Appendix E
Model Ordinances for Stormwater Management

Model Ordinances for Stormwater Management

The following provides examples of two model ordinances: a Stormwater Management Ordinance (including erosion and sediment control stormwater pollution prevention) and a Post Construction Ordinance, which can be adopted by localities to help prevent stormwater pollution within their jurisdiction. The ordinance examples are provided as a guide. More information on ordinances for stormwater pollution prevention can be found at the EPA Web site:
http://www.epa.gov/owow/NPS/ordinance/mol2.htm

MODEL ORDINANCE FOR STORMWATER MANAGEMENT

Construction / Erosion and Sediment Control

Illicit Discharges

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ARTICLE 1.0 INTRODUCTION

It is the intention of the _____ to protect the health and safety of the citizens and visitors of the County/City/City and to prevent damage to private property and public facilities through the proper design and construction of both on-site and regional stormwater management and/or detention facilities that prevent or adequately reduce increases in peak flow rates of runoff that may otherwise increase the risk of flooding and the associated risk of public endangerment, property damage and erosion. To accomplish this goal, the _____ finds it is necessary to provide stormwater management practices for drainage and control of flood and surface waters within the unincorporated portions of the County/City/City. This is to insure that storm and surface waters may be properly drained and controlled, pollution may be reduced and environment enhanced, and that the health property, safety and welfare of the County/City/City and its inhabitants may be safeguarded and protected.

Stormwater Runoff is a major contributor to degradation and pollution of receiving waters. Discharges into a Stormwater Runoff system may occur because of stormwater runoff, spills, dumping, and/or improper connections to the stormwater system from developments, residential, industrial, commercial, or institutional establishments. Such discharges not only impact waterways individually, but geographically dispersed, small volume discharges can have a cumulative impact on receiving waters, which can adversely affect public health and safety, drinking water supplies, recreation, fish and other aquatic life, property values and other uses of lands and waters. The _____ endorses promulgation of this ordinance to address the impacts of stormwater runoff, spills, improper dumping, and/or illegal connections to the County/City runoff system. This ordinance applies to all unincorporated lands within the County/City.

SECTION A PURPOSE

A. The purpose of this ordinance is to protect the environment, public health, safety, property and general welfare of the citizens of _____, through the regulation of Stormwater Runoff and Illicit Discharges into the County/City Drainage System or any separate storm sewer system, to the maximum extent practicable as required by Federal and State law. This ordinance establishes methods for controlling the introduction of pollutants into the County/City Drainage System in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process.

B. This ordinance is not intended to modify or repeal any other County/City ordinance, rule or regulation. The requirements of this ordinance are in addition to the requirements of any other County/City ordinance, rule or regulation, and where any provision of this ordinance imposes restrictions different from those imposed by any other County/City ordinance, rule or regulation, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

SECTION B OBJECTIVES

A. The objectives of this ordinance are:
   (1) to regulate or restrict the introduction of pollutants that may potentially enter the County/City Drainage System;
   (2) to prohibit Illegal Connections and Illicit Discharges to any separate storm sewer system;

(3) to identify, define, and regulate erosion, sediment and detention controls related to Stormwater Runoff;
(4) to prevent discharges that may occur as a result of spills, inappropriate dumping or disposal, and/or improper connections to the County/City Drainage System, whether from residential, industrial, commercial or institutional establishments;
(5) to provide the County/City with the means to effectively manage Stormwater Runoff, non-conformance, and Illicit Discharges, and to establish enforcement actions for those persons or entities found to be in noncompliance, or that refuse to allow access to their facilities; and
(6) to establish means to carry out all inspection, surveillance, monitoring and enforcement procedures necessary to ensure compliance with this ordinance.

SECTION C CITATION

This ordinance may be cited as_____, Mississippi Stormwater Ordinance.

ARTICLE 2.0 DEFINITIONS

Accidental Discharge: A discharge prohibited by this ordinance, which occurs by chance, and without planning or thought prior to occurrence.

Authorized Enforcement Agency: _____, Mississippi.

Best Management Practices (BMPs): Schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures and other management practices designed to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Best Management Practices (BMPs) – Non-Structural: A policy, practice or preventative action that involves operational planning and source controls designed to provide a similar approach to stormwater management.

Best Management Practices (BMPs) – Structural: A physical device designed and constructed or manufactured to trap or filter pollutants from runoff, to reduce runoff velocities, or to minimize or prevent the effects of soil erosion caused by Stormwater Runoff.

Clean Water Act: The Federal Water Pollution Control Act (33 U.S.C., 1251 et seq.), and any subsequent amendments thereto.

Construction Activity: Activities subject to NPDES construction permits. These include construction projects resulting in land disturbances. Such activities include, but are not limited to, clearing and grubbing, grading, excavating and demolition.

County/City Drainage System (CDS): Any County/City maintained or designated roadway, ditch, culvert, channel, or conduit intended to direct water flows.

Facility: A structure, installation, or system that is designed to serve a particular purpose, service, or function.

Hazardous Materials: Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illegal Connections: Any pipe, open channel, drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the drainage system including but not limited to any conveyances which allow any non-stormwater discharge including sewage, process wastewater, wash water, or any other such discharge, to enter the County/City Drainage System and any connections to the County/City Drainage System from any source, regardless of whether such pipe, open channel, drain, connection, or source had been previously allowed, permitted, or approved by the County/City.

Illicit Discharge: Any direct or indirect discharge into the County/City Drainage System that is not composed entirely of stormwater.

Industrial Activity: Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).

National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit: A permit issued by EPA (or by the State under authority delegated pursuant to (33 USC 1342(b)) that authorizes the discharge of Pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

Non-Stormwater Discharge: Any discharge to the County/City Drainage System that is not composed entirely of stormwater.

Person: Any individual, association, organization, partnership, firm, trust, estate, commission, board, public or private institution, utility, cooperative, city, County/City or other political subdivision of the State, any interstate body or other legal entity, joint venture, public or private corporation, or other entity recognized by law and acting as either the owner or as the owner's agent.

Pollutant: Any substance which causes or contributes to pollution. Pollutants may include, but are not limited to paints, varnishes, solvents, petroleum hydrocarbons, automotive fluids, cooking grease, detergents (biodegradable or otherwise), degreasers, cleaning chemicals, non-hazardous liquid and solid wastes, yard wastes, refuse, rubbish, garbage, litter, discarded or abandoned objects, munitions, accumulations that may cause or contribute to pollution, any floatables, pesticides, herbicides, fertilizers, hazardous substances and wastes, sewage, fecal coliform and pathogens, dissolved and particulate metals, animal wastes, wastes and residues that result from constructing a building or structure including concrete/cement (this includes water from washing out cement trucks) and noxious or offensive matter of any kind or any other substance which has been or may be determined to be a pollutant.

Pollution: The contamination or other alteration of any water’s physical, chemical or biological properties by the addition of any substance or condition including but not limited to, a change in temperature, taste, color, turbidity, or odor of such waters, or waters as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety, welfare, or environment, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

Premises: Any parcel of land whether improved or unimproved.

State Waters: Any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface and subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State, which are not entirely confined and retained completely upon the property of a single person.

Storm Drainage System: Any one (1) or more of various devices used in the collection, treatment or disposition of storm, flood or surface drainage waters, including but not limited to any roads with drainage systems, natural and human-made or altered drainage channels, reservoirs, manmade structures and natural watercourses and/or floodplains for the conveyance of runoff, such as detention or retention areas, berms, swales, improved gutters, pumping stations, pipes, ditches, siphons, catch basins, inlets, and other equipment and appurtenances and all extensions, improvements, remodeling, additions and alterations thereof; and any and all rights or interests in such stormwater facilities.

Stormwater/Stormwater Runoff: Any surface flow, runoff and/or drainage consisting entirely of water from any form of natural precipitation, which is not absorbed, transpired, evaporated or left in surface depressions, and which then flows controlled or uncontrolled into a watercourse or body of water.

Stormwater Pollution Prevention Plan (SWPPP): A document which describes the Best Management Practices (BMPs) and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems and/or receiving waters to the maximum extent practicable.

Structural Stormwater Control: A structural stormwater management facility or device that controls stormwater runoff and changes the characteristics of that runoff, including but not limited to, the quantity and quality, the period of release or the velocity of flow.

Wastewater: Any water or other liquid, other than uncontaminated stormwater, discharged from a facility.

Watercourse: Any stream, river, or drainage channel or drainage easement, that is located in the incorporated/unincorporated portions of_____.

ARTICLE 3.0 APPLICABILITY

This ordinance shall apply to any and all water entering the County/City Drainage System generated on any developed or undeveloped lands throughout all of the unincorporated portions of the County/City unless explicitly exempted by the County/City and the provisions of the State of Mississippi's Phase II Stormwater MS4 General Permit. The standards set forth herein and promulgated pursuant to this ordinance are minimum standards; therefore, this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, or unauthorized discharge of Pollutants.

ARTICLE 4.0 RESPONSIBILITY FOR ADMINISTRATION

The County/City Administrator, or designee, shall enforce the provisions of this ordinance.

ARTICLE 5.0 SEVERABILITY

The provisions of this ordinance are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this ordinance, or the application thereof to any person, establishment, or circumstances, shall be held invalid, such invalidity shall not affect the other provisions or application of this ordinance.

ARTICLE 6.0 POLICY

No owner of any parcel of land or property, whether with or without a structure thereupon, shall permit the erosion or escape of soil, sand, gravel, or similar material from said parcel onto any adjoining property, public street or into any drainage channel that receives Stormwater Runoff from said parcel in such quantities as to harm said adjoining property, public street, drainage channel or County/City Drainage System. In the development or use of any site, the owners or occupant shall not construct or conduct any activity so as to cause the discharge of Stormwater in such a manner as to cause erosion or to increase blockage of a channel or the County/City Drainage System. This includes both pre-construction and post-construction.

SECTION A PERMITTING

Stormwater permits and Stormwater Pollution Prevention Plans (SWPPP) are required as follows:

- 0-.9 Acre of land disturbed: No permit or SWPPP required unless the subject property is part of a larger common plan of development or sale.
- 1-5 Acres of land disturbed: Permit required from the County/City. A Notice of Intent (NOI) and SWPPP must be submitted to the County/City Permits Office (See Appendix B and C for examples).
- Above 5 Acres: Permit required from MDEQ. SWPPP must also be submitted to MDEQ.
- All land disturbance activities for commercial construction shall obtain a permit from County/City. Permit applications for commercial land disturbance activities less than five acres shall be submitted to the County/City complete with an NOI and SWPPP.
- For projects greater than 5 acres, the permitted entity is required to submit to the County/City copies of the approved MDEQ permits.
- Permitted shall provide proof of issuance of other applicable permits from the U.S. Army Corps of Engineers if waters of the United States are to be filled, rerouted, or dammed.

ARTICLE 7.0 CONSTRUCTION AND/OR INDUSTRIAL ACTIVITY

Any person subject to an industrial or construction activity National Pollution Discharge Elimination System (NPDES) Stormwater Discharge Permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the County/City prior to the allowing of discharges to the County/City Drainage System. Dumping excess cement and washing out cement trucks are included in this article.

All construction activities regulated through this ordinance including both residential and commercial construction shall include sediment and erosion control measures designed for a 2 year, 24-hour storm frequency. Structural components (post-construction) of a storm drainage system may be designed on the basis of a lesser storm event providing the calculations demonstrate that the 2 year, 24 hour storm event can be accommodated through a combination of design features, such as infiltration and storage. Post-Construction storm drainage design shall be completed in accordance with the requirements of the Mississippi Department of Transportation: “Roadway Design Manual”, particularly Chapter 7.

SECTION A STANDARDS AND REQUIREMENTS FOR EROSION/SEDIMENT CONTROL

(a) Prior to the final approval of the plat of any subdivision, or prior to commencement of construction upon any lot or parcel of land for which a drainage report and construction plan for the installation of stormwater facilities has not been prepared and approved, the owner of

the property being subdivided or upon which construction is being commenced shall, at such owners cost, prepare a detailed drainage report and construction plans for the installation of all Stormwater facilities required for such subdivision or lot, including any off-site facilities required to convey Stormwater to existing drains, channels, streams, detention ponds or to other points, all in conformity with the SWPPP on file.

(b) No final subdivision plat, subdivision construction plan, site plan or building permit shall be approved by the County/City unless the plans for the proposed development include temporary and permanent erosion and sedimentation control measures such that siltation of downstream drainage ways are minimized.

(c) The above requirement shall be accomplished through a combination of the following practices:
    a. installation of structural BMPs before and during construction in order to reduce on-site soil erosion and provide temporary capture of sediment;
    b. temporary and/or permanent revegetation of bare ground in order to stabilize disturbed soil at the earliest practicable date;
    c. construction of on-site Stormwater detention facilities by the landowner or developer in a manner such that detention ponds function as temporary sedimentation basins until permanent revegetation of the subject tract is accomplished;
    d. Control of construction debris, litter and sanitary wastes through appropriate and acceptable means; and
    e. Other measures which may be necessary to control erosion and sedimentation on a site-by-site basis.

SECTION B STANDARDS AND REQUIREMENTS FOR STORMWATER DETENTION

(a) It is prohibited to place fill material or construct impervious cover or construct or place any other structure on a person's property or perform any excavation or grading in a manner that alters the flow of surface water across said property in a manner that damages any adjacent property.
    1. No final subdivision plat, subdivision construction plan, site plan or building permit shall be approved by the County/City unless it can be demonstrated by the owner or developer of such property that the proposed development will not result in damage to any adjacent or downstream property. This will be certified by a professional engineer's submittal of sufficient data and calculations.

(b) The above requirement shall be accomplished through one of the following means:
    1. Design and construction of an on-site Stormwater detention facility, or facilities, by the owner or developer that limits the peak stormwater runoff from the proposed development to the existing peak stormwater runoff from the subject tract.
    2. Construction of, or participation in the construction of, off-site drainage improvements, such as storm inlets, storm sewers, culverts, channel modifications, land filling, and/or other drainage facilities such that the peak stormwater runoff for fully-developed watershed conditions from the watershed area in which the proposed development is located will be sufficiently and safely passed without flooding of adjacent and downstream property and roadways.
    3. Design and construction of the development utilizing engineering data and calculations using limited impervious cover, infiltration of runoff from impervious cover via flow through pervious areas, and/or grass-lined swales or channels such that these measures result in a minimal increase in peak stormwater runoff from the development. A thorough review of the downstream drainage facilities shall be performed to verify that any increase in the peak stormwater runoff does not adversely affect existing structures or properties.

4. All on-site Stormwater detention facilities shall be designed to adequately and safely pass all stormwater inflow, including on-site runoff and runoff from upstream and adjacent properties that have natural and/or existing overland flow toward and onto the subject tract. The on-site Stormwater detention facilities should not impound Stormwater onto or cause backwater to inundate any upstream or adjacent properties in excess of existing conditions.

SECTION C ILLICIT DISCHARGES

(a) It shall be unlawful for any person to allow discharges to the County/City Drainage System that are not composed entirely of Stormwater Runoff, or to contribute to increased nonpoint source pollution and degradation of receiving waters.

(b) It shall be unlawful for any person to throw, deposit, empty, drain, discharge, or to permit to be thrown, deposited, emptied, drained or discharged into any creek, or upon its margins, slopes, banks, or stormwater drainage system within the County/City any garbage, rubbish, refuse, hair, ashes, cinders, fruit, vegetables, paper, rags, any animal carcass or waste, sewerage, excrement, urine, liquid, or semi-liquid waste from any industry, or any noxious substance or liquid.

(c) No Person shall, or allow others under its control to, throw, drain, or otherwise discharge or cause to be discharged into the County/City Drainage System or watercourses any Pollutants or waters containing any Pollutants that cause or contribute to a violation of applicable water quality standards, other than Stormwater. The commencement, conduct or continuance of any Illicit Discharge to the County/City Drainage System is prohibited except as follows:
   1. discharges specified in writing by the County/City as being necessary to protect public health and safety;
   2. water line flushing performed by the County/City or the regional utility authority;
   3. landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (less than one PPM chlorine), fire fighting activities, and any other water source not containing Pollutants; and
   4. dye testing is an allowable discharge, but requires a verbal notification to the County/City prior to the time of the test.

This prohibition shall not apply to any non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the County/City Drainage System.

SECTION D ILLEGAL CONNECTIONS

The construction, connection, use, maintenance or continued existence of any illegal connection to the County/City Drainage System is prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. The construction, use, maintenance or continued existence of illicit connections to the storm drainage system is prohibited.

(a) A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the County/City Drainage System, or allows such a connection to continue.
(b) Improper connections in violation of this ordinance must be disconnected and redirected, if necessary, to an approved onsite wastewater management system or the sanitary sewer system upon approval of the County/City.
(c) Any drain or conveyance that has not been documented in plans, maps or equivalent, and which may be connected to the County/City Drainage System, shall be located by the owner or occupant of that property upon receipt of written notice of violation from the County/City requiring that such locating be completed. Such notice will specify a reasonable time period within which the location of the drain or conveyance is to be completed, that the drain or conveyance be identified as storm sewer, sanitary sewer or other, and that the outfall location or point of connection to County/City Drainage System, sanitary sewer system or other discharge point is identified. Results of these investigations are to be documented and provided to the County/City.

ARTICLE 8.0 MONITORING OF DISCHARGES/ACCESS AND INSPECTING PROPERTIES AND FACILITIES

A. Applicability

This section applies to all properties that create stormwater discharges associated with the use of the property.

1. Access to Properties and Facilities
   (a) The County/City Administrator or designee shall be permitted to enter and inspect properties and facilities subject to regulation under this ordinance at reasonable times and as often as may be necessary to determine compliance with this ordinance. If a discharger has security measures in force, which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the County/City.
   (b) Property owners and facility operators shall allow the County/City Administrator or designee access to all parts of the premises for the purposes of inspection, sampling, photographing, videotaping, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge stormwater, and the performance of any additional duties as defined by State and Federal law.
   (c) The County/City Administrator or designee shall have the right to set up on any permitted property such devices as are necessary in the opinion of the County/City Administrator or designee to conduct monitoring and/or sampling of the facility's Stormwater discharge.
   (d) The County/City Administrator or designee has the right to require a discharger to install monitoring equipment as necessary, and perform monitoring and make the monitoring data available to the County/City Administrator or designee. The sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure Stormwater flow and quality shall be calibrated to ensure their accuracy.
   (e) Any temporary or permanent obstruction that does not allow safe and easy access to the property to be inspected and/or sampled shall be promptly removed by the owner at the written or oral request of the County/City Administrator or designee and shall not be replaced. The costs of clearing such access shall be borne by the owner.
   (f) Unreasonable delays in allowing the County/City Administrator or designee access to a permitted property is a violation of a Stormwater discharge permit and of this ordinance. A person who is the owner of property with a NPDES permit to discharge Stormwater

associated with industrial activity commits an offense if the person denies the County/City Administrator or designee reasonable access to the permitted property for the purpose of conducting any activity authorized or required by this ordinance.

2. If the County/City Administrator or designee has been refused access to any part of the premises from which Stormwater is discharged, and is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, environment, and welfare of the community, then the County/City Administrator may seek issuance of an administrative warrant from the County/City Court.

ARTICLE 9.0 REQUIREMENT TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTION BY THE USE OF BEST MANAGEMENT PRACTICES (BMPs)

The Board of Supervisors will adopt requirements identifying Best Management Practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of Stormwater, the County/City Drainage System, or waters of the U.S. The owners or operators of commercial or industrial establishments shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the County/City Drainage System through the use of these structural and non-structural BMPs. Further, any person responsible for a parcel, which is, or may be, the source of an Illicit Discharge, may be required to implement, at said person's expense, additional structural and non-structural BMP's to prevent the further discharge of Pollutants to the County/City Drainage System. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of Stormwater associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMP's shall be part of a Stormwater Pollution Prevention Plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.

ARTICLE 10.0 WATERCOURSE OR EASEMENT PROTECTION

Any person owning property through which a Watercourse passes, or such person's lessee, shall keep and maintain that part of the Watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the Watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a Watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the Watercourse.

ARTICLE 11.0 NOTIFICATION OF SPILLS

In the event of a release of Hazardous Materials, emergency response agencies and/or other appropriate agencies shall be immediately notified. Notwithstanding other requirements of law, as soon as any person responsible for a facility, activity, or operation, or responsible for emergency response for a facility, activity, or operation has information of any known or suspected release of Pollutants or non-Stormwater materials from that facility or operations which are resulting or may result in Illicit Discharges or Pollutants discharging into Stormwater, the County/City Drainage System, State waters, or waters of the U.S., said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release so as to minimize the effects of a discharge .

In the event of recognition of such a release of Hazardous Materials said person shall immediately notify the County/City Administrator or designee and emergency response agencies of the occurrence, either in

person, by phone, or facsimile no later than 24 hours after discovery of the occurrence. In the event of a release of non-hazardous materials, said person shall notify the County/City Administrator or designee in person or by phone or facsimile no later than 5:00 P.M. the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the County/City Administrator or designee within three business days of the telephonic notice.

If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years. Said person shall also take immediate steps to ensure no recurrence of the discharge or spill. Failure to provide notification of a release as provided above is a violation of this ordinance.

ARTICLE 12.0 VIOLATIONS

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this ordinance. Anyone who has violated or continues to violate the provision of this ordinance, may be subject to enforcement actions outlined in this section or may be restrained by injunction or otherwise restricted in a manner provided by law. Whenever the County/City Administrator or designee finds a violation of this ordinance has occurred, the County/City Administrator or designee may order compliance by written notice of violation.

SECTION 1

A. A The notice shall contain:
   (1) the name and address of the alleged violator;
   (2) the address when available or a description of the building, structure or land upon which the violation is occurring, or has occurred;
   (3) a statement specifying the nature of the violation;
   (4) a description of the remedial measures necessary to restore compliance with this ordinance and time schedule for the completion of such remedial action;
   (5) a statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed; and
   (6) a statement that the determination of violation may be appealed to the Board of Supervisors by filing a written notice of appeal with the County/City Administrator, within fifteen (15) days of service of notice of violation.

B. Such notice may require:
   (1) the performance of monitoring, analyses, and reporting;
   (2) the elimination of illicit connections or discharges;
   (3) that violating discharges, practices, or operations shall cease and desist. Depending on severity of the violations, offending person(s) may be given as little as 24 hours to clean up sediments, pollutants, etc., and an additional 24 hours to put stormwater controls in place, otherwise, a stop-work order may be issued;
   (4) the abatement or remediation of Stormwater pollution or contamination hazards and the restoration of any affected property;
   (5) payment of a fine and any costs to cover administrative, remediation, and/or abatement expenses; and
   (6) the implementation of source control, pollution prevention practices, or treatment BMPs.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by the County/City or a contractor and the expense thereof shall be charged to the violator.

SECTION 2 VIOLATIONS ENFORCEMENT

In the event a violation constitutes an immediate danger to public health or public safety, the County/City Administrator or designee is authorized to enter upon the subject private property, without giving prior notice, to take any and all measures necessary to abate the violation and/or restore the property. After abatement of the violation, the owner of the property shall be notified of the cost of abatement, including administrative costs. The property owner may file an appeal within 15 days of the receipt of such notice. If the amount due is not paid within a timely manner as determined by the decision of the appropriate authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment.

ARTICLE 13.0 PENALTIES AND PROSECUTION

SECTION 1

A. CIVIL

In the event the alleged violator fails to take the remedial measures set forth in the notice of violation or otherwise fails to cure the violations described therein within ten days, or such greater period as the County/City Administrator shall deem appropriate, after the County/City has taken one or more of the actions described above, the County/City may seek any legal or equitable remedy available under the law. The County/City may recover all attorneys' fees, court costs, and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.

B. CRIMINAL

Violations of this ordinance shall be deemed a misdemeanor. The County/City may issue a citation to the alleged violator requiring such person to appear before the County/City Court to answer charges for such violation. Upon conviction, such person shall be punished by a fine not to exceed $1,000.00 or imprisonment in the County/City jail for 90 days, or both.

C. INJUNCTION

If a person has violated or continues to violate the provisions of this ordinance, the County/City may petition for an injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

D. ALTERNATIVE ACTION

In addition to any other remedy, the County/City may impose upon a violator alternative compensatory action, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, or similar action.

SECTION 2 REMEDIES NOT EXCLUSIVE

The remedies listed in this ordinance are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the County/City to seek cumulative remedies.

SECTION 3 VIOLATIONS DEEMED A PUBLIC NUISANCE

In addition to the enforcement processes and penalties provided herein, any condition caused or permitted to exist in violation of any of the provisions of this ordinance is a threat to public health, safety, and welfare, and environment, is declared and deemed a nuisance, and may be abated by injunctive or other equitable relief provided by law.

SECTION 4 SUSPENSION OF ACCESS TO STORM DRAINAGE SYSTEM(S)

A. Suspension due to Illicit Discharges in Emergency Situations

The County/City may, without prior notice, suspend discharge access to a person when such suspension is necessary to stop an actual or threatened discharge, which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the County/City may take such steps as deemed necessary to prevent or minimize damage to the County/City Drainage System or waters of the United States, or to minimize danger to persons.

B. Suspension due to the Detection of Illicit Discharge

1. A person discharging to the County/City Drainage System in violation of this ordinance may have access thereto terminated if such termination would abate or reduce an Illicit Discharge. The County/City Administrator will notify a violator of the proposed termination of its County/City Drainage System access. The violator may petition the County/City Administrator for a reconsideration and hearing.
2. A person commits an offense if the person reinstates access to premises terminated pursuant to this Section, without the prior approval of the County/City.

ARTICLE 14.0 APPEALS

Any person receiving a notice of violation may appeal the determination within 15 days of issuance of notice to the County/City Administrator. The notice of appeal must be filed with the County/City Administrator. A hearing on the appeal shall be set by the Board of Supervisors with at least ten (10) days notice to the violator.

If the violation has not been corrected pursuant to the requirements set forth in the notice of violation, or, in the event of an unsuccessful appeal, then representatives of the County/City may enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. If entry refused the County/City Administrator may need administrative warrant in County/City Court authorizing such access.

PASSED AND ADOPTED this ____ day of _____, 20__, by the following vote:

APPENDIX A SWPPP DETAILS AND REQUIREMENTS

A. SWPPP Development. A SWPPP shall be developed and implemented by the owner or operator of a small construction project. The SWPPP must include a description of appropriate control measures (i.e., BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges.

1. The SWPPP shall be retained at the permitted site or locally available. A copy of the SWPPP must be made available to the MDEQ inspectors for review at the time of an on-site inspection.
2. BMPs shall be in place upon commencement of construction.
3. The Executive Director of MDEQ may notify the owner or operator at any time that the SWPPP does not meet the minimum requirements of this permit. After notification, the owner or operator shall amend the SWPPP, implement the changes and certify in writing to the Executive Director that the requested changes have been made. Unless otherwise provided by the Executive Director, the requested changes shall be made within 15 days.
4. The owner or operator shall amend the SWPPP and implement the changes before there is a change in construction, operation, or maintenance, which may potentially affect the discharge of pollutants to State waters.
5. The owner or operator shall amend the SWPPP and implement the changes if the SWPPP proves to be ineffective in controlling storm water pollutants including, but not limited to, significant sediment leaving the site and non-functioning BMPs.

B. Compliance with Local Storm Water Ordinances.

1. In addition to the requirements of this permit, the SWPPP shall be in compliance with all local storm water ordinances and shall provide a brief description of applicable local erosion and sediment controls and post-construction BMPs.
2. When storm water discharges into a municipal storm sewer system, the owner or operator must make the SWPPP available to the municipal authority upon request.

C. SWPPP Details.

1. **Owner or Operator.** The SWPPP shall identify the "owner or operator" as defined in Part VII. of this permit. The operator's name, complete mailing address and telephone number(s) shall be identified on the plan.
2. **Erosion and Sediment Controls.** The owner or operator shall list and describe controls appropriate for the construction activities and the procedures for implementing such controls. Controls shall be designed to retain sediment onsite and should:
    - Divert upslope water around disturbed areas
    - Limit exposure of disturbed areas to the shortest time possible
    - Disturb the smallest area possible
    - Preserve existing vegetation where possible, especially trees
    - Preserve vegetated buffer zones around any creek, drain, lake, pond or wetland
    - Slow rainfall runoff velocities to prevent erosive flows
    - Avoid disturbing sensitive areas such as:
      - Steep and/or unstable slopes
      - Land upslope of surface waters
      - Areas with erodible soils
      - Existing drainage channels
    - Transport runoff down steep slopes through lined channels or piping
    - Minimize the amount of cut and fill
    - Re-vegetate disturbed areas as soon as possible

- Implement best management practices to mitigate adverse impacts from storm water runoff; and
- Remove sediment from storm water before it leaves the site by allowing runoff to pond in controlled areas to drop out sediment
- Filter runoff by using natural vegetation, brush barriers, silt fences, hay bales, etc.

At a minimum, the controls must be in accordance with the standards set forth in "Planning and Design Manual for the Control of Erosion, Sediment & Stormwater," or other recognized Manual of design as appropriate for Mississippi. The planning and design manual can be obtained by calling 601/961-5171 or may be found electronically at Mississippi State's educational web site at http://abe.msstate.edu/csd/p-dm/. In addition, Mississippi's "Storm Water Pollution Prevention Plan (SWPPP) Guidance Manual for Construction Activities" is available by calling 601/961-5171 or on the MDEQ website at www.deq.state.ms.us. The erosion and sediment controls shall address the following minimum components.

B. **Vegetative practices** shall be designed to preserve existing vegetation where possible and revegetate disturbed areas as soon as practicable after grading or construction. Such practices may include surface roughening, temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffer strips, and protection of trees.

C. **Structural practices** shall divert flows from exposed soils, store flows or otherwise limit runoff from exposed areas. Such practices may include construction entrance/exit, straw bale dikes, silt fences, earth dikes, brush barriers, drainage swales, check dams, subsurface drains, pipe slope drains, level spreaders, drain inlet protection, outlet protection, detention/retention basins, sediment traps, temporary sediment basins or equivalent sediment controls.

D. **Post construction control measures** shall be installed to control pollutants in storm water after construction is complete. These controls include, but are not limited to on-site infiltration of runoff, flow attenuation using open vegetated swales, exfiltration trenches and natural depressions, constructed wetlands and retention/detention structures. Where needed, velocity dissipation devices shall be placed at detention or retention pond outfalls and along the outfall channel to provide a non-erosive flow.

3. **Non-Storm Water Discharges**. Except for flows from fire fighting activities, sources of non-storm water listed in Part I. E. of this permit that are combined with storm water discharges associated with construction activity must be identified in the SWPPP. The SWPPP must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

4. **Housekeeping Practices.** The owner or operator shall describe and list practices appropriate to prevent pollutants from entering storm water from construction sites due to poor housekeeping. The owner or operator shall:
   - designate areas for equipment maintenance and repair and concrete chute wash off;
   - provide waste receptacles at convenient locations;
   - provide regular collection of waste;
   - provide protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials;
   - provide adequately maintained sanitary facilities; and
   - provide secondary containment around on-site fuel tanks.

Releases into the environment of hazardous substances, oil, and pollutants or contaminants, which pose a threat to applicable water quality standards or causes a film, sheen or discoloration of State waters, shall be reported to the:

- Mississippi Emergency Management Agency (601) 352-9100
- National Response Center 1-800-424-8802

5. **Prepare Scaled Site Map.** The owner or operator shall prepare a scaled site map showing total area of the site, original and proposed contours (if practicable), direction of flow of storm water runoff, adjacent receiving water bodies, north arrow, all erosion & sediment controls (vegetative and structural), post construction control measures as described in Part III. C. 2. of this permit, and an estimate of the pre and post construction runoff coefficients of the site (see runoff coefficients in Part VII.) and the increase in impervious area.

6. **Implementation Sequence.** The owner or operator shall prepare an orderly listing which coordinates the timing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project.

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MODEL POST CONSTRUCTION STORMWATER RUNOFF CONTROL

Environmental Protection Agency

This document is available for download in Word Perfect format at
http://www.epa.gov/owow/NPS/ordinance/documents/postcons.wpd

Contents

SECTION 1.GENERAL PROVISIONS

1.1. Findings of Fact

It is hereby determined that:

Land development projects and associated increases in impervious cover alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes, flooding, stream channel erosion, and sediment transport and deposition; This stormwater runoff contributes to increased quantities of water-borne pollutants, and; Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites.

Therefore, the (jurisdictional stormwater authority) establishes this set of water quality and quantity policies applicable to all surface waters to provide reasonable guidance for the regulation of stormwater runoff for the purpose of protecting local water resources from degradation. It is determined that the regulation of stormwater runoff discharges from land development projects and other construction activities in order to control and minimize increases in stormwater runoff rates and volumes, soil erosion, stream channel erosion, and nonpoint source pollution associated with stormwater runoff is in the public interest and will prevent threats to public health and safety.

1.2. Purpose

The purpose of this ordinance is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within this jurisdiction. This ordinance seeks to meet that purpose through the following objectives:

(1). minimize increases in stormwater runoff from any development in order to reduce flooding, siltation and streambank erosion and maintain the integrity of stream channels;

(2). minimize increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality

(3). minimize the total annual volume of surface water runoff which flows from any specific site during and following development to not exceed the pre-development hydrologic regime to the maximum extent practicable.

(4). reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, through stormwater management controls and to ensure that these management controls are properly maintained and pose no threat to public safety.

The above list is a general set of objectives to reduce the impact of stormwater on receiving waters. The local stormwater authority may wish to set some more specific objectives, based on priority water quality and habitat problems (e.g., to reduce phosphorus loads being delivered to recreational lakes, to sustain a class X trout fishery)

1.3. Applicability

This ordinance shall be applicable to all major subdivision or site plan applications, unless eligible for an exemption or granted a waiver by the (jurisdictional stormwater authority) under the specifications of Section 4 of this ordinance. The ordinance also applies to land development activities that are smaller than the minimum applicability criteria if such activities are part of a larger common plan of development that meets the following applicability criteria, even though multiple separate and distinct land development activities may take place at different times on different schedules. In addition, all plans must also be reviewed by local environmental protection officials to ensure that established water quality standards will be maintained during and after development of the site and that post construction runoff levels are consistent with any local and regional watershed plans.

The size of the site development to which post-construction stormwater management runoff control applies varies but many communities opt for a size limit of 5000 square feet or more. For sites less than 5000 square feet, local officials may wish to grant an exemption as long as the amount of impervious cover created does not exceed 1000 square feet.

To prevent the adverse impacts of stormwater runoff, the_(jurisdictional stormwater authority) has developed a set of performance standards that must be met at new development sites. These standards apply to any construction activity disturbing or more square feet of land. The following activities may be exempt from these stormwater performance criteria:

1. Any logging and agricultural activity which is consistent with an approved soil conservation plan or a timber management plan prepared or approved by the_(agency), as applicable.

2. Additions or modifications to existing single family structures

3. Developments that do not disturb more than square feet of land, provided they are not part of a larger common development plan;

- Repairs to any stormwater treatment practice deemed necessary by the (jurisdictional stormwater authority).

When a site development plan is submitted that qualifies as a redevelopment project as defined in Section 2 of this ordinance, decisions on permitting and on-site stormwater requirements shall be governed by special stormwater sizing criteria found in the current stormwater design manual. This criterion is dependent on the amount of impervious area created by the redevelopment and its impact on water quality. Final authorization of all redevelopment projects will be determined after a review by the (jurisdictional stormwater authority).

There are a number of decisions to be made by local communities when addressing the issue of redevelopment and stormwater treatment. The first is defining exactly what qualifies as redevelopment. The definition in Section 2 is from the current Maryland Stormwater Management regulations, and uses the square foot size of the project and its land use classification to establish the definition of a redevelopment project. The second decision involves to what level of stormwater management standards redevelopment projects will be held. Providing cost effective stormwater treatment at redevelopment sites is often a difficult task, and these projects may be given reduced criteria to meet to allow for site constraints. The State of Maryland currently requires that proposed redevelopment project designs

include either at least a 20 percent reduction in existing site impervious area, management of at least 20% of the water quality volume, or some combination of both.

1.4. Compatibility with Other Permit and Ordinance Requirements

This ordinance is not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, stature, or other provision of law. The requirements of this ordinance should be considered minimum requirements, and where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, whichever provisions are more restrictive or impose higher protective standards for human health or the environment shall be considered to take precedence.

1.5. Severability

If the provisions of any article, section, subsection, paragraph, subdivision or clause of this ordinance shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any article, section, subsection, paragraph, subdivision or clause of this ordinance.

1.6. Development of a Stormwater Design Manual

The (jurisdictional stormwater authority) may furnish additional policy, criteria and information including specifications and standards, for the proper implementation of the requirements of this ordinance and may provide such information in the form of a Stormwater Design Manual.

This manual will include a list of acceptable stormwater treatment practices, including the specific design criteria for each stormwater practice. The manual may be updated and expanded from time to time, at the discretion of the local review authority, based on improvements in engineering, science, monitoring and local maintenance experience. Stormwater treatment practices that are designed and constructed in accordance with these design and sizing criteria will be presumed to meet the minimum water quality performance standards.

Local communities will need to select the minimum water quality performance standards (e.g., 80% TSS, 40% P) they will require for stormwater treatment practices and place these in their design manual. The 80% removal goal for total suspended solids (TSS) is a management measure developed by EPA as part of the Coastal Zone Act Reauthorization Amendments of 1990. It was selected by EPA for the following factors: (1) removal of 80% is assumed to control heavy metals, phosphorus, and other pollutants; (2) a number of states including DE, FL, TX, MD, and MA require/recommend TSS removal of 80% or greater for new development; and (3) data show that certain structural controls, when properly designed and maintained, can meet this performance level. Further discussion of water quality standards for stormwater management measures can be found in the CZARA Coastal Zone 6217(g) management measures document entitled "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" (US EPA, 1993).

There are a number of good stormwater design manuals available around the country that communities may wish to refer to in creating their own local manual. One such manual is the new Maryland Department of the Environment 2000 Maryland Stormwater Design

Manual Volumes I & II. This manual contains innovative criteria for stormwater management, and is available online at

www.mde.state.md.us/environment/wma/stormwatermanual/mdswmanual ***.***

Local communities may also wish to consult a new resource available on the Internet called the Stormwater Managers Resource Center (SMRC). This site is dedicated to providing information to stormwater management program managers in Phase II communities to assist in meeting the requirements of the new National Pollutant Discharge Elimination System Phase II regulations. Among the resources available at the website will be a section devoted to supplying guidance on how to build a stormwater manual, including sizing and design criteria. The SMRC website and the manual-builder resources are located at www.stormwatercenter.net.

SECTION 2. DEFINITIONS:

"Accelerated Erosion" means erosion caused by development activities that exceeds the natural processes by which the surface of the land is worn away by the action of water, wind, or chemical action.

"Applicant" means a property owner or agent of a property owner who has filed an application for a stormwater management permit.

"Building" means any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal, or property, and occupying more than 100 square feet of area.

"Channel" means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

"Dedication" means the deliberate appropriation of property by its owner for general public use.

"**Detention**" means the temporary storage of storm runoff in a stormwater management practice with the goals of controlling peak discharge rates and providing gravity settling of pollutants.

"Detention Facility" means a detention basin or alternative structure designed for the purpose of temporary storage of stream flow or surface runoff and gradual release of stored water at controlled rates.

"Developer" means a person who undertakes land disturbance activities.

"Drainage Easement" means a legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

"Erosion and Sediment Control Plan" means a plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities.

"Fee in Lieu" means a payment of money in place of meeting all or part of the storm water performance standards required by this ordinance.

"**Hotspot**" means an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

"**Hydrologic Soil Group (HSG)**" means a Natural Resource Conservation Service classification system in which soils are categorized into four runoff potential groups. The groups range from A soils, with high permeability and little runoff production, to D soils, which have low permeability rates and produce much more runoff.

"**Impervious Cover**" means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, driveways, etc).

"**Industrial Stormwater Permit**" means an National Pollutant Discharge Elimination System permit issued to a commercial industry or group of industries which regulates the pollutant levels associated with industrial stormwater discharges or specifies on-site pollution control strategies.

"**Infiltration**" means the process of percolating stormwater into the subsoil.

"**Infiltration Facility**" means any structure or device designed to infiltrate retained water to the subsurface. These facilities may be above grade or below grade.

"**Jurisdictional Wetland**" means an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

"Land Disturbance Activity" means any activity which changes the volume or peak flow discharge rate of rainfall runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which bares soil or rock or involves the diversion or piping of any natural or man-made watercourse.

"Landowner" means the legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding proprietary rights in the land.

"**Maintenance Agreement**" means a legally recorded document that acts as a property deed restriction, and which provides for long-term maintenance of storm water management practices.

"**Nonpoint Source Pollution"** means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include, but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

"Offset Fee" means a monetary compensation paid to a local government for failure to meet pollutant load reduction targets.

"Off-Site Facility" means a stormwater management measure located outside the subject property boundary described in the permit application for land development activity.

"On-Site Facility" means a stormwater management measure located within the subject property boundary described in the permit application for land development activity.

"Recharge" means the replenishment of underground water reserves.

"**Redevelopment**" means any construction, alteration or improvement exceeding square feet in areas where existing land use is high density commercial, industrial, institutional or multi-family residential.

"Stop Work Order" means an order issued which requires that all construction activity on a site be stopped.

"Storm Water Management" means the use of structural or non-structural practices that are designed to reduce storm water runoff pollutant loads, discharge volumes, and/or peak flow discharge rates.

"Storm Water Retrofit" means a stormwater management practice designed for an existing development site that previously had either no stormwater management practice in place or a practice inadequate to meet the stormwater management requirements of the site.

"**Stormwater Runoff**" means flow on the surface of the ground, resulting from precipitation.

"**Stormwater Treatment Practices (STPs)**" means measures, either structural or nonstructural, that are determined to be the most effective, practical means of preventing or reducing point source or nonpoint source pollution inputs to stormwater runoff and water bodies.

"**Water Quality Volume (WQ_v)**" means the storage needed to capture and treat 90% of the average annual stormwater runoff volume. Numerically **(WQ_v)** will vary as a function of long term rainfall statistical data.

"Watercourse" means a permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.

SECTION 3. PERMIT PROCEDURES AND REQUIREMENTS

3.1. Permit Required

No land owner or land operator shall receive any of the building, grading or other land development permits required for land disturbance activities without first meeting the requirements of this ordinance prior to commencing the proposed activity.

The intent is to ensure that no activities that disturb the land are issued permits prior to review and approval of the stormwater management plan. Communities may elect to issue a stormwater management permit separate of any other land development permits they require, or, as in this ordinance, to tie the issuing of construction permits to the approval of a final stormwater management plan.

3.2. Application Requirements

Unless specifically excluded by this ordinance, any land owner or operator desiring a permit for a land disturbance activity shall submit to the (jurisdictional stormwater authority) a permit application on a form provided by the (jurisdictional stormwater authority) for that purpose.

Unless otherwise excepted by this ordinance, a permit application must be accompanied by the following in order that the permit application be considered: a stormwater management concept plan; a maintenance agreement; and a non-refundable permit review fee.

The stormwater management plan shall be prepared to meet the requirements of Sec. 5 of this ordinance, the maintenance agreement shall be prepared to meet the requirements of Sec. of this ordinance, and fees shall be those established by the (jurisdictional stormwater authority).

3.3. Application Review Fees

The fee for review of any land development application shall be based on the amount of land to be disturbed at the site, and the fee structure shall be established by the (jurisdictional stormwater authority). All of the monetary contributions shall be credited to an appropriate capital improvements program project, and shall be made prior to the issuance of any building permit for the development.

Local communities can use these review fees to raise funds for staff and resources to further their stormwater management programs.

3.4. Application Procedure

- Applications for land disturbance activity permits must be filed with the (appropriate review agency) on any regular business day.

- A copy of this permit application shall be forwarded to (jurisdictional stormwater authority) for review

- Permit applications shall include the following: two copies of the stormwater management concept plan, two copies of the maintenance agreement, and any required review fees.

- Within business days of the receipt of a complete permit application, including all documents as required by this ordinance, the (jurisdictional stormwater authority) shall inform the applicant whether the application, plan and maintenance agreement are approved or disapproved.

Local officials will need to decide the appropriate time frame for review of an application. This will often be determined by the staff available for permit review and for an inspection of sites undergoing construction.

- If the permit application, stormwater management plan or maintenance agreement are disapproved, the applicant may revise the stormwater management plan or agreement. If additional information is submitted, the (jurisdictional stormwater authority) shall have business days from the date the additional information is received to inform the applicant that the plan and maintenance agreement are either approved or disapproved.

- If the permit application, final stormwater management plan and maintenance agreement are approved by the (jurisdictional stormwater authority), all appropriate land disturbance activity permits shall be issued.

3.5. Permit Duration

Permits issued under this section shall be valid from the date of issuance through the date the (jurisdictional stormwater authority) notifies the permitholder that all stormwater management practices have passed the final inspection required under permit condition.

SECTION 4. WAIVERS TO STORMWATER MANAGEMENT REQUIREMENTS

4.1. Waivers for Providing Stormwater Management

Every applicant shall provide for stormwater management, unless they file a written request to waive this requirement. Requests to waive the stormwater management plan requirements shall be submitted to the (jurisdictional stormwater authority) for approval. The minimum requirements for stormwater management may be waived in whole or in part upon written request of the applicant, provided that at least one of the following conditions applies:

- It can be demonstrated that the proposed development is not likely to impair attainment of the objectives of this ordinance.

2. Alternative minimum requirements for on-site management of stormwater discharges have been established in a stormwater management plan that has been approved by the (jurisdictional stormwater authority) and that is required to be implemented by local ordinance.

- Provisions are made to manage stormwater by an off-site facility. The off-site facility is required to be in place, to be designed and adequately sized to provide a level of stormwater control that is equal to or greater than that which would be afforded by on-site practices and has a legally obligated entity responsible for long-term operation and maintenance of the stormwater practice.

- The (jurisdictional stormwater authority) finds that meeting the minimum on-site management requirements is not feasible due to the natural or existing physical characteristics of a site.
- Non-structural practices are provided that reduce the generation of stormwater from the site, the size and cost of stormwater storage and provide partial removal of many pollutants are to be used at the site. These non-structural practices are explained in detail in the current design manual and the amount of credit available for using such practices shall be determined by the (jurisdictional stormwater authority)

In instances where one of the conditions above applies, the (jurisdictional stormwater authority) may grant a waiver from strict compliance with stormwater management provisions that are not achievable, provided that acceptable mitigation measures are provided. However, to be eligible for a variance, the applicant must demonstrate to the satisfaction of the (jurisdictional stormwater authority) that the immediately downstream waterways will not be subject to:

- Deterioration of existing culverts, bridges, dams, and other structures;
- Deterioration of biological functions or habitat;
- Accelerated streambank or streambed erosion or siltation;
- Increased threat of flood damage to public health, life and property.

Furthermore, where compliance with minimum requirements for stormwater management is waived, the applicant will satisfy the minimum requirements by meeting one of the mitigation measures selected by the jurisdictional stormwater authority. Mitigation measures may include, but are not limited to, the following:

The purchase and donation of privately owned lands, or the grant of an easement to be dedicated for preservation and/or reforestation. These lands should be located adjacent to the stream corridor in order to provide permanent buffer areas to protect water quality and aquatic habitat,

The creation of a stormwater management facility or other drainage improvements on previously developed properties, public or private, that currently lack stormwater management facilities designed and constructed in accordance with the purposes and standards of this ordinance,

Monetary contributions (Fee-in-Lieu) to fund stormwater management related studies including regional wetland delineation studies, stream monitoring studies for water quality and macroinvertebrates, stream flow monitoring, and threatened and endangered species studies.

4.2. Fee in Lieu of Stormwater Management Practices.

Where the (jurisdictional stormwater authority) waives all or part of the minimum stormwater management requirements, or where the waiver is based on the provision of adequate stormwater facilities provided downstream of the proposed development, the applicant shall be required to pay a fee in an amount as determined by the (jurisdictional stormwater authority).

When an applicant obtains a waiver of the required stormwater management, the monetary contribution required shall be in accordance with a fee schedule (unless the developer and the stormwater authority agree on a greater alternate contribution) established by the (jurisdictional stormwater authority), and based on the cubic feet of storage required for stormwater management of the development in question. All of the monetary contributions shall be credited to an appropriate capital improvements program project, and shall be made by the developer prior to the issuance of any building permit for the development.

4.3. Dedication of land

In lieu of a monetary contribution, an applicant may obtain a waiver of the required stormwater management by entering into an agreement with the (jurisdictional stormwater authority) for the granting of an easement or the dedication of land by the applicant, to be used for the construction of an off-site stormwater management facility. The agreement shall be entered into by the applicant and the (jurisdictional stormwater authority) prior to the recording of plats or, if no record plat is required, prior to the issuance of the building permit.

SECTION 5. GENERAL PERFORMANCE CRITERIA FOR STORMWATER MANAGEMENT

Unless judged by the (jurisdictional stormwater authority) to be exempt or granted a waiver, the following performance criteria shall be addressed for stormwater management at all sites:

(A). All site designs shall establish stormwater management practices to control the peak flow rates of stormwater discharge associated with specified design storms and reduce the generation of stormwater. These practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater

runoff from driveways, sidewalks, rooftops, parking lots, and landscaped areas to the maximum extent practical to provide treatment for both water quality and quantity.

There are several sources of climatological references that can be consulted to find the rainfall depths for the appropriate design storm intervals (1, 10, 25, and 100 year). The NOAA National Climatological Data Center has a "Summary of the Day" database that can provide rainfall numbers for most major cities and airports in the country. Another possible source is the Urban Hydrology for Small Watersheds, TR-55 (Technical Release 55) published by the Engineering Division, United States Natural Resource Conservation Service (formerly known as the Soil Conservation Service) United States Department of Agriculture, June 1986.

(B). All stormwater runoff generated from new development shall not discharge untreated stormwater directly into a jurisdictional wetland or local water body without adequate treatment. Where such discharges are proposed, the impact of the proposal on wetland functional values shall be assessed using a method acceptable to the (jurisdictional stormwater authority). In no case shall the impact on functional values be any less than allowed by the Army Corp of Engineers (ACE) or the (Appropriate State Agency) responsible for natural resources.

(C). Annual groundwater recharge rates shall be maintained, by promoting infiltration through the use of structural and non-structural methods. At a minimum, annual recharge from the post development site shall mimic the annual recharge from pre-development site conditions.

Recharge is a relatively new stormwater criterion, and has been implemented so far in the Massachusetts coastal zone and in Maryland. The recharge criteria requires considerable effort to use existing pervious areas for stormwater treatment and infiltration, which means that it must be considered very early in the site design process when basic decisions about layout and vegetative cover are made.

(D). For new development, structural STPs shall be designed to remove % of the average annual post development total suspended solids load (TSS). It is presumed that a STP complies with this performance standard if it is:

- sized to capture the prescribed water quality volume (WQ_v).
- designed according to the specific performance criteria outlined in the local stormwater design manual,
- constructed properly, and
- maintained regularly.

For post construction stormwater runoff, the ability of stormwater management programs to meet federal guidelines under the NPDES regulations will become increasingly important. A local government seeking to manage runoff to achieve water quality standards has a number of options for reaching their goal. The options are listed below, from the most typical standard stormwater quality practice to more advanced program options. Each option has an associated level of effort for the management of stormwater, and the likelihood of realizing water quality treatment goals depends on the option a local government selects. Local governments should assess the option they wish to select in light of new Phase II regulations and the current ability of their stormwater management staff to meet more extensive local/state staff review and inspection requirements.

Option 1. ***Require Stormwater Treatment Practices for Stormwater Quality***

Many current stormwater programs simply require that the developer install stormwater treatment practices, but do not specify a target for specific pollutant reduction performance. These programs simply require that a standard volume of stormwater be treated (e.g., a half-inch of runoff). Many of these programs also have generous waiver and exemption provisions, so that as much as 25% of all new development can avoid criteria for water quality. Typically, these programs have no formal maintenance programs. Unless the target removal goals are very low, these communities cannot expect their current programs to eliminate net additional pollutants associated with future development.

Option 2. ***Institute More Rigorous Design Standards for Stormwater Practices.***

A number of communities have improved their stormwater programs by strengthening their design standards for stormwater practices. This has involved narrowing the list of acceptable practices to those with a proven ability to remove particular pollutants, increasing the volume of runoff that is treated by each practice (e.g., treat first 1" of stormwater runoff), clamping down on waivers and exemptions (or requiring a fee-in-lieu), and requiring design features that reduce maintenance problems.

The advantage of this program option is that compliance can be presumed as long as designers follow the design rules. It does require a good stormwater manual and more extensive local/state staff review and training. It can achieve significant reduction for some pollutants, such as sediment and nutrients. The disadvantage of the program option is that current stormwater technology may not be effective enough for some pollutants (e.g., bacteria), or capable of reducing the net additional load for high levels from future development.

Option 3. ***Require On-Site Load Calculation***

A handful of communities have adopted an approach whereby the design engineer must calculate pre- and post- development loads for a particular pollutant, and then design a system of practices to meet a load reduction target, based on STP removal rates. Phosphorus has been used in most cases, and the load reduction target varies. This option results in more directed design geared more specifically to the pollutant of concern.

The on-site load calculation option has several disadvantages. First, designers often utilize STP math tricks to come into compliance (fudging loads, removal efficiencies, etc). Second, technical data to support the program option are limited to just a few parameters, such as phosphorus, nitrogen and sediment. Third, the removal rates for the stormwater practices seldom account for factors where pollutant load removal is compromised, and tend to be optimistic. Lastly, this program option is very intensive in terms of local review and compliance, and requires more staffing to implement.

Option 4. ***Load Calculation w/ Stormwater Offset Fee to Provide Retrofits on Existing Development***

In this program option, a community requires the on-site load calculation described in Option 3, but is very conservative in the assumptions it allows on loading and removal efficiency. Consequently, designers at most sites cannot fully comply with the load reduction

for the requirement at their site. To fully comply, they must pay an offset fee to the local government which is used to support design and construction of stormwater retrofits at existing development in the watershed. The fee is set at the cost of providing an equivalent amount of pollutant removal elsewhere (dollars/pound).

The advantage of this approach is that it provides a means of financing the stormwater retrofits needed to reduce pollutant loads from existing development. It does require greater local staffing to find, design and build the retrofits which offset the loads from new development. If administered properly, this program option can potentially eliminate the net additional load from new development. Several communities currently provide this option for developers, but it is not clear how much revenue has been collected so far.

(E). To protect stream channels from degradation, a specific channel protection criteria shall be provided as prescribed in the current stormwater manual.

Channel protection is a relatively new criterion, but is increasingly viewed as a critical one due to the mounting evidence that stream channels enlarge in response to watershed development. Studies have found higher bank erosion rates and increased instream sediment loads for urban streams when compared to the 5-20% estimate for the annual sediment budget attributable to bank erosion in rural streams (Walling and Woodward, 1995; Collins et al., 1997). Research also indicates that channel enlargement can begin at a relatively low level of watershed development, as indicated by the amount of impervious cover. One study estimated that channel erosion rates were three to six times higher in a moderately urbanized watershed (14% impervious cover) than in a comparable rural one, with less than 2% impervious cover (Neller, 1988).

The basic methodology to calculate channel enlargement relies on obtaining historical cross-sectional data from past surveys (often obtained from transportation agencies or public works departments that conducted surveys at the time of road construction or improvement projects) and comparing these with current cross-sectional data obtained from field surveys conducted at the time of the study. The approach also utilizes predictive (i.e., empirical) equations to estimate an ultimate channel enlargement ratio once the channel has enlarged sufficiently to be in balance with its hydrological forces.

Basic Options for Stream Channel Protection

As many as five different design criteria have been suggested to protect downstream channels from erosion. It should be clearly noted that none of these criteria have yet been monitored in the field to demonstrate their effectiveness, and most are based on hydrologic or hydraulic modeling of streams. The five options are:

Two year control ***(post development peak discharge rate from two year storm is held to pre development levels). It is very important to note that research studies indicate that this***

criterion does not protect channels from downstream erosion, and may actually exacerbate erosion since banks are exposed to a longer duration of erosive bankfull and sub-bankfull events. (MaCrae, 1993 and 1996, McCuen and Moglen, 1988). In addition, many communities have provided anecdotal evidence that two year control has failed to protect downstream channels from erosion. This evidence suggests that while the magnitude of the peak discharge is unchanged from pre to post development under two year control, the duration of erosive flows sharply increases. As a result, "effective work" on the channel (sensu Wolman et al, 1964) is shifted to smaller runoff events that range from the half year event up to the 1.5 year runoff event (MacRae, 1993). Consequently, the two year control approach is considered ineffective for stream channel protection, although it remains a useful criterion for prevention of overbank flooding.

Two year over-control ***(post development peak discharge rate to 50% or less of predevelopment level). First proposed by McCuen and Moglen (1988), this design approach recognizes the inherent limitations of two year control. The approach emphasizes "overcontrol" of the two year storm. The most common numerical approach is to control the two year post development discharge rate to the one year predevelopment rate, using the 24 hour storm event. Subsequent analysis by Macrae (1996), however, indicates that this design criterion is still not fully capable of protecting the stream channel from erosion. His modeling suggests that "tail-end" of the post development hydrograph is subject to a considerable duration of "effective work."***

24 hour detention of the one year storm event. ***These criteria would result in up to 24 hours of detention for runoff generated by a rainfall depth based on annual rainfall for a region. Smaller storms events would also experience some detention, but probably much less than 24 hours. The premise of these criteria is that runoff would be stored and released in such a gradual manner that critical erosive velocities would seldom be exceeded in downstream channels. The required volume needed for 1 year extended detention is significant; it is roughly equivalent to about 90 to 95% of the required volume needed for ten year peak discharge control. Consequently, the need for two year peak discharge management would be eliminated when the 1 year ED is provided, as long as the ten year peak discharge control is achieved.***

Distributed runoff control (DRC): ***This criterion has been developed by MaCrae (1993) and involves complex field assessments and modeling to determine the hydraulic stress and erosion potential of bank materials. The criteria states that channel erosion is minimized if the alteration in the transverse distribution of erosion potential about a channel parameter is maintained constant with predevelopment values, over the range of available flows, such that the channel is just able to move the dominant particle size of the bed load. This Canadian method holds promise, but has not been tested extensively in the United States and requires significantly greater data collection and modeling then any of the other methods.***

Bankfull capacity/duration criteria: ***This criterion has been advanced by Tapley et al. 1996, and states that the post-development, bankfull flow frequency, duration and depth must be controlled to predevelopment values at a designated control point(s) in the channel. The Rule of thumb for selecting control point(s) is to use a 10: 1 ratio of peak discharge from the one year storm for the developed site to the discharge from the stream for the same frequency storm (Tapley et al. 1996). In theory, these criteria should result in a high level of downstream protection. The practical problem is in defining how the criteria is to be interpreted; whether sub-bankfull events (that typically erode the toe of the streambank)***

should also be considered; and precisely where the "bankfull" should be measured. For example, the channel of many streams has been modified in the past by prior land uses and channelization, and may not represent the "true" channel. In other cases, the stormwater outfall discharges laterally to a stream, and it is therefore difficult to assign which flows the developer is actually responsible for controlling.

Pros and Cons of Channel Protection Sizing Criteria.

If two year control and two year overcontrol are deemed inadequate to fully protect channels from erosion, then only three options remain, each of which has some limitations. For example, both the DRC and bankfull capacity sizing criteria options lack widely accepted or universal design methodologies. In each case, local stream cross-section and/or soil measurements are needed, and considerable contention between the designer and the reviewer can be expected on how and where the analysis should be performed. Given the many operational problems currently associated with either option, and the lack of a tested design methodology at present, the two options probably deserve further study, but are not ready for wide application.

This leaves only one remaining option-- the one-year 24 hour detention criteria. It, too, has some limitations:

- ***results in unacceptably small diameter orifices for sites less than ten acres in size.***
- ***requires a storage volume roughly equivalent to that needed for two year control.***
- ***has not been "tested" by continuous simulation modeling to determine if acceptable detention times can be achieved for smaller storms can be achieved (1.0 to 1.5 inches).***
- ***is only needed in streams that are susceptible to bank erosion.***

Based on the foregoing, it appears that the best option to provide channel protection (Cp_v) is 12 to 24 hour extended detention of the one-year 24 hour storm event. This Cp_v requirement only applies to sites greater than ten acres in size. Local governments may wish to retain the option of employing the DRC or bankfull capacity/duration criteria as an alternative, should their analytical and design requirements become more simplified and refined in the future

There are some basic exemptions to where the channel protection criteria should be applied (small drainage areas, direct discharge to tidal waters or a lake, flat terrain etc), and communities must decide how and when this criteria will be required.

(F). Stormwater discharges to critical areas with sensitive resources (i.e., cold water fisheries, shellfish beds, swimming beaches, recharge areas, water supply reservoirs) may be subject to additional performance criteria, or may need to utilize or restrict certain stormwater management practices.

(G). Certain industrial sites are required to prepare and implement a stormwater pollution prevention plan, and shall file a notice of intent (NOI) under the provisions of the National Pollutant Discharge Elimination System (NPDES) general permit. The stormwater pollution prevention plan requirement applies to both existing and new industrial sites.

Applicants and local communities may wish to consult the Environmental Protection Agency website at http://www.epa.gov/owm/swm/phase2 for more information on Phase II requirements.

(H). Stormwater discharges from land uses or activities with higher potential pollutant loadings, known as "hotspots," may require the use of specific structural STPs and pollution prevention practices.

(I). Prior to design, applicants are required to consult with the (jurisdictional stormwater authority) to determine if they are subject to additional stormwater design requirements.

(J). The calculations for determining peak flows as found in the Stormwater Design Manual shall be used for sizing all stormwater management practices.

SECTION 6. BASIC STORMWATER MANAGEMENT DESIGN CRITERIA

Rather than place specific stormwater design criteria into an ordinance, it is often preferable to fully detail these requirements in a stormwater design manual. This allows specific design information to change over time as new information or techniques become available without requiring the formal process needed to change ordinance language. The ordinance can then require those submitting any development application to consult the current stormwater design manual for the exact design criteria for the stormwater management practices appropriate for their site.

In the Maryland Stormwater Design Manual, for example, there are a set of specified performance criteria for each stormwater management practice, based on six factors:

- ***Site Design Feasibility -***
- ***Conveyance Issues -***
- ***Pretreatment Requirements -***
- ***Treatment/Geometry Conditions***
- ***Environmental/Landscaping Standards***
- ***Maintenance Needs***

Each community will need to decide the specific design and sizing criteria for the stormwater management practices they allow, and select a storm event frequency(1, 2, 10, 100 year) that they believe will meet their stormwater quality and quantity control requirements.

6.1. Minimum Control Requirements

All stormwater management practices will be designed so that the specific storm frequency storage volumes (e.g., recharge, water quality, channel protection, 10 year, 100 year) as identified in the current stormwater design manual are met, unless the (jurisdictional stormwater authority) grants the applicant a waiver or the applicant is exempt from such requirements.

In addition, if hydrologic or topographic conditions warrant greater control than that provided by the minimum control requirements, the (jurisdictional stormwater authority) reserves the right to impose any and all additional requirements deemed necessary to control the volume, timing, and rate of runoff.

6.2 Site Design Feasibility

Stormwater management practices for a site shall be chosen based on the physical conditions of the site. Among the factors that should be considered:

- Topography
- Maximum Drainage Area
- Depth to Water Table
- Soils
- Slopes
- Terrain
- Head
- Location in relation to environmentally sensitive features or ultra-urban areas

Applicants shall consult the Stormwater Design Manual for guidance on the factors that determine site design feasibility when selecting a stormwater management practice.

6.3. Conveyance Issues

All stormwater management practices shall be designed to convey stormwater to allow for the maximum removal of pollutants and reduction in flow velocities. This shall include, but not be limited to:

- Maximizing of flowpaths from inflow points to outflow points
- Protection of inlet and outfall structures
- Elimination of erosive flow velocities
- Providing of underdrain systems, where applicable

The Stormwater Design Manual shall provide detailed guidance on the requirements for conveyance for each of the approved stormwater management practices.

6.4. Pretreatment Requirements

Every stormwater treatment practice shall have an acceptable form of water quality pretreatment, in accordance with the pretreatment requirements found in the current stormwater design manual. Certain stormwater treatment practices, as specified in the Stormwater Design Manual, are prohibited even with pretreatment in the following circumstances:

A. Stormwater is generated from highly contaminated source areas known as "hotspots"

B. Stormwater is carried in a conveyance system that also carries contaminated, non- stormwater discharges

C. Stormwater is being managed in a designated groundwater recharge area

D. Certain geologic conditions exist (e.g., karst) that prohibit the proper pretreatment of stormwater

6.5. Treatment/Geometry Conditions

All stormwater management practices shall be designed to capture and treat stormwater runoff according to the specifications outlined in the Stormwater Design Manual. These specifications will designate the water quantity and quality treatment criteria that apply to an approved stormwater management practice.

6.6. Landscaping Plans Required

All stormwater management practices must have a landscaping plan detailing both the vegetation to be in the practice and how and who will manage and maintain this vegetation. This plan must be prepared by a registered landscape architect or soil conservation district.

6.7. Maintenance Agreements

All stormwater treatment practices shall have an enforceable operation and maintenance agreement to ensure the system functions as designed. This agreement will include any and all maintenance easements required to access and inspect the stormwater treatment practices, and to perform routine maintenance as necessary to ensure proper functioning of the stormwater treatment practice. In addition, a legally binding covenant specifying the parties responsible for the proper maintenance of all stormwater treatment practices shall be secured prior to issuance of any permits for land disturbance activities.

6.8. Non-Structural Stormwater Practices

The use of non-structural stormwater treatment practices is encouraged in order to minimize the reliance on structural practices. Credit in the form of reductions in the amount of stormwater that must be managed can be earned through the use of non-structural practices that reduce the generation of stormwater from the site. These non-structural practices are explained in detail in the current design manual and applicants wishing to obtain credit for use of non-structural practices must ensure that these practices are documented and remain unaltered by subsequent property owners.

SECTION 7. REQUIREMENTS FOR STORMWATER MANAGEMENT PLAN APPROVAL

7.1. Stormwater Management Plan Required for All Developments.

No application for development will be approved unless it includes a stormwater management plan detailing in concept how runoff and associated water quality impacts resulting from the development will be controlled or managed. This plan must be prepared by an individual approved by the (jurisdictional stormwater authority) and must indicate whether stormwater will be managed on-site or off-site and, if on-site, the general location and type of practices.

The stormwater management plan(s) shall be referred for comment to all other interested agencies, and any comments must be addressed in a final stormwater management plan. This final plan must be signed by a licensed professional engineer (PE), who will verify that the design of all stormwater management practices meet the submittal requirements outlined in the Submittal Checklist found in the stormwater design manual. No building, grading, or sediment control permit shall be issued until a satisfactory final stormwater management plan, or a waiver thereof, shall have undergone a review and been approved by

the (jurisdictional stormwater authority) after determining that the plan or waiver is consistent with the requirements of this ordinance.

One way to handle the submittal requirements for both the concept plan and the final design plan is to place Submittal Checklists in the stormwater design manual and require that they are used for submission of any plan. The benefit of this is that changes in submittal requirements can be made as needed without needing to revisit and alter the original ordinance. Attached are three model checklists that local communities may wish to review for ideas on requirements in their own submittal checklist.

7.2. Stormwater Management Concept Plan Requirements

A stormwater management concept plan shall be required with all permit applications and will include sufficient information (e.g., maps, hydrologic calculations, etc) to evaluate the environmental characteristics of the project site, the potential impacts of all proposed development of the site, both present and future, on the water resources, and the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. The intent of this conceptual planning process is to determine the type of stormwater management measures necessary for the proposed project, and ensure adequate planning for management of stormwater runoff from future development. To accomplish this goal the following information shall be included in the concept plan:

- A map (or maps) indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural stormwater management and sediment control facilities. The map(s) will also clearly show proposed land use with tabulation of the percentage of surface area to be adapted to various uses; drainage patterns; locations of utilities, roads and easements; the limits of clearing and grading; A written description of the site plan and justification of proposed changes in natural conditions may also be required.

This project description and site plan requirement includes information normally found in an Erosion and Sediment Control plan. For local governments that do not currently have ESC plan requirements or are looking to upgrade their ESC ordinance language, there is a model Erosion and Sediment Control ordinance located at this website.

- Sufficient engineering analysis to show that the proposed stormwater management measures are capable of controlling runoff from the site in compliance with this ordinance and the specifications of the Stormwater Design Manual.
- A written or graphic inventory of the natural resources at the site and surrounding area as it exists prior to the commencement of the project and a description of the watershed and its relation to the project site. This description should include a discussion of soil conditions, forest cover, topography, wetlands, and other native vegetative areas on the site. Particular attention should be paid to environmentally sensitive features that provide particular opportunities or constraints for development.
- A written description of the required maintenance burden for any proposed stormwater management facility.

- The (jurisdictional stormwater authority) may also require a concept plan to consider the maximum development potential of a site under existing zoning, regardless of whether the applicant presently intends to develop the site to its maximum potential.

For development or redevelopment occurring on a previously developed site, an applicant shall be required to include within the stormwater concept plan measures for controlling existing stormwater runoff discharges from the site in accordance with the standards of this Ordinance to the maximum extent practicable.

7.3. Final Stormwater Management Plan Requirements

After review of the stormwater management concept plan, and modifications to that plan as deemed necessary by the (jurisdictional stormwater authority), a final stormwater management plan must be submitted for approval. The final stormwater management plan, in addition to the information from the concept plan, shall include all of the information required in the Final Stormwater Management Plan checklist found in the Stormwater Design Manual. This includes:

1. Contact Information

The name, address, and telephone number of all persons having a legal interest in the property and the tax reference number and parcel number of the property or properties affected.

2. Topographic Base Map

A 1" = 200' topographic base map of the site which extends a minimum of feet beyond the limits of the proposed development and indicates existing surface water drainage including streams, ponds, culverts, ditches, and wetlands; current land use including all existing structures; locations of utilities, roads, and easements; and significant natural and manmade features not otherwise shown.

3. Calculations

Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in this ordinance. Such calculations shall include (i) description of the design storm frequency, intensity and duration, (ii) time of concentration, (iii) Soil Curve Numbers or runoff coefficients, (iv) peak runoff rates and total runoff volumes for each watershed area, (v) infiltration rates, where applicable, (vi) culvert capacities, (vii) flow velocities, (viii) data on the increase in rate and volume of runoff for the design storms referenced in the Stormwater Design Manual, and (ix) documentation of sources for all computation methods and field test results.

4. Soils Information

If a stormwater management control measure depends on the hydrologic properties of soils (e.g., infiltration basins), then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles. The number and location of required soil borings or soil sits shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure.

5. Maintenance and Repair Plan

The design and planning of all stormwater management facilities shall include detailed maintenance and repair procedures to ensure their continued function. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment and skills or training necessary. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan.

- Landscaping plan

The applicant must present a detailed plan for management of vegetation at the site after construction is finished, including who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved. This plan must be prepared by a registered landscape architect or by the soil conservation district.

- Maintenance Easements

The applicant must ensure access to all stormwater treatment practices at the site for the purpose of inspection and repair by securing all the maintenance easements needed on a permanent basis. These easements will be recorded with the plan and will remain in effect even with transfer of title to the property.

- Maintenance Agreement

The applicant must execute an easement and an inspection and maintenance agreement binding on all subsequent owners of land served by an on-site stormwater management measure in accordance with the specifications of this ordinance.

- Erosion and Sediment Control Plans for Construction of Stormwater Management Measures

The applicant must prepare an erosion and sediment control plan for all construction activities related to implementing any on-site stormwater management practices.

- Other Environmental Permits

The applicant shall assure that all other applicable environmental permits have been acquired for the site prior to approval of the final stormwater design plan.

7.4. Performance Bond/Security.

The (jurisdictional stormwater authority) may, at its discretion, require the submittal of a performance security or bond prior to issuance of a permit in order to insure that the stormwater practices are installed by the permit holder as required by the approved stormwater management plan. The amount of the installation performance security shall be the total estimated construction cost of the stormwater management practices approved under the permit, plus 25%. The performance security shall contain forfeiture provisions for failure to complete work specified in the stormwater management plan.

The installation performance security shall be released in full only upon submission of "as built plans" and written certification by a registered professional engineer that the stormwater practice has been

installed in accordance with the approved plan and other applicable provisions of this ordinance. The (jurisdictional stormwater authority) will make a final inspection of the stormwater practice to ensure that it is in compliance with the approved plan and the provisions of this ordinance. Provisions for a partial pro-rata release of the performance security based on the completion of various development stages can be done at the discretion of the (jurisdictional stormwater authority).

Some communities elect to also require a maintenance performance security. This bond typically is set at the maintenance costs estimated in the stormwater plan for the period during which the permit holder has maintenance responsibility and is released when the responsibility for practice maintenance is passed on to another party, via an approved maintenance agreement.

SECTION 8. CONSTRUCTION INSPECTION

8.1. Notice of Construction Commencement

The applicant must notify the (jurisdictional stormwater authority) in advance before the commencement of construction. Regular inspections of the stormwater management system construction shall be conducted by the staff of the (jurisdictional stormwater authority) or certified by a professional engineer or their designee who has been approved by the jurisdictional stormwater authority. All inspections shall be documented and written reports prepared that contain the following information:

- The date and location of the inspection;
- Whether construction is in compliance with the approved stormwater management plan
- Variations from the approved construction specifications
- Any violations that exist

If any violations are found, the property owner shall be notified in writing of the nature of the violation and the required corrective actions. No added work shall proceed until any violations are corrected and all work previously completed has received approval by the (jurisdictional stormwater authority).

8.2. As Built Plans

All applicants are required to submit actual "as built" plans for any stormwater management practices located on-site after final construction is completed. The plan must show the final design specifications for all stormwater management facilities and must be certified by a professional engineer. A final inspection by the (jurisdictional stormwater authority) is required before the release of any performance securities can occur.

8.3. Landscaping and Stabilization Requirements

Any area of land from which the natural vegetative cover has been either partially or wholly cleared or removed by development activities shall be revegetated within ten (10) days from the substantial completion of such clearing and construction. The following criteria shall apply to revegetation efforts:

Reseeding must be done with an annual or perennial cover crop accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until such time as the cover crop is established over ninety percent (90%) of the seeded area.

Replanting with native woody and herbaceous vegetation must be accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until the plantings are established and are capable of controlling erosion.

Any area of revegetation must exhibit survival of a minimum of seventy-five percent (75%) of the cover crop throughout the year immediately following revegetation. Revegetation must be repeated in successive years until the minimum seventy-five percent (75%) survival for one (1) year is achieved.

In addition to the above requirements, a landscaping plan must be submitted with the final design describing the vegetative stabilization and management techniques to be used at a site after construction is completed. This plan will explain not only how the site will be stabilized after construction, but who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved. This plan must be prepared by a registered landscape architect or by the soil conservation district, and must be approved prior to receiving a permit.

SECTION 9. MAINTENANCE AND REPAIR OF STORMWATER FACILITIES

A model operation and maintenance ordinance for stormwater facilities is available at this website. This ordinance goes into greater detail on the elements needed to create an effective stormwater maintenance ordinance. Requirements for inspection are also included in the model.

9.1. Maintenance Easement

Prior to the issuance of any permit that has an stormwater management facility as one of the requirements of the permit, the applicant or owner of the site must execute a maintenance easement agreement that shall be binding on all subsequent owners of land served by the stormwater management facility. The agreement shall provide for access to the facility at reasonable times for periodic inspection by the (jurisdictional stormwater authority), or their contractor or agent, and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any other provisions established by this ordinance. The easement agreement shall be recorded by the (jurisdictional stormwater authority) in the land records.

9.2. Maintenance Covenants

Maintenance of all stormwater management facilities shall be ensured through the creation of a formal maintenance covenant that must be approved by the (jurisdictional stormwater authority) and recorded into the land record prior to final plan approval. As part of the covenant, a schedule shall be developed for when and how often maintenance will occur to ensure proper function of the stormwater management facility. The covenant shall also include plans for periodic inspections to ensure proper performance of the facility between scheduled cleanouts.

The (jurisdictional stormwater authority), in lieu of an maintenance covenant, may accept dedication of any existing or future stormwater management facility for maintenance, provided such facility meets all

the requirements of this chapter and includes adequate and perpetual access and sufficient area, by easement or otherwise, for inspection and regular maintenance.

9.3. Requirements for Maintenance Covenants

All stormwater management facilities must undergo, at the minimum, an annual inspection to document maintenance and repair needs and ensure compliance with the requirements of this ordinance and accomplishment of its purposes. These needs may include; removal of silt, litter and other debris from all catch basins, inlets and drainage pipes, grass cutting and vegetation removal, and necessary replacement of landscape vegetation. Any maintenance needs found must be addressed in a timely manner, as determined by the (jurisdictional stormwater authority), and the inspection and maintenance requirement may be increased as deemed necessary to ensure proper functioning of the stormwater management facility.

9.4. Inspection of Stormwater Facilities

Inspection programs may be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type which are more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the NPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other stormwater treatment practices.

9.5. Right-of-Entry for Inspection

When any new drainage control facility is installed on private property, or when any new connection is made between private property and a public drainage control system, sanitary sewer or combined sewer, the property owner shall grant to the (jurisdictional stormwater authority) the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. This includes the right to enter a property when it has a reasonable basis to believe that a violation of this ordinance is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this ordinance.

9.6. Records of Installation and Maintenance Activities.

Parties responsible for the operation and maintenance of a stormwater management facility shall make records of the installation and of all maintenance and repairs, and shall retain the records for at least years. These records shall be made available to the (jurisdictional stormwater authority) during inspection of the facility and at other reasonable times upon request.

9.7 Failure to Maintain Practices

If a responsible party fails or refuses to meet the requirements of the maintenance covenant, the (jurisdictional stormwater authority), after reasonable notice, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition. In the event that the stormwater management facility becomes a danger to public safety or

public health, the (jurisdictional stormwater authority) shall notify the party responsible for maintenance of the stormwater management facility in writing. Upon receipt of that notice, the responsible person shall have __days to effect maintenance and repair of the facility in an approved manner. After proper notice, the (jurisdictional stormwater authority) may assess the owner(s) of the facility for the cost of repair work and any penalties; and the cost of the work shall be a lien on the property, or prorated against the beneficial users of the property, and may be placed on the tax bill and collected as ordinary taxes by the county.

SECTION 10. ENFORCEMENT AND PENALTIES.

10.1. Violations

Any development activity that is commenced or is conducted contrary to this Ordinance, may be restrained by injunction or otherwise abated in a manner provided by law.

10.2. Notice of Violation.

When the (jurisdictional stormwater authority) determines that an activity is not being carried out in accordance with the requirements of this Ordinance, it shall issue a written notice of violation to the owner of the property. The notice of violation shall contain:

(1) the name and address of the owner or applicant;

(2) the address when available or a description of the building, structure or land upon which the violation is occurring;

(3) a statement specifying the nature of the violation;

(4) a description of the remedial measures necessary to bring the development activity into compliance with this Ordinance and a time schedule for the completion of such remedial action;

(5) a statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed;

(6) a statement that the determination of violation may be appealed to the municipality by filing a written notice of appeal within fifteen (15) days of service of notice of violation.

10.3. Stop Work Orders

Persons receiving a notice of violation will be required to halt all construction activities. This "stop work order" will be in effect until the (jurisdictional stormwater authority) confirms that the development activity is in compliance and the violation has been satisfactorily addressed. Failure to address a notice of violation in a timely manner can result in civil, criminal, or monetary penalties in accordance with the enforcement measures authorized in this ordinance.

10.4. Civil and Criminal Penalties

In addition to or as an alternative to any penalty provided herein or by law, any person who violates the provisions of this Ordinance shall be punished by a fine of not less than Dollars ($xx) or by imprisonment for a period not to exceed (xx) days, or both such fine and imprisonment. Such person shall be guilty of a separate offense for each day during which the violation occurs or continues.

10.4. Restoration of lands

Any violator may be required to restore land to its undisturbed condition. In the event that restoration is not undertaken within a reasonable time after notice, the (jurisdictional stormwater authority) may take necessary corrective action, the cost of which shall become a lien upon the property until paid.

10.5. Holds on Occupation Permits

Occupation permits will not be granted until corrections to all stormwater practices have been made and accepted by the (jurisdictional stormwater authority).

Approved by: _____

Date _____