



May 2020

PILOT USE LEVEL DESIGNATION FOR BASIC (TSS)

For

Hydro International StormScape™ Green Infrastructure Filter

Ecology's Decision:

Based on the Hydro International application submission for the StormScape™ Green Infrastructure Filter (StormScape), Ecology hereby issues the following use level designation:

1. Pilot Use Level Designation (PULD) for Basic treatment:

- Sized at a hydraulic loading rate of 1.46 gallons per minute (gpm) per square foot (sq ft) of media surface area.
- Constructed with a minimum media thickness of 18-inches (1.5-feet).

2. Ecology approves the StormScape at the hydraulic loading rate listed above, to achieve the maximum water quality design flow rate. The water quality design flow rates are calculated using the following procedures:

- **Western Washington:** For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
- **Eastern Washington:** For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
- **Entire State:** For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

3. The use level designation expires on November 1, 2023 unless extended by Ecology, and is subject to the conditions specified below.

Ecology's Conditions of Use:

The StormScape shall comply with these conditions:

- 1) Applicants shall design, assemble, install, operate, and maintain the StormScape in accordance with Hydro International's applicable manuals and the Ecology Decision.**
- 2) StormScape media shall conform to the specifications submitted to and approved by Ecology.**
- 3) Install the StormScape in such a manner that you bypass flows exceeding the maximum operating rate and you will not resuspend captured sediment.**
- 4) Evaluate site characterization and suitability, as outlined in the Stormwater Management Manual for Western Washington Volume III or Stormwater Management Manual for Eastern Washington Chapter 6, before installing any StormScape that infiltrates a portion or all of the treated flow.**
- 5) Hydro International commits to submitting a QAPP for Ecology approval by January 1, 2021 that meets the TAPE requirements for attaining a GULD at a hydraulic loading rate of 1.46 gpm/sq. ft.**
- 6) Local jurisdictions must file a "Pilot Level Technologies Notice of Intent" form with the Department of Ecology prior to authorizing the StormScape for a Pilot Use Level application.**
- 7) Hydro International shall complete all required testing and submit a TER for Ecology review by April 1, 2023.**
- 8) Hydro International may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.**
- 9) Discharges from the StormScape 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:

StormScape™ Green Infrastructure Filter, Emerging Stormwater Treatment Technologies, Initial Application for Certification, Hydro International, May 2020

Applicant's Use Level Request:

- Pilot Use Designation as a Basic Treatment device in accordance with Ecology's *Stormwater Management Manual for Western Washington*

Applicant's Performance Claims:

- Based on laboratory testing, at a hydraulic loading rate of 1.46 gpm/sq ft using a custom blended sand filtration media, the StormScape will meet TAPE performance goals for TSS, dissolved metals, and total phosphorus.

Ecology's Recommendations:

Ecology finds that:

- Hydro International qualifies for the opportunity to demonstrate, through field-testing in the Pacific Northwest or at an approved TAPE testing facility, whether the StormScape can attain Ecology's Basic treatment goals at a hydraulic loading rate of 1.46 gpm/sq ft.
- The StormScape was not granted a PULD for Phosphorus Treatment because the application did provide data to support this designation. However, Hydro International may opt to demonstrate, through field-testing in the Pacific Northwest or an approved TAPE testing facility, whether the StormScape can attain Ecology's Phosphorus treatment goals. If they can do so, Ecology could issue a GULD for Phosphorus treatment along with Basic treatment.

Findings of Fact:

1. Hydro International conducted laboratory testing between July and November 2019 at their full-scale hydraulics testing facility in Portland, ME. The testing was done following the New Jersey Department of Environmental Protection Laboratory Protocol for Filtration MTDs. Since testing was carried in-house, Hydro International contracted with FB Environmental Associates of Portland, ME to provide third party oversight.
2. The testing evaluated a full-scale, commercially available 4-ft by 6-ft StormScape filled with a custom blended sand filtration media system at a hydraulic loading rate of 1.46 gpm/sq. ft (140 inches/hr). The test sediment used was silica sand based and had an average d50 of 64 µm. Based on the lab test results:.
3. Hydro International evaluated TSS removal efficiency over 10 events. The influent concentration ranged from 185 to 198 mg/L with a mean concentration of 191 mg/L and a median removal efficiency of 90.3%.
4. Hydro International evaluated sediment mass loading capacity over an additional 36 events as a continuation of removal efficiency testing. The cumulative removal efficiency during these events was 90.37% and the cumulative mass captured was 50 kg.

Other StormScape Related Issues to be Addressed By the Company:

1. Test the system under normal operating conditions, such that pollutants partially fill the media bed. Results obtained for “clean” systems may not be representative of typical performance.
2. Conduct field-testing at sites that are indicative of the treatment goals.
3. Conduct testing to obtain information about maintenance requirements in order to come up with a maintenance cycle.

Technology Description: <https://hydro-int.com/en/products/hydro-stormscape>

Contact Information:

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Applicant website: <http://www.hydro-int.com/us>

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

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Revision History

Date	Revision
May 2020	PULD Granted