



Alternative/Innovative Technology Review Checklist (October 2019)

Product Name	Date Received
Manufacturer/Representative	email
Street Address	Phone Number
City/State/Zip	

MDE requires that a formal request be submitted to initiate the review process for alternative/innovative technologies. If the following information is not provided with this request, no product review will be performed.

Product Description:

- Provide a brief description of the practice and how it will be used for stormwater treatment;
- State what type of approval is being sought (e.g., ESD, structural control, restoration); and
- Check One:
 - The practice is comparable to a generic practice listed in the 2000 Maryland Stormwater Design Manual, Volumes I & II (the Manual); or
 - The practice is not comparable to a generic practice or deviates from the specifications listed in the Manual. Monitoring data demonstrating compliance with the general performance criteria must be submitted (see monitoring plan contents below).

Technology Specifications: A description of the technology, including any components and process units, must be provided. The following information is required:

- Standard drawings, including schematics of the technology and a process flow diagram;
- Discussion of system hydraulics and sizing to meet performance standards and goals;
- Range of operating conditions, including minimal, maximal, and optimal conditions for achieving performance goals;
- Projected operation and maintenance requirements and procedures;
- Discussion of any special licensing or hauling requirements, safety issues, and access requirements associated with the operation and maintenance of the technology;
- If comparable to a generic practice found in the Manual, then design standards & specifications, including supporting calculations and test results, demonstrating compliance with the performance standards, specifications, and design criteria (e.g., treatment volume, media composition, drainage area limitations) found in Chapters 2, 3 and 5, and Appendices B.3 and B.4 shall be submitted; and
- If the practice is not comparable to those in the Manual, then field monitoring data and results demonstrating compliance with the general performance criteria found in Chapter 1, 2, and 5 of the Manual shall be submitted. Field monitoring must conform to the standards listed below.

Monitoring Plan Contents: Field monitoring results are needed to support performance claims; laboratory testing is not acceptable. The monitoring plan should fully describe the procedures and techniques used to sample influent to and effluent from the alternative/innovative technology. MDE will accept field monitoring that conforms to the most recent methodology of either the *Technology Acceptance Reciprocity Partnership (TARP) Protocol* (New Jersey Center for Applied Technology, 2003) or the *Technology Assessment Protocol– Ecology (TAPE)*, State of Washington, Department of Ecology, 2011) with the exception of the rainfall criteria listed here:

Rainfall Criteria: All practices must demonstrate compliance with the general performance criteria listed in Section 1.2 of the Manual. Rainfall patterns (e.g., intensity, duration) may be different at a proposed monitoring location than those that are found in Maryland. To ensure that monitoring data reflect local conditions, the Department requires that the criteria listed below be met:

- A storm event must have a minimum total rainfall depth of 0.1 inches. A minimum of 20 storms need to be sampled for device performance (sampled storms do not need to be consecutive);
- A minimum inter-event period of 6 hours between successive storm events, where the period starts when runoff from the first storm ceases;
- To assess practice performance under large storm or surcharge events, the total rainfall from at least one storm shall exceed the 1 year, 24-hour design storm (e.g., 2.7 inches of rainfall); and
- The minimum total rainfall for all storms sampled shall be 15 inches.

Additional Criteria: Any field monitoring studies not conforming to either the TARP or TAPE protocols must conform to the minimum standards listed below, in addition to the rainfall criteria above:

- Location: Water quality samples and flow measurements must be collected from both the inlet and outlet of an in-the-field installation of the stormwater practice.
- Flow: Influent, effluent, and bypass flows must be measured and continuously recorded over each storm event during the entire field monitoring period. Influent and effluent flow measurements should be recorded close to the stormwater practice. Bypass flow must not be measured in areas that are mixed with effluent. Any conditions that may affect flow measurement accuracy (e.g., high groundwater, backwater conditions) should be avoided.
- Water Quality Sampling: Samples must be collected from both the inlet and outlet of each stormwater practice at a location where stormwater flow is well mixed. Parameters shall include total suspended solids (TSS), total phosphorus (TP), and median particle size for each storm event. Sampling shall meet the following:
 - Sufficient discrete samples should be taken to represent a minimum of 70% of a sampled storm's total runoff volume;
 - A minimum of 10 discrete water quality samples (i.e., 10 influent and 10 effluent) shall be collected using automated sampling methods for storms lasting 1 hour or more. Grab sampling is not acceptable.
 - TSS sampling and testing shall meet the following:
 - Standard method (SM) 2540 D shall be used to establish the TSS removal efficiency;
 - The mean influent TSS concentration should be in the range of 100-300 mg/L; and
 - The mean particle size should not exceed 100µm;

- TP sampling and testing: Acceptable testing methods for establishing TP removal efficiency include Environmental Protection Agency (EPA) 365.3 or 365.4; or SM 4500-P E or 4500-P F
- Particle size distribution (PSD) sampling and testing – ASTM Method D3977-7 shall be used.
- Other parameters that are not required by MDE but may be sampled include pH, total petroleum hydrocarbons (TPH), bacteria, or total dissolved metals (e.g., Cu, Zn). Where these are included, the appropriate standard test methods shall be used to determine removal efficiency.

Documentation of Testing Results: The final report should include the following:

- A description of site use (e.g., commercial parking lot, roadway, construction site), and pertinent characteristics of area being treated (e.g., total area and percent impervious);
- A list of the number of storms tested, each storm's peak rate, and the total volumes treated by the device; and
- Information on total rainfall, runoff, duration, intensity, and antecedent dry period for each storm tested. For each pollutant tested, results should be presented for each storm individually and summarized statistically for all storms.