



# Metropolitan St. Louis Sewer District

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2350 Market Street  
St. Louis, MO 63103-2555  
(314) 768-6200

January 27, 2010

Mr. John S. MacKinnon, P.E.  
Hydro International  
94 Hutchins Drive  
Portland, Maine 04102

RE: Hydro International Up-Flo<sup>®</sup> Filter (with Downstream Defender as Pretreatment)  
Redevelopment Use Level (RUL) + Provisional Use Level (PUL) Approval within District

Dear Sir:

The Metropolitan St. Louis Sewer District (MSD) has reviewed your application regarding the Up-Flo Filter for use as a Best Management Practice for stormwater management. MSD is pleased to provide Redevelopment Use Level (RUL) + Provisional Use Level (PUL) approval for use of the Up-Flo<sup>®</sup> Filter (with Downstream Defender as Pretreatment) as a stand-alone water quality BMP, subject to the following provisions.

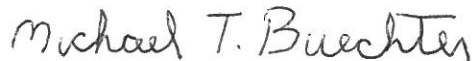
- The Up-Flo<sup>®</sup> Filter is approved for use on redevelopment sites of any size. This approval is based on compliance with requirements listed in MSD's Proprietary Water Quality Products and the MSD's Stormwater Management Program (Rev. Jan. 2009). Proprietary devices should be treated as a supplementary (rather than a primary) means of meeting small MS 4 requirements.
- Proposed uses and designs of the device must be in general conformance with the information and methodologies provided in Hydro International's application dated December 16, 2009.
- The use of buried filters shall be avoided on residential type projects.
- The Up-Flo<sup>®</sup> Filter must be sized to capture all floatable trash and free oil, and remove 80% of the total suspended solids for the site Water Quality Volume (WQ<sub>v</sub>). Procedures for calculating WQ<sub>v</sub> are provided in Volume I of the Maryland Stormwater Design Manual (2000). All units shall be installed with adequate storage to treat 75% of the WQ<sub>v</sub>.
- The peak inflow is limited to 20 gpm (0.045 cfs) for each 1.1 ft<sup>2</sup> Hydro-Filter-Sand (HFS) filter module (18.2 gpm/ft<sup>2</sup>) and an operating head of 20 inches above the filter. Each module shall be designed for an annual sediment removal of less than 190 lbs. The minimum size orifice between the WQ<sub>v</sub> storage vessel and filter vault is 1.5 inches (with orifice protection).
- Up-Flo<sup>®</sup> Filter systems must provide a minimum of 2.8 ft<sup>3</sup> of sediment storage volume for each filter module. The sediment storage should be provided in the sump below the filter modules.
- The device must be configured so that the outlet module is closed off from the outfall (i.e., the bypass weir shall not be used). All units including pretreatment, should be configured in an off-line layout.
- Adequate pretreatment shall be provided in all site designs in this case this will likely include Downstream Defender unit. No reduction in the number of filter modules shall be made for

the installation of pretreatment. The Downstream Defender shall be sized to remove 50% of the TSS (OK-110 PSD) at the water quality flowrate (WQ<sub>f</sub>).

- All units shall include at least one (1) drain down filter. Replacement of the draindown filter is required anytime inspection reveals that the water level within the filter structure is not equal with the base of the filter modules within 36 hours of the design storm.
- All proprietary lids and covers should be captive components. At least one “oversized” access shall be provided on the filter vault and storage chamber (each). The Neenah MH R-1741-F1, or equivalent, MSD approved cover is required over the storage chamber. The Neenah MH R-1741-D cover, or equivalent, MSD approved cover is required over the filter vault.
- Project specific design calculations and maintenance plans furnished by Hydro International must be included within the project’s “Stormwater Management Facilities Report” prepared by the consulting engineer. The devices maintenance plan shall be consistent with the plans presented in Hydro International’s Up-Flo<sup>®</sup> Filter applications.
- In addition to testing and reports to be provided as part of NJCAT field-testing, Hydro International will provide local field-testing and observations in accordance with the November 2009 QAPP for Quality Assurance Testing at the Brentwood Target T-1102 for the Up-Flo<sup>®</sup> Filter and Downstream Defender.

MSD reserves the ability to withdraw or modify this approval based on subsequent information, including information indicating that this BMP does not satisfy MSD rules, requirements, or construction specifications.

Sincerely,



Michael T. Buechter, P.E.  
Principal Engineer (BMP Committee Chairman)  
Engineering/Design  
Metropolitan St. Louis Sewer District