

# Attachment 1

## Manufactured Treatment Device (MTD) Registration

### 1. Manufactured Treatment Device Name: StormKleener Filter Cartridge System

### 2. Company Name: Lane Enterprises

Mailing Address: 3905 Hartzdale Drive, Suite 514

City: Camp Hill

State: PA Zip: 17011

### 3. Contact Name (to whom questions should be addressed): Kevin Miller

Mailing Address: P.O Box 130482

City: Spring

State: Texas Zip: 77393

Phone number: 832-773-8396

Fax number:

E-mail address: kmiller@lane-enterprises.com

Web address: www.stormkeeperchambers.com

### 4. Technology

Specific size/capacity of MTD assessed (include units): Variable. Each cartridge is designed to treat a flow rate. The cartridges are then placed in a containment structure. Storm water flows into the containment structure and the number of cartridges necessary to treat the storm water are utilized. The models available include:

StormKleener 1522	15" diameter treating 22 gpm
StormKleener 1830	18" diameter treating 30 gpm
StormKleener 2453	24" diameter treating 53 gpm
StormKleener 3083	30" diameter treating 83 gpm

The system is sized to treat the required water quality volume discharged from the site. Because the StormKleener is based on a modular filter cartridge system it can be configured for any size necessary.

Range of drainage areas served by MTD (acres): The StormKleener can be configured for drainage areas from less than an acre to several acres. Because the system is constructed from modular filter components, the required size is determined by utilizing a containment vessel and number of cartridges necessary to accommodate the required water quality volume.

Include sizing chart or describe sizing criteria: The sizing is based on the first ½" to 1" of rainfall discharged from the site. The rainfall from the site is filtered through the required number of filter cartridges before exiting the site in accordance with sizing criteria mentioned above. If a flow based design the StormKleeners can filter water at the rates provided above. For a water quality volume design basis, the number of cartridges needed to achieve a 24 hour draw down should be utilized.

Intended application: on-line or offline: The StormKleener is intended to be used offline. However designs utilizing an internal bypass can be accomplished and put into practice. Testing for both online and offline use cases were completed.

Media used (if applicable): Primarily filter sand is used in the StormKleener cartridges, however different media is available for different pollutants.

**5. Warranty Information** (describe, or provide web address):

Warranted in accordance with our Standard Manufactures warranty. Information is available on our website at [www.lane-enterprises.com](http://www.lane-enterprises.com)

**6. Treatment Type**

- Hydrodynamic Structure
- Filtering Structure
- Manufactured Bioretention System  
Provide Infiltration Rate (in/hr):
- Other (describe):

**7. Water Quality Treatment Mechanisms** (check all that apply)

- Sedimentation/settling
- Infiltration
- Filtration (specify filter media) Soil Onsite
- Adsorption/cation exchange
- Chelating/precipitation
- Chemical treatment
- Biological uptake
- Other (describe):

**8. Performance Testing and Certification** (check all that apply):

Performance Claim (include removal efficiencies for treated pollutants, flow criteria, drainage area):

Removal efficiencies were lab tested in accordance with “NJDEP Laboratory Protocol to Asses Total Suspended Solids Removal by Filtration Manufactured Treatment Device”. The unit was found to have a removal rate of 80.6% of Total Suspended Solids.

Removal rates claimed for the unit are 80% TSS. In addition nutrients and other pollutants are removed as part of the filtration process.

Flow rate criteria is based on the flowrates as provided in the table presented in the technology description, Section 4.

Drainage area is variable and based on the modular capacity of the cartridges. As many cartridges as necessary can be added to accommodate the appropriate volume. The system can be as small or as big as required in order to treat the water quality volume.

Specific size/Capacity of MTD assessed:

One 18” diameter 30 gpm cartridge was utilized for testing. The filter provided a treatment flow rate of 2.97 gmp/sf. Testing was conducted in accordance with the NJCAT protocol indicated earlier in the report.

Has the MTD been "approved" by an established granting agency, e.g. New Jersey Department of Environmental Protection (NJDEP) , Washington State Department of Ecology, etc.

**No**

**Yes;** For each approval, indicate (1) the granting agency, (2) use level if awarded (3) the protocol version under which performance testing occurred (if applicable), and (4) the date of award, and attach award letter.

1. New Jersey Department of Environmental Protection.
2. NJDEP certification of 80% TSS removal in accordance with NJCAT protocol.
3. New Jersey Department of Environmental Protection Laboratory Protocol to Asses total Suspended Solids Removal by a Filtration Manufactured Treatment Device. Certification issued
4. June 11, 2018 letter attached

Was an established testing protocol followed?

**No**

**Yes,** (1) Provide name of testing protocol followed, (2) list any protocol deviations:

1. NJDEP Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device.

Provide the information below and provide a performance report (attach report):

For lab tests:

- i. Summarize the specific settings for each test run (flow rates, run times, loading rates) and performance for each run:

Total of 10 Test runs with a minimum duration of 30 minutes. Results are included in the attached report however. The following table provides the information requested here.

Run Number	Flow Rate	Run Time	Loading Rate	Removal Eff.
1	30 gpm	30 min	204 mg/L	79.6%
2	30 gpm	30 min	201mg/l	81.4%
3	30 gpm	30 min	202 mg/l	85.3%
4	30 gpm	30 min	201 mg/l	83.2%
5	30 gpm	30 min	204 mg/l	77.5%
6	30 gpm	30 min	202 mg/l	78.9%

7	30 gpm	30 min	203 mg/l	78.2%
8	30 gpm	30 min	201 mg/l	80.8%
9	30 gpm	30 min	201 mg/3	80.7%
10	30 gpm	30 min	203 mg/l	80.4%

- ii. If a synthetic sediment product was used, include information about the particle size distribution of the test material: Distribution was not Synchronic
- iii. If less than full-scale setup was tested, describe the ratio of that tested to the full-scale MTD: Full Scale

For field tests:

- i. Provide the address, average annual rainfall and characterized rainfall pattern, and the average annual number of storms for the field-test location:
- ii. Provide the total contributing drainage area for the test site, percent of impervious area in the drainage area, and percentages of land uses within the drainage area (acres):
- iii. Describe pretreatment, bypass conditions, or other special circumstances at the test site:
- iv. Provide the number of storms monitored and describe the monitored storm events (amount of precipitation, duration, etc.):
- v. Describe whether or not monitoring examined seasonal variation in MTD performance:
- vi. If particle size distribution was determined for monitored runoff and/or sediment collected by the MTD, provide this information:

**9. MTD History:**

How long has this specific model/design been on the market? The StormKleener has just been introduced to the market. However equivalent technologies have been on the market for the last 18 years.

List no more than three locations where the assessed model size(s) has/have been installed in Virginia. If applicable, provide permitting authority. If known, provide latitude & longitude: N/A

**10. Maintenance:**

What is the generic inspection and maintenance plan/procedure? (attach necessary documents): The frequency of inspection of a stabilized completed site varies by location. It is determined by the local conditions, runoff from adjacent sites, particle size, and pollutant loading. A predefined inspection and maintenance schedule should be established based on local conditions including the percent of impervious area and climate.

The system should be inspected annually at a minimum. During the first year of operation the system should be inspected every six months. Subsequently the inspection should be adjusted based on the sediment loading that is observed at the site during previous inspections.

The Containment Structure has man access located throughout the system to facilitate access to the system and the required inspection that should occur. If sediment is discovered in the system during the inspection then a measuring device should be used to determine the depth of the system. When greater than 4 inches of sediment is found to be located throughout the containment structure, cleaning of the system must be performed. In addition, the system should be cleaned if storm water at a depth of 8 inches is present 24 hours after the storm has ended.

Manholes are provided for access to the StormKleener for personnel and equipment. Adequate confined space entry procedures should be followed during cleanout of the system.

Cleanout and removal of the sediment stored in the StormKleener is completed utilizing the JetVac or similarly approved system. The StormKleener cartridges are removed. Piping is set aside. Water and sediment is vacuumed out of the vault. Piping is placed back in original locations. New StormKleeners are installed. The attached design manual further explains maintenance procedures.

Is there a maintenance track record/history that can be documented?

No, No track record. The system is new. However, scour testing and maintenance testing was performed during the evaluation.

Yes.

Recognizing that maintenance is an integral function of the MTD, provide the following: amount of runoff treated, the water quality of the runoff, and what is the expected maintenance frequency for this MTD in Virginia, per year?

The amount of runoff treated is variable and is determined by the number of cartridges that are installed to control the water quality for the systems. The runoff will be treated to a rate of 80% TSS removal. The expected frequency of maintenance is once per year or less depending on pollutant loading and volume of water treated per rain event.

Total life expectancy of MTD when properly operated in Virginia and, if relevant, life expectancy of media:

Life expectancy depends on maintenance frequency. The filters backwash as part of the storm event which extends life. At replacement of the cartridge the media is replaced. On some sites this may be yearly. However based on site conditions life expectancy could extend to 5 years. The total life expectancy is the life of the site with proper maintenance.

For media or amendments functioning based on cation exchange or adsorption, how long will the media last before breakthrough (indicator capacity is nearly reached) occurs?

N/A

For media or amendments functioning based on cation exchange or adsorption, how has the longevity of the media or amendments been quantified prior to breakthrough (attach necessary performance data or documents)? N/A

Is the maintenance procedure and/or are materials/components proprietary?

- Yes, proprietary  
 No, not proprietary

Maintenance complexity (check all that apply):

- Confined space training required for maintenance  
 Liquid pumping and transportation

Specify method: Jet Vac

- Solids removal and disposal

Specify method:

Other noteworthy maintenance parameter (describe):

### 11. Comments

Include any additional explanations or comments:

### 12. Certification

Signed by the company president or responsible officer of the organization:

"I certify that all information submitted is to the best of my knowledge and belief true, accurate, and complete."

Signature: 

Name: Kevin Miller, P.E.

Title: Director of Product Development

Date: 06/11/18

NOTE: All information submitted to the department will be made publically accessible to all interested parties. This MTD registration form will be posted on the Virginia Stormwater BMP Clearinghouse website.