



**May 2008**  
**(Updated May 2009 extending due dates)**

## **PILOT USE LEVEL DESIGNATION FOR BASIC TREATMENT**

**For**

**Hydro International, Inc. Up-Flo™ Filter**

### **Ecology's Decision:**

**Based on Hydro International's application submissions and recommendations by the Technical Review Committee (TRC), Ecology hereby issues the following use level designations:**

**1. Pilot use level designation (PULD) for the Up-Flo™ Filter for basic treatment:**

- **Using a carbon-peat-zeolite (CPZ™) filter media as specified by Hydro International.**
- **Sized at hydraulic loading rate of no more than 22.7 gpm/ft<sup>2</sup> per filter module (given a filter module surface area of 1.1 ft<sup>2</sup> containing 2 filter bags with a combined filter media depth of 8 inches).**

**2. Pilot use level designation (PULD) for the Up-Flo™ Filter for basic treatment:**

- **Using a filter sand media as specified by Hydro International.**
- **Sized at hydraulic loading rate of no more than 22.7 gpm/ft<sup>2</sup> per filter module (given a filter module surface area of 1.1 ft<sup>2</sup> containing 2 filter bags with a combined filter media depth of 8 inches).**

**3. Pilot use level designation (PULD) for the Up-Flo™ Filter for basic treatment:**

- **Using a carbon-peat-sand (CPS™) filter media as specified by Hydro International.**
- **Sized at hydraulic loading rate of no more than 22.7 gpm/ft<sup>2</sup> per filter module (given a filter module surface area of 1.1 ft<sup>2</sup> containing 2 filter bags with a combined filter media depth of 8 inches).**

**4. Pilot use level designation (PULD) for the Up-Flo™ Filter for basic treatment:**

- **Using a perlite filter media as specified by Hydro International.**
- **Sized at hydraulic loading rate of no more than 22.7 gpm/ft<sup>2</sup> per filter module (given a filter module surface area of 1.1 ft<sup>2</sup> containing 2 filter bags with a combined filter media depth of 8 inches).**

**The use level designations expire on May 1, 2012 unless extended by Ecology, and is subject to the conditions specified below.**

**Ecology's Conditions of Use:**

**Up-Flo™ Filter units shall be designed, installed, and maintained to comply with these conditions:**

- 1. Up-Flo™ Filter units must be designed, assembled, installed, operated, and maintained in accordance with Hydro International's applicable manuals and documents and the Ecology Decision.**
- 2. Up-Flo™ Filter units are approved for basic treatment at the hydraulic loading rate of 22.7 gpm/ft<sup>2</sup> at the 15-minute water quality design flow rate (as specified in Ecology's most recent Stormwater Manual), as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model. Note that if single event methods are used to estimate runoff flowrates, Figures 9.6a and 9.6b of the 2005 Stormwater Management Manual for Western Washington should be used to adjust the peak single event flowrate for calculation purposes. This is done by dividing the peak 10 minute flowrate predicted by the single event method by the ratio indicated in Figure 9.6a for on-line designs, or Figure 9.6b for off-line designs. The 6-month, 24-hour rainfall amount for the project site must be known to identify the appropriate ratio. The adjusted flowrate is then divided by the approved module flowrate to compute the number of modules necessary. Note: This method is not applicable for Eastern Washington.**
- 3. Hydro International commits to submitting a QAPP for TRC review and Ecology approval by May 1, 2010 that meets the TAPE requirements for attaining a GULD for basic treatment for the CPZ™, filter sand, CPS™, and perlite media filters. Additional QAPPs must be reviewed and approved by the TRC and Ecology for each field site in Washington State. The sites chosen should be reflective of the product's treatment intent.**
- 4. Local jurisdictions must file a "Pilot Level Technologies Notice of Intent" form with the Department of Ecology prior to authorizing Up-Flo™ Filter for a pilot use level application.**
- 5. Hydro International shall complete all required testing and submit a TER for TRC and Ecology review by November 1, 2011.**
- 6. Hydro International may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.**
- 7. Discharges from the Up-Flo™ Filter units shall not cause or contribute to water quality standards violations in receiving waters.**

**Applicant:** Hydro International

**Applicant's Address:** 94 Hutchins Drive  
Portland, ME, 04102

**Application Documents:**

Up-Flo™ Filter: Washington Department of Ecology (WA/DOE) Submission, Version 3.0 (December 2007) which includes:

- The Up-Flo™ Filter Stormwater Treatment System Product Development and Performance Overview (December 2007)
- Final Report Upflow Filters for the Rapid and Effective Treatment of Stormwater at Critical Source Areas, U.S. Infrastructure, Inc. July 31, 2003
- Field Verification Report for the Up-Flo™ Filter by: Robert Pitt and Uday Khambhammettu, April 2006

**Applicant's Use Level Request:**

- Conditional use level designation as a basic, enhanced, phosphorus, and oil treatment device in accordance with Ecology's 2005 Western Washington Stormwater Manual.

**Applicant's Performance Claims:**

- Using either CPZ Mix™, CPS Mix™, or perlite filter media, the Up-Flo™ Filter can meet the performance goals for oil control in runoff from pollution-generating impervious and pervious surfaces at high-use sites.
- Using either CPZ Mix™, filter sand, CPS Mix™, or perlite filter media, the Up-Flo™ Filter can remove greater than 80% of total suspended solids in runoff from pollution-generating impervious and pervious surfaces on residential, commercial, and industrial sites.
- Using either CPZ Mix™ or CPS Mix™ the Up-Flo™ Filter can remove greater than 50% of total phosphorus in runoff from pollution-generating impervious and pervious surfaces on residential, commercial, and industrial sites.
- Using the CPZ Mix™, the Up-Flo™ Filter can provide a higher rate of removal of dissolved metals than treatment technologies commonly used for removal of total suspended solids in runoff from pollution-generating impervious surfaces.

## **Technical Review Committee's Recommendations:**

The TRC finds that:

- Hydro International should be given the opportunity to demonstrate, through additional laboratory and field testing, whether the Up-Flo™ Filter can attain Ecology's basic treatment goals.

## **Findings of Fact:**

- Based on laboratory testing at a flowrate of 25 GPM per filter module, the Up-Flo™ Filter containing CPZ Mix™ media had an average suspended solids concentration removal efficiency of 87% using Sil-Co-Sil 106 with an average influent concentration of about 260 mg/L and zero initial sediment loading.
- Based on laboratory testing at a flowrate of 23 GPM per filter module, the Up-Flo™ Filter containing filter sand media had an average suspended solids concentration removal efficiency of 92% using Sil-Co-Sil 106 with an average influent concentration of about 295 mg/L and zero initial sediment loading.
- Based on laboratory testing at a flowrate of 25 GPM per filter module, the Up-Flo™ Filter containing CPS Mix™ media had an average suspended solids concentration removal efficiency of 88% using Sil-Co-Sil 106 with an average influent concentration of about 151 mg/L and zero initial sediment loading.
- Based on laboratory testing at a flowrate of 25 GPM per filter module, the Up-Flo™ Filter containing perlite media had an average suspended solids concentration removal efficiency of 88% using Sil-Co-Sil 106 with an average influent concentration of about 103 mg/L and zero initial sediment loading.

## **Other Up-Flo Filter™ Related Issues to be Addressed By the Company:**

1. Hydro International should test a variety of operating rates to establish conservative design rates. Pollutant loading capacities of and breakthrough data on the filter media should also be determined to better predict maintenance cycles.
2. The system should be tested under normal operating conditions, such that the settling basin is partially filled with pollutants. Results obtained for "clean" systems may not be representative of typical performance.
3. Field testing should be conducted at sites that are indicative of the treatment goals.
4. Testing should be conducted to obtain information about maintenance requirements in order to come up with a maintenance cycle.

5. Loading tests should be conducted on the filter to determine maximum treatment life of the system.

**Technology Description:** Download at: [www.hydro-international.biz](http://www.hydro-international.biz)

**Contact Information:**

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Applicant website: [www.hydro-international.biz](http://www.hydro-international.biz)

Ecology web link: <http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html>

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