

CAERNARVON TOWNSHIP STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO.102

CAERNARVON TOWNSHIP, LANCASTER COUNTY, PENNSYLVANIA

AN ORDINANCE OF THE TOWNSHIP OF CAERNARVON, COUNTY OF LANCASTER, COMMONWEALTH OF PENNSYLVANIA, ADOPTING THE ACT 167 STORMWATER MANAGEMENT ELEMENTS CONTAINED IN “BLUEPRINTS: AN INTEGRATED WATER RESOURCES PLAN FOR LANCASTER COUNTY (ACT 247 AND 167)”, AS APPROVED BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, PROVIDING PROVISIONS RELATING TO THE IMPLEMENTATION OF THAT PLAN, INCLUDING EXTENSIVE DEFINITIONS, DESIGN CRITERIA FOR STORM WATER MANAGEMENT FACILITIES, ESTABLISHING STORM WATER MANAGEMENT PERFORMANCE STANDARDS AND CRITERIA, ESTABLISHING REQUIREMENTS FOR STORM WATER MANAGEMENT PLANS, PROVIDING FOR EXEMPTIONS, PROVIDING A REVIEW PROCEDURE FOR STORM WATER MANAGEMENT PLANS, PROVIDING FOR INSPECTIONS, FEES, SECURITY DEPOSITS AND EXPENSES, REQUIRING MAINTENANCE RESPONSIBILITIES FOR STORM WATER FACILITIES, ESTABLISHING A CAERNARVON TOWNSHIP STORM WATER MAINTENANCE FUND, PROVIDING PENALTIES AND AN ENFORCEMENT MECHANISM, AND PROVIDING A LIEN FOR TOWNSHIP EXPENSES.

Adopted at a Public Meeting Held on

May 5, 2014

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ARTICLE I GENERAL PROVISIONS

Section 101. Short Title

This Ordinance shall be known and may be cited as the “CAERNARVON TOWNSHIP Stormwater Management (SWM) Ordinance.”

Section 102. Statement of Findings

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, overtakes 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 practicable.
- 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" and Act 394 of 1937, as amended, 35 P.S. Section 691.1 et seq. the Pennsylvania Clean Streams Law. The municipality also is empowered to regulate land use activities that affect stormwater impacts by the authority of the Second Class Township Code, (53 P.S. §§ 65101 et. seq. – *Second 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 provisions of any ordinances of the Township of Caernarvon inconsistent with the provisions of this Ordinance shall be hereby repealed to the extent of the inconsistency only. Moreover, it is the specific intent to completely supplant the current Township Storm Water Management Ordinance which was adopted on June 2, 2008 upon adoption of this Ordinance. The repeal of the aforesaid current Storm water management Ordinance shall be effective the effective date of this new 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. If more stringent requirements concerning regulation of storm water or erosion and sediment pollution control are contained in other codes, rules, acts, or ordinances, the more stringent regulation shall apply.

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 undertaken 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 Township of CAERNARVON or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the Township of CAERNARVON 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 Township of CAERNARVON and its officials and employees. Township of CAERNARVON, by enacting and amending this Ordinance, does not waive or limit any immunity granted to the Township of CAERNARVON 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, restricted account 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 Township 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 equal to 110% of the construction cost of the required controls and, as applicable, in accordance with the provisions of Sections 509, 510, and 511 of the MPC.
- C. The amount of financial security must be established based on the Township's review and approval of an "Opinion of Probable Cost" of the required improvements submitted by the developer's engineer. The Opinion shall be signed, sealed, and dated by the Registered Professional Engineer (Qualified Person) responsible for the Opinion.

- D. 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 completed 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.
- E. 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.
- F. If an Irrevocable Letter of Credit from a financial institution is submitted as security, it shall not expire without at least sixty (60) days prior notice to the Township.

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 MPC 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

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. The Plan for managing storm water runoff in the Conestoga River Watershed adopted by Lancaster County as required by the Storm Water Management Act, and known as the Conestoga River Watershed Act 167 Storm Water Management Plan.

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.

As-Built Survey and Plan – A record survey and plan, including but not limited to a survey upon completion of the construction of improvements within or adjacent to a development site for the purpose of verifying compliance with the approved Storm Water Management Plan, including topographic survey of final land contouring, storm sewer facility locations and pipe grades, and related facilities. As part of the As-Built Survey and Plan, the developer shall be responsible for verifying the adequacy of all Storm water facilities by submitting hydraulic and hydrologic calculations, as necessary, to confirm compliance with the approved design and Plan. All plans and calculations must include the seal, date and signature of the qualified registered professional(s) responsible for the As-Built Survey and Plan and calculations.

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 activities¹. See also Non-structural BMP and Structural BMP.

BMP Manual – The Pennsylvania Stormwater Best Management Practices Manual of December 2006, or most recent version thereof.

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. Carbonate geology is often associated with karst topography.

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

Chapter 105 – 25 Pa. Code, Chapter 105, Dam Safety and Waterway Management

Chapter 106 – 25 Pa. Code, Chapter 106, Floodplain Management

Cistern - A reservoir or tank for storing rainwater.

Clean Water Act – the 1972 Amendments to the Federal Water Pollution Control Act, P.L. 92-500 of 1972, 33 U.S.C. §1251 ET seq.

Conservation District - The Lancaster County Conservation District.

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 – (n) Any structure that carries a flow. (v) 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 can convey a stream under or through an embankment or fill.

Dam - An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid, or a refuse bank, fill or structure for highway, railroad or other purposes which does or may impound water or another fluid or semifluid. The dam falls under the requirements of Chapter 105, Dam Safety and Waterway Management, if the following is true;

- A. The contributory drainage area exceeds 100 acres.
- B. The greatest depth of water measured by upstream toe of the dam at maximum storage elevation exceeds 15 feet.
- C. The impounding capacity at maximum storage elevation exceeds 50 acre-feet.

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.

Designee - The agent of a municipal governing body involved with the administration, review or enforcement of any provisions of this Ordinance by contract or memorandum of understanding.

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

Developer - A person who 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 - A land area where an earth disturbance activity is occurring or has occurred.

Downslope Property Line - That portion of a property line of a parent tract located at the topographically lowest point of the tract such that some or all overland, swale, or pipe flow from a Development Site would be directed toward it.

Drainage Conveyance Facility - A storm water management facility designed to transmit storm water runoff, including streams, channels, swales, pipes, conduits, storm sewers, etc.

Drainage Permit - A permit issued by the Township after the Storm Water Management Plan has been approved by the Board of Supervisors.

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 drainage ways 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 materials¹.

Effective Agricultural Zone – For the purposes of this Ordinance exclusively, a Zoning District which allows no more than 1 lot for every 20 or more acres of the parent tract.

Energy Dissipater – A device used to slow the velocity of storm water particularly at points of concentrated discharge such as pipe outlets.

Environmentally Sensitive Area - slopes greater than 15% percent, shallow bedrock (located within 6 feet of ground surface²), 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.

Ephemeral Stream - A transient stream, one that flows for a relatively short time.

Erosion - The natural process by which the surface of the land is worn away by water, wind, or chemical action. See also, “Accelerated Erosion” as defined above.

Erosion and Sediment Pollution Control (E&SPC) Plan - A plan which is designed to minimize accelerated erosion and sedimentation.

Exempt Project – Regulated activities that, measured on a cumulative basis from May 6, 2014, 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.

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

FEMA - the Federal Emergency Management Agency.

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 floodway³.

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.

Floodplain Management Act - Act of October 4, 1978, P.L. 851, No. 166, as amended 32 P.S. Section 679.101 et seq.

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 stream⁴.

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.

Freeboard - The difference between the design high water elevation and the top of a dam, embankment, berm, tank, levee, basin, or diversion ridge.

Frequency - The probability or chance that a given storm event/flood will be equaled or exceeded in a given year.

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

Grassed Waterway - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water. (Also see Swale)

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 by NRCS. There are four (4) runoff potential groups ranging from A to D.

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 (greater than 0.30 inches/hour).

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 (from 0.15 to 0.30 inches/hour).

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 (from 0.05 to 0.15 inches/hour).

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 (from 0 to 0.05 inches/hour).

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, all other areas as determined by the Township Engineer to be impervious within the meaning of this definition shall also be considered impervious surface.

Impoundment - A retention or detention facility 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 features including but not limited to 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.

Land Disturbance - Any activity involving grading, tilling, digging, or filling of ground or stripping of vegetation or any other activity that causes an alteration to the natural condition of the land.

Limiting Zone - A rock formation, other stratum, or soil condition which is so slowly permeable that it effectively limits downward passage of effluent¹². Season high water tables, whether perched or regional also constitute a limiting zone.

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 means of control is appropriate.⁵

Memorandum of Understanding - An agreement between Caernarvon Township and the Lancaster County Conservation District to provide for cooperation between the Lancaster County Conservation District and Caernarvon Township officials, Lancaster County, to include within its ordinances, and to jointly promote conservation of natural resources within Caernarvon Township on lands both public and private, for the purposes of preventing accelerated soil erosion and sedimentation of streams, reducing storm water damage, and promoting the health, safety and general welfare of the residents of Caernarvon Township.

MPC - The Pennsylvania Municipalities Planning Code, Act of 1968, P.L. 805, No. 247, as reenacted and amended, 53 P.S. Section 10101 et seq.

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)(v).

Municipality - The Township of CAERNARVON, 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.

Non-structural 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.

Parent Tract - All contiguous land held in single and separate ownership, regardless of whether (i) such land is divided into one or more lots, parcels, purparts or tracts; (ii) such land was acquired by the landowner at different times or by different deeds, devise, partition or otherwise; or (iii) such land is bisected by public or private streets or rights-of-way, which was held by the landowner or his predecessor in title on the effective date of this Ordinance.

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

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

Person – Any person, corporation (non-profit or profit), partnership, association, limited partnership, limited liability company, limited liability partnership or any other entity whatsoever.

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 CAERNARVON Township, 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.

Record Plan - Where a regulated activity constitutes a subdivision or land development, the Final Subdivision or Land Development plan which contains the information the Ordinance requires. Where a regulated activity does not constitute a subdivision or land development, a Storm Water Management Plan containing all required information and prepared in a form acceptable to the Office of the Recorder of Deeds for recording.

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 specific area.

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.

Return Period - The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the 25-year return period rainfall would be expected to recur on the average once every twenty-five years.

Riparian – Pertaining to a stream, river or other watercourse. 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 a watercourse.

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 a watercourse 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 May 6, 2014, create additional impervious areas of more than 1,000 sq. ft. and less than 5,000 sq. ft. 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.

Small Storm Event – A storm having a frequency of recurrence of once every two (2) years or smaller.

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”, Second edition, Technical Release No. 55, SCS, June 1986 (or most current edition).

Soil Group, Hydrologic - See "Hydrologic Soil Group".

Spillway - A depression in the embankment of a pond or basin which is used to pass a Post development 100 year storm peak flow rate.

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

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 designed to convey stormwater.

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

Stormwater Management Act - Act of October 4, 1978, P.L. 864, No. 167, as amended 32 P.S. Section 680.1 et seq.

Stormwater Management Best Management Practices (SWM BMP) – See **BMPs**.

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 Operation and Maintenance Plan (O & M Plan) – A plan, including a narrative, to ensure proper functioning of the SWM facilities in accordance with Article VI of this Ordinance.

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.⁸

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 devisees, transfer of ownership, or Building, or Lot development. or as defined in the MPC.

Sub watershed Area - The smallest drainage unit of a watershed for which storm water management criteria have been established in the "Conestoga River Watershed Act 167 Storm Water Management Plan".

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.

Top of stream bank – First substantial break in slope between the edge of the bed of the stream and the surrounding terrain. The top of stream bank 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, or 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 either specifically exempted according to the requirements of Section 502 of this Ordinance 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. Where an NPDES permit for stormwater discharges associated with construction activities is required, issuance of an NPDES permit shall constitute satisfaction of consultation with DEP.
- E. For all regulated activities, erosion and sediment control and stormwater management 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)⁹, No. 363-2134-008 (March 2012), as amended and updated, and the BMP Manual.
- 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 requirements of this ordinance and the requirements of the Regional Stormwater Management Plan are met.
- G. Unless prohibited by the CAERNARVON Township Zoning Ordinance or any Ordinance which regulates construction and development within the areas of the Township of CAERNARVON 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, regulatory requirements and the requirements of this ordinance.

H. Impervious areas:

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 drainage ways 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. (See Appendix F for Map of Carbonate Geology in the Township)

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 unless shown to be unnecessary.

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 limiting zone, unless it is demonstrated to the satisfaction of the Municipality that 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 calculation methodology to be used in the analysis of volume and 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 Drip line 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.

O. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum 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 twenty (20) 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 provided 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" on Pennsylvania's Clean Water Act 303(d)/305(b) Integrated List.

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 be tributary to infiltration or vegetative BMPs. Use of catchment facilities for the purpose of reuse is also permitted.
- U. Non-structural BMPs shall be utilized for all regulated activities unless proven to be impractical.
- V. All storm water runoff flowing over the Development Site shall be considered in the design of the storm water management facilities.
- W. When the final plan will be submitted in phases, any temporary E&SPC basins should be evaluated for their long term ability to function as a permanent storm water facility. Since the E&SPC basins are a temporary item and not designed for a 100 year storm event, it may be necessary to convert them to storm water basins between construction phases due to the potential extended length of time between the phases. Upon stabilization of the individual phase, an E&SPC basin should be converted to function as a storm water basin to meet the requirements of this ordinance. If necessary, it can be converted back to an E&SPC facility upon the start of the next phase.

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. 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. When the existing project site contains impervious area, twenty percent (20%) of existing impervious area to be disturbed shall be

considered meadow in good condition in the model for existing conditions.

- 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. 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.

D. Storage facilities, including normally dry, open top 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.

E. 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 which will be used for rate control is that storage which is available within 24 hours from the end of the design storm based on the stabilized infiltration rate and/or the evapo-transpiration rate.

F. Volume control storage facilities designed to infiltrate shall avoid the least permeable Hydrologic Soil Group(s) at the Development Site.

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 effect 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, Post-development rates of runoff from any regulated activity shall not exceed the release rates (% of pre-development) in Appendix E for all design storms. Offsite areas that drain through a proposed development site or into a basin are not subject to release rate criteria. However, offsite areas shall only enter a basin when absolutely necessary or by approval of the Township Engineer. Otherwise offsite areas shall be safely conveyed through the site. Also see section 304. Runoff calculations for the pre- and post-development comparison shall consider five (5) different storm frequencies (2-, 10-, 25-, 50-, and 100- year storm events*). *A 24 hour SCS type II storm or an IDF Curve Rational Method storm. See Table III-1 in Section 305

- 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 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 Redevelopment¹⁰, 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 drainage way, 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. Existing on-site natural and man-made SWM facilities shall be used to the maximum extent practicable.
- 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 and the effect of the transfer does not alter the peak discharge onto adjacent lands.
- 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 to convey 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 to convey a 50 year storm event*. Safe conveyance of the 100-year runoff event* to appropriate peak rate control BMPs must be demonstrated in the design.

* A 24 hour SCS Type II 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 time of concentration (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 III-1 ACCEPTABLE COMPUTATION METHODOLOGIES FOR STORMWATER MANAGEMENT PLANS		
METHOD	METHOD DEVELOPED BY	APPLICABILITY
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
WinTR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1 / HEC-HMS	US Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For development sites less than 200 acres, Tc<60 min. or as approved by the Municipality.
EFH2	USDA NRCS	Applicable in rural and undeveloped areas subject to the Program Limits.
Other Methods	Varies	Other methodologies approved by the Municipality.

- C. If the SCS method is used, the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 data for a 24 hour storm event shall be used, and 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 National Oceanic and Atmospheric Administration (NOAA) Atlas 14 data (see item "B" above) or Penn DOT Publication 584 "Penn DOT Drainage Manual," 2008 Edition, or latest, 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 length equal to three times the time of concentration ($3 \times T_c$) and the descending leg shall have a length equal to 7 times the time of concentration ($7 \times T_c$) 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 all discharge points.
- 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-1 and B-2 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 T_c is provided in Appendix B-4. Times of concentration (T_c) 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-3, or the Manning’s kinematic solution shown in the Sheet Flow section of Worksheet No. 1 in Appendix B-4.
 - 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-5.
 - 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 to 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 stormwater credits for Non-Structural BMPs in accordance with the BMP Manual. The allowable reduction will be determined by the Municipality.
 4. Peak rate control is not required for off-site runoff. Off-site runoff may be by-passed around the site provided all other discharge requirements are met. If offsite runoff is routed through rate control facilities, runoff coefficients for off-site discharges used to design those rate control facilities shall be based on actual land use assuming winter or poor land conditions.
- I. Times of Concentration shall be calculated based on the methodology recommended in the respective model used. Times of Concentration for channel and pipe flow shall be computed using Manning's equation. Supporting documentation and calculations must be submitted for review and approval

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 stream bank (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 practicable 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 enforceable by the municipality and shall be recorded in the Lancaster County Recorder of Deeds Office, so that it shall run with the land 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, unless otherwise specified in the municipal Zoning Ordinance.
- 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 drain fields and sewage disposal systems shall not be permitted within the Riparian Corridor Easement and shall comply with setback requirements established under 25 Pa Code Chapter 73.

Section 307. Detention and Retention Basins

- A. For any storm water management facility designed to store storm water runoff and requiring a berm or earth embankment (i.e. detention or retention basin) the following shall be required, at a minimum:
 - 1. An emergency spillway to handle the 100-year post-development peak flow rate.
 - 2. An emergency spillway shall be provided for the basin and shall be capable of discharging the 100-year peak rate of runoff which enters the basin after development, in a manner which will not damage the integrity of the facility and will not create a downstream hazard. Where practical, the emergency spillway shall be constructed in undisturbed ground.
 - 3. The height of embankment must be set to provide a minimum 1.0 foot of freeboard above the maximum elevation computed when the entire one-hundred (100) year peak flow passes through the spillway.
 - 4. The maximum water depth shall not exceed six (6) feet.
 - 5. The minimum top width of all embankments/berms shall be five (5) feet.
 - 6. The interior side slopes shall not be greater than five (5) horizontal to one (1) vertical. The exterior side slopes shall not be greater than three (3) horizontal to one (1) vertical.
 - 7. All basins shall be structurally sound and shall be constructed of sound and durable materials. The completed structure and the foundation of all basins shall be stable under all probable conditions of operation. Compaction requirements and berm material requirements for the impoundment embankment shall be provided.
 - 8. The emergency spillway elevation shall be at least six inches (6") above the highest principal outlet device.
 - 9. An easement shall be provided from the spillway outfall to a natural or artificial watercourse.
 - 10. An easement for inspection and repair shall be provided when the conveyance structure crosses property boundaries. Appropriate easements to enclose and permit access to all detention and retention facilities shall be provided, complete with dimensions (i.e. bearings and distances).

11. All basins not including Volume Control storage shall include an outlet structure to permit draining the basin to a completely dry position within twenty-four (24) hours following the end of the design rainfall.
 12. All basins that do include Volume Control storage shall include an outlet structure to permit draining the basin to the level of the Volume Control storage within twenty-four (24) hours following the end of the design rainfall.
 13. A cutoff trench of impervious material shall be provided within all basin embankments.
 14. All structures passing through Detention Basin embankments shall have properly spaced concrete cutoff collars and all piping must be watertight.
 15. All discharge control devices with appurtenances (except discharge pipes) shall be made of reinforced concrete and stainless steel. Bolts/fasteners shall also be stainless steel. Discharge pipes shall conform to the requirements of Section 307.C.
 16. The effect on downstream areas if the basin embankment fails shall be considered in the design of all basins. Where possible, the basin shall be designed to minimize the potential damage caused by such failure of the embankment.
 17. All structures (detention basins, cisterns, etc.), other than those used for Volume Control, must completely drain within 24 hours after the end of the design storm.
 18. Soils used for the construction of basins shall have low erodibility factors ("K" factors).
 19. All outlet structures and emergency spillways shall be designed to ensure that the basin will be structurally sound. Calculations should be provided to ensure that the conveyance of flow will not endanger the integrity of the basin and the down slope area.
 20. No outflow from a detention basin shall discharge directly onto or be conveyed onto a public road but shall discharge into a culvert under, or storm sewer along a public road. The capacity of the receiving conveyance must be adequate to accept flow and calculations shall be submitted to verify the safe conveyance of flow, to the satisfaction of the Township.
- B. Stormwater management structures and facilities shall comply with PaDOT Standards and Specifications (such as: Roadway Construction Standards, Publication 72M; and Highway Specifications, Publication 408, etc.).
 - C. For On-Lot Storm water Management Systems, alternate design of structures and facilities may be acceptable that do not comply with PaDOT Standards and Specifications, subject to the review by the Township Engineer.
 - D. For On-Lot Storm water Management Systems utilizing infiltration design, the storage volume of such systems shall be sized to safely contain the 100-year runoff volume, at a minimum, and assuming no infiltration. Infiltration into the ground, where acceptable, may be used for verifying "drawdown" of the system storage volume within the time prescribed by this Ordinance. Infiltration shall not be used as a primary outlet in the sizing of the facility.
 - E. Ease of maintenance shall be considered in the design of all storm water management facilities. Subsurface facilities must be provided with adequate safe points of access for maintenance of the system.

Section 308 - Conveyance Facilities

- A. All conveyance facilities shall be designed for worst case conditions (winter/poor).
- B. Storm sewer pipes, other than those used as roof drains, detention basin under drains, and street sub base under drains, shall have a minimum diameter of fifteen (15) inches and be made of reinforced concrete pipe (RCP), smooth lined corrugated polyethylene pipe (SLCPP), or approved equivalent. Where installation conditions merit, structural calculations that address the actual design requirements will be required.
- C. Storm sewer pipes and culverts shall be installed on sufficient slopes to provide a minimum velocity of three (3) feet per second when flowing full. All storm sewer pipes shall have a minimum slope of 0.5 percent unless approved by the Township Engineer.
- D. All storm sewer pipe and culverts shall be laid to a minimum depth of one (1) foot from finished subgrade to the crown of pipe in paved areas and one (1) foot from finished grade to the crown of pipe in grassed/non-paved/non-traffic areas. Pipe manufactures may require greater minimum cover.
- E. Changes in horizontal or vertical direction of storm sewers shall be accomplished by installing an inlet, manhole or junction box. Curves in pipes or box culverts without an inlet or manhole are prohibited. Tee joints, elbows and wyes are also prohibited.
- F. Storm water structures, including, pipes, culverts, manholes, inlets, headwalls, endwalls and end-sections shall conform to the requirements of the Pennsylvania Department of Transportation (PaDOT), Bureau of Design, Standards for Roadway Construction (RC), in effect at the time the design is submitted. All construction and materials shall be in accordance with PaDOT Publication 408, as amended.
- G. Headwalls and endwalls shall be used where storm water runoff enters or leaves the storm sewer horizontally from a natural or manmade channel. PaDOT Type "DW" headwalls and endwalls shall be utilized, and stainless steel horizontal grating shall be installed in accordance with Township standards.
- H. The following conditions shall be met for all swales:
 - 1. Capacities and velocities shall be computed using the Manning Equation. The design parameters shall be as follows:
 - a. Vegetated swales shall meet the following two (2) design considerations:
 - i. the first shall consider swale stability based upon a low degree of retardance ("n"=.03);
 - ii. the second shall consider swale capacity based upon a high degree of retardance ("n"=.05).
 - b. All vegetated swales shall have a minimum slope of one (1) percent unless approved by the Township Engineer.
 - 2. The "n" factors to be used for paved or rip-rap swales or gutters shall be based upon accepted engineering design practices as approved by the Township.
 - 3. Swales within Township rights-of-way shall be designed such that they can be maintained with existing Township equipment and resources. All such swale linings and configurations shall be subject to review and approval by the Board of

Supervisors. Riprap-lined swales within Township rights-of-way shall be avoided, but may be allowed if specifically approved by the Board of Supervisors.

- I. All storm sewer crossings of streets shall be perpendicular to the street centerline.
- J. Storm Water Conveyance Facilities not located within a public right-of-way shall be contained in and centered within an easement. Easements shall follow property boundaries where possible.
- K. Inlets shall be placed on both sides of the street at low spots (at a maximum spacing specified by this Ordinance) and at points of abrupt changes in the horizontal or vertical directions of storm sewers. Inlets shall be located along the curb line and are not permitted along the curb radius at an intersection.
- L. For the applicable design storm, flow depth in roadside swales shall not exceed six (6) inches. Flow depth in gutters shall not exceed three (3) inches. Flow depth across access drives and street intersections shall not exceed one and one-half inches (1-1/2"). Flow depth across street intersections with other streets shall not exceed one (1) inch.
- M. Inlet capacity information shall be provided for all inlets. All inlets grates shall be bicycle safe.
- N. All inlets used along existing and proposed curbed streets shall include PaDOT Type "C" top units or approved equivalent.
- O. Inlets shall be depressed two inches (2") below the grade of the street gutter or ground surface. Inlets used in ground areas shall have their tops installed level. Inlets used along curbed streets shall have their tops installed at a grade equal to the street.
- P. Manholes and inlets, when proposed, shall not be spaced more than four hundred (400) feet apart.
- Q. All storm sewers which discharge from residential lots to a street or from a street to residential lots shall extend from the street right-of-way a minimum distance of two-thirds (2/3) the length of the longest adjacent lot dimension.
- R. Trench excavations within existing street right-of-way areas shall be backfilled with suitable stone aggregate materials from the bottom of the trench to the pavement subgrade elevation. All other areas shall be backfilled with suitable stone aggregate materials from the bottom of the trench to the pipe spring line elevation, followed by proper backfilling and compaction of suitable soil material to finish grade.
- S. When drainage swales are traversed by driveways or other crossings, design and construction details of the crossings shall be provided, and calculations indicating that the swales will continue to function in accordance with the swale design shall be provided.

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.
- D. Where the regulated activity constitutes subdivision or land development as hereinabove defined, the SWM Site Plan shall be submitted with and form an integral part of the plans required under the Municipal Subdivision and Land Development Ordinance.

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:

Caernarvon Township SWM Site Plan Approval Certification

At a meeting on _____, 20____, the Board of Supervisors 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 Caernarvon Township 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 water bodies, 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.

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 drain field 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.

L. The plan shall clearly state the maximum allowable impervious surface coverage used in the design of the property's Storm Water Management Facilities. Any construction which would alter the original design or increase impervious surface coverage beyond the design limits will not be allowed without a redesign and/or analysis of the Storm Water Management design and shall be subject to review by the Township.

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 25 Pa. Code Chapter 102, shall be provided to the municipality prior to unconditional final plan approval.
- C. 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 unconditional final plan approval.
- D. An Operation and Maintenance (O&M) Plan that addresses the requirements of Section 603.

ARTICLE V PLAN PROCESSING PROCEDURES

Section 501. Small Projects.

- A. Anyone proposing a Small Project, shall submit two (2) 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 Caernarvon Township'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.
 - 4. The installation of 1,000 or fewer square feet of Impervious Surface coverage proposed after May 6, 2014, provided that the activities meet the criteria of Section 502.C below and are conducted in accordance with all requirements of this Ordinance.
 - 5. Domestic landscape and/or vegetable gardens.

- 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.
- C. An applicant proposing the cumulative (effective since May 6, 2014) installation of 1,000 square feet or less of Impervious Surface coverage may be exempt from the design, plan submittal and processing requirements of Articles IV and V of this Ordinance if the proposal meets the criteria in Section 502.C. No person or activity is exempted from compliance with Section 605 and Articles VII, VIII and IX of this Ordinance. Exemptions do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by other code, law, regulations or ordinance. Exemption shall not relieve an applicant from implementing such measures as necessary to meet compliance with any NPDES Permit requirements.
1. Any applicant desiring exemption from design, plan submission, and plan processing requirements shall complete an application for exemption in the form set forth in Appendix D and pay any applicable filing fee.
 2. The Applicant for exemption under Section 502.C shall provide the municipality with all information necessary for the municipality to determine that:
 - i. There shall be no disturbance of land within Floodplains, Wetlands, Environmentally Sensitive Areas, Riparian Forest Buffers, or slopes greater than 15%.
 - ii. No Impervious Surface coverage shall be installed and no Earth Disturbance Activity shall be conducted within any existing drainage or Stormwater easement create by or shown on any recorded plan.
 - iii. The applicant shall minimize soil disturbance, take steps to minimize Erosion and Sedimentation during construction activity, and promptly reclaim all disturbed areas with topsoil and vegetation.
 - iv. The applicant shall take steps that Runoff be directed to Pervious Areas on the subject property. No Runoff shall be directed onto an abutting street or neighboring property.
 - v. The proposed Impervious Surface shall not adversely impact any existing known problem areas or downstream property owners or the quality of Runoff entering any municipal separate Storm Sewer system.
 - vi. The proposed Impervious Surface shall not create accelerated Erosion and Sedimentation.
 3. If the proposed activity does not meet all of the criteria set forth in Section 502.C.2 above, the Applicant shall the applicant shall follow the Small Project processing procedure in Section 501.
 4. If the proposed activity is located in a High Quality (HQ) or Exceptional Value (EV) watershed, the applicant shall be responsible for compliance with all federal and state requirements. This exemption does not provide relief from any other applicable state or federal requirements.
 5. No Applicant and no activity shall violate or cause to be violated: the Federal Clean Water Act, Clean Stream Law, or any regulation issued thereunder, an NPDES permit, any recorded Stormwater Management or Operations and Maintenance

Agreement, or any requirement applicable to a Municipal Separate Storm Sewer System.

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 drainage ways, 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. Five (5) copies of 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 Caernarvon Township's current fee schedule).
- B. Distribution of the Storm Water Management Plan will be as follows:
 - 1. Four (4) copies of the plan and one (1) copy of supplemental data to the Township accompanied by the requisite Township Review Fee, as specified in this Ordinance or other ordinance currently in effect.
 - 2. One (1) copy of plan and supplemental data to the Township Engineer.
- C. The SWM Site Plan shall be submitted in a format that is clear, concise, legible, neat and well organized.
- D. The applicant is responsible for submitting plans to any other agencies such as the Lancaster County Conservation District, Penn DOT, DEP, etc. when permits and/or

approvals from these agencies are required. Final approval shall be conditioned upon the applicant obtaining all necessary permits and/or approvals.

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

Section 505. Municipal Review

- A. When the regulated activity constitutes a Subdivision or Land Development as defined in either the Caernarvon Township SALDO or the Lancaster County SALDO (whichever regulates said activity), the SWM Site Plan and Subdivision/Land Development Plan shall be processed concurrently according to the plan processing procedure outlined in the appropriate Ordinance or otherwise as directed by Caernarvon Township.
- B. When the regulated activity constitutes a Small Project the Municipality shall review and take action on the Small Project Application within thirty (30) 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 substantial 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 three (3) 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

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.

- A. 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. Concurrently with 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, unless the Site Plan has already been recorded.

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 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. The O&M Plan and Agreement shall be recorded as a restrictive covenant agreement that runs with the land.

Section 602. Operation and Maintenance Agreements

- A. The Operation and Maintenance Agreement shall be subject to the review and approval of the municipal solicitor and governing body.
- B. The Municipality is 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 a qualified person, which may include 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 25 Pa. Code 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 any proposal to dedicate ownership and operating responsibility of any SWM facilities to the municipality.
- 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. ball field, 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.

- 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 according to the following minimum frequencies:
 - 1. Annually for the first 5 years.
 - 2. Once every 3 years thereafter.
 - 3. During or immediately after the cessation of a 10-year or greater storm.
 - 4. As specified in the O&M Agreement pursuant to Section 602.
- E. Maintenance shall be conducted as necessary to provide for the continued functioning of the facility. Costs of inspections, maintenance 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 and review of As-Built Plan and calculations for compliance.
- E. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

Section 703. Liens for Township Expenses

In the event the Township incurs any expense or cost in the administration of this Ordinance or in the enforcement thereof pursuant to Article VIII hereof, or in the event that the Township incurs any expense in maintenance of facilities on private property, all costs and expenses of the Township (including a reasonable attorney's fees related to collection and/or enforcement thereof) shall be promptly reimbursed by the property owner. Upon the failure of the property owner to promptly reimburse the Township the aforesaid costs, expenses and attorney's fees, the Township shall have the right, pursuant to applicable statutory authority to proceed in Court for the collection thereof and/or to take action to file a municipal lien for the recovery thereof.

ARTICLE VIII

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 the 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 –

- 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 One Hundred and 00/100 dollars (\$ 100.00), or more than Five Hundred and 00/100 dollars (\$ 500.00), for each violation, recoverable with costs. Each day that a violation occurs shall constitute a separate offense. All fines shall be paid to Caernarvon Township.
- B. In addition, the Caernarvon Township may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance, and may request 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 administrative action of the Township may appeal to the Board of Supervisors within 30 days of that action. Any such appeal shall be governed by the procedures of Article V of the Local Agency Law, 2 Pa. C.S.A. 401 et seq.
- B. Any person aggrieved by any decision of Board of Supervisors may appeal to the Lancaster County Court of Common Pleas, in accordance with Article VII of Local Agency Law, 2 Pa. C.S.A. 701 et seq. the Local Agency Law, 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
3. Code of Federal Regulations – Title 44: Emergency Management and Assistance, §9.4 Definitions
4. *25 Pa.Code Chapter 105*
5. Based on definition in Wisconsin Department of Natural Resources Administrative Rule NR 151.006.
6. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual*. Harrisburg, PA.
7. City of Jacksonville website, <http://www3.coj.net/Departments/CityFees/Glossary.aspx>
8. Lancaster County Model Subdivision and Land Development Ordinance.
9. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (March 2012), as amended and updated. *Erosion and Sediment Pollution Control Program Manual*. Harrisburg, PA.
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.
11. “Penn State Urban Hydrology Model User Manual” by Thomas A. Seybert, PE, David F. Kibler, PE, and Elizabeth I. White, PE, August 1993 page 70 and VT/PSUHM help screen.
12. 25 Pa. Code, Chapter 71 Administration of Sewage Facilities Planning Program, § 71.1
13. Conestoga River Watershed Act 167 Storm Water Management Plan.

ENACTED and ORDAINED at a regular meeting of the Caernarvon Township Board of Supervisors on the 5th day of May, 2014. This Ordinance shall take effect immediately.

Terry Hartranft, Chairman

Terry Martin, Township Supervisor

Gary Van Dyke, Township Supervisor

ATTEST:

Kathryn Norris, Secretary

I hereby certify that the foregoing Ordinance was advertised in the Lancaster Newspaper on, a newspaper of general circulation in the Municipality and was duly enacted and approved as set forth at a regular meeting of the Caernarvon Township Board of Supervisors held on May 5, 2014.

Kathryn Norris, Secretary

**APPENDIX A
SMALL PROJECT APPLICATION**

File Number _____

Date Received _____

Submitted Fees \$ _____

Approval of Application Date _____

Project Street Address: _____

Project Name: _____

Project Description: _____

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 to 5,000 SF)

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.

Net impervious surface proposed for construction: _____ sq. ft.

Small Project Application Pg. 2

Check all items below that will be impacted by the project:

<input type="checkbox"/> Floodplain	<input type="checkbox"/> Wetlands
<input type="checkbox"/> Steep Slopes (15% or greater)	<input type="checkbox"/> Sinkholes
<input type="checkbox"/> Mature trees	<input type="checkbox"/> Known Shallow Bedrock
<input type="checkbox"/> Water wells	<input type="checkbox"/> Easements
<input type="checkbox"/> Septic drain fields	<input type="checkbox"/> Alternate septic drain fields
<input type="checkbox"/> Creeks, streams, wetlands, or ponds	
<input type="checkbox"/> Existing stormwater management facility (basin, swale, etc.)	
<input type="checkbox"/> Existing stormwater problem areas	

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
- Location and approximate footprint of existing structures (buildings, patios, driveways, etc.)
- Approximate location of any of the following features which will be impacted by the project:
Mature trees, Sinkholes, Water wells, Septic drain fields,
Alternate septic drain fields, 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: _____

Small Project Application Calculation Worksheet

The applicant may use the following to calculate the amount of runoff which must be managed in accordance with Section 302.B of this Ordinance.

Project Name: _____

Owner Name: _____

Proposed Additional Impervious Area: _____ square feet

Impervious Area Calculations

Calculate the amount of runoff to be permanently removed (managed on site through reuse, evaporation, transpiration or infiltration):

Additional impervious area \div 12 = Permanently Removed Runoff Volume (PRV)

_____ square feet of additional impervious \div 12 = _____ cubic feet PRV

_____ cubic feet \times 7.48 gallons per cubic foot = _____ gallons PRV

EXAMPLE

Small Project Application Calculation Worksheet

Landowner Name: Jane Doe (20 x 45' garage)

Owner Name: Jane Doe

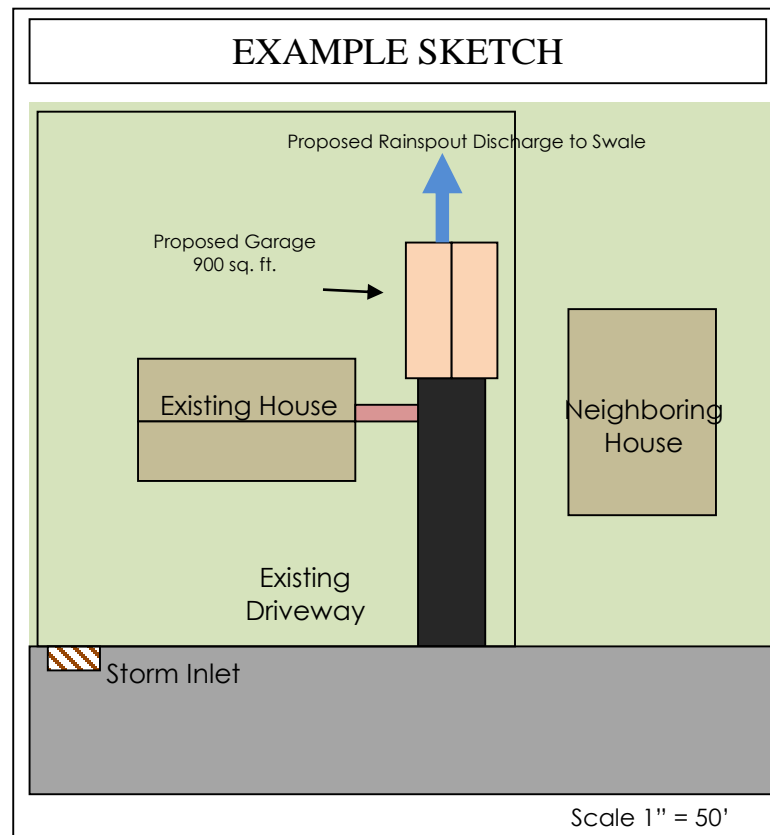
Proposed Additional Impervious Area: 900 square feet

Impervious Area Calculations

Calculate the amount of runoff to be permanently removed (managed on site through reuse, evaporation, transpiration or infiltration) using the following formula:

Additional impervious area ÷ 12 = Permanently Removed Runoff Volume (PRV)

900 square feet of additional impervious ÷ 12 = 75 cubic feet PRV
75 cubic feet x 7.48 gallons per cubic feet = 561 gallons PRV



APPENDIX NO. B-1

RUNOFF COEFFICIENTS “C” FOR RATIONAL FORMULA(E&S Manual March 2012)

TABLE 5.2
Runoff Coefficients for the Rational Equation*

LAND USE	A Soils ¹			B Soils ¹			C Soils ¹			D Soils ¹		
	< 2%	2 - 6%	>6%	< 2%	2 - 6%	>6%	< 2%	2 - 6%	>6%	< 2%	2 - 6%	>6%
Cultivated land	0.08	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
Meadow	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
Residential lot size 1/8 acre	0.25	0.28	0.31	0.27	0.30	0.35	0.30	0.33	0.38	0.33	0.36	0.42
Residential lot size 1/4 acre	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.30	0.34	0.40
Residential lot size 1/3 acre	0.19	0.23	0.26	0.22	0.26	0.30	0.25	0.29	0.34	0.28	0.32	0.39
Residential lot size 1/2 acre	0.16	0.20	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.30	0.37
Residential lot size 1 acre	0.14	0.19	0.22	0.17	0.21	0.26	0.20	0.25	0.31	0.24	0.29	0.35
Industrial	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.68	0.69	0.69	0.69	0.70
Commercial	0.71	0.71	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Streets	0.70	0.71	0.72	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
Open Space	0.05	0.10	0.14	0.08	0.13	0.19	0.12	0.17	0.24	0.15	0.21	0.28
Parking	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
Construction Sites - Bare packed soil, smooth	0.30	0.35	.040	0.35	.040	0.45	0.40	0.45	0.50	0.50	0.55	0.60
Construction Sites - Bare packed soil, rough	.020	0.25	0.30	0.25	0.30	0.35	0.30	0.35	0.40	0.40	0.45	0.50

* Runoff Coefficients for storm recurrence intervals less than 25 years

Adapted from McCuen, R.H., Hydrologic Analysis and Design (2004)

1. According to the USDA NRCS Hydrologic Soils Classification System

Runoff Coefficients "C" for Rational Formula												
Soil Group	A			B			C			D		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land												
winter conditions	.14	.23	.34	.21	.32	.41	.27	.37	.48	.34	.45	.56
summer conditions	.10	.16	.22	.14	.20	.28	.19	.26	.33	.23	.29	.38
Fallowed Fields												
poor conditions	.12	.19	.28	.17	.25	.34	.23	.33	.40	.27	.35	.45
good conditions	.08	.13	.16	.11	.15	.21	.14	.19	.26	.18	.23	.31
Forest/Woodland	.08	.11	.14	.10	.14	.18	.12	.16	.20	.15	.20	.25
Grass Areas												
good conditions	.10	.16	.20	.14	.19	.26	.18	.22	.30	.21	.25	.35
average conditions	.12	.18	.22	.16	.21	.28	.20	.25	.34	.24	.29	.41
poor conditions	.14	.21	.30	.18	.28	.37	.25	.35	.44	.30	.40	.50
Impervious Areas	.90	.91	.92	.91	.92	.93	.92	.93	.94	.93	.94	.95
Weighted Residential												
lot size \geq acre	.29	.33	.36	.31	.35	.40	.34	.38	.44	.36	.41	.48
lot size $\frac{1}{4}$ acre	.26	.30	.34	.29	.33	.38	.32	.36	.42	.34	.38	.46
lot size $\frac{1}{8}$ acre	.24	.28	.31	.26	.32	.35	.29	.35	.40	.32	.36	.45
lot size $\frac{1}{2}$ acre	.21	.25	.28	.24	.27	.32	.27	.31	.37	.30	.34	.43
lot size 1 acre	.18	.23	.26	.21	.24	.30	.24	.29	.36	.28	.32	.41

Source: Lancaster County Act 167 Model Stormwater Ordinance (June 2002)

APPENDIX NO. B-2

RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD*

Runoff Curve Numbers "CN" for SCS Method												
Soil Group	A			B			C			D		
Slope	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land winter conditions	48	60	65	62	73	73	68	78	79	77	81	88
summer conditions	35	51	61	48	55	70	57	65	77	64	69	80
Fallowed Fields poor conditions	45	54	76	56	63	85	64	74	90	69	77	93
good conditions	30	44	74	43	48	83	48	54	88	56	60	90
Forest/Woodland	30	30	40	42	46	55	45	50	70	50	56	77
Grass Areas good conditions	35	39	51	48	54	61	56	59	74	62	63	80
average conditions	45	49	53	52	55	69	60	63	79	65	69	84
poor conditions	48	55	68	56	67	79	66	74	86	73	81	89
Impervious Areas	96	97	98	96	97	98	96	97	98	96	97	98
Weighted Residential lot size c acre	71	75	77	74	76	85	78	80	90	81	83	92
lot size ¼ acre	61	62	67	66	69	75	67	69	83	75	78	87
lot size a acre	57	59	65	64	66	72	65	66	81	74	77	86
lot size ½ acre	54	57	63	62	64	70	63	65	80	72	76	85
lot size 1 acre	51	55	62	61	63	68	61	64	79	71	75	84

Source: Lancaster County Act 167 Model Stormwater Ordinance (June 2002)

Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area ^{2/}	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas					
(pervious areas only, no vegetation) ^{5/}		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

¹ Average runoff condition, and $I_a = 0.2S$.

² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands ^{1/}

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment ^{2/}	Hydrologic condition ^{3/}	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

¹ Average runoff condition, and $I_a=0.2S$

² Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

³ Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good $\geq 20\%$), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. ^{2/}	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. ^{3/}	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 ^{4/}	48	65	73
Woods—grass combination (orchard or tree farm). ^{5/}	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. ^{6/}	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 ^{4/}	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

¹ Average runoff condition, and $I_a = 0.2S$.

² *Poor*: <50% ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: > 75% ground cover and lightly or only occasionally grazed.

³ *Poor*: <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

⁴ Actual curve number is less than 30; use CN = 30 for runoff computations.

⁵ CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

⁶ *Poor*: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

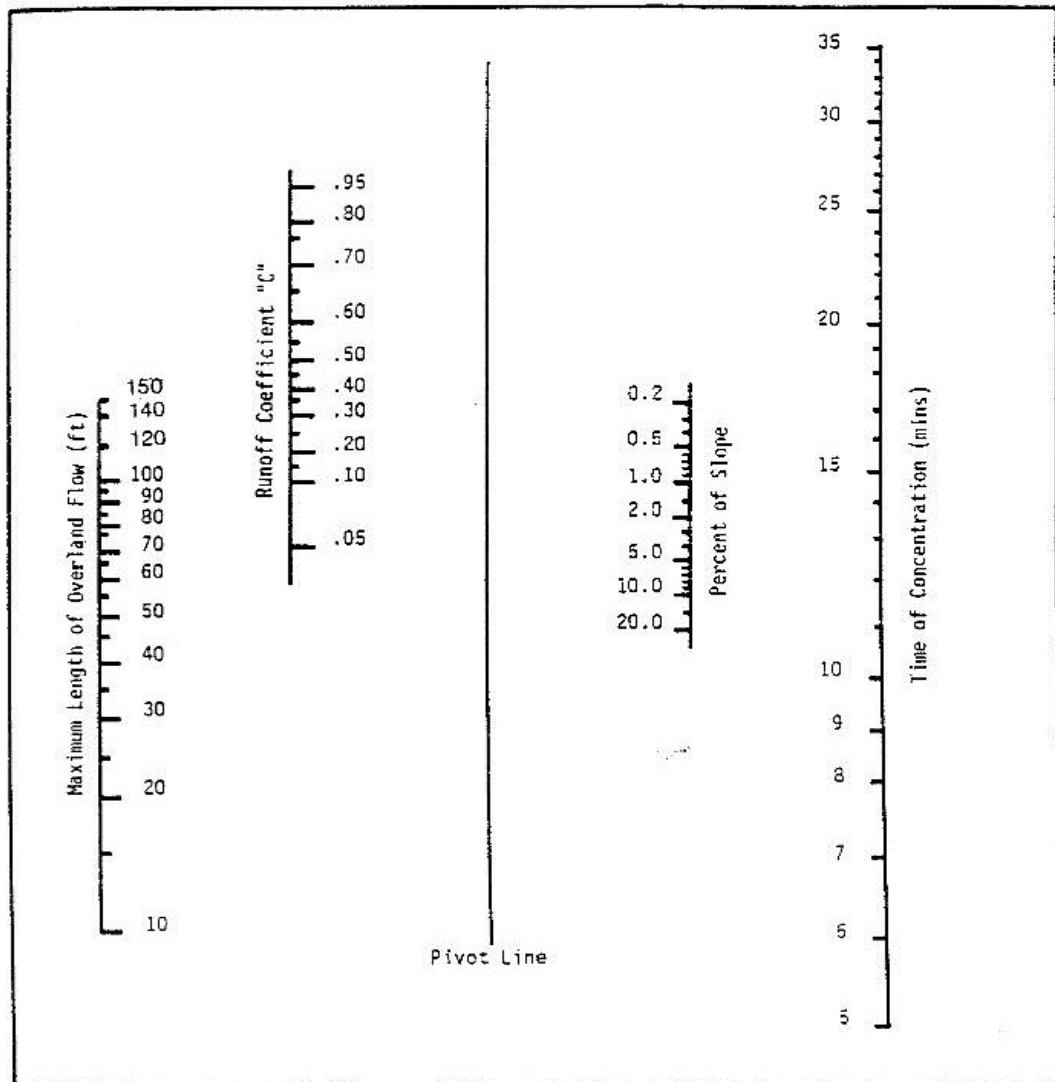
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Source: U. S. Department of Agriculture, Natural Resources Conservation Service, June 1986, Urban Hydrology for Small Watersheds, Technical Release No. 55 (TR-55), Second Edition

APPENDIX NO. B-3

NOMOGRAPH FOR DETERMINING SHEET FLOW

(for use with the Rational Method)



APPENDIX NO. B-4

Worksheet #1: Time of concentration (T_c) or travel time (T_t)

Project _____ By _____ Date _____

Location _____ Checked _____ Date _____

Circle one: Present Developed

Circle one: T_c T_t 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 T_c only)

Segment ID

1. Surface description (table 3-1)

2. Manning's roughness coeff., n (table 3-1)

3. Flow length, L (total $L \leq$ **150 ft) ft

4. Two-yr 24-hr rainfall, P_2 in

5. Land slope, s ft/ft

6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t hr

		+		=	

Shallow concentrated flow

Segment ID

7. Surface description (paved or unpaved)

8. Flow length, L ft

9. Watercourse slope, s ft/ft

10. Average velocity, V (figure 3-1) ft/s

11. $T_t = \frac{L}{3600 V}$ Compute T_t hr

		+		=	

Channel flow

Segment ID

12. Cross sectional flow area, a ft²

13. Wetted perimeter, P_w ft

14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r ft

15. Channel slope, s ft/ft

16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V ft/s

18. Flow length, L ft

19. $T_t = \frac{L}{3600 V}$ Compute T_t hr

		+		=	

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) hr

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

**150' sheet flow length per latest TR-55 revision

APPENDIX NO. B-5

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

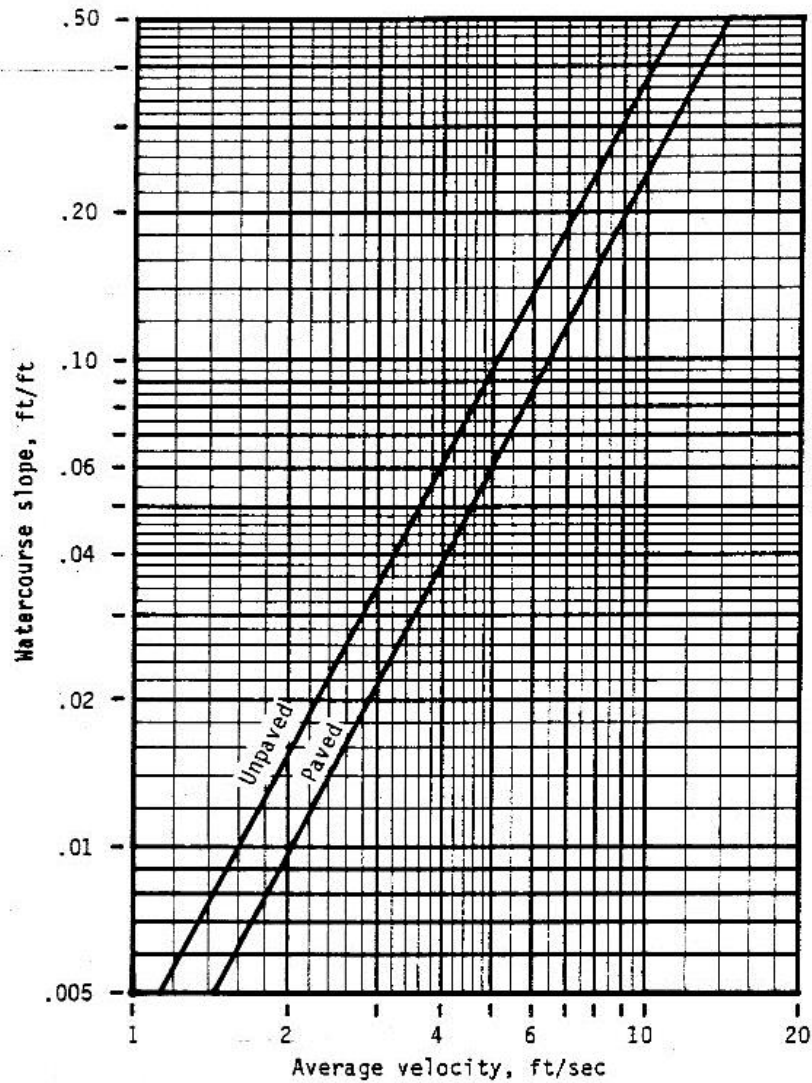


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

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 Caernarvon Township, Lancaster County, Pennsylvania, (hereinafter “Municipality”);

WITNESSETH

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of Lancaster 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)

**APPENDIX D
EXEMPT PROJECT APPLICATION**

File Number _____

Date Received _____

Submitted Fees \$ _____

Approval of Application Date _____

Project Street Address: _____

Project Name: _____

Project Description: _____

Owner's Name and Address: _____

Phone# / Fax# / Email: _____

Please list the date of any previous Exempt or 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.

Net impervious surface proposed for construction: _____ sq. ft.

Exempt Project Application Pg. 2

Check all items below that will be impacted by the project:

- | | |
|---|--|
| <input type="checkbox"/> Floodplain | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Steep Slopes (15% or greater) | <input type="checkbox"/> Sinkholes |
| <input type="checkbox"/> Mature trees | <input type="checkbox"/> Known Shallow Bedrock |
| <input type="checkbox"/> Water wells | <input type="checkbox"/> Easements |
| <input type="checkbox"/> Septic drain fields | <input type="checkbox"/> Alternate septic drain fields |
| <input type="checkbox"/> Creeks, streams, wetlands, or ponds | |
| <input type="checkbox"/> Existing stormwater management facility (basin, swale, etc.) | |
| <input type="checkbox"/> Existing stormwater problem areas | |

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 and/or land disturbance. Include the following on the sketch:

- Property boundary
- Location and approximate footprint of existing structures (buildings, patios, driveways, etc.)
- Approximate location of any of the following features which will be impacted by the project:
 - Mature trees
 - Sinkholes
 - Water wells
 - Septic drain fields
 - Alternate septic drain fields
 - 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: _____

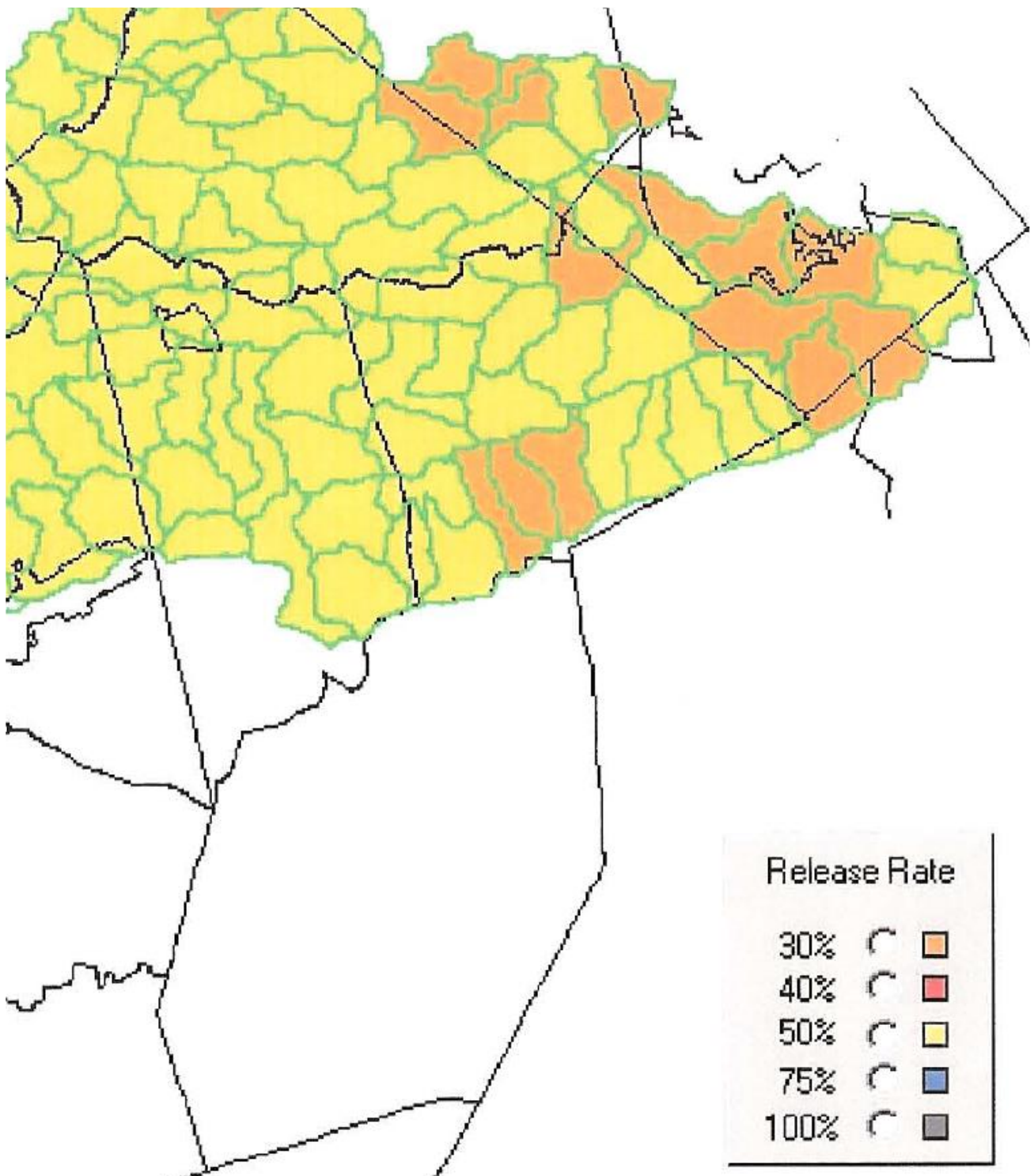
Phone# / Fax# / Email: _____

Name of Person Submitting this Application: _____

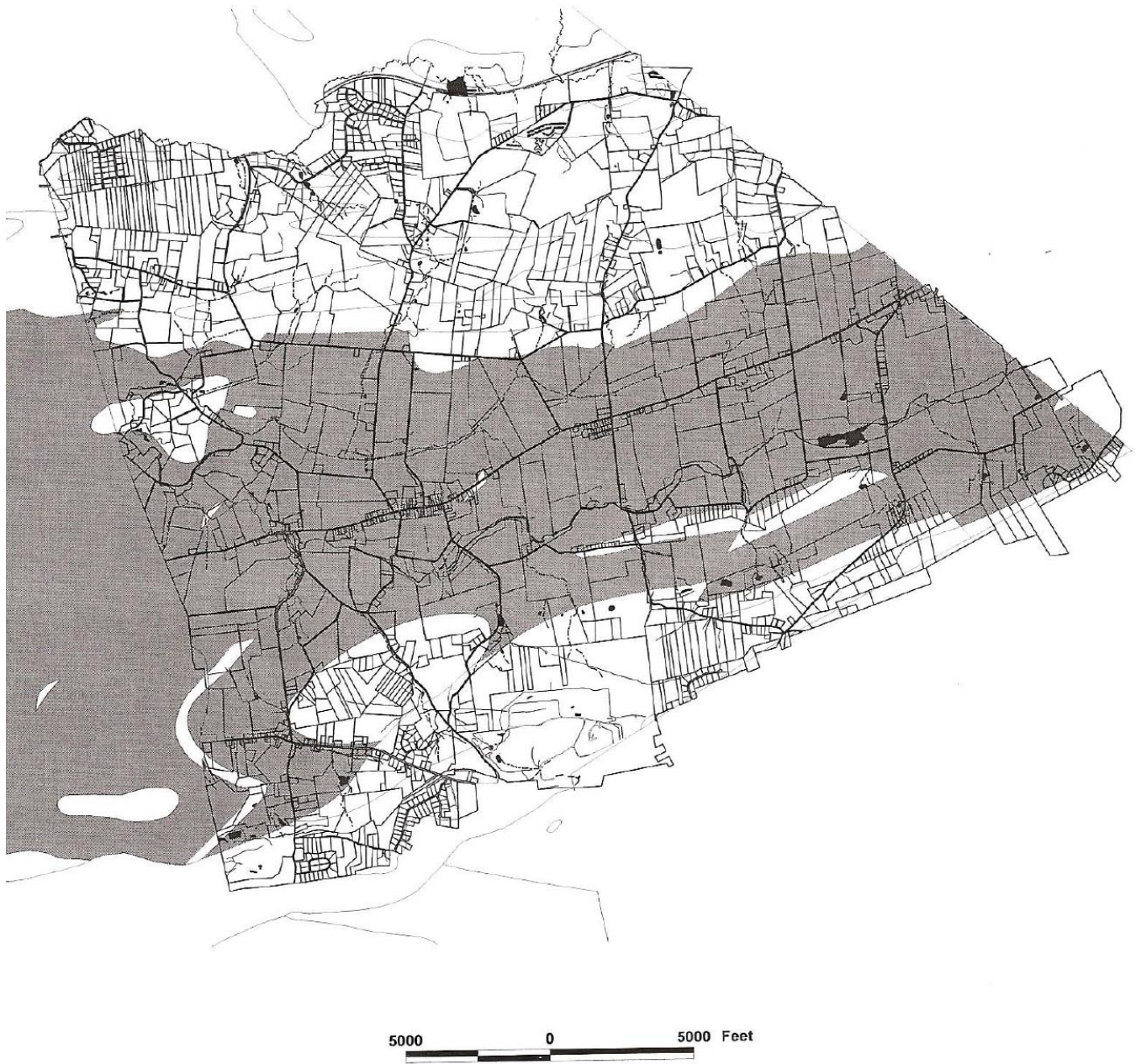
Signature: _____

Date: _____

APPENDIX E RELEASE RATE MAP (Source Lancaster County ACT 167)



APPENDIX F
CARBONATE GEOLOGY MAP



Source: Lancaster County GIS