



**MARYLAND
MODEL STORMWATER
MANAGEMENT ORDINANCE**
JULY 2000
&
SUPPLEMENT
JANUARY 2007



1800 Washington Boulevard | Baltimore, MD 21230-1718 | www.mde.state.md.us
410-537-3000 | 800-633-6101 | TTY Users: 800-735-2258
Martin O'Malley, *Governor* | Anthony G. Brown, *Lt. Governor* | Shari T. Wilson, *Secretary*



MODEL STORMWATER MANAGEMENT ORDINANCE

This model stormwater management ordinance provides the minimum content for implementing and enforcing Maryland's stormwater management program consistent with the Code of Maryland Regulations (COMAR) 26.17.02. The Maryland Department of the Environment, Water Management Administration (MDE/WMA) provides this model ordinance for guidance to establish minimum criteria for county and municipal code development. While all local development review and approval processes are unique, WMA will use this document as a template to ensure that all stormwater management ordinances contain the minimum requirements for effective program implementation.

The complexity of local stormwater management implementation varies depending upon the extent and nature of local development. While Maryland's urbanizing jurisdictions may find this model ordinance helpful in supplementing existing codes, the model also provides assistance to jurisdictions that are developing new stormwater management ordinances. This model stormwater management ordinance provides minimum content only. Each local jurisdiction should review the enclosed components and tailor their ordinances in accordance with local conditions and development activities. All local stormwater management ordinances within Maryland are subject to the MDE/WMA approval. Inclusion of all model ordinance components is necessary to obtain MDE/WMA approval.

If there are any questions or comments regarding this model stormwater management ordinance please contact the MDE/WMA at (410) 537-3543.

July 2005

**MARYLAND DEPARTMENT OF THE ENVIRONMENT
MODEL STORMWATER MANAGEMENT ORDINANCE
JULY 2005**

1.0 PURPOSE AND AUTHORITY	1
1.1 INCORPORATION BY REFERENCE.....	1
2.0 DEFINITIONS	1
3.0 APPLICABILITY	5
3.1 SCOPE.....	5
3.2 EXEMPTIONS.....	5
3.3 WAIVERS / WATERSHED MANAGEMENT PLANS.....	5
3.4 REDEVELOPMENT.....	7
3.5 VARIANCE.....	7
4.0 STORMWATER MANAGEMENT CRITERIA	8
4.1 MINIMUM CONTROL REQUIREMENTS.....	8
4.2 STORMWATER MANAGEMENT MEASURES.....	8
4.3 SPECIFIC DESIGN CRITERIA.....	10
5.0 STORMWATER MANAGEMENT PLANS	10
5.1 REVIEW AND APPROVAL OF STORMWATER MANAGEMENT PLANS.....	10
5.2 CONTENTS OF THE STORMWATER MANAGEMENT PLAN.....	10
5.3 PREPARATION OF THE STORMWATER MANAGEMENT PLAN.....	12
6.0 PERMITS	12
6.1 PERMIT REQUIREMENT.....	12
6.2 PERMIT FEE.....	12
6.3 PERMIT SUSPENSION AND REVOCATION.....	13
6.4 PERMIT CONDITIONS.....	13
7.0 PERFORMANCE BOND	13
8.0 INSPECTION	13
8.1 INSPECTION SCHEDULE AND REPORTS.....	13
8.2 INSPECTION REQUIREMENTS DURING CONSTRUCTION.....	14
9.0 MAINTENANCE	16
9.1 MAINTENANCE INSPECTION.....	16
9.2 MAINTENANCE AGREEMENT.....	17
9.3 MAINTENANCE RESPONSIBILITY.....	17
10.0 APPEALS	18
11.0 SEVERABILITY	18
12.0 PENALTIES	18
13.0 EFFECTIVE DATE	18

MODEL STORMWATER MANAGEMENT ORDINANCE

1.0 PURPOSE AND AUTHORITY

The purpose of this Ordinance is to protect, maintain and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures to control the adverse impacts associated with increased stormwater runoff. Proper management of stormwater runoff will minimize damage to public and private property, reduce the effects of development on land, control stream channel erosion, reduce local flooding, and maintain after development, as nearly as possible, the pre-development runoff characteristics.

The provisions of this Ordinance, pursuant to the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland, 1996 replacement volume, are adopted under the authority of the (local unit) Code and shall apply to all development occurring within the unincorporated/incorporated area of (local unit). The application of this Ordinance and provisions expressed herein shall be the minimum stormwater management requirements and shall not be deemed a limitation or repeal of any other powers granted by State statute. The (governing authority/agency) shall be responsible for the coordination and enforcement of the provisions of this Ordinance.

1.1 Incorporation By Reference

For the purpose of this Ordinance, the following documents are incorporated by reference:

- A. The 2000 Maryland Stormwater Design Manual, Volumes I & II (Maryland Department of the Environment, April 2000) is incorporated by reference by (governing authority/agency) and shall serve as the official guide for stormwater principles, methods, and practices.
- B. USDA Natural Resources Conservation Service Maryland Conservation Practice Standard Pond Code 378 (January 2000).

2.0 DEFINITIONS

- A. For the purpose of this Ordinance, the following definitions describe the meaning of the terms used in this Ordinance:
 - (1) "Administration" means the Maryland Department of the Environment (MDE) Water Management Administration (WMA).
 - (2) "Adverse impact" means any deleterious effect on waters or wetlands, including their quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses which are or may potentially be harmful or injurious to human health, welfare, safety or property, to biological productivity, diversity, or stability or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.
 - (3) "Agricultural land management practices" means those methods and procedures used in the cultivation of land in order to further crop and livestock production and conservation of related soil and water resources.

- (4) "Applicant" means any person, firm, or governmental agency who executes the necessary forms to procure official approval of a project or a permit to carry out construction of a project.
- (5) "Aquifer" means a porous water bearing geologic formation generally restricted to materials capable of yielding an appreciable supply of water.
- (6) "Best Management Practice (BMP)" means a structural device or nonstructural practice designed to temporarily store or treat stormwater runoff in order to mitigate flooding, reduce pollution, and provide other amenities.
- (7) "Channel Protection Storage Volume (C_{p_v})" means the volume used to design structural management practices to control stream channel erosion. Methods for calculating the channel protection storage volume are specified in the 2000 Maryland Stormwater Design Manual, Volumes I & II.
- (8) "Clearing" means the removal of trees and brush from the land but shall not include the ordinary mowing of grass.
- (9) "Design Manual" means the 2000 Maryland Stormwater Design Manual Volumes I & II that serves as the official guide for stormwater management principles, methods, and practices.
- (10) "Detention structure" means a permanent structure for the temporary storage of runoff, which is designed so as not to create a permanent pool of water.
- (11) "Develop land" means to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.
- (12) "Direct discharge" means the concentrated release of stormwater to tidal waters or vegetated tidal wetlands from new development or redevelopment projects in the Critical Area.
- (13) "Drainage area" means that area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line.
- (14) "Easement" means a grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.
- (15) "Exemption" means those land development activities that are not subject to the stormwater management requirements contained in this Ordinance.
- (16) "Extended detention" means a stormwater design feature that provides gradual release of a volume of water in order to increase settling of pollutants and protect downstream channels from frequent storm events. Methods for designing extended detention BMPs are specified in the Design Manual.

- (17) "Extreme flood volume (Q_f)" means the storage volume required to control those infrequent but large storm events in which overbank flows reach or exceed the boundaries of the 100- year floodplain.
- (18) "Flow attenuation" means prolonging the flow time of runoff to reduce the peak discharge.
- (19) "Grading" means any act by which soil is cleared, stripped, stockpiled, excavated, scarified, filled or any combination thereof.
- (20) "Infiltration" means the passage or movement of water into the soil surface.
- (21) "Off-site stormwater management" means the design and construction of a facility necessary to control stormwater from more than one development.
- (22) "On-site stormwater management" means the design and construction of systems necessary to control stormwater within an immediate development.
- (23) "Overbank flood protection volume (Q_p)" means the volume controlled by structural practices to prevent an increase in the frequency of out of bank flooding generated by development. Methods for calculating the overbank flood protection volume are specified in the Design Manual.
- (24) "Recharge volume (Re_v)" means that portion of the water quality volume used to maintain groundwater recharge rates at development sites. Methods for calculating the recharge volume are specified in the Design Manual.
- (25) "Redevelopment" means any construction, alteration, or improvement exceeding 5000 square feet of land disturbance performed on sites where existing land use is commercial, industrial, institutional or multifamily residential.
- (26) "Retention structure" means a permanent structure that provides for the storage of runoff by means of a permanent pool of water.
- (27) "Retrofitting" means the construction of a structural BMP in a previously developed area, the modification of an existing structural BMP, or the implementation of a nonstructural practice to improve water quality over current conditions.
- (28) "Sediment" means soils or other surficial materials transported or deposited by the action of wind, water, ice, or gravity as a product of erosion.
- (29) "Site" means:
 - (a) for "new development" any tract, lot or parcel of land or combination of tracts, lots, or parcels of land, which are in one ownership, or are contiguous and in diverse ownership where development is to be performed as part of a unit, subdivision, or project.
 - (b) for "redevelopment" the area of new construction as shown on an approved site plan; or the original parcel. Final determination of the applicable are shall be made by (local agency).

- (30) "Stabilization" means the prevention of soil movement by any of various vegetative and/or structural means.
- (31) "Stormwater management" means:
- (a) For quantitative control, a system of vegetative and structural measures that control the increased volume and rate of surface runoff caused by man-made changes to the land; and
 - (b) For qualitative control, a system of vegetative, structural, and other measures that reduce or eliminate pollutants that might otherwise be carried by surface runoff.
- (32) "Stormwater Management Plan" means a set of drawings or other documents submitted by a person as a prerequisite to obtaining a stormwater management approval, which contain all of the information and specifications pertaining to stormwater management.
- (33) "Stripping" means any activity which removes the vegetative surface cover including tree removal, clearing, grubbing and storage or removal of topsoil.
- (34) "Variance" means the modification of the minimum stormwater management requirements for specific circumstances such that strict adherence to the requirements would result in necessary hardship and not fulfill the intent of the Ordinance.
- (35) "Waiver" means the relinquishment from stormwater management requirements by the (local agency) for a specific development on a case-by-case review basis.
- (a) "Qualitative stormwater management waiver" includes water quality volume and recharge volume design parameters.
 - (b) "Quantitative stormwater management waiver" includes channel protection storage volume, overbank flood protection volume, and extreme flood volume design parameter.
- (36) "Watercourse" means any natural or artificial stream, river, creek, ditch, channel, canal, conduit, culvert, drain, waterway, gully, ravine or wash, in and including any adjacent area that is subject to inundation from overflow or flood water.
- (37) "Watershed" means the total drainage area contributing runoff to a single point.
- (38) "Water quality volume (WQ_v)" means the volume needed to capture and treat the runoff from 90 percent of the average annual rainfall at a development site. Methods for calculating the water quality volume are specified in the Design Manual.

3.0 APPLICABILITY

3.1 Scope

No person shall develop any land for residential, commercial, industrial, or institutional uses without having provided stormwater management measures that control or manage runoff from such developments, except as provided within this section. The stormwater management measures must be designed consistent with the Design Manual and constructed according to an approved plan for new development or the policies stated in section 3.4 for redevelopment.

3.2 Exemptions

The following development activities are exempt from the provisions of this Ordinance and the requirements of providing stormwater management:

- A. Agricultural land management activities;
- B. Additions or modifications to existing single family detached residential structures if they comply with C of this section;
- C. Developments that do not disturb over 5,000 square feet of land area;
- D. Land development activities that the Administration determines will be regulated under specific State laws, which provide for managing stormwater runoff.

3.3 Waivers / Watershed Management Plans

[NOTE: Developing a waiver policy that is consistent and applicable throughout the entire State is quite difficult. Local development patterns, economic conditions, hydrology, and many other relevant factors make a single pattern for issuing stormwater management waivers virtually impossible. However, because the design policies in the 2000 Maryland Stormwater Design Manual, Volumes I and II change drastically the way BMPs are now implemented, a commensurate change in how waivers are granted is appropriate. Given the inclusion of nonstructural practices and innovative site planning techniques, the Design Manual provides greater opportunity to manage runoff than in the past. While WMA will evaluate all proposed local waiver policies on their own merits, the following section outlines those tenets that shall be included to ensure adequate stormwater management implementation.]

- A. Stormwater management quantitative control waivers shall be granted only to those projects within areas where watershed management plans have been developed consistent with F. of this section.
- B. If watershed management plans consistent with F. of this section have not been developed, then stormwater management quantitative control waivers may be granted to projects:
 - (1) That have direct discharges to tidally influenced receiving waters;

- (2) That do not increase the post-development peak discharge for the 2-year storm event by more than 10 percent in those areas of the State where the 2-year storm serves as the overbank flood protection volume according to the Design Manual (NOTE: This waiver category applies to jurisdictions located on the eastern shore of the Chesapeake Bay only); or
 - (3) When the approving agency determines that circumstances exist that prevent the reasonable implementation of quantity control practices.
- C. Stormwater management qualitative control waivers apply only to:
- (1) In-fill development projects where stormwater management implementation is not feasible;
 - (2) Redevelopment projects if the requirements of section 3.4 of this ordinance are satisfied; or
 - (3) Sites where the approving agency determines that circumstances exist that prevent the reasonable implementation of quality control practices.
- D. Waivers granted must:
- (1) Be on a case-by-case basis;
 - (2) Consider the cumulative effects of the (local agency) waiver policy; and
 - (3) Reasonably ensure the development will not adversely impact stream quality.
- E. If (local agency) has established an overall watershed management plan for a specific watershed, then (local agency) may develop quantitative waiver and redevelopment provisions that differ from sections 3.3B and 3.4.
- F. A watershed management plan developed for the purpose of implementing different stormwater management policies for waivers and redevelopment shall:
- (1) Include detailed hydrologic and hydraulic analyses to determine hydrograph timing;
 - (2) Evaluate both quantity and quality management;
 - (3) Include cumulative impact assessment of watershed development;
 - (4) Identify existing flooding and receiving stream channel conditions;
 - (5) Be conducted at a reasonable scale;
 - (6) Specify where on-site or off-site quantitative and qualitative stormwater management practices are to be implemented;
 - (7) Be consistent with the General Performance Standards for Stormwater Management in Maryland found in Section 1.2 of the Design Manual; and

(8) Be approved by the Administration.

G. The (local agency) may grant a waiver of quantitative stormwater management requirements for individual developments in areas where watershed management plans have been developed provided that a written request is submitted by the applicant containing descriptions, drawings, and any other information that is necessary to evaluate the proposed development. A separate written waiver request shall be required in accordance with the provisions of this section if there are subsequent additions, extensions, or modifications to a development receiving a waiver.

3.4 Redevelopment

- A. Stormwater management plans for redevelopment shall be consistent with the Design Manual except that the recharge, channel protection storage volume, and overbank flood protection volume requirements specified in the Design Manual do not apply unless required by (local agency).
- B. All redevelopment projects shall reduce existing site impervious areas by at least 20 percent. Where site conditions prevent the reduction of impervious area, then stormwater management practices shall be implemented to provide qualitative control for at least 20 percent of the site's impervious area. When a combination of impervious area reduction and stormwater practice implementation is used, the combined area shall equal or exceed 20 percent of the site.
- C. Where conditions prevent impervious area reduction or on-site stormwater management, practical alternatives may be considered, including but not limited to:
- (1) Fees;
 - (2) Off-site BMP implementation for a drainage area comparable in size and percent imperviousness to that of the project;
 - (3) Watershed or stream restoration;
 - (4) Retrofitting; or
 - (5) Other practices approved by (local agency).

3.5 Variance

The (local agency) may grant a written variance from any requirement of Section 4.0 (Stormwater Management Criteria), of this Ordinance if there are exceptional circumstances applicable to the site such that strict adherence will result in unnecessary hardship and not fulfill the intent of the Ordinance. A written request for variance shall be provided to the (local agency) and shall state the specific variances sought and reasons for their granting. The (local agency) shall not grant a variance unless and until sufficient justification is provided by the person developing land.

4.0 STORMWATER MANAGEMENT CRITERIA

4.1 Minimum Control Requirements

- A. The minimum control requirements established in this section and the Design Manual are as follows:
- (1) Caroline, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester counties and their incorporated municipalities shall require that the recharge volume, water quality volume, and overbank flood protection volume for the 2-year frequency storm event be used to design BMP's according to the Design Manual; and
 - (2) The City of Baltimore, Allegany, Anne Arundel, Baltimore, Calvert, Carroll, Cecil, Charles, Frederick, Garrett, Harford, Howard, Montgomery, Prince George's, St. Mary's, and Washington counties and their incorporated municipalities shall require that the recharge volume, water quality volume, and channel protection storage volume sizing criteria be used to design BMP's according to the Design Manual. Control of the 10-year frequency storm event is required according to the Design Manual if the (local agency) determines that historical flooding problems exist and downstream floodplain development and conveyance system design cannot be controlled.
 - (3) (Local agency) may require more than the minimum control requirements specified in this Ordinance if hydrologic or topographic conditions warrant or if flooding, stream channel erosion, or water quality problems exist downstream from a proposed project.
- B. Stormwater management and development plans where applicable, shall be consistent with adopted and approved watershed management plans or flood management plans as approved by the Maryland Department of the Environment in accordance with the Flood Hazard Management Act of 1976.

4.2 Stormwater Management Measures

The structural and nonstructural stormwater management measures established in this Ordinance shall be used, either alone or in a combination, in developing a stormwater management plan.

- A. Structural Stormwater Management Measures.
- (1) The following structural stormwater management practices shall be designed according to the Design Manual to satisfy the applicable minimum control requirements established in Section 4.1 of this Ordinance.
 - (a) Stormwater management ponds;
 - (b) Stormwater management wetlands;
 - (c) Stormwater management infiltration;
 - (d) Stormwater management filtering systems; and
 - (e) Stormwater management open channel systems.

- (2) The performance criteria specified in the Design Manual with regard to general feasibility, conveyance, pretreatment, treatment and geometry, environment and landscaping, and maintenance shall be considered when selecting structural stormwater management practices.
- (3) Structural stormwater management practices shall be selected to accommodate the unique hydrologic or geologic regions of the state.

B. Nonstructural Stormwater Management Measures.

- (1) The following nonstructural stormwater management practices shall be applied according to the Design Manual to minimize increases in new development runoff:
 - (a) Natural area conservation;
 - (b) Disconnection of rooftop runoff;
 - (c) Disconnection of non-rooftop runoff;
 - (d) Sheet flow to buffers;
 - (e) Grass channels; and
 - (f) Environmentally sensitive development.
- (2) The use of nonstructural stormwater management practices shall be encouraged to minimize the reliance on structural BMP's.
- (3) The minimum control requirements listed in Section 4.1 of this Ordinance may be reduced when nonstructural stormwater management practices are incorporated into site designs according to the Design Manual.
- (4) The use of nonstructural stormwater management practices may not conflict with existing State or local laws, ordinances, regulations, or policies.
- (5) Nonstructural stormwater management practices used to reduce the minimum control requirements must be recorded in the land records of (appropriate county) and remain unaltered by subsequent property owners. Prior approval from (local agency) shall be obtained before nonstructural stormwater practices are altered.

C. Alternative structural and nonstructural stormwater management practices may be used for new development water quality control if they meet the performance criteria established in the Design Manual and are approved by the Administration. Practices used for redevelopment projects shall be approved by (local agency).

- D. For the purposes of modifying the minimum control requirements or design criteria, the owner/developer shall submit to (local agency) an analysis of the impacts of stormwater flows downstream in the watershed. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development upon a dam, highway, structure, or natural point of restricted streamflow. The point of investigation is to be established with the concurrence of (local agency), downstream of the first downstream tributary whose drainage area equals or exceeds the contributing area to the project or stormwater management facility.

4.3 Specific Design Criteria

The basic design criteria, methodologies, and construction specifications, subject to the approval of the (local agency) and the WMA, shall be those of the Design Manual.

5.0 STORMWATER MANAGEMENT PLANS

5.1 Review and Approval of Stormwater Management Plans

- A. For any proposed development, the developer shall submit a stormwater management plan or waiver application to the (local agency) for review and approval, unless otherwise exempted. The stormwater management plan shall contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff will be managed from the entire development. The (local agency) shall review the plan to determine compliance with the requirements of this Ordinance prior to approval. The plan shall serve as the basis for all subsequent construction.
- B. Notification of approval or reasons for disapproval or modification shall be given to the applicant within [30 days](time frame) after submission of the completed stormwater plan. If a decision is not made within [30 days](time frame) the applicant shall be informed of the status of the review process and the anticipated completion date. The stormwater management plan shall not be considered approved without the inclusion of the signature and date of signature of the (approving agency) on the plan.

5.2 Contents of the Stormwater Management Plan

- A. The developer is responsible for submitting a stormwater management plan that meets the design requirements of this Ordinance. The plan shall be accompanied by a report that includes sufficient information to evaluate the environmental characteristics of affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The developer or builder shall certify on the drawings that all clearing, grading, drainage, construction, and development shall be conducted in strict accordance with the plan. If a stormwater management plan involves direction of some or all runoff off of the site, it is the responsibility of the developer to obtain from adjacent property owners any easements or necessary property interests concerning flowage of water. Approval of a stormwater management plan does not create or affect any right to direct runoff onto adjacent property without that property owner's permission. The minimum information submitted for support of a stormwater management plan or application for a waiver shall be as follows:

B. Reports submitted for stormwater management plan approval shall include:

- (1) A brief narrative description of the project;
- (2) Geotechnical investigations including soil maps, borings, site specific recommendations, and any additional information necessary for the proposed stormwater management design;
- (3) Descriptions of all water courses, impoundments, and wetlands on or adjacent to the site or into which stormwater directly flows;
- (4) Hydrologic computations, including drainage area maps depicting pre development and post development runoff flow path segmentation and land use;
- (5) Hydraulic computations;
- (6) Structural computations;
- (7) Unified sizing criteria volume computations according to the Design Manual; and
- (8) Any other information required by (local agency).

C. Construction drawings submitted for stormwater management plan approval shall include the following:

- (1) A vicinity map;
- (2) Topography survey showing existing and proposed contours, including the area necessary to determine downstream analysis for proposed stormwater management facilities;
- (3) Any proposed improvements including location of buildings or other structures, impervious surfaces, storm drainage facilities, and all grading;
- (4) The location of existing and proposed structures and utilities;
- (5) Any easements and rights-of-way;
- (6) The delineation, if applicable, of the 100-year floodplain and any on-site wetlands;
- (7) Structural and construction details for all components of the proposed drainage system or systems, and stormwater management facilities.
- (8) All necessary construction specifications;
- (9) A sequence of construction;
- (10) Data for total site area, disturbed area, new impervious area, and total impervious area;
- (11) A table showing the unified sizing criteria volumes required in the Design Manual;

- (12) A table of materials to be used for stormwater management facility planting;
- (13) All soil boring logs and locations;
- (14) A maintenance schedule;
- (15) Certification by the owner/developer that all stormwater management construction will be done according to this plan;
- (16) An as-built certification signature block to be executed after project completion; and
- (17) Any other information required by (local agency).

5.3 Preparation of the Stormwater Management Plan

- A. The design of stormwater management plans shall be prepared by any individual whose qualifications are acceptable to (local agency). (Local agency) may require that the design be prepared by either a professional engineer, professional land surveyor, or landscape architect licensed in the State, as necessary to protect the public or the environment.
- B. If a stormwater BMP requires either a dam safety permit from MDE or small pond approval from the (local) Soil Conservation District (SCD), (local agency) shall require that the design be prepared by a professional engineer licensed in the State.

6.0 PERMITS

6.1 Permit Requirement

A grading or building permit may not be issued for any parcel or lot unless a stormwater management plan has been approved or waived by the (local agency) as meeting all the requirements of this Ordinance. Where appropriate, a building permit may not be issued without:

- A. Recorded easements for the stormwater management facility and easements to provide adequate access for inspection and maintenance from a public right-of-way;
- B. A recorded stormwater management maintenance agreement;
- C. A performance bond; and
- D. Permission from adjacent property owners as necessary.

6.2 Permit Fee

A non-refundable permit fee will be collected at the time the stormwater management plan or application for waiver is submitted. The permit fee will provide for the cost of plan review, administration, and management of the permitting process, and inspection of all projects subject to this Ordinance. A permit fee schedule shall be established by the (local agency) based upon the relative complexity of the project and may be amended from time to time.

6.3 Permit Suspension and Revocation

Any grading or building permit issued by the (local agency) may be suspended or revoked after written notice is given to the permittee for any of the following reasons:

- A. Any violation(s) of the conditions of the stormwater management plan approval.
- B. Changes in site runoff characteristics upon which an approval or waiver was granted.
- C. Construction is not in accordance with the approved plan.
- D. Noncompliance with correction notice(s) or stop work order(s) issued for the construction of the stormwater management facility.
- E. An immediate danger exists in a downstream area in the opinion of the (local agency).

6.4 Permit Conditions

In granting the plan approval, the (local agency) may impose such conditions that may be deemed necessary to ensure compliance with the provisions of this Ordinance and the preservation of the public health and safety.

7.0 PERFORMANCE BOND

The (local authority) shall require from the developer a surety or cash bond, irrevocable letter of credit, or other means of security acceptable to the (local authority) prior to the issuance of any building and/or grading permit for the construction of a development requiring a stormwater management facility. The amount of the security shall not be less than the total estimated construction cost of the stormwater management facility. The bond required in this section shall include provisions relative to forfeiture for failure to complete work specified in the approved stormwater management plan, compliance with all of the provisions of this Ordinance, and other applicable laws and regulations, and any time limitations. The bond shall not be fully released without a final inspection of the completed work by the (local agency), submission of "As-built" plans, and certification of completion by the (local agency) that the stormwater management facilities comply with the approved plan and the provisions of this Ordinance. A procedure may be used to release parts of the bond held by (local agency) after various stages of construction have been completed and accepted by (local agency). The procedures used for partially releasing performance bonds must be specified by (local agency) in writing prior to stormwater management plan approval.

8.0 INSPECTION

8.1 Inspection Schedule and Reports

- A. The developer shall notify the (local agency) at least 48 hours before commencing any work in conjunction with the stormwater management plan and upon completion of the project when a final inspection will be conducted.

- B. Inspections shall be conducted by (local agency) , its authorized representative, or certified by a professional engineer licensed in the State. Written inspection reports shall be made of the periodic inspections necessary during construction of stormwater management systems to ensure compliance with the approved plans.
- C. Written inspection reports shall include:
 - (1) The date and location of the inspection;
 - (2) Whether construction was in compliance with the approved stormwater management plan;
 - (3) Any variations from the approved construction specifications; and
 - (4) Any violations that exist.
- D. The owner/developer and on-site personnel shall be notified in writing when violations are observed. Written notification shall describe the nature of the violation and the required corrective action.
- E. No work shall proceed until the (local agency) inspects and approves the work previously completed and furnishes the developer with the results of the inspection reports as soon as possible after completion of each required inspection.

8.2 Inspection Requirements During Construction

- A. At a minimum regular inspections shall be made and documented at the following specified stages of construction:
 - (1) For Ponds:
 - (a) Upon completion of excavation to sub-foundation and when required, installation of structural supports or reinforcement for structures, including but not limited to:
 - (i) Core trenches for structural embankments
 - (ii) Inlet and outlet structures, anti-seep collars or diaphragms, and watertight connectors on pipes; and
 - (iii) Trenches for enclosed storm drainage facilities;
 - (b) During placement of structural fill, concrete, and installation of piping and catch basins;
 - (c) During backfill of foundations and trenches;
 - (d) During embankment construction; and
 - (e) Upon completion of final grading and establishment of permanent stabilization.
 - (2) Wetlands – at the stages specified for pond construction in 8.2 A (1) of this section, during and after wetland reservoir area planting, and during the second growing season to verify a vegetation survival rate of at least 50 percent.
 - (3) For infiltration trenches:

- (a) During excavation to subgrade;
 - (b) During placement and backfill of underdrain systems and observation wells;
 - (c) During placement of geotextiles and all filter media;
 - (d) During construction of appurtenant conveyance systems such as diversion structures, pre-filters and filters, inlets, outlets, and flow distribution structures; and
 - (e) Upon completion of final grading and establishment of permanent stabilization;
- (4) For infiltration basins – at the stages specified for pond construction in 8.2 A (1) of this section and during placement and backfill of underdrain systems.
- (5) For filtering systems:
- (a) During excavation to subgrade;
 - (b) During placement and backfill of underdrain systems;
 - (c) During placement of geotextiles and all filter media;
 - (d) During construction of appurtenant conveyance systems such as flow diversion structures, pre-filters and filters, inlets, outlets, orifices, and flow distribution structures; and
 - (e) Upon completion of final grading and establishment of permanent stabilization.
- (6) For open channel systems:
- (a) During excavation to subgrade;
 - (b) During placement and backfill of underdrain systems for dry swales;
 - (c) During installation of diaphragms, check dams, or weirs; and
 - (d) Upon completion of final grading and establishment of permanent stabilization.
- (7) For nonstructural practices – upon completion of final grading, the establishment of permanent stabilization, and before issuance of use and occupancy approval.
- B. The (local agency) may, for enforcement purposes, use any one or a combination of the following actions:
- (1) A notice of violation shall be issued specifying the need for a violation to be corrected if stormwater management plan noncompliance is identified;
 - (2) A stop work order shall be issued for the site by (local agency) if a violation persists;
 - (3) Bonds or securities may be withheld or the case may be referred for legal action if reasonable efforts to correct the violation have not been undertaken; or
 - (4) In addition to any other sanctions, a civil action or criminal prosecution may be brought against any person in violation of the Stormwater Management subtitle or this Ordinance.
- C. Any step in the enforcement process may be taken at any time, depending on the severity of the violation.

- D. Once construction is complete, as-built plan certification shall be submitted by either a professional engineer or professional land surveyor licensed in the State to ensure that constructed stormwater management practices and conveyance systems comply with the specifications contained in the approved plans. At a minimum, as-built certification shall include a set of drawings comparing the approved stormwater management plan with what was constructed. (Local agency) may require additional information.
- E. (Local agency) shall submit notice of construction to the Administration on a form supplied by the Administration for each stormwater management practice within 45 days of construction completion. If BMPs requiring SCD approval are constructed, notice of construction completion shall also be submitted to the appropriate SCD.

9.0 MAINTENANCE

9.1 Maintenance Inspection

The (local agency) shall ensure that preventative maintenance is performed by inspecting all stormwater management systems. Inspection shall occur during the first year of operation and at least once every 3 years thereafter. In addition, a maintenance agreement between the owner and (local agency) shall be executed for privately owned stormwater management systems as described in 9.2 of this section.

- A. Inspection reports shall be maintained by the (local agency) for all stormwater management systems.
- B. Inspection reports for stormwater management systems shall include the following:
 - (1) The date of inspection;
 - (2) Name of inspector;
 - (3) The condition of:
 - (a) Vegetation or filter media;
 - (b) Fences or other safety devices;
 - (c) Spillways, valves, or other control structures;
 - (d) Embankments, slopes, and safety benches;
 - (e) Reservoir or treatment areas;
 - (f) Inlet and outlet channels or structures;
 - (g) Underground drainage;
 - (h) Sediment and debris accumulation in storage and forebay areas;
 - (i) Any nonstructural practices to the extent practicable; and

- (j) Any other item that could affect the proper function of the stormwater management system.
- (4) Description of needed maintenance.
- C. After notification is provided to the owner of any deficiencies discovered from an inspection of a stormwater management system, the owner shall have 30 days or other time frame mutually agreed to between (local agency) and the owner to correct the deficiencies. (Local agency) shall then conduct a subsequent inspection to ensure completion of the repairs.
- D. If repairs are not undertaken or are not found to be done properly, then enforcement procedures following 9.2 C of this section shall be followed by (local agency)
- E. If, after an inspection by the (local agency), the condition of a stormwater management facility presents an immediate danger to the public health or safety, because of an unsafe condition or improper maintenance, the (local agency) shall take such action as may be necessary to protect the public and make the facility safe. Any cost incurred by the County/Municipality shall be assessed against the owner(s), as provided in section 9.2 C.

9.2 Maintenance Agreement

- A. Prior to the issuance of any building permit for which stormwater management is required, the (local agency) shall require the applicant or owner to execute an inspection and maintenance agreement binding on all subsequent owners of land served by a private stormwater management facility. Such agreement shall provide for access to the facility at reasonable times for regular inspections by the (local agency) or its authorized representative to ensure that the facility is maintained in proper working condition to meet design standards.
- B. The agreement shall be recorded by the applicant and/or owner in the land records of the County/Municipality.
- C. The agreement shall also provide that, if after notice by the (local agency) to correct a violation requiring maintenance work, satisfactory corrections are not made by the owner(s) within a reasonable period of time (30 days maximum), the (local agency) may perform all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the cost of the work and any penalties. This may be accomplished by placing a lien on the property, which may be placed on the tax bill and collected as ordinary taxes by the County/Municipality.

9.3 Maintenance Responsibility

- A. The owner of the property on which work has been done pursuant to this Ordinance for private stormwater management facilities, or any other person or agent in control of such property, shall maintain in good condition and promptly repair and restore all grade surfaces, walls, drains, dams and structures, vegetation, erosion and sediment control measures, and other protective devices. Such repairs or restoration and maintenance shall be in accordance with approved plans.

- B. A maintenance schedule shall be developed for the life of any stormwater management facility and shall state the maintenance to be completed, the time period for completion, and who shall perform the maintenance. This maintenance schedule shall be printed on the approved stormwater management plan.

10.0 APPEALS

Any person aggrieved by the action of any official charged with the enforcement of this Ordinance, as the result of the disapproval of a properly filed application for a permit, issuance of a written notice of violation, or an alleged failure to properly enforce the Ordinance in regard to a specific application, shall have the right to appeal the action to the (special hearing examiner). The appeal shall be filed in writing within (time frame) of the date of official transmittal of the final decision or determination to the applicant, shall state clearly the grounds on which the appeal is based, and shall be processed in the manner prescribed for hearing administrative appeals under (local or state code provision).

11.0 SEVERABILITY

If any portion of this Ordinance is held invalid or unconstitutional by a court of competent jurisdiction, such portion shall not affect the validity of the remaining portions of this Ordinance. It is the intent of the (governing authority) that this Ordinance shall stand, even if a section, subsection, sentence, clause, phrase, or portion may be found invalid.

12.0 PENALTIES

Any person convicted of violating the provisions of this Ordinance shall be guilty of a misdemeanor, and upon conviction thereof, shall be subject to a fine of not more than Five Thousand Dollars (\$5,000.00) or imprisonment not exceeding 1 year or both for each violation with costs imposed in the discretion of the court. Each day that a violation continues shall be a separate offense. In addition, the (governing authority) may institute injunctive, mandamus or other appropriate action or proceedings of law to correct violations of this Ordinance. Any court of competent jurisdiction shall have the right to issue temporary or permanent restraining orders, injunctions or mandamus, or other appropriate forms of relief.

13.0 EFFECTIVE DATE

And be it further enacted, that this Ordinance shall take effect (time frame) from the date it becomes adopted.

SUPPLEMENT TO THE MODEL STORMWATER MANAGEMENT ORDINANCE

This supplement to the Maryland Department of the Environment's (MDE) **Model Stormwater Management Ordinance** contains optional content for implementing an advanced stormwater management program in Maryland. MDE provides this guidance to assist county and municipal code development as part of local land use and planning to enhance protection of receiving waters, and meet the requirements of the Water Resources Element of local Comprehensive Plans. While all local development review and approval processes are unique, MDE will use this document as a template to ensure effective implementation of advanced stormwater management ordinances.

HOW TO USE THIS GUIDANCE

MDE developed the **2000 Maryland Stormwater Design Manual** (Manual) to address three goals:

- (1) Protect the waters of the State from the adverse impacts urban stormwater;
- (2) Provide design guidance on effective structural and nonstructural best management practices (BMPs) for new development sites; and
- (3) Improve the quality of BMPs that are constructed in Maryland.

The Manual recognizes an evolving, more comprehensive approach to stormwater management. Included in this approach is better guidance and incentives for environmentally sustainable or "green" development techniques. The projected outcome of this new approach will be site designs that more closely mimic natural processes and reduce reliance on the use of structural management techniques. It is difficult to accommodate the full spectrum of water resource protection principles into each project. However, the importance of these principles should be recognized and their use encouraged during project planning. This supplement provides options that can be used in local stormwater management ordinances to shift focus from the structural management of runoff to mimicking natural processes as part of total site design.

The various options listed in this guidance are designed to replace **Section 4.2** (Stormwater Management Measures) of MDE's **Model Stormwater Management Ordinance**. Each option requires that nonstructural practices be used to some extent to minimize reliance on structural best management practices (BMPs) and more closely mimic natural processes. After all nonstructural options have been exhausted, the remaining runoff should then be treated using structural BMPs to mitigate water quality and channel stability impacts. Each local jurisdiction should review these options and tailor their ordinances in accordance with local conditions and development activities. All local stormwater management ordinances within Maryland are subject to the MDE approval. If there are any questions or comments regarding this supplemental guidance, please contact the MDE/WMA at (410) 537-3543.

4.2 Stormwater Management Measures.

The structural and nonstructural stormwater management measures established in this Ordinance shall be used, either alone or in a combination, in developing a stormwater management plan.

A. Nonstructural Stormwater Management Measures.

- (1) [Option 1] Nonstructural stormwater management practices shall be used to the maximum extent practicable to minimize the reliance on structural BMPs. As a minimum, the recharge volume shall be addressed using nonstructural practices.

[Option 2] Nonstructural stormwater management practices shall be used to the maximum extent practicable to treat the recharge volume and a minimum of (X) percent of the water quality volume before implementing structural BMPs.

[Option 3] Nonstructural stormwater management practices shall be used to the maximum extent practicable to treat the recharge volume, water quality volume, and channel protection volume before implementing structural BMPs.
- (2) With respect to the requirements of A.1, the “maximum extent practicable” means the stormwater management plan achieving maximum compliance and conforming to the following:
 - (a) the plan includes no stormwater management practices that are inconsistent with the provisions of this ordinance or with other stormwater policies adopted by (local agency);
 - (b) the plan considers natural conditions of the site for the purposes of stormwater management;
 - (c) the plan takes into consideration existing science and technology; and
 - (d) the plan satisfies other relevant factors as may be determined by the (local agency)
- (3) The following nonstructural stormwater management practices shall be applied according to the Design Manual to minimize increases in new development runoff:
 - (a) Natural area conservation;
 - (b) Disconnection of rooftop runoff;
 - (c) Disconnection of non-rooftop runoff;
 - (d) Sheet flow to buffers;
 - (e) Grass channels; and
 - (f) Environmentally sensitive development.
- (4) The minimum control requirements listed in Section 4.1 of this Ordinance may be reduced when nonstructural stormwater management practices are incorporated into site designs according to the Design Manual.

- (5) The use of nonstructural stormwater management practices may not conflict with existing State or local laws, ordinances, regulations, or policies.
- (6) Nonstructural stormwater management practices used to reduce the minimum control requirements must be recorded and remain unaltered by subsequent property owners. Prior approval from (local agency) shall be obtained before nonstructural stormwater practices are altered.

B. Structural Stormwater Management Measures.

- (1) [Options 1 & 2] Structural stormwater management practices may be used to supplement nonstructural techniques to satisfy the applicable minimum control requirements established in Section 4.1 of this Ordinance.

[Option 3] Structural stormwater management practices may only be used to treat the water quality volume and channel protection volume after all opportunities to implement nonstructural practices are exhausted.

- (2) The following structural stormwater management practices shall be designed according to the Design Manual:

- (a) Stormwater management ponds;
- (b) Stormwater management wetlands;
- (c) Stormwater management infiltration;
- (d) Stormwater management filtering systems; and
- (e) Stormwater management open channel systems.

- (3) The performance criteria specified in the Design Manual with regard to general feasibility, conveyance, pretreatment, treatment and geometry, environment and landscaping, and maintenance shall be considered when selecting structural stormwater management practices.

- (4) Structural stormwater management practices shall be selected to accommodate the unique hydrologic or geologic regions of the state.

C. Alternative structural and nonstructural stormwater management practices may be used for new development water quality control if they meet the performance criteria established in the Design Manual and are approved by the WMA. Practices used for redevelopment projects shall be approved by (local agency).

D. For the purposes of modifying the minimum control requirements or design criteria, the owner/developer shall submit to (local agency) an analysis of the impacts of stormwater flows downstream in the watershed. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development upon a dam, highway, structure, or natural point of restricted streamflow. The point of investigation is to be established with the concurrence of (local

agency), downstream of the first downstream tributary whose drainage area equals or exceeds the contributing area to the project or stormwater management facility.

4.3 Specific Design Criteria.

The basic design criteria, methodologies, and construction specifications, subject to the approval of the (local agency) and the WMA, shall be those of the Design Manual.