inspected by: (signature) \_\_\_\_\_

Inspected by: (printed) \_\_\_\_\_





# Up-Flo® Filter Maintenance Log

Site Name: \_\_\_\_\_ Owner Change since last inspection? Y N

Location: \_\_\_\_\_

Owner Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Site Status: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Site conditions: \_\_\_\_\_  
*\*(Stable, Under Construction, Needing Maintenance, etc.)*

Estimated volume of oil/floatable trash removed: \_\_\_\_\_

Sediment depth measured in sump prior to removal: \_\_\_\_\_

Number of Filter Modules fitted with new media packs: \_\_\_\_\_

Inspector Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Overall Condition of Up-Flo® Filter:  Acceptable  Unacceptable  
*\*\*"Acceptable" would mean properly functioning; "unacceptable" would mean damaged or required further maintenance.*

Maintained by: (signature) \_\_\_\_\_

Maintained by: (printed) \_\_\_\_\_





## Hydro International Certification Program

### for Stormwater BMP Maintenance Providers

The Hydro International Stormwater BMP Maintenance Certification verifies that a stormwater BMP maintenance provider has been trained on the proper inspection and maintenance procedures for Hydro International's manufactured stormwater treatment products.

Maintenance providers who complete this complimentary web-based program become a Hydro International Preferred Stormwater BMP Maintenance Partner. Become a Hydro International certified Stormwater BMP maintenance provider today.

Learn more at <http://www.hydro-int.com/us/products/service-parts>



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[www.hydro-int.com](http://www.hydro-int.com)

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