WASHINGTON STATE DEPARTMENT OF ECOLOGY

October 2020

PILOT USE LEVEL DESIGNATION FOR BASIC (TSS)

For

Jensen Stormwater
StormVault BioFiltration with Sierra Blend

Ecology's Decision:

Based on the Jensen Stormwater application submissions for the StormVault BioFiltration with Sierra Blend (SVBF), Ecology hereby issues the following use level designation:

1. **Pilot Use Level Designation (PULD) for Basic treatment:**
   - **Sized at a hydraulic loading rate of 2 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 SVBF 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, 2022 unless extended by Ecology, and is subject to the conditions specified below.**

Ecology's Conditions of Use:

The SVBF shall comply with these conditions:

1) **Applicants shall design, assemble, install, operate, and maintain the SVBF in accordance with Jensen Stormwater's applicable manuals and the Ecology Decision.**

2) **SVBF Sierra Blend media shall conform to the specifications submitted to and approved by Ecology.**

3) **Install the SVBF in such a manner that flows exceeding the maximum operating rate will bypass the filtering system and 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 SVBF that infiltrates a portion or all of the treated flow.**

5) **Jensen Stormwater commits to submitting a QAPP for Ecology approval by January 1, 2020 that meets the TAPE requirements for attaining a GULD at a hydraulic loading rate of 2 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 SVBF for a Pilot Use Level application.**

7) **Jensen Stormwater shall complete all required testing and submit a TER for Ecology review by April 1, 2022.**

8) **Jensen Stormwater may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.**

9) **Discharges from the SVBF shall not cause or contribute to water quality standards violations in receiving waters.**

Applicant:	Jensen Stormwater
Applicant's Address:	521 Dunn Circle Sparks, NV 89431

Application Documents:

Application for Pilot Use Level Designation, Jensen BioBox, Jensen Stormwater, May 2019

WASDOE Initial Application for the Jensen BioBox (JBB), a Filtration Manufactured Treatment Device (MTD) for Stormwater Treatment, Jensen® Water Resources, a Division of Jensen Precast Concrete, May 2019

Confidential Mix Design and Final 3rd Party Testing Results for the Jensen BioBox (JBB), a Filtration Manufactured Treatment Device (MTD) for Stormwater Treatment, Jensen® Water Resources, a Division of Jensen Precast Concrete, May 2019

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 an infiltration rate of 191 inches per hour using media mix #11, the SVBF will meet TAPE performance goals for TSS, dissolved metals, and total phosphorus.

Ecology's Recommendations:

Ecology finds that:

- Jensen Stormwater qualifies for the opportunity to demonstrate, through field-testing in the Pacific Northwest, whether the SVBF can attain Ecology's Basic treatment goals at a hydraulic loading rate of 2 gpm/sq ft.
- The SVBF was not granted a PULD for Enhanced or Phosphorus Treatment because the application did not include enough metals and phosphorus data points. However, Jensen Stormwater may opt to demonstrate, through field-testing in the Pacific Northwest, whether the SVBF can attain Ecology's Enhanced and Phosphorus treatment goals. If they can do so, Ecology could issue a GULD for Enhanced and Phosphorus treatment along with Basic treatment.

Findings of Fact:

1. From January to July 2019, the Desert Research Institute (DRI), under the supervision of Alan Heyvaert Ph.D. conducted laboratory column testing on 12 different media selected by Jensen Stormwater to evaluate its ability to remove TSS, nutrients, and heavy metals. Columns were 3-inch diameter by 36-inch tall PVC columns. The columns contained a 6-inch layer of bed gravel, followed by an 18-inch layer of engineered media with a 3-inch layer of shredded mulch on top. Based on results from the column testing Jensen Stormwater selected mix #11 for TAPE evaluation.

- DRI evaluated the system at a hydraulic loading rate of 2 gpm/sq. ft (191 inches/hr) using natural stormwater runoff collected in Reno from Steamboat Creek. To ensure the stormwater met the influent requirements DRI amended it with Sil-Co-Sil 106, potassium phosphate, CuCl2, and ZnCl2.
- TSS removal efficiency was evaluated over 3 events. The influent concentration ranged from 134 to 227 mg/L with a median concentration of 165.3 mg/L and a median removal efficiency of 82%.
- Dissolved copper removal efficiency was evaluated over 3 events. The influent concentration ranged from 0.029 to 0.16 mg/L with a median concentration of 0.07 mg/L and a median removal efficiency of 76%. When the influent was capped at 0.02 mg/L, the upper end of the TAPE range, the median removal efficiency was 57%
- Dissolved zinc removal efficiency was evaluated over 3 events. The influent concentration ranged from 0.77 to 0.203 mg/L with a median concentration of 0.39 mg/L and a median removal efficiency of 93%. When the influent was capped at 0.30 mg/L, the upper end of the TAPE range, the median removal efficiency was 88%.
- Total phosphorus removal efficiency was evaluated over 3 events. The influent concentration ranged from 0.18 to 0.454, with a median concentration of 0.36 mg/L and a median removal efficiency of 82%.

2. In June and July 2019 Jensen Stormwater conducted an evaluation on a 4'x8' SVBF filled with media mix #11 at a design flow rate of 62.6 gpm (1.95 gpm/sq. ft). Jensen Stormwater evaluated the system for TSS removal efficiency over 8 events using tap water amended with NJCAT Blended Sediment (d50 of 69 μm). The influent concentration ranged from 186.4 to 222.8 mg/L, with a median concentration of 207.9 mg/L and a median removal efficiency of 94.5%.

Other SVBF 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: Download at http://www.JensenStormwater.com/

Contact Information:

Applicant: Austin Martin
Jensen Stormwater

521 Dunn Circle
Sparks, NV 89431
(754) 440-2025
amartin@jensenprecast.com

Applicant website: http://www.JensenStormwater.com/

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

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	**Revision**
July 2019	PULD Granted
October 2020	Revised device name from BioBox to StormVault BioFiltration using Sierra Blend