



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHILIP D. MURPHY
Governor

DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING & WATER QUALITY MANAGEMENT

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December 1, 2023

Amr Zaky, Ph.D.
Associate Vice President, Research and
Advanced Process Technology
BioMicrobics, Inc.
16002 West 110th Street
Lenexa, KS 66219

Re: MTD Lab Certification
BioSTORM Stormwater Treatment System
Offline Installation

TSS Removal Rate 50%

Dear Dr. Zaky:

The Stormwater Management rules under N.J.A.C. 7:8-5.2(f) and 5.2(j) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). BioMicrobics, Inc. has requested a Laboratory Certification for the BioSTORM Stormwater Treatment System (BioSTORM).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 1, 2021, updated April 2023.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated November 2023) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the BioSTORM by BioMicrobics, Inc. at a TSS removal rate of 50% when designed, operated and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.
2. The BioSTORM stormwater treatment device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.
3. This BioSTORM stormwater treatment device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 11.3 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at <https://dep.nj.gov/stormwater/>.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the BioSTORM. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at <https://biomicrobics.com/wp-content/uploads/2023/08/BioSTORM-IM-Manual-4-AUG-2023.pdf> for any changes to the maintenance requirements.
6. Sizing Requirements:

The example below demonstrates the sizing procedure for the BioSTORM:

Example: A 0.25-acre impervious site with a slope of 5% is to be treated to 50% TSS removal using a BioSTORM. The hydraulically most distant point to the inlet of the BioSTORM is 110 feet. The site is located in an area for which the projected 2-year storm rainfall depth was calculated to be 3.84 inches.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

CN = 98 (Curve Number for impervious)
 Dimensionless Unit Hydrograph (DUH) = SCS Standard DUH (peak rate factor of 484)
 Time of concentration = 0.8 minutes
 Q = 0.77 cfs

Given the site runoff is 0.77 cfs and based on Table 1 below, the BioSTORM Model 1.0 with an MTFR of 1.0 cfs would be the smallest model approved that could be used for this site that could remove 50% of the TSS from the impervious area without exceeding the MTFR.

The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1, A-2 and A-3.

Table 1: BioSTORM Stormwater Treatment System Models and Associated MTRs

BioST Model	Maximum Treatment Flow Rate ¹ (cfs)	Treatment Area (sq. ft.)	Hydraulic Loading Rate (gpm/sf)	50% Sediment Storage ² (cf)
BioSTORM 0.5	0.5	44.7	5.1	22.4
BioSTORM 0.75	0.75	66.5	5.1	33.3
BioSTORM 1.0	1.0	88.5	5.1	44.0
BioSTORM 1.25	1.25	110.3	5.1	55.1

1. Based on a verified loading rate of 5.1 gpm/ft² for test sediment with a mean particle size of 66 μm and an annualized weighted TSS removal of at least 50% using the methodology in the current NJDEP HDS protocol.

2. 50% Sediment Storage Capacity is equal to treatment area x 6 inches of sediment depth. Each BioSTORM model has a 12-inch-deep sediment sump.

Be advised a detailed maintenance plan is mandatory for any project with a NJ Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Lisa Schaefer of my office at lisa.schaefer@dep.nj.gov.

Sincerely,



Gabriel Mahon, Chief
 Bureau of NJPDES Stormwater Permitting & Water Quality Management
 Division of Watershed Protection and Restoration
 New Jersey Department of Environmental Protection

Attachment: Maintenance Plan

c: Richard Magee, NJCAT