This Model Stormwater Management Ordinance (MO) is intended to implement the Act 167 Stormwater Management element of Lancaster County’s Integrated Water Resources Plan (IWRP). It is based in part on Pennsylvania Department of Environmental Protection’s (DEP’s) September 27, 2011 draft Model Stormwater Management Ordinance as well as input provided by stakeholders involved in the development of the County IWRP and the Act 167 Plan Advisory Committee.

The Model Ordinance establishes performance standards and criteria consistent with the County IWRP, of which this ordinance is a part. Within six months following adoption by the Lancaster County Board of Commissioners and approval by the Pennsylvania Department of Environmental Protection (DEP), each municipality within Lancaster County must adopt or amend and implement ordinances to regulate development in a manner consistent with the Act 167 elements of the County’s IWRP.

A municipality may choose to adopt a stand-alone stormwater ordinance, which can be incorporated by reference in other municipal ordinances (the preferred approach), or incorporate the necessary standards into existing ordinances. Further, a municipality may enact additional and/or more stringent regulations, e.g. detailed design criteria. Additional regulatory provisions are acceptable only if such provisions neither conflict with, nor subvert, the IWRP, and the standards and criteria contained in this Model Ordinance.

Notes appear throughout the Model Ordinance indicating sections that require completion by the municipality. In some instances the completion of such information may require consultation with the municipal solicitor and/or engineer.
ORDINANCE NO.

LANCASTER COUNTY, PENNSYLVANIA

[Name of Municipality]

Adopted at a Public Meeting Held on

___________________, 20___

LCPC __/__/2011
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ARTICLE I
GENERAL PROVISIONS

Section 101. Short Title

This Ordinance shall be known and may be cited as the "______________ (Name of Municipality) Stormwater Management (SWM) Ordinance."

Section 102. Statement of Findings

[This Section is intended to articulate the purpose of Stormwater Management regulations. These general purposes can be applied to most communities in Lancaster County; however, the Municipality should review its own Comprehensive Plan and/or other appropriate planning document(s). The Municipality may insert additional findings as appropriate.]

The governing body of the Municipality finds that:

A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases nonpoint source pollution of water resources.

B. A comprehensive program of SWM, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, welfare, and the protection of the people of the Municipality and all the people of the Commonwealth, their resources, and the environment.

C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

D. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their Municipal Separate Storm Sewer Systems (MS4) under the National Pollutant Discharge Elimination System (NPDES).

E. Riparian forest buffers enhance water quality by filtering pollutants in runoff, providing light control and temperature moderation, processing pollutants, increasing infiltration and providing channel and shoreline stability thus decreasing erosion (DEP Riparian Forest Buffer Guidance, November 27, 2010).

Section 103. Purpose
The purpose of this Ordinance is to promote health, safety, and welfare by minimizing the harms and maximizing the benefits described in Section 102 of this Ordinance through provisions designed to:

A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code Chapter 93 to protect, maintain, reclaim, and restore the existing and designated uses of the waters of this Commonwealth.

B. Preserve the natural drainage systems as much as possible.

C. Manage stormwater runoff close to the source.

D. Provide procedures and performance standards for stormwater planning and management.

E. Maintain groundwater recharge to prevent degradation of surface and groundwater quality and to otherwise protect water resources.

F. Prevent scour and erosion of stream banks and streambeds.

G. Provide proper Operation and Maintenance of all Stormwater Management Best Management Practices (SWM BMPs) that are implemented within the Municipality.

H. Provide standards to meet NPDES permit requirements.

I. Promote stormwater runoff prevention through the use of nonstructural Best Management Practices (BMPs).

J. Provide a regulatory environment that supports the proportion, density and intensity of development called for in the comprehensive plan; allow for creative methods of improving water quality and managing stormwater runoff; and promote a regional approach to water resource management.

K. Help preserve and protect exceptional natural resources, and conserve and restore natural resource systems.

L. Promote stormwater management practices that emphasize infiltration, evaporation, and transpiration.
Section 104. Statutory Authority

A. Primary Authority:

The Municipality is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), 32 P.S. Section 680.1, et seq., as amended, the “Stormwater Management Act.” The municipality also is empowered to regulate land use activities that affect stormwater impacts by the authority of the (cite relevant sections of the applicable municipal code (e.g. 53 P.S. §§ 55101 et seq. – First Class Township Code)).

B. Secondary Authority:

The municipality also is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1968, P.L. 805, No. 247, The Pennsylvania Municipalities Planning Code, as amended.

Section 105. Applicability

The provisions, regulations, limitations, and restrictions of this ordinance shall apply to regulated activities, as defined in this Ordinance.

Section 106. Repealer

Any other ordinance provision(s) or regulation of the municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

~ OR ~

Section 106. Repeals and Continuation of Prior Regulations.

A. Except as otherwise required by law, this Ordinance is intended as a continuation of, and not a repeal of, existing regulations governing the subject matter. To the extent that this Ordinance restates regulations contained in ordinances previously enacted by the [Governing Body], this Ordinance shall be considered a restatement and not a repeal of such regulations. It is the specific intent of the [Governing Body] that all provisions of this Ordinance shall be considered in full force and effect as of the date such regulations were initially enacted. All ordinances or parts of ordinances inconsistent with the provisions of this Ordinance are hereby repealed. It is expressly provided that the provisions of this Ordinance shall not affect any act done, contract executed or liability incurred prior to its effective date, or affect any suit or prosecution pending or to be instituted to enforce any rights, rule, regulation or ordinance, or part thereof, or to punish any violation which occurred under any prior storm water regulation or ordinance. In the event any violation has occurred under any prior storm water regulation or ordinance of [Municipality], prosecution may be initiated against the alleged offender pursuant to the provisions of said prior storm water regulation or ordinance, and the provisions and penalties provided in said prior stormwater regulation or ordinance shall remain effective as to said violation.

Comment [MG1]: DEP language

Comment [MG2]: Language suggested by Morgan, Hallgren, Crosswell, and Kane.
B. Any Plan (hereinafter defined) pending at the time of the effective date of this Ordinance shall be allowed to proceed with revisions, finalization and implementation in accordance with any Ordinance in effect prior hereto. Any Subdivision and Land Development Plan filed pursuant to the provisions of the Pennsylvania Municipalities Planning Code where there isn’t a prior storm water management ordinance in effect may proceed with development in accordance with the filing at the time of the effective date of this Ordinance.

Section 107. Severability

Should any section, provision or part thereof of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 108. Compatibility with Other Ordinance Requirements

Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

Section 109. Erroneous Permit

Any permit or authorization issued or approved based on false, misleading or erroneous information provided by an applicant is void without the necessity of any proceedings for revocation. Any work, alteration or use established pursuant to such permit or other authorization is unlawful. No action may be taken by a board, agency or employee of the Municipality purporting to validate such a violation.

Section 110. Municipal Liability

Except as specifically provided by the Pennsylvania Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. §680.1 et seq., the making of any administrative decision by the [Municipality] or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the [Municipality] of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, storm water runoff, flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the [Municipality] and its officials and employees. [Municipality], by enacting and amending this Ordinance, does not waive or limit any immunity granted to the [Municipality] and its officials and employees by the Governmental Immunity Act, 42 Pa. C.S. §8541 et seq., and does not assume any liabilities or obligations.

Section 111. Duty of Persons Engaged in the Development of Land

Notwithstanding any provision(s) of this Ordinance, including exemptions, any landowner or any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety, or other property. Such measures also shall include actions as are required to
manage the rate, volume, direction, and quality of resulting stormwater runoff in a manner which otherwise adequately protects health, property, and water quality.

Section 112. Financial security

A. A financial security (bond or letter of credit) for stormwater related improvements shall be supplied by the Developer in conjunction with the subdivision/land development approval, or in conjunction with the SWM Site Plan approval if no subdivision/land development plan is required.

B. The applicant shall provide a financial security to the Municipality for the timely installation and proper construction of all SWM facilities, including E&S BMPS, as required by the approved SWM Site Plan and this ordinance and in accordance with the provisions of Sections 509, 510, and 511 of the MPC.

C. As the work of installing the required SWM Facilities proceeds, the party posting the financial security may request the Governing Body to release or authorize the release, from time to time, such portions of the financial security necessary for payment to the contractor or contractors performing the work. Any such requests shall be in writing addressed to the Governing Body, and the Governing Body shall have 45 days from receipt of such request within which to allow the Municipal Engineer to certify, in writing, to the Governing Body that such portion of the work upon the SWM Facilities has been competed in accordance with the approved SWM Site Plan. Upon such certification the Governing Body shall authorize release by the bonding company or lending institution of an amount as estimated by the Municipal Engineer fairly representing the value of the SWM Facilities completed. The Governing Body may, prior to final release at the time of completion and certification by its Engineer, require retention of 10% of the estimated cost of the aforesaid SWM Facilities.

D. In the event that any SWM Facilities which may be required have not been installed as provided in the approved SWM Site Plan the Governing Body of the Municipality is hereby granted the power to enforce any corporate bond, or other security by appropriate legal and equitable remedies. If proceeds of such bond, or other security are insufficient to pay the cost of installing or making repairs or corrections to all the SWM Facilities covered by said security, the Governing Body of the Municipality may, at its option, install part of such SWM Facilities and may institute appropriate legal or equitable action to recover the monies necessary to complete the remainder of the SWM Facilities. All of the proceeds, whether resulting from the security or from any legal or equitable action brought against the Developer, or both, shall be used solely for the installation of the SWM Facilities covered by such security, and not for any other Municipal purpose.
ARTICLE II
DEFINITIONS OF TERMS

Section 201. Interpretation and Word Usage

The language set forth in the text of this Ordinance shall be interpreted in accordance with the following rules of construction:

A. Words used or defined in one tense or form shall include other tenses or derivative forms.

B. Words in the singular number shall include the plural number, and words in the plural number shall include the singular number.

C. The masculine gender shall include the feminine and neuter. The feminine gender shall include the masculine and neuter. The neuter gender shall include the masculine and feminine.

D. The word "person" includes individuals, firms, partnerships, joint ventures, trusts, trustees, estates, corporations, associations and any other similar entities.

E. The word "Lot" includes the words "plot", "Tract", and "Parcel".

F. The words "shall," "must" and "will" are mandatory in nature and establish an obligation or duty to comply with the particular provision. The words "may" and "should" are permissive.

G. The time, within which any act required by this Ordinance is to be performed, shall be computed by excluding the first day and including the last day. However, if the last day is a Saturday or Sunday or a holiday declared by the United States Congress or the Pennsylvania General Assembly, it shall also be excluded. The word "day" shall mean a calendar day, unless otherwise indicated.

H. Any words not defined in this Ordinance or in Section 107 of the Pennsylvania Municipalities Planning Code (Act 247) shall be construed as defined in standard dictionary usage.

I. References to officially adopted regulations, standards, or publications of DEP or other governmental agencies shall include the regulation, publication, or standard in effect on the date when a SWM Site Plan is first filed. It is the intent of the (Governing Body) in enacting this Section to incorporate such changes to statutes, regulations, and publications to the extent authorized by 1 Pa. C.S. § 1937.

Section 202. Definitions of Terms

(The Municipality should review definitions and amend as necessary to ensure consistency with any pertinent regulations, e.g. floodplain management)

Accelerated Erosion - The removal of the surface of the land through the combined
action of man’s activity and the natural processes at a rate greater than would occur because of the natural process alone.

**Access Easement** – A right granted by a landowner to a grantee, allowing entry for the purpose of inspecting, maintaining and repairing SWM Facilities.

**Act 167 Plan** – A plan prepared under the authority of Pennsylvania’s Stormwater Management Act of October 4, 1978.

**Agricultural Activity** – Activities associated with agriculture such as agricultural cultivation, agricultural operation, and animal heavy use areas. This includes the work of producing crops and raising livestock including tillage, land clearing, plowing, disking, harrowing, planting, harvesting crops, or pasturing and raising of livestock and installation of Conservation Practices. Construction of new buildings or impervious areas is not considered an agricultural activity.

**Alteration** - As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the changing of surface conditions by causing the surface to be more or less impervious; earth disturbance activity.

**Animal Heavy Use Areas** – A barnyard, feedlot, loafing area, exercise lot, or other similar area on an agricultural operation where due to the concentration of animals, it is not possible to establish and maintain vegetative cover of a density capable of minimizing accelerated erosion and sedimentation by usual planting methods. The term does not include entrances, pathways and walkways between areas where animals are housed or kept in concentration.

**Applicant** - A Landowner and/or Developer, as hereinafter defined, including his heirs, successors and assigns, who has filed an application to the municipality for approval to engage in any regulated activity at a Development Site located within the municipality.

**BMP (Best Management Practice)** - Activities, facilities, control measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during and after earth disturbance activities. See also Non-structural BMP and Structural BMP.


**Building** – Any enclosed or open structure, other than a boundary wall or fence, occupying more than four (4) square feet of area and/or having a roof supported by columns, piers, or walls.

**Carbonate Geology** - Limestone or dolomite bedrock.

**Certificate of Completion** – Documentation verifying that all permanent SWM facilities have been constructed according to the plans and specifications and approved revisions
thereto.

Chapter 102 – 25 Pa. Code Chapter 102, Erosion and Sediment Control


Cistern - A reservoir or tank for storing rainwater.

Conservation Plan – A plan written by an NRCS certified planner that identifies Conservation Practices and includes site specific BMPs for agricultural plowing or tilling activities and Animal Heavy Use Areas.

Conservation Practices – Practices installed on agricultural lands to improve farmland, soil and/or water quality which have been identified in a current Conservation Plan.

Conveyance - The ability of a pipe, culvert, swale or similar facility to carry the peak flow from the design storm.

Culvert - A structure with appurtenant works which carries a stream under or through an embankment or fill.

DEP also PA DEP or PADEP – The Pennsylvania Department of Environmental Protection or any agency successor to the Pennsylvania Department of Environmental Protection.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of SWM systems.

Detention Basin - An impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Developer - A person that undertakes any Regulated Activity of this Ordinance.

Development Site (Site) - The specific area of land where regulated activities in the municipality are planned, conducted or maintained.

Disappearing Stream - A stream in an area underlain by limestone or dolomite that flows underground for a portion of its length.

Disturbed Area - An unstabilized land area where an earth disturbance activity is occurring or has occurred.

Drainage Easement - Rights to occupy and use another person’s real property for the installation and operation of stormwater management facilities, or for the maintenance of natural drainageways to preserve and maintain a channel for the flow of stormwater therein, or to safeguard health, safety, property, and facilities
E&S – Erosion and Sediment.

E&S Plan (also Erosion and Sediment Control Plan) – A site-specific plan consisting of both drawings and a narrative that identifies BMPs to minimize accelerated erosion and sedimentation before, during and after earth disturbance activities.

Earth Disturbance Activity - A construction or other human activity which disturbs the surface of the land, including, but not limited to: clearing and grubbing; grading; excavations; embankments; land development; agricultural plowing or tilling; operation of animal heavy use areas; timber harvesting activities; road maintenance activities; oil and gas activities; well drilling; mineral extraction; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

Environmentally Sensitive Area - slopes greater than 15% percent, shallow bedrock (locating within 6 feet of ground surface), wetlands, Natural Heritage Areas and other areas designated as Conservation or Preservation in Greenscapes, the Green Infrastructure Element of the County Comprehensive Plan, where encroachment by land development or land disturbance results in degradation of the natural resource.

Erosion - The natural process by which the surface of the land is worn away by water, wind, or chemical action.

Existing Conditions - The dominant land cover during the 5-year period immediately preceding a proposed regulated activity.


Flood - A general but temporary condition of partial or complete inundation of normally dry land areas from the overflow of streams, rivers, and other waters of this Commonwealth.

Flood Fringe – That portion of the floodplain outside of the floodway.

Floodplain - Any land area susceptible to inundation by water from any natural source or delineated by applicable Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary - Mapped as being a special flood hazard area. Also, the area of inundation that functions as a storage or holding area for floodwater to a width required to contain a base flood of which there is a one percent (1%) chance of occurrence in any given year. The floodplain contains both the floodway and the flood fringe.


Floodway – That portion of the floodplain which is effective in carrying flow, within which this carrying capacity must be preserved and where the flood hazard is generally highest, i.e., where water depths and velocities are the greatest. It is that area which
provides for the discharge of the base flood so the cumulative increase in water surface elevation is no more than one foot.

**Alternative Definition from 25 Pa Code Chapter 105:**

*Floodway* – The channel of the watercourse and those portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed - absent evidence to the contrary - that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

**Forest Management/Timber Operations** - Planning and activities necessary for the management of forest land. These include conducting a timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

**Frequency** - The number of times that a given storm “event” occurs or is exceeded on the average within one year.

**Grade** - A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein. (To) Grade - to finish the surface of a roadbed, top of embankment or bottom of excavation.

**Groundwater Recharge** - The process by which water from above the ground surface is added to the saturated zone of an aquifer, either directly or indirectly.

**Hydrologic Soil Group (HSG)** – Refers to soils grouped according to their runoff-producing characteristics.

A. (Low runoff potential) Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission.

B. Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well-to-well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

C. Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.

D. (High runoff potential) Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the...
surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

**Impervious Surface (Impervious Area)** – Surfaces which prevent the infiltration of water into the ground. All structures, buildings, parking areas, driveways, roads, streets, sidewalks, decks, and any areas of concrete, asphalt, packed stone, and compacted soil shall be considered impervious surface if they prevent infiltration. In addition, the Municipality, at its sole discretion, may determine other areas to be an impervious surface.

**Impoundment** - A retention or detention basin designed to retain stormwater runoff and infiltrate it into the ground (in the case of a retention basin) or release it at a controlled rate (in the case of a detention basin).

**Infiltration Structures** - A structure designed to direct runoff into the ground (e.g. french drains, seepage pits, seepage trench, rain gardens, vegetated swales, pervious paving, infiltration basins, etc.).

**Inlet** - A surface connection to a closed drain. The upstream end of any structure through which water may flow.

**Intermittent** – A natural, transient body or conveyance of water that exists for a relatively long time, but for weeks or months of the year is below the local water table and obtains its flow from both surface runoff and groundwater discharges.

**Invasive Vegetation (Invasives)** – Plants which grow quickly and aggressively, spreading, and displacing other plants. Invasives typically are introduced into a region far from their native habitat. See [Invasive Plants in Pennsylvania](#) by the Department of Conservation and Natural Resources.

**Karst** - A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

**Land Development** - Any of the following activities:

1. The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:
   a. A group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or
   b. The division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.
2. Any subdivision of land.

3. Development in accordance with Section 503(1.1) of the Pennsylvania Municipalities Planning Code.

**Landowner** - The legal or beneficial owner or owners of land including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if he is authorized under the lease to exercise the rights of the landowner, or other person having a proprietary interest in land.

**Lineament** - A linear feature in a landscape which is an expression of an underlying geological structure such as a fault.

**Manning’s Equation** - An equation for calculation of velocity of flow (e.g. feet per second) and flow rate (e.g. cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. Manning’s Equation assumes steady, gradually varied flow.

**Maximum Extent Practicable (MEP)** – Applies when the applicant demonstrates to the Municipality’s satisfaction that the performance standard is not achievable. The applicant shall take into account the best available technology, cost effectiveness, geographic features, and other competing interests such as protection of human safety and welfare, protection of endangered and threatened resources, and preservation of historic properties in making the assertion that the performance standard cannot be met and that a different level of control is appropriate.


**Municipal Separate Storm Sewer** – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), which is all of the following: (1) owned or operated by a state, city, town, borough, township, county, district, association or other public body (created under state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater or other wastes; (2) designed or used for collecting or conveying stormwater; (3) not a combined sewer; and (4) not part of a Publicly Owned Treatment Works as defined at 40 CFR § 122.2.

**Municipal Separate Storm Sewer System (MS4):** All separate storm sewers that are defined as “large” or “medium” or “small” municipal separate storm sewer systems pursuant to 40 CFR §§ 122.26(b)(18), or designated as regulated under 40 CFR § 122.26(a)(1)(iv).

**Municipality** - The [Borough, City, or Township] of [Name of Municipality], Lancaster County, Pennsylvania.

**NRCS** - Natural Resources Conservation Service (previously Soil Conservation Service, or SCS).
National Pollution Discharge Elimination System (NPDES) – A permit issued under 25 Pa. Code Chapter 92a (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance) for the discharge or potential discharge of pollutants from a point source to surface waters.

Native Vegetation – Plant species that have evolved or are indigenous to a specific geographical area. These plants are adapted to local soil and weather conditions as well as pests and diseases.

Natural Drainageway - An existing channel for water runoff that was formed by natural processes.

Natural Ground Cover – Ground cover which mimics the infiltration characteristics of predominant hydrologic soil group found at the site.

Nonpoint Source Pollution - Any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act.

Nonstructural BMPs – Planning and design approaches, operational and/or behavior-related practices which minimize stormwater runoff generation resulting from an alteration of the land surface or limit contact of pollutants with stormwater runoff.

Open Channel - A drainage element in which stormwater flows with an open surface. Open channels include, but shall not be limited to, natural and man-made drainage ways, swales, streams, ditches, canals, and pipes flowing partly full. Open channels may include closed conduits so long as the flow is not under pressure.

Outfall - Point where water flows from a conduit, stream, pipe, or drain.

Peak Discharge - The maximum rate of stormwater runoff from a specific storm event.

PennDOT - The Pennsylvania Department of Transportation or any agency successor thereto.

Pervious Area - Any material / surface that allows water to pass through at a rate equal to or greater than Natural Ground Cover.

Pipe - A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Plans - The SWM and erosion and sediment control plans and narratives.

Planning Commission - The planning commission of [Name of Municipality], Lancaster County, Pennsylvania.

Process Wastewater - Water that comes in contact with any raw material, product, by-product, or waste during any production or industrial process.
**Qualified Person** - Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

**Rate Control** - SWM controls used to manage the peak flows for the purposes of channel protection and flood mitigation.

**Rational Formula (Rational Method)** - A rainfall-runoff relation used to estimate peak flow.

**Redevelopment** – Any physical improvement to a previously developed lot that involves earthmoving, removal, or addition of impervious surfaces.

**Regional Stormwater Management Plan** – A plan to manage stormwater runoff from an area larger than a single Development Site. A Regional Stormwater Management Plan could include two adjacent parcels, an entire watershed, or some defined area in between. Regional Stormwater Management Plans can be prepared for new development, or as a retrofit to manage runoff from already developed areas.

**Regulated Activities** - Activities, including Earth Disturbance Activities that involve the alteration or development of land in a manner that may affect stormwater runoff. Regulated activities shall include, but not be limited to:

- Land Development subject to the requirements of the [name of municipality] Subdivision and Land Development Ordinance;
- Removal of ground cover, grading, filling or excavation;
- Construction of new or additional impervious or semi-impervious surfaces (driveways, parking lots, etc.), and associated improvements;
- Construction of new buildings or additions to existing buildings;
- Installation or alteration of stormwater management facilities and appurtenances thereto;
- Diversion or piping of any watercourse; and,
- Any other regulated activities where the Municipality determines that said activities may affect any existing watercourse’s stormwater management facilities, or stormwater drainage patterns.

**Release Rate** – For a specific design storm or list of design storms, the percentage of peak flow rate for existing conditions which may not be exceeded for the proposed conditions.

**Release Rate Map** – A graphical representation of the release rates for a given watershed. Release rate maps were created for each of the previously approved Act 167 plans for Lancaster County including Mill Creek, Little Conestoga Creek, Cocalico Creek, and the Conestoga River.

**Retention Basin** - A Stormwater Management Facility that includes a permanent pool for water quality treatment and additional capacity above the permanent pool for temporary runoff storage.
Riparian – Pertaining to a stream or river. Also, plant communities occurring in association with any spring, lake, river, stream or creek through which waters flow at least periodically⁶.

Riparian Buffer – A BMP that is an area of permanent vegetation along surface waters.

Riparian Corridor – A narrow strip of land, centered on a stream or river that includes the floodplain as well as related riparian habitats adjacent to the floodplain⁶.

Riparian Corridor Easement – An easement created for the purpose of protecting and preserving a Riparian Corridor.

Riparian Forest Buffer – A type of Riparian Buffer that consists of permanent vegetation that is predominantly native trees, shrubs and forbs along surface waters that is maintained in a natural state or sustainably managed to protect and enhance water quality, stabilize stream channels and banks, and separate land use activities from surface waters.

Rooftop Detention - Temporary ponding and gradual release of stormwater falling directly onto roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff - Any part of precipitation that flows over the land surface.

SCS - U.S. Department of Agriculture, Soil Conservation Service (now known as NRCS).

Sediment – Soils or other materials transported by stormwater as a product of erosion¹.

Sediment Basin - A barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other material transported by water.

Sediment Pollution - The placement, discharge or any other introduction of sediment into the waters of the Commonwealth occurring from the failure to design, construct, implement or maintain control measures and control facilities in accordance with the requirements of this Ordinance.

Sedimentation - The action or process of forming or depositing sediment in Waters of this Commonwealth¹.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the ground.

Semi-impervious / Semi-pervious surface - A surface which prevents some infiltration of water into the ground.

Sheet Flow - Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.
Small Project – Regulated activities that (measured on a cumulative basis from *the date of enactment of this Ordinance* or other date as determined by the municipality) create additional impervious areas of 1,000 sq. ft. or less or involve removal of ground cover, grading, filling or excavation of an area less than 5,000 sq. ft. and do not involve the alteration of stormwater facilities or watercourses.

Soil-Cover Complex Method - A method of runoff computation developed by the SCS (now NRCS) that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN). For more information, see “Urban Hydrology for Small WATERSHEDS”, Technical Release No. 55, SCS, January 1975 (or most current edition).

Soil Group, Hydrologic - See “Hydrologic Soil Group”.

State Water Quality Requirements - The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code and the Clean Streams Law.

Storage – A volume above or below ground that is available to hold stormwater.

Storm event - A storm of a specific duration, intensity, and frequency. 7

Storm Sewer - A system of pipes and/or open channels that is designed to convey intercepted stormwater.

Stormwater - Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.


Stormwater Management Facility (SWM Facility) - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, infiltrates/evaporates/transpires, cleans or otherwise affects stormwater runoff. Typical SWM facilities include, but are not limited to, detention and retention basins, open channels, watercourses, road gutters, swales, storm sewers, pipes, BMPs, and infiltration structures.

Stormwater Management Plan - The Lancaster County Act 167 Plan for managing stormwater runoff adopted by the County of Lancaster as required by the “Storm Water Management Act.”

Stormwater Management Site Plan (SWM Site Plan) - The Plan prepared by the Developer or his representative indicating how stormwater runoff will be managed at a particular development site according to this Ordinance.

Stream – A watercourse
**Structural BMPs** – Physical devices and practices that capture and treat stormwater runoff. Structural stormwater BMPs are permanent appurtenances to the Development Site.

**Structure** – Any man-made object having an ascertainable stationary location on or in land or water, whether or not affixed to the land.  

**Subdivision** - The division or re-division of a single Lot, Tract or Parcel of land by any means into two (2) or more Lots, Tracts, Parcels or other divisions of land, including changes in existing Lot Lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devises, transfer of ownership, or Building, or Lot development. or As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247.

**Swale** - A low lying stretch of land which gathers or carries surface water runoff.

**SWM** – Stormwater Management

**SWM Site Plan** – A Stormwater Management Site Plan.

**Timber Operations** - See Forest Management.

**Time of Concentration (Tc)** - The time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any. Or The time needed for water to flow from the most remote point in a watershed to the watershed outlet.

**Top of streambank** – First substantial break in slope between the edge of the bed of the stream and the surrounding terrain. The top of streambank can either be a natural or constructed (that is, road or railroad grade) feature, lying generally parallel to the watercourse.

**Treatment Train** – The sequencing of structural Best Management Practices to achieve optimal flow management and pollutant removal from urban stormwater.

**USDA** – United States Department of Agriculture.

**Volume Control** - SWM controls, mainly BMPs, used to remove a predetermined amount of runoff or the increase in volume between the pre and post development design storm.

**Watercourse** - A channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

**Watershed** - The entire region or area drained by a watercourse.
Waters of this Commonwealth - Any and all rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of Pennsylvania.

Wetland - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, ferns, and similar areas.

Woodland – land predominantly covered with trees and shrubs. Without limiting the foregoing, Woodlands include all land areas of 10,000 square feet or greater, supporting at least 100 trees per acre, so that either (i) at least 50 trees are two inches or greater in diameter at breast height [(DBH)], or (ii) 50 trees are at least 12 feet in height.
ARTICLE III
STORMWATER MANAGEMENT STANDARDS

Section 301. General Requirements

A. Preparation of a SWM Site Plan is required for all regulated activities, unless preparation and submission of the SWM Site Plan is specifically exempted according to Section 502 or the activity qualifies as a Small Project.

B. No regulated activities shall commence until the municipality issues unconditional written approval of a SWM Site Plan or Stormwater Permit.

C. SWM Site Plans approved by the municipality, in accordance with Section 505, shall be on site throughout the duration of the regulated activity.

D. The municipality may, after consultation with DEP, approve measures for meeting the state water quality requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, state law including, but not limited to, the Clean Streams Law. The municipality shall maintain a record of consultations with DEP pursuant to this paragraph.

E. For all regulated activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the Erosion and Sediment Pollution Control Program Manual (E&S Manual), No. 363-2134-008 (March 2012), as amended and updated.

F. Developers have the option to propose a Regional Stormwater Management Plan or participate in a Regional Stormwater Management Plan developed by others. A regional stormwater management plan may include offsite volume and rate control, as appropriate and supported by a detailed design approved by the Municipality in accordance with Section 301.D. A Regional Stormwater Management Plan must meet all of the volume and rate control standards required by this Ordinance for the area defined by the Regional Stormwater Management Plan, but not necessarily for each individual Development Site. Appropriate agreements must be established to ensure the long term viability of this option.

G. Notwithstanding any provisions of the [Name of Municipality] Zoning Ordinance, [Name of Municipality] Subdivision and Land Development Ordinance, any Ordinance which regulates construction and development within the areas of the [Name of Municipality] subject to flooding, and any other applicable requirements of the Floodplain Management Act, stormwater management facilities located in the floodplain are permitted when designed and constructed in accordance with the provisions of the BMP Manual.

H. Impervious areas:

Comment [MG6]: Municipalities are encouraged to review their Floodplain Regulations and amend as needed to allow for stream and floodplain restoration. Guidance will be provided upon request.
1. The measurement of impervious area shall include all of the impervious areas in the total proposed development even if development is to take place in stages or phases.

2. For development taking place in stages or phases, the entire development plan must be used in determining conformance with this Ordinance.

3. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious.

I. All regulated activities shall include such measures as necessary to:

1. Protect health, safety, and property;

2. Meet the water quality goals of this Ordinance by implementing measures to:
   a. Protect and/or improve the function of floodplains, wetlands, and wooded areas.
   b. Protect and/or improve native plant communities including those within the riparian corridor.
   c. Protect and/or improve natural drainageways from erosion.
   d. Minimize thermal impacts to waters of this Commonwealth.
   e. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.


J. The design of all stormwater management facilities over karst shall include an evaluation of measures to minimize adverse effects.

K. Infiltration BMPs shall be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance. Infiltration BMPs shall include pretreatment BMPs when appropriate.

L. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and Development Site conditions and shall be constructed on soils that have the following characteristics:
1. A minimum depth of 24 inches between the bottom of the facility and the seasonal high water table and/or bedrock (limiting zones), unless the selected BMP has design criteria which allow for a smaller separation.

2. A stabilized infiltration rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the Applicant's professional designer.
   a. The stabilized infiltration rate is to be determined in the same location and within the same soil horizon as the bottom of the infiltration facility.
   b. The stabilized infiltration rate is to be determined as specified in the BMP Manual.

M. The design storm volumes and precipitation intensities to be used in the analysis of peak rates of discharge shall be as required in Section 305.

N. A planting plan is required for all vegetated stormwater BMPs.
   1. Native or Naturalized/Non-invasive Vegetation suitable to the soil and hydrologic conditions of the Development Site shall be used unless otherwise specified in the BMP Manual.
   2. Invasive Vegetation may not be included in any planting schedule. (See Invasive Plants in Pennsylvania by the Department of Conservation and Natural Resources (DCNR))
   3. The limit of existing, native vegetation to remain shall be delineated on the plan along with proposed construction protection measures.
   4. Prior to construction, a tree protection zone shall be delineated at the Dripline of the tree canopy. All trees scheduled to remain during construction shall be marked; however, where groups of trees exist, only the trees on the outside edge need to be marked. A 48 inch high snow fence or 48 inch high construction fence mounted on steel posts located 8 feet on center shall be placed along the tree protection boundary. No construction, storage of material, temporary parking, pollution of soil, or regrading shall occur within the tree protection zone.
   5. All planting shall be performed in conformance with good nursery and landscape practice. Plant materials shall conform to the standards recommended by the American Association of Nurseryman, Inc. in the American Standard of Nursery Stock.
      a. Planting designs are encouraged to share planting space for optimal root growth whenever possible.
      b. No staking or wiring of trees shall be allowed without a maintenance note for the stake and/or wire removal within one year of planting.

(Municipalities who wish to include more specific requirements regarding the planting plan can refer to the County's Model SLDO Section 810.2.F for guidance.)

O. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum acceptable infiltration
capacity. Staging of earthmoving activities and selection of construction equipment should consider this protection.

P. Infiltration BMPs shall not be constructed nor receive runoff from disturbed areas until the entire contributory drainage area to the infiltration BMP has achieved final stabilization.

Q. A minimum ten (10) foot wide access easement shall be provided for all stormwater facilities with tributary areas equal or greater than 1000 sq. ft. and not located within a public right-of-way. Easements shall provide for ingress and egress to a public right-of-way.

R. Drainage easements shall be reserved where the conveyance, treatment, or storage of stormwater, either existing or proposed, is identified on the SWM Site Plan. Drainage easements shall be provided to contain and convey the 100-year frequency flood.

S. The Municipality may require additional stormwater control measures for stormwater discharges to special management areas including but not limited to:
   1. Water bodies listed as “impaired” by PADEP.
   2. Any water body or watershed with an approved Total Maximum Daily Load (TMDL).
   3. Critical areas with sensitive resources (e.g., state designated special protection waters, cold water fisheries, carbonate or other groundwater recharge areas highly vulnerable to contamination, drainage areas to water supply reservoirs, source water protection zones, etc.)

T. Roof drains and sump pumps shall discharge to infiltration or vegetative BMPs.

Section 302. Volume Controls

Volume control BMPs are intended to maintain existing hydrologic conditions for small storm events by promoting groundwater recharge and/or evapotranspiration as described in this section. Low Impact Development (LID) practices provided in the BMP Manual shall be utilized for all regulated activities to the maximum extent practicable. Runoff volume controls shall be implemented using the Design Storm Method described in Subsection A below, or through continuous modeling approaches or other means as described in the BMP Manual. Small Projects may use the method described in Subsection B to design volume control BMPs.

A. The Design Storm Method is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.

   1. Do not increase the post development total runoff volume for all storms equal to or less than the 2-year 24-hour storm event.
2. For modeling purposes:
   
a. Existing (predevelopment) non-forested pervious areas must be considered meadow in good condition.

b. Twenty percent (20%) of existing impervious area shall be considered meadow in good condition in the model for existing conditions, subject to the limit stated in Section 302.C.

c. The maximum loading ratio for volume control facilities in Karst areas shall be 3:1 impervious drainage area to infiltration area and 5:1 total drainage area to infiltration area. The maximum loading ratio for volume control facilities in non-Karst areas shall be 5:1 impervious drainage area to infiltration area and 8:1 total drainage area to infiltration area. A higher ratio may be approved by the municipality if justification is provided. Hydraulic depth may be used as an alternative to an area based loading ratio if the design hydraulic depth is shown to be less than the depth that could result from the maximum area loading ratio.

B. Volume Control for Small Projects

   1. At least the first one inch (1") of runoff from new impervious surfaces or an equivalent volume shall be permanently removed from the runoff flow – i.e. it shall not be released into the surface Waters of this Commonwealth. Removal options include reuse, evaporation, transpiration and infiltration.

C. For projects that add impervious area to a parcel, an amount of existing impervious area not to exceed 200% of the proposed impervious area is subject to the volume control requirements of this Ordinance.

D. A detailed geologic evaluation of the Development Site shall be performed in areas of carbonate geology to determine the design parameters of recharge facilities. A report shall be prepared in accordance with Section 405.A of this Ordinance.

E. Normally dry, open top, storage facilities shall completely drain the volume control storage over a period of time not less than 24 hours and not more than 72 hours from the end of the design storm. Any designed infiltration at such facilities is exempt from the minimum 24 hour standard, i.e. may infiltrate in a shorter period of time, provided that none of this water will be discharged into Waters of this Commonwealth.

F. Any portion of the volume control storage that meets the following criteria may also be used as rate control storage:

   1. Volume control storage that depends on infiltration is designed according to the infiltration standards in Section 301.

   2. The volume control storage is located within a rate control facility.

   3. The volume control storage which will be used for rate control is that storage which is available within 24 hours based on the stabilized infiltration rate and/or the evapo-transpiration rate.
G. To the maximum extent practicable, the volume control storage provided at the Development Site shall be directed to the most permeable Hydrologic Soil Group available.

Section 303. Rate Controls

Rate control for large storms, up to the 100-year event, is essential to protect against immediate downstream erosion and flooding.

A. Match Pre-development Hydrograph

Applicants shall provide infiltration facilities or utilize other techniques which will allow the post-development 100 year hydrograph to match the pre-development 100 year hydrograph, along all parts of the hydrograph, for the Development Site. To match the pre-development hydrograph, the post development peak rate must be less than or equal to the pre-development peak rate, and the post development runoff volume must be less than or equal to the pre-development volume for the same storm event. A shift in hydrograph peak time of up to five minutes and a rate variation of up to 5% at a given time may be allowable to account for the timing affect of BMPs used to manage the peak rate and runoff volume. “Volume Control” volumes as given in Section 302 above may be used as part of this option.

B. Where the pre-development hydrograph cannot be matched, one of the following shall apply:

1. For areas not covered by a release rate map from an approved Act 167 Plan:

   Post development discharge rates shall not exceed the predevelopment discharge rates for the 2, 10, 25, 50, and 100-year 24-hour storm events*. If it is shown that the peak rates of discharge indicated by the post development analysis are less than or equal to the peak rates of discharge indicated by the predevelopment analysis for 2, 10, 25, 50, and 100-year, 24-hour storms*, then the requirements of this section have been met. Otherwise, the applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.

   * A 24 hour SCS type II storm or an IDF Curve Rational Method storm. See Table III-1.

2. For areas covered by a release rate map from an approved Act 167 Plan:

   For the 2, 10, 25, 50, and 100-year storm events*, the post development peak discharge rates will follow the applicable approved release rate maps.

   *A 24 hour SCS type II storm or an IDF Curve Rational Method storm. See Table III-1
C. Normally dry, open top, storage facilities shall completely drain the rate control storage over a period of time less than or equal to 24 hours from the peak 100 year water surface design elevation.

D. A variety of BMPs should be employed and tailored to suit the Development Site. The following is a partial listing of BMPs which can be utilized in SWM systems for peak rate control where appropriate:

1. Decreased impervious surface coverage
2. Routed flow over grass
3. Grassed channels and vegetated strips.
4. Bio-retention areas (rain gardens)
5. Concrete lattice block or permeable surfaces
6. Seepage pits, seepage trenches or other infiltration structures
7. Rooftop detention
8. Parking lot detention
9. Cisterns and underground reservoirs
10. Amended soils
11. Retention basins
12. Detention basins
13. Other methods as may be found in the BMP Manual.

E. Small Projects are not required to provide for Rate Control.

Section 304. Stormwater Management Performance Standards

A. Runoff from impervious areas shall be drained to pervious areas within the Development Site, unless the site has 85% or more impervious cover and is a Redevelopment, in which case the portion of the site that discharges to pervious areas shall be maximized.

B. Stormwater runoff from a Development Site to an adjacent property shall flow directly into a natural drainageway, watercourse, or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow.

C. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification of the adjacent property owner(s) by the developer. Such stormwater flows shall be subject to the requirements of this Ordinance, including the establishment of a drainage easement. Copies of all such notifications shall be included in SWM Site Plan submissions.

D. Maximum use shall be made of the existing on-site natural and man-made SWM facilities.

E. Stormwater runoff shall not be transferred from one sub-watershed to another unless they are sub-watersheds of a common watershed that join together within the perimeter.
of the Development Site, the effect of the transfer does not alter the peak discharge onto adjacent lands and drainage easements from the affected landowners are provided.

F. Minimum floor elevations for all structures that would be affected by a basin, other temporary impoundments, or open conveyance systems where ponding may occur shall be two (2) feet above the 100-year water surface elevation. If basement or underground facilities are proposed, detailed calculations addressing the effects of stormwater ponding on the structure and water-proofing and/or flood-proofing design information shall be submitted for approval.

G. All stormwater conveyance facilities (excluding detention, retention, and wetland basin outfall structures) shall be designed for a 25 year storm event*. All stormwater conveyance facilities (excluding detention, retention, and wetland basin outfall structures) conveying water originating from offsite shall be designed for a 50 year storm event*. Safe conveyance of the 100-year runoff event* to appropriate peak rate control BMPs must be provided in the design.

* A 24 hour SCS type storm or an IDF Curve Rational Method storm.

H. Erosion protection shall be provided along all open channels, and at all points of discharge. Flow velocities from any storm sewer may not result in erosion of the receiving channel.
Section 305. Calculation Methodology

A. Any stormwater runoff calculations involving drainage areas greater than 200 acres and Tc greater than 60 minutes, including on- and off-site areas, shall use generally accepted calculation techniques based on the NRCS soil-cover complex method.

B. Stormwater runoff from all Development Sites shall be calculated using either the modified rational method, a soil-cover-complex methodology, or other method acceptable to the Municipality. Table III-1 summarizes acceptable computation methods. It is assumed that all methods will be selected by the design professional based on the individual limitations and suitability of each method for a particular Development Site.

<table>
<thead>
<tr>
<th>METHOD</th>
<th>METHOD DEVELOPED BY</th>
<th>APPLICABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR-20 (or commercial computer package based on TR-20)</td>
<td>USDA NRCS</td>
<td>Applicable where use of full hydrology computer model is desirable or necessary.</td>
</tr>
<tr>
<td>TR-55 (or commercial computer package based on TR-55)</td>
<td>USDA NRCS</td>
<td>Applicable for land development plans within limitations described in TR-55.</td>
</tr>
<tr>
<td>HEC-1 / HEC-HMS</td>
<td>US Army Corps of Engineers</td>
<td>Applicable where use of full hydrologic computer model is desirable or necessary.</td>
</tr>
<tr>
<td>Rational Method (or commercial computer package based on Rational Method)</td>
<td>Emil Kuichling (1889)</td>
<td>For development sites less than 200 acres, Tc&lt;60 min. or as approved by the Municipality.</td>
</tr>
<tr>
<td>Other Methods</td>
<td>Varies</td>
<td>Other methodologies approved by the Municipality.</td>
</tr>
</tbody>
</table>

C. If the SCS method is used, Antecedent Moisture Condition 1 is to be used in areas of carbonate geology, and Antecedent Moisture Condition 2 is to be used in all other areas. A type II distribution shall be used in all areas.

D. If the Rational Method is used, the NOAA Atlas 14 data (see item “B” above) shall be used to determine the rainfall intensity in inches per hour based on the information for the 5 through 60 minute duration storm events.

E. Hydrographs may be obtained from NRCS methods such as TR-55, TR20, or from use of the “modified” or “unit hydrograph” rational methods. If “modified” or “unit hydrograph” rational methods are used, the ascending leg of the hydrograph shall have a time of
three times the time of concentration (3xTc) and the descending leg shall have a time of 7 times the time of concentration (7xTc) to approximate an SCS type II hydrograph.11

F. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediment basins, retention and detention structures and sufficient design information to construct such facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of stormwater runoff from the Development Site.

G. For the purpose of calculating pre-development peak discharges, all runoff coefficients, both on-site and off-site, shall be based on actual land use assuming summer or good land conditions. Post-development runoff coefficients for off-site discharges used to design conveyance facilities shall be based on actual land use assuming winter or poor land conditions.

H. Criteria and assumptions to be used in the determination of stormwater runoff and design of management facilities are as follows:

1. Runoff coefficients shall be based on the information contained in Appendix B-2 and B-3 if the actual land use is listed in those Appendices. If the actual land use is not listed in these Appendices, runoff coefficients shall be chosen from other published documentation, and a copy of said documentation shall be submitted with the SWM Site Plan.

2. A sample worksheet for calculating Tc is provided in Appendix B-5. Times of concentration (Tc) shall be based on the following design parameters:

   a. Sheet flow: The maximum length for each reach of sheet or overland flow before shallow concentrated or open channel flow develops is one hundred fifty (150) feet. Flow lengths greater than one hundred (100) feet shall be justified based on the actual conditions at each Development Site. Sheet flow may be determined using the nomograph in Appendix B-4, or the Manning’s kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in Appendix B-5.

   b. Shallow concentrated flow: Travel time for shallow concentrated flow shall be determined using Figure 3-1 from TR-55, Urban Hydrology for small watersheds, as shown in Appendix B-6.

   c. Open Channel flows: At points where sheet and shallow concentrated flows concentrate in field depressions, swales, gutters, curbs, or pipe collection systems, the travel times and downstream end of the Development Site between these design points shall be based upon Manning’s Equation and/or acceptable engineering design standards as determined by the Municipal Engineer.
3. The developer may use the stormwater credits. The allowable reduction will be determined by the Municipality.

Section 306. Riparian Corridors

A. In order to protect and improve water quality, a Riparian Corridor Easement shall be created and recorded as part of any subdivision or land development that encompasses a Riparian Corridor.

B. Except as otherwise required by Chapter 102, the Riparian Corridor Easement shall be measured to be the greater of the limit of the 100 year floodplain or 35 feet from the top of streambank (on each side).

C. Minimum Management Requirements for Riparian Corridors

1. Existing native vegetation shall be protected and maintained within the Riparian Corridor Easement.
2. Whenever feasible invasive vegetation shall be actively removed and the Riparian Corridor Easement shall be planted with native trees, shrubs and other vegetation to create a diverse native plant community appropriate to the intended ecological context of the site.

D. The Riparian Corridor Easement shall be incorporated into the deed for the property or lot(s) and shall limit the use of the property located therein. The easement shall allow for the continued private ownership and shall count toward the minimum lot area as required by Zoning.

E. Any permitted use within the Riparian Corridor Easement shall be conducted in a manner that will maintain the extent of the existing one-hundred-year floodplain, improve or maintain the stream stability, and preserve and protect the ecological function of the floodplain.

F. The following conditions shall apply when public and/or private recreation trails are permitted within Riparian Corridors

1. Trails shall be for non-motorized use only.
2. Trails shall be designed to have the least impact on native plant species and other sensitive environmental features.

G. Septic drainfields and sewage disposal systems shall not be permitted within the Riparian Corridor Easement and shall maintain a minimum distance of one hundred (100) feet from the top of streambank.

Comment [MG7]: Examples of BMPs that may result in a credit include but are not limited to: natural area conservation, disconnection of rooftop and non-rooftop runoff, buffers, grass channels, and environmental site design. Municipalities may consult the DEP BMP Manual for further guidance on credits.

Comment [MG8]: The Municipality may institute additional management requirements, including but not limited to mandating the establishment of a riparian forest buffer for stormwater discharges to watercourses listed as “impaired” by the DEP or any watercourse or watershed with an approved Total Maximum Daily Load (TMDL).]

Comment [MG9]: Municipalities may want to make reference to existing standards regarding trail design.

Comment [MG10]: The 100-foot set back is consistent with the County’s Model Conservation Zone and Natural Resource Protection Standards. Consider revising to comply with Pa regs. Minimum 50' setback required under Chapter 73  http://www.pacode.com/secure/data/025/chapter73/s73.12.html
ARTICLE IV
INFORMATION TO BE INCLUDED ON OR WITH STORMWATER MANAGEMENT SITE PLANS

Section 401. General Plan Requirements

A. The SWM Site Plan shall consist of a narrative and all applicable calculations, maps, plans and supplemental information necessary to demonstrate compliance with this Ordinance.

B. All landowners of land included in the SWM Site Plan shall be required to execute all applications and final documents.

C. All SWM Site Plans shall be prepared by a Qualified Person.

Section 402. Drafting Standards

A. The Plan should be clearly and legibly drawn.

B. If the Plan is prepared in two (2) or more drawing sheets, a key map showing the location of the sheets and a match line shall be placed on each sheet.

C. Each sheet shall be numbered to show the relationship to the total number of sheets in the Plan (e.g. Sheet 1 of 5).

D. Drawings or maps of the project area shall be drawn at 1" = 50' or larger scale (i.e. 1" = 40', 1" = 30', etc.) and shall be submitted on 24-inch x 36-inch sheets.

E. SWM Site Plans shall be prepared in a form that meets the requirements for recording for the Office of the Recorder of Deeds of Lancaster County.

F. The total Development Site boundary and size with distances marked to the nearest foot and bearings to the nearest degree

Section 403. SWM Site Plan Information

The following items shall be included in the SWM Site Plan:

A. The date of the SWM Site Plan and latest revision, graphic scale, written scale and North arrow.

B. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the Plan.

C. The file or project number assigned by the firm that prepared the Plan.
D. A statement, signed by the landowner, acknowledging the SWM Facilities to be permanent fixtures that cannot be altered or removed unless a revised Plan is approved by the Municipality.

E. The following signature block for the municipality:

__________________________________________ (Name of Municipality) SWM Site

Plan Approval Certification

At a meeting on ______________________, 20____, the __________________________ (Municipal Governing Body) approved this project, and all conditions have been met. This approval includes the complete set of plans and information that are filed with the Municipality in File No. ______________________, based upon its conformity with the standards of the _________________________ (Name of Municipality) Storm Water Management Ordinance.

Governing Body Signature  Governing Body Signature

F. For SWM facilities located off-site,

1. A note on the Plan referencing a recorded Stormwater Operation and Maintenance (O&M) Agreement that indicates the location and responsibility for maintenance of the off-site facilities.

2. All off-site SWM Facilities shall meet the performance standards specified in this Ordinance.

G. A note informing the owner that the Municipality shall have the right of entry for the purposes of inspecting all stormwater conveyance, treatment, or storage facilities.

H. A location map, drawn to a scale of a minimum of one inch equals two thousand feet (1” = 2,000’), relating the Plan to municipal boundaries, at least two (2) intersections of road centerline or other identifiable landmarks.

I. Existing Features

1. In areas of disturbance, contours at intervals of one (1) or two (2) feet. In areas of steep slopes (greater than 15 percent) and areas undisturbed, five-foot contour intervals may be used.

2. The locations of all existing utilities (including on lot disposal systems and wells), sanitary sewers, and water lines and associated easements.

3. Physical features including flood hazard boundaries, wetlands, sinkholes, streams, lakes, ponds and other waterbodies, existing drainage courses, karst features, areas of native vegetation including trees greater than 6” diameter at breast height, woodlands, other environmentally sensitive areas and the total extent of the upstream area draining through the Development Site

4. An overlay showing soil names and boundaries

5. All existing man-made features within two hundred (200) feet of the Development Site boundary.

Comment [MG12]: Municipalities may adapt as needed.
J. Proposed Features

1. Changes to the land surface and vegetative cover, including final proposed contours at intervals of one (1) or two (2) feet in areas of disturbance. In areas of steep slopes (greater than 15 percent) and areas undisturbed, five-foot contour intervals may be used.

2. Proposed structures, roads, paved areas, buildings and other impervious and semi-impervious areas.

3. The location of any proposed on-lot disposal systems, replacement drainfield easements, and water supply wells.

4. A note indicating existing and proposed land use(s).

5. Plan and profile drawings of all proposed SWM facilities, including BMPs, drainage structures, pipes, open channels, and swales.

6. Where pervious pavement is to be installed, pavement material and construction specifications shall be included.

7. The location of all existing and proposed easements, including drainage easements, access easements and riparian corridor easements.

8. A planting plan shall be provided for all vegetated BMPs in accordance with Section 301.N.

K. The location of all E&S control facilities.

Section 404. Additional Information

A. General description of the Development Site, including a description of existing natural and hydrologic features and any environmentally sensitive areas.

B. General description of the overall SWM concept for the project, including a description of permanent SWM techniques, non-structural BMPs to be employed and construction specifications of the materials to be used for structural SWM facilities. The narrative shall include a description of any treatment trains and how the facilities are meant to function with each other to manage stormwater runoff.

C. The effect of the project (in terms of runoff volumes, water quality and peak flows) on adjacent properties and on any existing municipal stormwater management facilities that may receive runoff from the Development Site.

D. Complete hydrologic, hydraulic, and structural computations for all SWM facilities.

E. Expected project time schedule.

Section 405. Supplemental Information

A. In areas of carbonate geology, a detailed geologic evaluation prepared by a registered Professional Geologist (PG) must be submitted as part of the SWM Site Plan. The report shall include, but not limited to the following:

1. The location of the following karst features;
a. sinkholes
b. closed depressions
c. lineaments in carbonate areas
d. fracture traces
e. caverns
f. intermittent lakes
g. ephemeral disappearing streams
h. bedrock pinnacles (surface or subsurface)

2. A plan for remediation of any identified karst features.

3. Impacts of stormwater management facilities on adjacent karst features, and impacts of karst features on adjacent stormwater management facilities.

B. An E&S Plan, including all approvals, as required by DEP or the Lancaster County Conservation District shall be provided to the municipality prior to final plan approval.

C. A Declaration of Adequacy / Highway Occupancy Permit from the PennDOT District Office when utilization of a Penn DOT stormwater facility is proposed.

D. For any activities that require a DEP Joint Permit Application and are regulated under Chapter 105 or Chapter 106, require a Penn DOT Highway Occupancy Permit, or require any other permit under applicable state or federal regulations, the permit(s) shall be part of the SWM Site Plan and must be obtained prior to final plan approval.

E. An Operation and Maintenance (O&M) Plan that addresses the requirements of Section 603.
ARTICLE V
PLAN PROCESSING PROCEDURES
[This information may be revised based on current municipality plan processing procedures]

Section 501. Small Projects.
A. Anyone proposing a Small Project, shall submit # copies of the Small Project Application to the Municipality.

B. A complete Small Project Application shall include:
   1. Small Project Application Form (Appendix A)
   2. Small Project Sketch Plan including the following:
      a. Name and address of landowner (and/or) developer
      b. Date of Small Project Application submission.
      c. Name of individual and/or firm that prepared the sketch if different than the landowner and/or developer
      d. Location and square footage of proposed impervious area or land disturbance
      e. Approximate footprint and location of all structures on adjacent properties if located within 50 feet of the proposed impervious area or land disturbance
      f. Approximate location of existing stormwater management facilities if present
      g. Location and description of proposed stormwater management facilities
      h. Direction of proposed stormwater discharge (e.g. with arrows)
      i. Scale and north arrow
   3. Filing fee (in accordance with the Municipality’s current fee schedule).

C. The Small Project Application shall be submitted in a format that is clear, concise, legible, neat and well organized.

Section 502. Exemption from Plan Submission Requirements
A. The following regulated activities are specifically exempt from the SWM Site Plan preparation and submission requirements articulated in Section 301.A and Articles IV and V of this Ordinance:
   1. Agricultural activity (see definitions) provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
   2. Forest management and timber operations (see definitions) provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
   3. Conservation Practices being installed as part of the implementation of a Conservation Plan written by an NRCS certified planner.

B. The municipality may deny or revoke any exemption pursuant to this Section at any time for any project that the municipality believes may pose a threat to public health, safety, property or the environment.
Section 503. Pre-Application Meeting

Applicants are encouraged to schedule a pre-application meeting to review the overall stormwater management concept with Municipal staff/engineer. The pre-application meeting is not mandatory and shall not constitute formal filing of a plan with the Municipality. Topics discussed may include the following:

- Available geological maps, plans and other available data.
- Findings of the site analysis including identification of any environmentally sensitive areas, wellhead protection areas, riparian corridors, hydrologic soil groups, existing natural drainageways, karst features, areas conducive to infiltration to be utilized for volume control, etc.
- Results of infiltration tests.
- Applicable municipal Subdivision and Land Development and/or Zoning ordinance provisions.
- The conceptual project layout, including proposed structural and non-structural BMPs.

Section 504. Stormwater Management Site Plan Submission

A. When a Stormwater Management Site Plan is required, the applicant shall submit the following to the Municipality:
   1. _______ copies to the SWM Site Plan prepared in accordance with the requirements of Article IV of this Ordinance.
   2. Two (2) copies of all supplemental data.
   3. A filing fee (in accordance with the Municipality’s current fee schedule).

B. The SWM Site Plan shall be submitted in a format that is clear, concise, legible, neat and well organized.

C. The applicant is responsible for submitting plans to any other agencies such as the Lancaster County Conservation District, PennDOT, DEP, etc. when permits from these agencies are required. Final approval shall not be granted until applicable Permits have been obtained.

D. Incomplete submissions as determined by the governing body or its designee, shall be returned to the Applicant within 7 days, along with a statement that the submission is incomplete, and stating the deficiencies found. Otherwise, the application shall be deemed accepted for filing as of the date of submission. Acceptance of the application shall not, however, constitute an approval of the plan or a waiver of any deficiencies or irregularities. The applicant may appeal the
Municipality’s decision not to accept a particular application in accordance with Section 805 of this Ordinance.

E. At its sole discretion and in accordance with this Article, when a SWM Site Plan is found to be deficient, (name of municipality) may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, (name of municipality) may accept submission of revisions.

Section 505. Municipal Review

A. When the regulated activity constitutes a Subdivision or Land Development as defined in [municipal SALDO], the SWM Site Plan and Subdivision/Land Development Plan shall be processed concurrently according to the plan processing procedure outlined in [cite ordinance section].

B. When the regulated activity constitutes a Small Project the Municipality shall review and take action on the Small Project Application application within X days of filing.

C. When the regulated activity does not constitute a Subdivision or Land Development or Small Project the Municipal Engineer shall review the SWM Site Plan for conformance with the provisions of this ordinance.

D. Following receipt of the Municipal Engineer’s report and within ninety (90) days following the date of the first regular meeting of the Governing Body after the date the application is filed, the Governing Body will schedule the SWM Site Plan application for action at a regularly scheduled Public Meeting.

E. Within fifteen (15) days of the meeting at which the SWM Site Plan application is acted upon by the Governing Body, written notice of the Governing Body’s action shall be sent to the following individuals:

1. Landowner or his agent.
2. Applicant.
3. Firm that prepared the Plan.
4. Lancaster County Planning Commission.
5. Lancaster County Conservation District.

F. If the Municipality disapproves the SWM Site Plan, the municipality will state the reasons for the disapproval in writing. The Municipality also may approve the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing. Such conditional approval shall be contingent upon the applicant’s written acceptance of the conditions.

Section 506. Revision of Plans
A. Revisions to a SWM Site Plan after submission but before municipal action shall require a re-submission of the modified SWM Site Plan consistent with Section 504 of this Ordinance and be subject to review as specified in Section 505 of this Ordinance.

B. For the purposes of review deadlines, each resubmission required under Section 506.A (after submission but before approval) shall constitute a new submission for the purposes of time limits as set forth in the MPC and this ordinance.

C. Any revisions to a SWM Site Plan after approval shall be submitted as a new plan to the Municipality, accompanied by the applicable Review Fee.

Section 507. Authorization to Construct and Term of Validity

Approval of a SWM Site Plan shall be valid for a period not to exceed [2-5] years. This time period shall commence on the date that the Municipality approves the SWM Site Plan. If a Certificate of Completion as required by Section 508 of this Ordinance has not been submitted within the specified time period, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits issued by the municipality. SWM Site Plans that are considered disapproved by the Municipality may be resubmitted in accordance with Section 504 of this Ordinance.

Section 508. Certificate of Completion

A. At the completion of the project, and as prerequisite for the release of the Financial Security, the applicant shall provide Certification of Completion from an Engineer, Landscape Architect, Surveyor or other qualified person verifying that all permanent SWM facilities have been constructed according to the Plans and specifications and approved revisions thereto.

B. Upon receipt of the Certificate of Completion, and prior to release of the remaining Financial Security the municipality shall conduct a final inspection to certify compliance with this Ordinance.

Section 509. Plan Recordation

A. Upon completion of the plan improvements the applicant shall submit an As-Built Plan for recordation in the Office of the Recorder of Deeds. The As-Built Plan must show the final design specifications for all stormwater management facilities and be sealed by a registered professional engineer. When a digital submission of an As-Built Plan is required, all coordinates as depicted on the plan shall be based on the PA South Zone State Plane Coordinate System (NAD83 for horizontal and NAVD88 for vertical).

B. Subsequent to the recordation of the As-Built Plan, the applicant shall submit the SWM Site Plan for recordation in the Office of the Recorder of Deeds.
ARTICLE VI
OPERATION AND MAINTENANCE (O&M)

Section 601. Responsibilities of Developers and Landowners

A. The Landowner, successor and assigns shall maintain all Stormwater Management Facilities in good working order in accordance with the approved O & M Plan.

B. The Landowner shall convey to the Municipality easements to assure access for inspections and maintenance, if required.

C. The Landowner shall keep on file with the Municipality the name, address and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information will be submitted to the Municipality within ten (10) days of the change.

D. Enumerate permanent SWM facilities as permanent real estate appurtenances and record as deed restrictions or easements that run with the land.

E. The O&M Plan shall be recorded as a restrictive deed covenant that runs with the land.

F. The municipality may take enforcement actions against a landowner for any failure to satisfy the provisions of this Article.

Section 602. Operation and Maintenance Agreements

A. The record owner of the Development Site shall sign and record an Operation and Maintenance (O&M) Agreement covering all Stormwater Management Facilities, including riparian buffers and riparian forest buffers, which are to be privately owned. Said agreement, designated as Appendix C, is attached and made part hereto.

B. The Operation and Maintenance Agreement shall be subject to the review and approval of the municipal solicitor and governing body.

C. Municipalities are exempt from the requirement to sign and record an O&M agreement.

Section 603. Operation and Maintenance (O&M) Plan Contents

A. The O&M Plan shall clearly establish the operation and maintenance necessary to ensure the proper functioning of all temporary and permanent stormwater management facilities and erosion and sedimentation control facilities.

B. The following shall be addressed in the O&M Plan:
   1. Description of maintenance requirements, including, but not limited to, the following:
      a. Regular inspection of the SWM facilities to assure proper implementation of BMPs, maintenance and care. SWM BMPs should be inspected by the
landowner, or the owner's designee (including the municipality for dedicated and owned facilities), according to the following minimum frequencies:

i. Annually for the first 5 years.
ii. Once every 3 years thereafter.
iii. During or immediately after the cessation of a 10-year or greater storm.
iv. As specified in the O&M Agreement pursuant to Section 602.

b. All pipes, swales and detention facilities shall be kept free of any debris or other obstruction and in original design condition.
c. Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, or BMPs, and thus reducing their capacity to convey or store water.
d. Re-establishment of vegetation of scoured areas or areas where vegetation has not been successfully established. Selection of seed mixtures shall be subject to approval by the Municipality.

2. Riparian forest buffer management plan prepared in accordance with Chapter 102 §14(b)(4) if required.

3. Identification of a responsible individual, corporation, association or other entity for ownership and maintenance of both temporary and permanent stormwater management and erosion and sedimentation control facilities.

4. Establishment of suitable easements for access to all facilities.

Section 604. Maintenance of Facilities Accepted by the Municipality

A. The municipality reserves the right to accept or reject the ownership and operating responsibility of any SWM facilities.

B. If SWM facilities are accepted by the Municipality for dedication, the landowner/developer shall be required to pay a specified amount to the Municipal Stormwater Maintenance Fund to defray costs of periodic inspections and maintenance expenses. This fee shall be provided to the Municipality prior to unconditional plan approval. The amount of the deposit shall be determined as follows subject to the approval of the municipal governing body:

1. The deposit shall cover the estimated costs for maintenance and inspections for twenty-five (25) years. The Municipality will establish the estimated costs according to the O&M requirements outlined in the approved O&M Plan.

2. The amount of the deposit to the fund shall be converted to present worth of the annual series values.

3. If a storage facility is proposed that also serves as a recreation facility (e.g. ballfield, lake), the Municipality may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.

Comment [MG17]: The municipality may want to establish a different time frame.
C. If at any time a dedicated storage facility is eliminated due to the installation of storm sewers or other storage facility such as a regional detention facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

D. All dedicated facilities shall be inspected by the Municipality at least once a year for the first five years and once every three (3) years thereafter. Facilities shall also be inspected after all major storm events. Maintenance shall be conducted as necessary to provide for the continued functioning of the facility. Costs of inspections and repairs are recoverable from the Municipal Stormwater Maintenance Fund.

Section 605. Maintenance of Existing Facilities / BMPs

A. SWM facilities existing on the effective date of this Ordinance, which have not been accepted by the Municipality or for which maintenance responsibility has not been assumed by a private entity such as a homeowners’ association shall be maintained by the individual Landowners. Such maintenance shall include at a minimum those items set forth in Section 603.B.1 above. If the Municipality determines at any time that any permanent SWM facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials, or improperly maintained, the condition constitutes a nuisance and the Municipality shall notify the Landowner of corrective measures that are required, and provide for a reasonable period of time, not to exceed 30 days; within which the property owner shall take such corrective action. If the Landowner does not take the required corrective action, the Municipality may either perform the work or contract for the performance of the work and bill the Landowner for the cost of the work plus a penalty of 10% of the cost of the work. If such bill is not paid by the property owner within 30 days, the Municipality may file a municipal claim against the property upon which the work was performed in accordance with the applicable laws. The municipality shall have the right to choose among the remedies and may use one or more remedies concurrently.
ARTICLE VII
FEES AND EXPENSES

Section 701. General
The municipality may include all costs incurred in the review fee charged to an applicant.

Section 702. Expenses Covered by Fees
The review fee may include, but not be limited to, costs for the following:

A. Administrative and clerical costs.
B. Review of the SWM Site Plan.
C. Review of the Stormwater Operation and Maintenance Plan and Stormwater Agreement by the Municipal Solicitor/Staff.
D. Inspections.
E. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

Comment [MG18]: This section may be amended by the Municipality.
ARTICLE VII
PROHIBITIONS

Section 801. Prohibited Discharges and Connections

A. The following connections are prohibited, except as provided in Section 801.D below.
   1. Any drain or conveyance, whether on the surface or subsurface, that allows any
      non-stormwater discharge including sewage, process wastewater, and wash
      water to enter a municipal separate storm sewer (if applicable), or waters of this
      Commonwealth, and any connections to the storm sewer from indoor drains and
      sinks; and
   2. Any drain or conveyance connected from a commercial or industrial land use to
      the municipal separate storm sewer (if applicable) which has not been
      documented in plans, maps, or equivalent records, and approved by the
      Municipality.

B. No person shall allow, or cause to allow, discharges into surface waters of this
   Commonwealth which are not composed entirely of stormwater, except (1) as provided
   in Section 801.D below and (2) discharges allowed under a state or federal permit.

C. No person shall place any structure, fill, landscaping or vegetation into a SWM facility or
   within a drainage easement that will limit or diminish the functioning of the facility in any
   manner.

D. The following discharges are authorized unless they are determined to be significant
   contributors to pollution to the waters of this Commonwealth:
   • Discharges from firefighting activities
   • Potable water sources including water line flushing
   • Irrigation drainage
   • Air conditioning condensate
   • Springs
   • Water from crawl space pumps
   • Pavement wash waters where spills or leaks of toxic or hazardous materials have not
     occurred (unless all spill material has been removed) and where detergents are not
     used
   • Flows from riparian habitats and wetlands
   • Uncontaminated water from foundations or from footing drains
   • Lawn watering
   • De-chlorinated swimming pool discharges
   • Uncontaminated groundwater
   • Water from individual residential car washing
   • Routine external building wash down (which does not use detergents or other
     compounds)
   • Diverted stream flows
   • Rising ground waters
E. In the event that the municipality or DEP determines that any of the discharges identified in Section 801.D above significantly contribute to pollution of the waters of this Commonwealth, the municipality or DEP will notify the responsible person(s) to cease the discharge.

Section 802. Alteration of SWM BMPs

No person shall modify, remove, fill, landscape, or alter any SWM BMPs, facilities, areas, or structures without the written approval of the municipality.
ARTICLE IX  
ENFORCEMENT AND PENALTIES

Section 901. Right-of-Entry

Upon presentation of proper credentials, duly authorized representatives of the Municipality may enter at reasonable times upon any property within the Municipality to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Ordinance.

Section 902. Enforcement

The municipal governing body is hereby authorized and directed to enforce all of the provisions of this ordinance.

A. Any permit or approval issued by the municipality pursuant to this ordinance may be suspended by municipality for:

1. Noncompliance with or failure to implement any provision of the approved SWM Site Plan or O&M Agreement.

2. A violation of any provisions of this ordinance or any other applicable law, ordinance, rule, or regulation relating to the regulated activity.

3. The creation of any condition or the commission of any act during construction or development that constitutes or creates a hazard, nuisance, pollution or endangers the life or property of others.

B. A suspended permit may be reinstated by the municipality when:

1. The Municipality has inspected and approved the corrections to the violation that caused the suspension;

2. The Municipality is satisfied that the violation has been corrected.

Section 903. Penalties - Section 903.A should be reviewed by the Municipal Solicitor to determine its appropriateness to the Class of the Municipality (i.e. First or Second Class Township or Borough):

A. Any person who or which has violated any provisions of this Ordinance, shall, upon a judicial determination thereof, be subject to civil judgment for each such violation of not less than and 00/100 dollars ($ ), or more than and 00/100 dollars ($ ), for each violation, recoverable with costs. Each day that a violation occurs shall constitute a separate offense. All fines shall be paid to [Name of Municipality].

B. In addition, the [Name of Municipality] may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this
Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

Section 904. Appeals

A. Any person aggrieved by any action of the [Municipality] may appeal to [the Municipality’s governing body] within 30 days of that action.

B. Any person aggrieved by any decision of [the Municipality’s governing body] may appeal to the Lancaster County Court of Common Pleas, in accordance with the Administrative Agency Act, within 30 days of that decision.

Section 905. Modification of Ordinance Provisions

A. The provisions of this Ordinance not relating to water quality are intended as minimum standards for the protection of the public health, safety, and welfare. The Municipality reserves the right to modify or to extend them conditionally in individual cases as may be necessary in the public interest; provided, however, that such variation shall not have the effect of nullifying the intent and purpose of this Ordinance, and that the applicant shows that to the satisfaction of the Municipality that the applicable regulation is unreasonable, or will cause undue hardship, or that an alternative proposal will allow for equal or better results. The list of such modifications, along with an explanation of and justification for each modification, shall be included on the plan. This section does not apply during an enforcement action.

B. In granting waivers/modifications for provisions of this Ordinance not relating to water quality, the Municipality may impose such conditions as will, in its judgment, secure substantially the objectives of the standards and requirements of this Ordinance.
ARTICLE X
REFERENCES

1. 25 Pennsylvania Code, Chapter 102 Erosion and Sediment Control
2. Minnesota Pollution Control Agency
4. 25 Pa.Code Chapter 105
5. Based on definition in Wisconsin Department of Natural Resources Administrative Rule NR 151.006.
8. Lancaster County Model Subdivision and Land Development Ordinance.
10. CSN Technical Bulletin No. 5, Stormwater Design for High Intensity Redevelopment Projects in the Chesapeake Bay Watershed, version 2.0. Chesapeake Stormwater Network, January 5, 2011 – page 43 – cost differential between redevelopment and new development narrows when impervious cover is less than 85%.
ENACTED and ORDAINED at a regular meeting of the [Name of the municipal governing body] on the __ th day of _____________. 20 __. This Ordinance shall take effect immediately.

______________________________________
[Name], [Title]

______________________________________
[Name], [Title]

______________________________________
[Name], [Title]

ATTEST:

[Name], Secretary (type or print)

I hereby certify that the foregoing Ordinance was advertised in the [name of newspaper] on [date], a newspaper of general circulation in the Municipality and was duly enacted and approved as set forth at a regular meeting of the [name of municipal governing body] held on [date].

______________________________________
[name], Secretary
APPENDIX A
SAMPLE SMALL PROJECT APPLICATION

File Number__________ Date Received ____________
Submitted Fees $______ Approval of Application Date ________

Project Street Address:__________________________________________________________

Project Name:_______________________________________________________________

Owner’s Name and Address:_____________________________________________________

Phone# / Fax# / Email:________________________________________________________

Please list the date of any previous Small Project Applications for the subject property:
________________

Proposed Activity:

[ ] Removal of ground cover, grading, filling or excavation of an area less than 5,000 square feet

Total area of land disturbance: _________________ sq. ft.

Type of Regulated Activity (check all that apply):

[ ] Removal of ground cover
[ ] Grading
[ ] Filling
[ ] Excavation
[ ] Other earth disturbance activity (please describe)

_________________________ ____________________________

[ ] Addition of Impervious Surface (1,000 SF or less)

Type of new impervious surface: ___driveway, ___shed, ___garage, ___deck,
____walkway, Other (describe)

____________________________________________________________________________

Total new impervious surface proposed for construction: ______________ sq. ft.

Are you removing existing impervious as part of this project?

[ ] No
[ ] Yes – Total area of existing Impervious to be removed ______________ sq. ft.
Check all items below that will be impacted by the project:

- Mature trees
- Sinkholes
- Water wells
- Septic drainfields
- Alternate septic drainfields
- Creeks, streams, wetlands, or ponds
- Existing stormwater management facility (basin, swale, etc.)
- Easements

Total runoff volume to be permanently removed/managed on site from attached calculation worksheet:
- ______ gallons or _______ cubic feet

Proposed Stormwater Management Controls (Best Management Practice):

- Rain Garden
- Infiltration Trench
- Cistern
- Rain Barrel
- Other (describe) __________________________________________________________
- ______

Sketch

Provide a sketch of the proposed additional impervious area or land disturbance. Include the following on the sketch:

- Property boundary
- Show approximate location of any of the following features which will be impacted by the project:
  - Mature trees
  - Sinkholes
  - Water wells
  - Septic drainfields
  - Alternate septic drainfields
  - Creeks, streams, wetlands, ponds
  - Existing stormwater management facilities (basins, swales, etc.)
- Location and approximate footprint of proposed impervious area or land disturbance.
- Approximate footprint and location of all structures on adjacent properties if located within fifty feet (50’) of the proposed impervious area or land disturbance.
• Location and description of proposed stormwater management facilities (e.g. rain gardens, swales, rain barrels, etc.)

• Direction of proposed stormwater discharge (e.g. with arrows)

• Scale and north arrow

**Person/Firm to be completing work:**
__________________________________________________________________________________
__________________________________________________________________________________
________________________________________________________________________

**Phone# / Fax# / Email:**
__________________________________________________________________________________

**Name of Person Submitting this Application:**
__________________________________________________________________________________

**Signature:**
__________________________________________________________________________________

**Date:**
__________________________________________________________________________________
# APPENDIX NO. B-1

## RUNOFF COEFFICIENTS "C" FOR RATIONAL FORMULA

### Runoff Coefficients “C” for Rational Formula

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<th>B</th>
<th>C</th>
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<td>.18</td>
<td>.22</td>
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<tr>
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<td>.14</td>
<td>.21</td>
<td>.30</td>
<td>.18</td>
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<td>.92</td>
<td>.91</td>
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<td>.29</td>
<td>.33</td>
<td>.36</td>
<td>.31</td>
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<tr>
<td>lot size ¼ acre</td>
<td>.26</td>
<td>.30</td>
<td>.34</td>
<td>.29</td>
</tr>
<tr>
<td>lot size acre</td>
<td>.24</td>
<td>.28</td>
<td>.31</td>
<td>.26</td>
</tr>
<tr>
<td>lot size ½ acre</td>
<td>.21</td>
<td>.25</td>
<td>.28</td>
<td>.24</td>
</tr>
<tr>
<td>lot size 1 acre</td>
<td>.18</td>
<td>.23</td>
<td>.26</td>
<td>.21</td>
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APPENDIX NO. B-2
RUNOFF CURVE NUMBERS "CN" FOR
SCS METHOD

Runoff Curve Numbers "CN" for SCS Method

<table>
<thead>
<tr>
<th>Soil Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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<tbody>
<tr>
<td></td>
<td>0-2%</td>
<td>2-6%</td>
<td>6%+</td>
<td>0-2%</td>
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<tr>
<td>Slope</td>
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<td>Cultivated Land</td>
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<td>62</td>
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<td>summer conditions</td>
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<td>Forest/Woodland</td>
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<td>Grass Areas</td>
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<td>good conditions</td>
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<tr>
<td>average conditions</td>
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<td>53</td>
<td>52</td>
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<tr>
<td>poor conditions</td>
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<td>Impervious Areas</td>
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<tr>
<td>Weighted Residential</td>
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<td>lot size ¼ acre</td>
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<td>75</td>
<td>77</td>
<td>74</td>
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<td>lot size ½ acre</td>
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<td>62</td>
<td>67</td>
<td>66</td>
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<td>lot size 1 acre</td>
<td>57</td>
<td>59</td>
<td>65</td>
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<tr>
<td></td>
<td>51</td>
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<td>62</td>
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</tbody>
</table>
APPENDIX NO. B-3

NOMOGRAPH FOR DETERMINING SHEET FLOW

(for use with the Rational Method)
## APPENDIX NO. B-4

**Worksheet #1: Time of concentration (Tc) or travel time (Tt)**

**Project** ___________________________  **By** ____________  **Date** ____________

**Location** ___________________________  **Checked** ____________  **Date** ____________

Circle one: Present  Developed

Circle one: Tc  Tt  through subarea

**NOTES:** Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

### Sheet flow (Applicable to Tc only)

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>1. Surface description (table 3-1)</th>
<th>2. Manning's roughness coeff., n (table 3-1)</th>
<th>3. Flow length, L (total L x **150 ft.)</th>
<th>4. Two-yr 24-hr rainfall, P2</th>
<th>5. Land slope, s</th>
<th>6. $T_c = \frac{Ac^2}{nLa^2}$, Compute $T_c$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$T_c$</td>
</tr>
</tbody>
</table>

### Shallow concentrated flow

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>7. Surface description (paved or unpaved)</th>
<th>8. Flow length, L</th>
<th>9. Watercourse slope, s</th>
<th>10. Average velocity, V (figure 3-1)</th>
<th>11. $T_t = \frac{V}{S}$, Compute $T_t$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$T_t$</td>
</tr>
</tbody>
</table>

### Channel flow

<table>
<thead>
<tr>
<th>Segment ID</th>
<th>12. Cross sectional flow area, a</th>
<th>13. Wetted perimeter, $P_w$</th>
<th>14. Hydraulic radius, $r = \frac{P_w}{a}$</th>
<th>15. Channel slope, s</th>
<th>16. Manning's roughness coeff., n</th>
<th>17. $V = \frac{1K}{n^2} \frac{a^2}{a}$, Compute $V$</th>
<th>18. Flow length, L</th>
<th>19. $T_t = \frac{V}{S}$, Compute $T_t$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$T_t$</td>
</tr>
</tbody>
</table>

### Other calculations

- **Watershed or subarea Tc or Tt** (add Tt in steps 6, 11, and 19)

*Table 3-1 per latest TR-55, Urban Hydrology for Small Watersheds*

**150' sheet flow length per latest TR-55 revision**
APPENDIX NO. B-5

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.
APPENDIX C

OPERATION AND MAINTENANCE (O&M) AGREEMENT
STORMWATER MANAGEMENT FACILITIES

THIS AGREEMENT, made and entered into this _______ day of ______________, 20___, by and between ____________________________________, (hereinafter the “Landowner”), and ____________________________________, Pennsylvania, (hereinafter “Munipality”); WITNESSETH

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of ________________ County, Pennsylvania, Deed Book ___________ at page ________, (hereinafter “Property”).

WHEREAS, the Landowner is proceeding to build and develop the Property; and

WHEREAS, the SWM FACILITIES Operation and Maintenance (O&M) Plan approved by the Municipality (hereinafter referred to as the “O&M Plan”) for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the Municipality, provides for management of stormwater within the confines of the Property through the use of Stormwater Management Best Management Practices (BMPs); and

WHEREAS, the Municipality, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site SWM Facilities be constructed and maintained on the Property; and

WHEREAS, the Municipality requires, through the implementation of the SWM Site Plan, that SWM Facilities as required by said SWM Site Plan and the Municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, successors, and assigns.

NOW, THEREFORE, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The Landowner shall construct the SWM Facilities in accordance with the plans and specifications identified in the SWM Site Plan.

2. The Landowner shall operate and maintain the SWM Facilities as shown on the SWM Plan in good working order in accordance with the specific operation and maintenance requirements noted on the approved O&M Plan.
3. The Landowner hereby grants permission to the Municipality, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the SWM Facilities whenever necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.

4. In the event the Landowner fails to operate and maintain the SWM Facilities per paragraph 2, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said SWM Facilities. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.

5. In the event the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred, plus a 10% penalty, within 10 days of receipt of invoice from the Municipality.

6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite SWM Facilities by the Landowner; provided, however, that this Agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.

7. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the Municipality from all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality.

8. The Municipality intends to inspect the SWM Facilities at a minimum of once every three years to ensure their continued functioning.
This Agreement shall be recorded at the Office of the Recorder of Deeds of ________________ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs, and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL) For the Municipality:

For the Landowner:

ATTEST:

_____________________________ (City, Borough, Township)

County of _______________, Pennsylvania

I, _______________, a Notary Public in and for the county and state aforesaid, whose commission expires on the ______ day of _______________, 20____, do hereby certify that _______________, whose name(s) is/are signed to the foregoing Agreement bearing date of the ______ day of _______________, 20____, has acknowledged the same before me in my said county and state.

GIVEN UNDER MY HAND THIS ______ day of _______________, 20____.

________________________________

NOTARY PUBLIC (SEAL)