

**BOARD OF SUPERVISORS**  
**TOWNSHIP OF PALMER**  
**NORTHAMPTON COUNTY, PENNSYLVANIA**

**ORDINANCE NO. 2023-482**

**AN ORDINANCE OF THE PALMER TOWNSHIP BOARD OF SUPERVISORS AMENDING CHAPTER 158 OF THE PALMER TOWNSHIP CODE BY REPEALING THE EXISTING CHAPTER 158 AND REENACTING A REVISED CHAPTER 158, PROVIDING REGULATIONS FOR STORMWATER MANAGEMENT, STORMWATER MANAGEMENT PLANS, MAINTENANCE RESPONSIBILITIES, PROHIBITIONS, ENFORCEMENT, AND PENALTIES TO BE APPLICABLE THROUGHOUT PALMER TOWNSHIP AND PROVIDING FOR SEVERABILITY AND AN EFFECTIVE DATE**

**BE IT ENACTED AND ORDAINED BY** the Board of Supervisors of Palmer Township, Northampton County, Pennsylvania, and the same is hereby ordained and enacted as follows to wit:

**SECTION I:            REPEAL AND REPLACEMENT OF STORMWATER MANAGEMENT ORDINANCE**

Chapter 158 of the Palmer Township Code is hereby amended with the repeal of all provisions of the existing Chapter 158 and enactment of the Stormwater Management Ordinance attached hereto and incorporated herein as *Exhibit "A"* to this Ordinance.

**SECTION II:            SEVERABILITY**

The provisions of this Ordinance are declared to be severable. If any article, section, subsection, paragraph, clause, phrase or provision of this Ordinance shall be held to be invalid or held unconstitutional, the same shall not affect the validity of this Ordinance as a whole or any part or provisions hereof, other than the part determined to be invalid or unconstitutional.

**SECTION III:            CONFLICTS**

Any ordinance, resolution and/or other regulation of the Township, or any parts of ordinances, resolutions and/or other regulations of the Township, in conflict herewith are hereby repealed. All other provisions of the ordinances, resolutions and/or other regulations of Palmer Township, Northampton County, Pennsylvania shall remain in full force and effect.

**SECTION IV:      EFFECTIVE DATE**

This Ordinance shall become effective five (5) days after enactment.

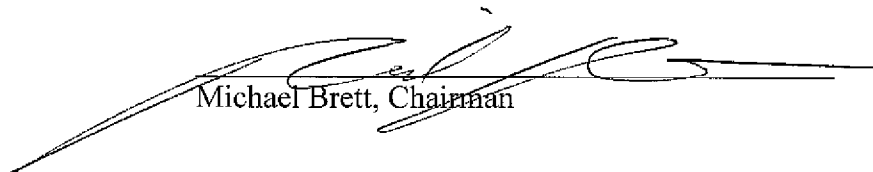
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**BOARD OF SUPERVISORS**  
**TOWNSHIP OF PALMER**  
**NORTHAMPTON COUNTY, PENNSYLVANIA**


**ORDINANCE NO. 2023-482**

**SIGNATURE PAGE**


**ENACTED AND ORDAINED BY THE TOWNSHIP OF PALMER, NORTHAMPTON  
COUNTY, PENNSYLVANIA, THIS 20th DAY OF November, 2023**

  
Michael Brett, Chairman


\_\_\_\_\_  
Joseph Armato, Vice-Chairman

  
\_\_\_\_\_  
K. Michael Mitchell, Member

  
\_\_\_\_\_  
Ann-Marie Panella, Member

  
\_\_\_\_\_  
Jeffrey Young, Member

Attest:

  
\_\_\_\_\_  
Robert Williams  
Township Manager  
(Seal)

# STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. 2023-482

MUNICIPALITY OF

PALMER TOWNSHIP

NORTHAMPTON COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

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## **ARTICLE I – GENERAL PROVISIONS**

### **Section 101. Short Title**

This Ordinance shall be known and may be cited as the “Palmer Township Stormwater Management Ordinance.”

### **Section 102. Statement of Findings**

The governing body of the Municipality finds that:

- A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases runoff volumes, flows, and velocities; contributes to erosion and sedimentation; overtaxes the carrying capacity of streams and storm sewers; greatly increases the cost of public facilities to carry and control stormwater; undermines floodplain management and flood control efforts in this and downstream communities; reduces groundwater recharge; threatens public health and safety; and increases nonpoint source pollution of water resources.
- B. A comprehensive program of stormwater management (SWM), including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, and welfare, and the protection of people of the Commonwealth, their resources, and the environment.
- C. Existing improvements that lack compliant stormwater controls and are proposed for re-development disproportionately increase the cost of comprehensive stormwater management for the Municipality.
- D. Stormwater is an important water resource that provides groundwater recharge for water supplies and supports the base flow of streams.
- E. The use of green infrastructure and low impact development (LID) are intended to address the root cause of water quality impairment by using systems and practices which use or mimic natural processes, unless otherwise required, to: 1. infiltrate and recharge, 2. evapotranspire, and/or 3. harvest and use precipitation near where it falls to earth. Green infrastructure practices and LID contribute to the restoration or maintenance of pre-development hydrology.
- F. 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 separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES) program.
- G. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.
- H. Non-stormwater discharges to municipal separate storm sewer systems can contribute to pollution of waters of the Commonwealth by the municipality.

### **Section 103. Purpose**

The purpose of this Ordinance is to promote health, safety, and welfare within the Municipality and its watersheds 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 in 25 Pa. Code 93 to protect, maintain, reclaim, and restore the existing and designated uses of the waters of this Commonwealth.
- B. Preserve natural drainage systems.
- C. Manage stormwater runoff close to the source, reduce runoff volumes, and mimic predevelopment hydrology.
- 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 (O&M) of all stormwater best management practices (BMPs) that are implemented within the Municipality.
- H. Provide standards to meet NPDES permit requirements.
- I. Provide standards to meet the stormwater management plans for the Bushkill Creek and Fry's Run watersheds as prepared by the Lehigh Valley Planning Commission of Lehigh and Northampton Counties as adopted by the County of Northampton.
- J. Preserve and restore the flood carrying capacity of streams.
- K. Maintain the existing flows and quality of streams and watercourses in the municipality.
- L. Encourage infiltration of stormwater, where appropriate, to maintain groundwater recharge, to prevent degradation of surface and groundwater quality and to otherwise protect water resources.

#### **Section 104. Statutory Authority**

The Municipality 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, 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/or the Act of June 24, 1931, P.L. 1206, as amended, the Second Class Township Code.

#### **Section 105. Applicability**

All regulated activities and all activities that may affect stormwater runoff, including land development and earth disturbance activity, are subject to regulation by this Ordinance.

#### **Section 106. Repealer**

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

#### **Section 107. Severability**

In the event that a court of competent jurisdiction declares any section or provision of this Ordinance invalid, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

#### **Section 108. Compatibility with Other Requirements**

Approvals issued and actions taken under this Ordinance do not relieve the applicant of the responsibility to comply with or to secure required permits or approvals for activities regulated by any other applicable code, laws, rules, statutes, or Ordinance. To the extent that that this chapter imposes more rigorous or stringent requirements for stormwater management, the specific requirements contained in this chapter shall be followed.

#### **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. Waivers**

- A. If the Municipality determines that any requirement under this Ordinance cannot be achieved for a particular regulated activity, the Municipality may, after an evaluation of alternatives, approve measures other than those in this Ordinance, subject to Section 110, paragraphs B and C.



- B. Waivers or modifications of the requirements of this Ordinance may be approved by the Municipality if enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that the modifications will not be contrary to the public interest and that the purpose of the Ordinance is preserved. Cost or financial burden shall not be considered a hardship. Modification may be considered if an alternative standard or approach will provide equal or better achievement of the purpose of the Ordinance. A request for modifications shall be in writing. The written request shall provide the facts on which the request is based, the provision(s) of the Ordinance involved, and the proposed modification. Any SWM Site Plan, Report, or other related changes not matching the written request are considered void.
  
- C. No waiver or modification of any regulated stormwater activity involving earth disturbance greater than or equal to one acre may be granted by the Municipality unless that action is approved in advance by the Department of Environmental Protection (DEP) or the delegated county conservation district.

## ARTICLE II – DEFINITIONS

For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.
- B. The words and phrases “includes”, “including”, “for example”, “e.g.”, and/or other related words and phrases shall not limit the term to the specific example, but are intended to extend their meaning to all other instances of like kind and character.
- C. The words “shall” and “must” are mandatory; the words “may” and “should” are permissive.

These definitions do not necessarily reflect the definitions contained in pertinent regulations or statutes, and are intended for this Ordinance only.

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

**Applicant** – A landowner, developer, or other person/entity who has filed an application to the Municipality for approval to engage in any regulated activity at a project site in the Municipality. “Applicant” also refers to any person/entity that may be exempt from certain, but not all, provisions of this Ordinance.

**Best Management Practice (BMP)** – Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities, to meet state water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: “structural” or “non-structural.” In this Ordinance, non-structural BMPs or measures refer to operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff, whereas structural BMPs or measures are those that consist of a physical device or practice that is installed to capture and treat stormwater runoff. Structural BMPs include but are not limited to a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the project site.

**Closed Depression** – The low area of a field with no outlet that accumulates or receives runoff.

**Conservation District** – A conservation district, as defined in Section 3(c) of the Conservation District Law (3 P. S. § 851(c)), that has the authority under a delegation agreement executed with DEP to administer and enforce all or a portion of the regulations promulgated under 25 Pa. Code 102.

**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 stormwater management systems. Also see Return Period.

**Detention Volume** – The volume of runoff that is captured and released into the waters of the Commonwealth at a controlled rate.

**DEP** – The Pennsylvania Department of Environmental Protection.

**Development Site (Site)** – See Project Site.

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

**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; road maintenance; parking lot maintenance; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

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

**Existing Condition** – The dominant land cover and/or condition during the 5-year period immediately preceding a proposed regulated activity.

**Facility, Conveyance** – Any structure or practice that is designed and/or constructed to transmit or otherwise transfer stormwater runoff from one location to another. Typical Conveyance Facilities include but are not limited to: swales and other open channel facilities; stormsewers; and pipe culverts.

**Facility, Erosion and Sediment Control** – Any structure or practice that is designed and/or constructed to capture, reduce, prevent, or otherwise mitigate the effects of stormwater runoff and sedimentation. Typical Erosion and Sediment Control Facilities include but are not limited to: erosion control matting, silt fence, silt sock, inlet protection, temporary seeding, and sediment ponds. **Erosion and Sediment Control Facility** may be designated as **ESC Facility** throughout this Ordinance.

**Facility, Stormwater Management** – Any structure or practice that is designed and/or constructed to store or otherwise attenuate stormwater runoff. Typical stormwater management facilities include but are not limited to: detention and retention basins; rain gardens; and infiltration facilities. **Stormwater Management Facility** may be designated as **SWM Facility** throughout this Ordinance.

**FEMA** – Federal Emergency Management Agency.

**Floodplain** – Any land area susceptible to inundation by water from any natural source or delineated by applicable FEMA maps and studies as being a special flood hazard area. Also includes areas that comprise Group 13 Soils, as listed in Appendix A of the Pennsylvania DEP Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by DEP).

**Floodway** – The channel of the watercourse and those portions of the adjoining floodplains that are reasonably required to carry and discharge the 100-year 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 floodway, it is assumed – absent evidence to the contrary – that the floodway extends from the stream to 50 feet from the top of the bank of the stream.

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

**Green Infrastructure** – Systems and practices that use or mimic natural processes to infiltrate, evapotranspire, or reuse stormwater on the site where it is generated.

**Hotspot Use** – Any proposed land use that has the potential to have an increased amount of stormwater pollutant runoff, generally based upon its use or generation of pollutants, including but not limited to: chemicals, oil-based products, pesticides, fertilizers, large traffic volume, and/or outdoor storage. Example uses include but are not limited to automobile repair, filling, and washing facilities; automobile, boat, and trailer storage and/or sales; commercial and/or retail uses with parking lots; restaurants with drive-thrus; industrial or heavy manufacturing establishments; warehousing; athletic fields; golf courses; and swimming pools not accessory to an individual residential use.

**Hydrologic Soil Group (HSG)** – Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The NRCS defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less pervious as the HSG varies from A to D (NRCS<sup>1,2</sup>).

**Impervious Surface (Impervious Area)** – A surface that prevents the infiltration of water into the ground. Impervious surfaces (or areas) shall include but not be limited to: roofs; additional indoor living spaces; patios and similar structures (including those made of wood or other planks); ponds and other permanent water-storage areas

(excluding swimming pools); garages; storage sheds and similar structures; driveways; and any new streets or sidewalks. Pervious pavement, stone, and other traditionally-impervious surfaces that are specifically designed to allow for porous infiltration of stormwater are also considered impervious surfaces. Pervious pavement and similar surfaces that are specifically designed to allow for porous infiltration of stormwater, however, may be used with proper operation and maintenance provisions in lieu of traditional SWM conveyance facilities, such as inlets and pipes, in order to provide for the transmission of stormwater runoff to subsurface SWM Facilities; if this method of transmission is utilized, the surfaces in question are still considered impervious surfaces for this Ordinance and the purpose of modeling.

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

**Land Development (Development)** – As defined in the Municipality's Subdivision and Land Development Ordinance.

**Low Impact Development (LID)** – Site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater. LID can be applied to new development, urban retrofits, and revitalization projects. LID utilizes design techniques that infiltrate, filter, evaporate, and store runoff close to its source. Rather than rely on costly large-scale conveyance and treatment systems, LID addresses stormwater through a variety of small, cost-effective landscape features located on-site.

**Municipality** – Palmer Township, Northampton County, Pennsylvania.

**NRCS** – USDA Natural Resources Conservation Service (previously SCS).

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

**Pervious Area** – Any area not defined as an impervious area.

**Pollutant** – Any substance, as certain chemicals or waste products, that renders the air, soil, water, or other natural resource harmful or unsuitable for a specific purpose.

**Project Site** – The specific area of land where any regulated activities in the Municipality are planned, conducted, or maintained.

**Qualified Professional** – Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Ordinance.

**Regulated Activities** – Any earth disturbance activities, any activities that involve the alteration or development of land in a manner that may affect stormwater runoff, or any activities that clearly increase the pollution potential of stormwater runoff.

**Regulated Earth Disturbance Activity** – Activity involving earth disturbance subject to regulation under 25 Pa. Code 92, 25 Pa. Code 102, or the Clean Streams Law.

**Retention Volume/Removed Runoff** – The volume of runoff that is captured and not released directly into the surface waters of this Commonwealth during or after a storm event.

**Return Period** – The average interval, in years, within which a storm event of a given magnitude can be expected to occur one time. For example, the 25-year return period rainfall would be expected to occur on average once every 25 years. Stated in another way, the probability of a 25-year storm occurring in any one year is 0.04 (i.e., a 4% chance).

**Riparian Buffer** – A permanent area of trees and shrubs located adjacent to streams, lakes, ponds, and wetlands.

**Runoff** – Any part of precipitation that flows over the land.

**Sediment** – Soils or other materials transported by surface water as a product of erosion.

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

**Stormwater** – Drainage runoff from the surface of the land resulting from precipitation, snow, or ice melt.

**Stormwater Management Permit** – The permit prepared by the applicant or his or her representative providing necessary details, including but not limited to disturbance area, impervious areas, and other items. **Stormwater Management Permit** will be designated as **SWM Permit** throughout this Ordinance, and shall be divided into two categories:

1. **Minor SWM Permit** – Regulated activities that result in: the alteration or development of 1,000-4,999 SF of land in a manner that may affect stormwater runoff; earth disturbances of 5,000 to 43,559 SF; and/or the cumulative increase of 1,000-4,999 SF of impervious area. "Cumulative" shall include incremental and phased development.
2. **Major SWM Permit** – Regulated activities that result in: the alteration or development of greater than or equal to 5,000 SF of land in a manner that may affect stormwater runoff; earth disturbances of greater than or equal to 43,560 SF; and/or the cumulative increase of greater than or equal to 5,000 SF of impervious area. Regulated activities taking place on sites: 1. with greater than or equal to 5,000 SF of existing impervious area; 2. that are not controlling the runoff from the existing impervious area in a manner consistent with this Ordinance; and 3. whose activities do not qualify for the exemptions listed in Section 302, shall also fall under the category of Major SWM Permit. "Cumulative" shall include incremental and phased development.

**Stormwater Management Report** – The report prepared by the applicant or his or her representative documenting the necessary design computations and data in order to demonstrate that the maximum practicable measures have been taken to meet the requirements of this Ordinance. **Stormwater Management Report** will be designated as **SWM Report** throughout this Ordinance.

**Stormwater Management Site Plan** – The plan prepared by the applicant or his or her representative indicating how stormwater runoff will be managed at the development site in accordance with this Ordinance. **Stormwater Management Site Plan** will be designated as **SWM Site Plan** throughout this Ordinance.

**Subdivision** – As defined in the Municipality's Subdivision and Land Development Ordinance.

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

**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 this Commonwealth.

**Watershed** – Region or area drained by a river, watercourse, or other surface water of this Commonwealth.

**Wetland** – Areas that are inundated or saturated by surface or groundwater 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, and similar areas.

## ARTICLE III – STORMWATER MANAGEMENT STANDARDS AND METHODOLOGIES

### Section 301. General Requirements

- A. For all regulated activities, SWM Facilities 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, the Clean Streams Law, and the Storm Water Management Act. Various SWM BMPs and their design standards are listed in the *Pennsylvania Stormwater Best Management Practices Manual* (BMP Manual<sup>3</sup>), as amended and updated, which shall be followed unless otherwise noted within this or other Ordinances or regulations of the Municipality. Deviations from these specifications and standards shall only be allowed by specific written request to and explicit approval of the Municipalities Engineer.
- B. For all regulated activities, ESC Facilities shall be designed, implemented, operated, and maintained during the regulated earth disturbance activities (e.g., during construction) 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 ESS BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual* (E&S Manual<sup>4</sup>), as amended and updated, which shall be followed unless otherwise noted within this or other Ordinances or regulations of the Municipality. Deviations from these specifications and standards shall only be allowed by specific written request to and explicit approval of the Municipalities Engineer.
- C. For all regulated activities, improvements shall be designed and constructed in accordance with PennDOT's Publications 408 and 72M, as amended and updated, unless otherwise noted within this or other Ordinances or regulations of the Municipality. If design or construction conflicts arise between Publications 408/72M and PADEP regulations, such as the BMP and E&S Manual, the PADEP regulations shall preside. Deviations from these specifications and standards shall only be allowed by specific written request to and explicit approval of the Municipalities Engineer.
- D. Provide a note on the plan addressing 301.A, 301.B, and 301.C, as listed in Section 401.X.4.
- E. Corrugated metal pipe shall not be used for any purpose within the Municipality.
- F. 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. Minimize disturbance to floodplains, wetlands, and wooded areas.
    - b. Maintain or extend riparian buffers.
    - c. Avoid erosive flow conditions in natural flow pathways.
    - d. Minimize thermal impacts to waters of this Commonwealth.
    - e. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.
    - f. Prevent pollution of stormwater runoff by ceasing activities that clearly contaminate runoff.
  - 3. Incorporate the techniques for Low Impact Development Practices described in the BMP Manual.
- G. For all regulated activities, unless preparation of a SWM Site Plan and Report is specifically exempted in Section 302:
  - 1. Preparation, submission, and implementation of a SWM Site Plan and SWM Report is required.
  - 2. No regulated activities shall commence until the Municipality issues written approval of a SWM Site Plan.
- H. SWM Site Plans approved by the Municipality shall be on site throughout the duration of the regulated activity.

- I. Impervious areas:
1. The measurement of impervious areas shall include all of the impervious areas in the total proposed development even if development is to take place in stages.
  2. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.
  3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Ordinance. Volume and peak rate controls in Article IV do not need to be retrofitted to existing impervious areas unless otherwise specified.
- J. Stormwater flows may not be transferred from one watershed listed within an approved Act 167 Stormwater Management Plan to another.
- K. Stormwater flows onto adjacent property shall not be created, increased, relocated, significantly concentrated, or otherwise detrimentally altered without written approval from the affected property owner(s). Such stormwater flows shall be subject to the requirements of this Ordinance.
- L. No stormwater or other related discharges shall discharge directly into a public right-of-way or onto paved surfaces intended for vehicular or pedestrian travel (including but not limited to parking lots, public or private streets, sidewalks, shared driveways, etc.). "Directly", for the purpose of this Ordinance, will vary depending on site conditions, the concentration and volume of the discharge, and intermediary surfaces, but in no case shall a discharge directed to the above areas be closer than 15 feet.
- M. All regulated activities shall limit surface water runoff or stormwater discharges into areas of karst geology or where karst features are observed.
- N. All stormwater discharges with pipe sizes greater than or equal to 12" shall be provided with either reinforced concrete endwalls or plastic end sections, and shall also include outlet protection consistent with the E&S Manual.
- O. For regulated activities involving the subdivision and/or land development of 5 or more lots or structures, communal SWM and Conveyance Facilities with a single entity responsible for operation and maintenance of all facilities shall be utilized. Stormwater management may not be accomplished by utilizing SWM facilities individually designed for and placed within or on each lot or structure, and the operation and maintenance of facilities shall not be delegated to individual lot owners, tenants, or other multiples of entities within the project.
- P. For regulated activities involving the subdivision and/or land development of 5 or more lots or structures, subterranean SWM facilities (such as, but not limited to, infiltration pits, beds, or trenches) are prohibited. Amended soils and similar items incidental to the construction of above-ground SWM Facilities are not included in this prohibition.
- Q. For regulated activities proposing earth disturbances of greater than or equal to 5,000 SF, submission of an erosion and sediment control plan to the county conservation district/reviewing authority for adequacy review shall be required at the sole discretion of the Municipalities Engineer. Subsequent evidence of approval shall also be required.
- R. For regulated activities proposing earth disturbances of greater than or equal to 43,560 SF, submission of an erosion and sediment control plan to the county conservation district/reviewing authority for NPDES permit approval shall be required. Subsequent evidence of approval shall also be required.
- S. Any regulated activities within an existing, known stormwater management problem area, or having the potential to negatively impact an existing, known stormwater management problem area, may be required by the Municipality to include additional, reasonable measures beyond those listed within this Ordinance in order to ensure that any effects of the regulated activity do not exacerbate or further contribute to the issues affecting said problem area. In no case shall the applicant be required to resolve the existing, known stormwater management problems beyond the obligations so-listed.
- T. All drainage plans shall take into account and provide for existing flows within the entire watershed.

- U. All lots shall be laid out and graded to prevent cross lot drainage, and to provide positive drainage away from proposed building locations and any primary or alternate septic system location.
- V. An adequate storm sewer system consisting of inlets and other underground drainage structures with approved outlets shall be constructed where the runoff of stormwater and the prevention of erosion cannot be accomplished satisfactorily by surface drainage facilities, as determined by the Municipalities Engineer.
- W. Outlet locations shall be approved by the Municipalities Engineer.
- X. Sequence of construction. No substantial grading shall occur and no building permits shall be issued for any building unless any detention basin, siltation basin, or improved major swale approved to handle the resulting runoff is in place. Any detention basin shall be seeded and stabilized and have an installed outlet structure prior to the construction of any streets or building within that drainage basin.
- Y. All stormwater management methods are subject to approval by the Municipalities Engineer.
- Z. On-site SWM Facilities and Conveyance Facilities shall be designed to safely convey off-site flows in accordance with the regulations of this Ordinance. Off-site flows are not required to be attenuated in volume and peak rate SWM Facilities.
- AA. The Municipality, after consultation with Northampton County Conservation District and/or DEP, may approve measures for meeting the state water quality and other stormwater runoff 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.

### **Section 302. Exemptions**

- A. Regulated activities that result in: the alteration or development of less than 1,000 SF of land in a manner that may affect stormwater runoff (excluding stormwater BMPs); earth disturbances of less than 5,000 SF; and/or the cumulative increase of impervious area less than 1,000 SF from the original date of the passage of this Ordinance are exempt from the requirements in Article IV of this Ordinance.
- B. Agricultural activity is exempt from the requirements in Article IV of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
- D. Forest management and timber operations are exempt from the requirements in Article IV of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
- E. Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Section 301. If any of the requirements in Section 301 are not met, the Municipality at its sole discretion may revoke any exemptions from any provisions of this Ordinance without the necessity of any proceedings for revocation, and the applicant may be required by the Municipality to cease all activities and/or comply with the provisions of this Ordinance.

### **Section 303. Riparian Buffers**

- A. For all regulated activities requiring a Major SWM Permit, a Riparian Buffer Easement shall be created and recorded that encompasses an existing or potential Riparian Buffer.
- B. Except as required by Chapter 102, the Riparian Buffer Easement shall be measured to be the greater of the limit of the 100-year floodplain or a minimum of 50 feet from the top of the streambank (on each side).
- C. When present, provisions for permanent access to Riparian Buffer Easements shall also be granted to the Municipality via a note as listed in Subsection 401.X.10.
- D. Minimum Management Requirements for Riparian Buffers:
  - 1. Existing native vegetation shall be protected and maintained within the Riparian Buffer Easement. If no or limited existing native vegetation is present, additional native vegetation shall be specified and planted within the Riparian Buffer Easement to create a diverse native plant community appropriate to the intended ecological context of the site.



2. Whenever practicable, invasive vegetation shall be actively removed, and the Riparian Buffer Easement shall be specified and planted with native trees, shrubs, and other native vegetation in the invasive vegetation's place to create a diverse native plant community appropriate to the intended ecological context of the site.
- E. The Riparian Buffer Easement shall be enforceable by the Municipality and shall be recorded in the appropriate 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 continued private ownership and shall count toward the minimum lot area as required by Zoning, unless otherwise specified in the Zoning Ordinance.
  - F. Any permitted use within the Riparian Buffer Easement shall be conducted in a manner that will maintain the extent of the existing 100-year floodplain, improve or maintain the stream stability, leave native vegetation undisturbed as much as is practicable, and preserve and protect the ecological function of the floodplain.
  - G. Specific Prohibitions within Riparian Buffer Easements:
    - a. Septic drainfields and sewage disposal systems
    - b. Livestock grazing and access, except areas specifically necessary for livestock crossing of waterways
    - c. Mowing is prohibited, exceptions may be granted at the sole discretion of the Municipalities Engineer
    - d. Use of fertilizers, pesticides, and herbicides
  - H. Specific Requirements for Uses within Riparian Buffer Easements:
    - a. All uses shall comply with the ordinances, provisions, and regulations of the Municipality and any other applicable entities.
    - b. All uses shall limit vegetative clearing to the minimum extent necessary for the execution of the use; general clearing of the Riparian Buffer Easement is not permitted.
    - c. Trails shall be for non-motorized use only.
    - d. Docks, boat ramps, and other similar improvements shall be comprised of stable, non-erosive material(s).

#### **Section 304. SWM Facilities Standards and Methodologies**

SWM Facilities shall comply with the below standards as applicable to the proposed facility:

- A. Infiltration facilities shall be required unless subsurface conditions prevent the use of infiltration BMPs, in which case Section 304.B below shall be followed. Infiltration facilities:
  1. 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
  2. Must have soil permeability greater than or equal to 0.5 inches/hour and less than or equal to 12 inches per hour.
  3. Shall be protected from disturbance and compaction.
  4. Shall be set back by the following distances:
    - a. For all SWM Permits: 100 feet from water supply wells.
    - b. For Major SWM Permits: 15 feet downgradient or 100 feet upgradient from building foundations.
    - c. For Minor SWM Permits: 15 feet downgradient or 40 feet upgradient from building foundations.
    - e. For Major SWM Permits: 50 feet from septic system drainfields.

- d. For Minor SWM Permits: 25 feet from septic system drainfields.
  - e. For Major SWM Permits: if the above neighboring features are not present, 100 feet from property lines unless evidence is provided that the above setbacks can be maintained for existing or potential wells, foundations, and drainfields on neighboring properties.
  - f. For Major SWM Permits: 50 feet from a geologic contact with carbonate bedrock unless a Carbonate Assessment Report is done and shows either the absence of special geologic features within 50 feet of the proposed infiltration area or provides recommendations on the means of acceptability for infiltration.
5. Infiltration for stormwater management is encourage where soils and geology permit, consistent with the provisions of this ordinance and, where appropriate, the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D.
- B. All SWM Facilities shall be set back a minimum 15 feet from a property line or public right-of-way as measured from the nearest point of the facility that may provide water storage.
  - C. Runoff not being treated by infiltration shall utilize two SWM BMPs in series ("treatment train"), including but not limited to bioretention facilities, capture/reuse, constructed wetlands, dry extended detention ponds, stormwater filters, vegetated buffers/filter strips, vegetated roofs, vegetated swales, water quality inlets, and/or wet detention ponds. The second BMP shall be a vegetated buffer, filter strip, bioretention facility, vegetated swale, or other BMP that provides a thermal benefit to surface waters.
  - D. Low-flow channels are prohibited.
  - E. Trash racks shall be provided for all orifices equivalent to 12 inches or smaller in diameter. Additionally, all basin inflow and outflow structures shall be designed with trash racks over the outflows where practicable.
  - F. Anti-seep collars shall be provided on all outflow culverts in accordance with the methodology in the E&S Manual. An increase in seepage length of 15 percent must be used in accordance with the requirements for permanent anti-seep collars.
  - G. Embankment/berm tops shall not be planted with vegetation greater than 3 feet in mature height. Only vegetation that is tolerant to the conditions of embankment planting (for example: lack of water retainage in the soil) may be utilized. When this requirement is in conflict with other ordinances or regulations (for example: landscape buffer plantings), this requirement shall preside for the purposes of public safety and protection.
  - H. Embankment/berm side slopes shall be no steeper than 3:1.
  - I. Embankment/berm soils shall have low erodibility factors as per the E&S Manual and be identified on the SWM Site Plan.
  - J. If a Major SWM Permit is required, all embankments/berms shall meet Subsection 1 through 4. If a Minor SWM Permit is required, embankments/berms greater than or equal to 3 feet in height shall:
    1. Have a cross-sectional top width of at least 5 feet.
    2. Have emergency spillways capable of providing non-erosive release of the post-development 100-year design storm. The emergency spillway shall provide a minimum 1 foot of freeboard below the top of berm elevation, convey the entire 100-year design storm at a maximum depth of one foot over the spillway, and may not be utilized as an outflow for design storms up to and including the 100-year storm.
    3. Have cutoff/key trenches of impervious material.
    4. The primary outflow structure must be designed to pass all design storms (up to and including the 100-year event) without discharging through the emergency spillway.
  - K. All facilities shall drain over a period of time not less than 24 hours and not more than 72 hours from the end of the facility's inflow hydrograph unless, at the sole discretion of the Municipal Engineer, the BMP is specifically designed to function with differing timeframes (for example, wet ponds, constructed wetlands, etc.).

- L. Maximum water depth in any open SWM Facility shall be no greater than 6 feet when functioning through the primary outlet structure.
- M. The 100-year water surface elevation within any SWM Facility shall provide a minimum of 1.0 feet of freeboard below the invert of the emergency spillway. For facilities that do not utilize an emergency spillway, this freeboard shall be provided to the top of the storage facility (i.e., top of berm, top of stone pit, etc.).
- N. A minimum 4-foot high, galvanized or vinyl-clad chain link metal fence, or any material and fence design acceptable to the Municipality, with a self-closing and self-latching gate with a minimum opening of 10 feet shall be provided around stormwater management facilities if any of the following conditions are present:
  - 1. When deemed a public safety hazard at the sole discretion of the Municipality.
  - 2. The maximum depth of water in the basin after a 10- or 25-year storm is greater than 30 inches.
  - 3. The basin is intended to hold water for periods of longer than three hours after the storm subsides.
  - 4. The basin is to be dedicated to the Municipality.
  - 5. Fencing of a detention basin may be waived by the Municipality upon the recommendation of the Municipal Engineer if the nearest residential zoning district, school, existing dwelling or recreation facility is at least 1,500 feet away in walking distance from the basin.
- O. Floodplains:
  - 1. Facilities and their points of discharge shall not be located within the 1 percent flood event (100-year floodplain) as determined by FEMA, HEC-RAS, or similar analysis. If no floodplain is defined, the floodplain is assumed to extend 50' from the top of stream bank in both directions.
  - 2. Facility bottom elevations must be greater than 1 percent (100-year) floodplain elevations. If no floodplain is defined, the floodplain is assumed to extend 50' from the top of stream bank in both directions.
  - 3. Novel approaches to stormwater management that require placement within the floodplain, including but not limited to floodplain restorations, may be exempted from the requirements in Subsections 304.O.1 and 304.O.2 above at the sole discretion of the Municipalities Engineer.
  - 4. Properties that are entirely or majority constrained by floodplains may be exempted from the requirements in Subsections 304.O.1 and 304.O.2 above at the sole discretion of the Municipalities Engineer.
- P. SWM Facility bottom elevations:
  - 1. Shall be located at least 2 feet above any bedrock.
  - 2. For Major SWM Permits: shall be located at least 3 feet above the seasonal high water table.
  - 3. Shall be located above any other soil limiting zone.
- Q. The type, location, and number of landscaping and planting specification shall be provided for all stormwater management facilities and be specific for each type of facility.
- R. Stormwater management facilities excavated to carbonate rock must either be fitted with an impervious clay liner, or if infiltration is determined to be an acceptable practice, over-excavated four feet and refilled with a suitable material mix. Suitable backfill material is subject to approval from the Municipalities Engineer.
- S. The minimum circular orifice diameter for controlling discharge rates from detention facilities shall be 3 inches.
- T. Aeration devices may be required for retention basins, dependent upon the quality of influent and retention time.
- U. Within areas containing soils identified by the Soil Conservation Service to be sinkhole prone, permanent detention basins shall be lined with a material, which after installation, attains a maximum permeability rate as determined by the Townships Geotechnical Engineer or Township Engineer.

## Section 305. Conveyance Facilities Standards and Methodologies

Conveyance Facilities shall:

- A. Safely convey the 25-year design storm without erosion or hazard utilizing Manning's equation.
- B. Be prohibited from connecting to or discharging into existing downstream conveyance or storage systems, whether manmade or natural, without verification of the adequacy of downstream hydraulic capacity.
- C. In the case of stormsewers:
  1. Completely contain flows with no surface discharges.
  2. Be constructed with watertight joints. If Conveyance Facilities are proposed that require watertight joints, provide a note as listed in Subsection 401.X.7.
  3. Be designed and constructed without "knocking out" any inlet or structure corners. If inlets or structures are proposed, provide a note as listed in Subsection 401.X.8 below.
  4. Have inlets, manholes, or similar structures at all horizontal and/or vertical directional changes. Tee joints, elbows, wyes, and similar structures are prohibited. No run of pipe shall exceed 400 feet in length without appropriate measures to allow cleanout.
  5. Include double inlets set 0.2 feet below the final paving elevation on both sides of the low point of a curbed street.
  6. Not have inlets placed in front of or within 3 feet of a driveway.
  7. Not have inlets spaced more than 600 feet apart.
  8. Not have manholes spaced more than 600 feet apart without an inlet in between.
  9. Have all upstream pipe crown elevations be greater than or equal to all downstream pipe crown elevations.
  10. Have flow velocities greater than or equal to 2.5 feet per second.
  11. Have slopes greater than or equal to 0.5%.
  12. Have a minimum pipe size of 15 inches in diameter.
  14. Have a minimum two-inch drop between the lowest inlet pipe invert elevation and the outlet pipe invert elevation within inlets.
  15. All inlets in paved areas shall have heavy-duty bicycle-safe grating consistent with PennDOT Publication 72M. If inlets or structures are proposed, provide a note as listed in Subsection 401.X.16 below.
  16. Inlets, junction boxes, or manholes greater than five feet in depth shall be equipped with ladder rungs and shall be detailed on the SWM Site Plan.
  17. Inlets shall not have a sump condition in the bottom unless designed as a water quality BMP, and shall have flow channels installed.
  19. Provide the note listed in Subsection 401.X.18 stating concrete top units and grade adjustment rings shall be set in a bed of full mortar according to Publication 408.
  20. Pavement base drain shall be provided at all low points in cut areas, toe of slope areas, and other areas dictated by proven engineering principles and design judgements. All base drains shall be in accordance with PennDOT Publication 408.
- D. In the case of gutters:

1. Not allow flow to encroach into adjacent roadway lanes more than one-half of the lane width, exceed 3 inches in depth, or exceed 1.5 inches in depth across driveways.
  2. Not allow flow to cross intersections or street centerlines.
  3. Have a minimum slope of 1%.
- E. In the case of swales:
1. Provide 6 inches of freeboard to the top of the swale.
  2. Have a minimum slope of 1%.
  3. Have side slopes no steeper than 3:1.
  4. Be designed for stability using velocity (slopes less than 10%) or shear (all slopes) criteria.
  5. Multiply velocities or shear stresses by the following factors when swale bends occur:
    - a. 1.75: when the bend is 30 to 60 degrees.
    - b. 2.00: when the bend is 60 to 90 degrees.
    - c. 2.5: when the bend is 90 degrees or greater.
  6. Be designed for both temporary and permanent conditions.
- F. In the case of culverts, bridges, and other conveyance facilities that convey surface drainage across or under streets or other vehicular passageways (excluding driveways and access drives), whether public or private:
1. Safely convey the 100-year design storm without erosion or hazard utilizing Manning's equation. This shall replace the requirement listed in Section 305.A above.

### **Section 306. Volume and Rate Control Standards and Methodologies**

- A. For modeling purposes of both volume and rate controls:
1. Design storm values should be obtained from the following sources depending on methodology:
    - a. TR-20/TR-55 precipitation frequency estimates: the latest version of the Precipitation-Frequency Atlas of the United States<sup>6</sup>, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, for the 24-hour storm
    - b. Rational Method design intensity values: the latest version of PennDOT Publication 584<sup>7</sup>, Chapter 7A, Region 4, for the 1- through 100-year storm (U.S. Customary)If either source is replaced in full by either entity, the latest version of the replacement source shall be utilized.
  2. Time of concentration ( $T_c$ ) shall be calculated utilizing the TR-55 segmental method, with a maximum sheet flow length of 100 feet.
    - a. The minimum  $T_c$  for any watershed or sub-watershed shall be 5 minutes.
    - b. Post-development conditions may assume a 5-minute  $T_c$ , but may never be greater than the pre-development  $T_c$  for any watershed or sub-watershed.
    - c. Pre-development  $T_c$  values may not be assumed; pre-development  $T_c$  values must be calculated.
    - d. The time of concentration for all conveyance facilities shall be the minimum  $T_c$  of 5-minutes.

3. Runoff coefficients and curve numbers are listed within Appendix B.
4. Existing (pre-development) non-forested pervious areas must be considered meadow in good condition.
5. 20% of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions.
6. For regulated activities requiring a Major SWM Permit due to taking place on sites: 1. with greater than or equal to 5,000 SF of existing impervious area; 2. that are not controlling the runoff from the existing impervious area in a manner consistent with this Ordinance; and 3. whose activities do not qualify for the exemptions listed in Section 302, 50% of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions. This requirement replaces the requirement in Subsection 306.5 above.
7. Meadow may not be used to model proposed (post-development) non-forested pervious areas unless the area being modeled is specifically designed to be and designated/delineated on the plan to remain as a bona fide meadow that may not be removed or altered by the property owner. Specified native plantings and O&M, including but not limited to routine weeding of invasive species, should be included on the plan and in any agreements if this option is chosen.
8. Other than for calculating dewatering times, dynamic rate and volume control credits and/or calculations – including but not limited to infiltration, exfiltration, and evapotranspiration – are not permitted in the modeling of said controls. Only permanent structural improvements shall be modeled and/or credited.
9. Alternative methods of modeling volume and rate controls may be accepted on a case-by-case basis at the sole discretion of the Municipal Engineer.

#### B. Volume Controls

1. Volume controls shall be required for all regulated activities requiring a Minor or Major SWM Permit.
2. Water volume controls shall be implemented using the *Design Storm Method* or the *Simplified Method*:
  - a. The *Design Storm Method* (similar to CG-1 in the BMP Manual) is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.
    1. For regulated activities requiring a Minor SWM Permit, do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation plus 20%.
    2. For regulated activities requiring a Major SWM Permit, do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation plus 50%.
  2. Unless subsurface conditions prevent the use of infiltration BMPs per Sections 304.A and 304.B, at least the first 1.25 inches of runoff from impervious surfaces and 0.675 inches of runoff from pervious surfaces within the limit of disturbance shall be infiltrated as part of the required volume controls. If this infiltration volume exceeds the volume in 306.B.2.a.1 above, the infiltration volume itself shall be used as the total runoff volume that must be mitigated.
3. For modeling purposes of volume controls, in addition to the modeling requirements of Subsection 306.A above:
  - a. Volume shall be calculated using the NRCS Type-II Curve Number runoff method (SCS).
  - b. Non-structural and other credits not directly representative of a SWM Facility's physical volume, including but not limited to tree planting and impervious area disconnection, are prohibited from being used in the modeling of volume controls.
  - c. A BMP designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall provide storage volume for the full volume control increase (Section 306.B) below the lowest outlet invert.

- b. The *Simplified Method* (similar to CG-2 in the BMP Manual) provided below is independent of site conditions, may only be used if the *Design Storm Method* is not followed, and may only be used for regulated activities requiring a Minor SWM Permit. For new impervious surfaces:
  - 1. Stormwater facilities shall capture at least the first 3.6 inches of runoff from all new impervious surfaces.
  - 2. Unless subsurface conditions prevent the use of infiltration BMPs per Sections 304.A and 304.B, at least the first 1.25 inches of runoff from new impervious surfaces shall be infiltrated.
- c. Methodologies shall not be combined.

#### C. Rate Controls

- 1. Rate controls shall be required only for regulated activities requiring a Major SWM Permit; regulated activities that require a Minor SWM Permit are not required to provide rate controls.
- 2. For areas that *are not* covered by a release rate map from an approved Act 167 Stormwater Management Plan, post-development peak discharge rates shall not exceed the pre-development peak discharge rates for the 5-, 10-, 25-, 50-, and 100-year storm events. For the 1- and 2-year storm events, post-development peak discharge rates shall not exceed 30% of the pre-development peak discharge rate.
- 3. For areas that *are* covered by a release rate map from an approved Act 167 Stormwater Management Plan, post-development peak discharge rates shall not exceed the pre-development peak discharge rates for the 5-, 10-, 25-, 50-, and 100-year storm events as listed within the applicable, approved release-rate map. For the 1- and 2-year storm events, post-development peak discharge rates shall not exceed the pre-development peak discharge rates as listed within the applicable, approved release-rate map OR 30% of the pre-development peak discharge rate, whichever provides the greater amount of rate reduction.
  - a. For sites that are covered by two or more release rate areas, the allowable peak discharge rate from any subareas shall be the pre-development peak discharge for that subarea multiplied by the applicable release rate reduction for that subarea. Discharges from one release rate district shall not be redirected to any other release rate district without the explicit consent of the Municipal Engineer; such redirected discharges, when allowed, shall comply with the more-restrictive release rate reduction from the existing or proposed discharge subarea.
  - b. Due to frequent waterway, localized, stormsewer, and overland flooding in Palmer Township clearly showing inadequate downstream capacity for increased peak flows, The Township will not recognize Conditional/Provisional No Detention stormwater management designs in release rate districts so-named; such areas shall comply with Section 306.C.2 above.
- 4. For modeling purposes of rate controls, in addition to the modeling requirements of Subsection 306.A above:
  - a. For regulated activities under 10 acres in size, Modified Rational Method or TR-55 may be used for the calculation of peak rates; this Ordinance shows no preference for either method. For regulated activities above 10 acres in size, TR-55 shall be used.
  - b. BMPs designed to have a permanent pool of water shall assume that the permanent pool volume below the primary outlet is full at the beginning of the design event routing for the purpose of evaluating peak outflows.
  - c. Drainage areas tributary to sinkholes or closed depressions in areas underlain by limestone or carbonate geologic features shall be excluded from the modeled point of analysis defining pre-development flows. If left undisturbed during construction activities, areas draining to closed depressions may also be removed from peak runoff rates in the post-development analysis. New, additional, contributing runoff shall not be directed to existing sinkholes or closed depressions.

#### Section 307. Hotspot Uses

The following criteria shall apply to any use of property that meets the definition of hotspot. Non-commercial accessory uses incidental to residential uses shall not be considered hotspot uses.

A. All hotspot uses (as determined by the Municipality on a case-by-case basis based upon the definition in Article II of this ordinance) shall include a Stormwater Pollution and Prevention Plan as part of the O&M Plan. The Stormwater Pollution and Prevention Plan (SWPP) shall implement regular pavement sweeping, practice proper salt storage, maintain an on-site spill kit with oil booms, perform regular visual inspection of the site and SWM Facilities, and report to the Municipality every 2 years on the implementation and use of this plan.

1. The following are typical Hot Spot Land Uses and acceptable Pre-Treatment Method(s):

Hot Spot Land Use	Pre-Treatment Method(s)
Vehicle Maintenance and Repair Facilities including Auto Parts Stores	<ul style="list-style-type: none"> <li>• Water Quality Inlets</li> <li>• Use of Drip Pans and/or Dry Sweep Material Under Vehicles/Equipment</li> <li>• Use of Absorbent Devices to Reduce Liquid Releases</li> <li>• Spill Prevention and Response Program</li> </ul>
Vehicle Fueling Stations	<ul style="list-style-type: none"> <li>• Water Quality Inlets</li> <li>• Spill Prevention and Response Program</li> </ul>
Storage Areas for Public Works	<ul style="list-style-type: none"> <li>• Water Quality Inlets</li> <li>• Use of Drip Pans and/or Dry Sweep Material Under Vehicles/Equipment</li> <li>• Use of Absorbent Devices to Reduce Liquid Releases</li> <li>• Spill Prevention and Response Program</li> <li>• Diversion of Stormwater away from Potential Contamination Areas</li> </ul>
Outdoor Storage of Liquids	<ul style="list-style-type: none"> <li>• Spill Prevention and Response Program</li> </ul>
Commercial Nursery Operations	<ul style="list-style-type: none"> <li>• Vegetated Swales/Filter Strips</li> <li>• Constructed Wetlands</li> <li>• Stormwater Collection and Reuse</li> </ul>
Other Hotspot Uses	<ul style="list-style-type: none"> <li>• As determined for acceptability by the Municipal Engineer</li> </ul>
Other NPDES-regulated facilities	<ul style="list-style-type: none"> <li>• As required by the site's NPDES permit</li> </ul>

B. All hotspot uses shall utilize a "treatment train" that treats any and all required stormwater management volumes in a series of at least 2 water quality SWM BMPs before surface discharge.

C. Infiltration of runoff from hotspot uses will only be allowed after the runoff has been treated by one or more SWM BMPs – not including the infiltration BMP itself – designed to treat the quality of stormwater runoff based upon the pollutants expected at the hotspot use.



## ARTICLE IV – SWM SITE PLAN AND REPORT SUBMISSION REQUIREMENTS

### Section 401.a Major SWM Site Plan Requirements

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

- A. Project information:
  1. Project name
  2. Project address
  3. Name, address, telephone number, and email address of applicant and, if separate from applicant, property owner
  4. Name, address, telephone number, and email address of the qualified professional responsible for project design
  5. Project description
- B. Date of submission, and the dates of all revisions
- C. Graphical and written scale on all drawings, maps, details, profiles, and other items as necessary
- D. North arrow
- E. Location map at a minimum scale of 1 inch equals 1,000 feet
- F. Metes and bounds of the entire tract perimeter
- G. Existing and proposed contours at intervals of 1 or 2 feet
- H. A determination of site conditions in accordance with the BMP Manual. A detailed site evaluation shall be completed for projects proposed in environmentally sensitive areas such as brownfields.
- I. Soil names, boundaries, and hydrologic soil group classification
- J. Location of all existing and proposed on-site improvements
- K. Location of improvements outside of the property boundary that may be affected by the project
- L. Location of all existing and proposed utilities and utility easements, including but not limited to on-lot wastewater facilities, water supply wells, sanitary sewers, water lines, gas lines, and electric lines
- M. Location of all sensitive natural features, including waterways, wetlands, floodplains, significant karst features (including but not limited to sinkholes, rock pinnacles, and closed depressions), and natural slopes over 25%. If no sensitive natural features are present on the site, provide a note as listed in Subsection 401.X.9 below, and provide evidence of their absence. See Subsection 403.C below for further requirements on the identification of wetlands.
- N. Location and clear identification of the type of permanent SWM Facilities
- O. Proposed limit of disturbance line(s) and disturbed acres
- P. Construction details, specifications, and material schedules including data necessary for proper construction
- Q. Plan and profile drawings of all ESC, SWM, and Conveyance Facilities, including but not limited to basins, drainage structures, pipes, open channels, sediment traps, and swales
  1. Plans and profiles for the same facilities shall be displayed together on the same sheet.

2. All facilities shall be clearly labeled, with labels matching calculations and designations within the SWM Report.
  3. All plans and profiles shall provide clear labels of applicable data necessary for proper construction, including but not limited to inverts, top of grate elevations, pipe slopes, materials, spillway elevations and widths, outlet structure elevations, orifice sizes and elevations, basin bottom elevations, etc.
  4. Plan and profile drawings may take the place of, supplement, or be combined with construction details where desired so long as the above standards and overall design clarity are maintained
- R. An erosion and sediment control plan. Note that further review by the county conservation district/reviewing authority may be required per Subsection 301.N.
- S. An O&M plan for all existing and proposed physical stormwater management facilities. This plan shall address short-term and long-term responsibilities for O&M as well as schedules for O&M activities.
- T. SWM Conservation Easements for all physical SWM Facilities, Conveyance Facilities, areas downstream of discharges and spillways, and designated meadows. When present, provisions for permanent access to SWM Conservation Easements shall also be granted to the Municipality via a note as listed in Subsection 401.X.10 below.
1. Easements shall be a minimum of 20' in width, and must extend at least 5' beyond the edge of any SWM facility.
  2. Where possible, easements should be centered on the facilities within the easement.
  3. Nothing shall be placed, stored, erected, constructed over, planted, or otherwise located within an easement other than the SWM facilities within the easement. If SWM conservation easements are required on the site, provide a note stating such as listed in Subsection 401.X.11 below.
  4. Easements shall be identified with metes and bounds. In the case of conveyance facilities such as pipes and swales, and if desired by the applicant, a note as listed in Subsection 401.X.12 below may be added to the plan in lieu of metes and bounds stating that easements are to be located and offset from the center of the installed conveyance facility. Subterranean facilities utilizing this alternative easement identification method shall use metal marking tape – or other methods that provide simple identification from the surface as reviewed and accepted by the Municipal Engineer – in order to mark the location of said facilities; subsurface conveyance facilities shall add the identification method to the note required above, and the identification method shall be added to relevant construction details.
  5. Roof leader manifolds and discharges shall also require SWM conservation easements, but may be sized less than 20' in width, and are exempt from the requirements in Subsection 401.T.3 above so long as the items above the manifolds and/or discharges do not negatively affect their function.
- U. For SWM Site Plans involving two (2) or more lots, an assignment of impervious area to each individual lot that may not be exceeded at the time of construction and is accounted for in the SWM Report
- V. A list of any permits or authorizations related to stormwater management, erosion and sediment control, waterways and wetlands, or other relevant plan authorizations/permits other than those required by the Municipality, including but not limited to Conservation District adequacy letters; NPDES permits; PADEP/ACOE water obstruction and encroachments permits; FEMA CLOMR/LOMRs; PNDI clearances; PennDOT HOP approvals when the proposed project encroaches into or impacts a PennDOT right-of-way; and other appropriate permits as determined by the Municipality. The reviewing authority for each permit shall also be included in this list. If no outside permits are required, provide a note as listed in Subsection 401.X.13 below.
- W. Reasonable and appropriate design, plan, drafting requirements from the Municipality's Subdivision and Land Development and Zoning Ordinances (for example, clear sight triangle, setbacks, etc.) shall be followed in preparing the SWM Site Plan
- X. Notes, signature blocks, and certifications:

1. "(Municipal Engineer or Municipal designee), on this date, (signature date), has reviewed and hereby certifies that the SWM Site Plan appears to meet all design standards and criteria of the stormwater management ordinance. Strict compliance with the stormwater management ordinance, however, is the responsibility of the applicant."
2. "(Applicant or owner), on this date, (signature date), acknowledges that SWM and Conveyance Facilities are permanent fixtures and may not be modified, removed, filled, landscaped, or otherwise altered without written approval of Palmer Township."
3. "Qualified professional responsible for project design), on this date, (signature date), certifies that this plan complies with the ordinances, provisions, and regulations of the Municipality and any other applicable entities." A seal with dated signature shall accompany this statement.
4. "All design and construction shall comply with the PADEP E&S Manual, PADEP BMP Manual, PennDOT Publication 408, and PennDOT Publication 72M, all as amended and updated, unless written requests for deviation have been reviewed and explicitly approved by the Municipal Engineer."
5. "Palmer Township is not responsible for the maintenance of any area not dedicated to and accepted for public use."
6. "The Operation and Maintenance Agreement is a part of the plan. If the Owner fails to adhere to the terms of the agreement, the Municipality may perform the services required and charge the owner appropriate fees."
7. If Conveyance Facilities are proposed that require watertight joints, "All stormwater conveyance facilities shall be constructed with watertight joints."
8. If inlets or other structures are proposed, "The knocking out of inlet or other structure corners is prohibited."
9. If no sensitive natural features are present on the site per Subsection 401.M above, "Qualified professional responsible for project design), on this date, (signature date), certifies that there are no sensitive natural features on the project site, including waterways, wetlands, floodplains, significant karst features, and natural slopes over 25%."
10. If SWM Conservation Easements and/or Riparian Buffer Easements are required on the site per Section 303.C and/or Subsection 401.T above, "The Landowner hereby grants permission to the Municipality, its authorized agents, and employees access to any and all SWM Conservation Easements and Riparian Buffer Easements on the property."
11. If SWM Conservation Easements are required on the site per Subsection 401.T above, "Nothing shall be placed, stored, erected, constructed over, planted, or otherwise located within an easement other than the SWM Facilities within the easement."
12. If any easements on the site are to be located based upon the location of conveyance facilities per Subsection 401.T.4 above, "SWM conservation easements for conveyance facilities shall be located and offset from the center of the respective conveyance facility as installed." If the conveyance facilities are subterranean, also add, "Underground conveyance facilities can be identified from the surface via (identification method)."
13. If no outside permits are required per Subsection 401.V above, "Qualified professional responsible for project design), on this date, (signature date), certifies that no stormwater management, erosion and sediment control, waterways and wetlands, and/or other relevant plan authorizations/permits are required other than those of the Municipality."
14. If an as-built plan is required per Section 410 below, "A copy of the recorded As-Built Plan will be provided to the Municipality prior to occupancy and/or the release of financial security."
15. "The SWM Report is a part of the plan."
16. If an indemnification statement is required for carbonate site conditions per Section 403.B below, "The Applicant, including its agents, heirs, assigns and anyone on behalf of whom the application is submitted,

does hereby indemnify, defend, and hold harmless Palmer Township and its respective assigns, officials, officers, employees, and agents, from and against any and all demands, claims, actions, or causes of action, assessments, losses, damages, liabilities, costs, and expenses, including reasonable fees and expenses of counsel, other expenses of investigation, handling, and litigation, and settlement amounts, together with interest and penalties asserted against, resulting to, imposed upon, or incurred by the Applicant and anyone on behalf of whom the application is submitted or raised against the Township, directly or indirectly, by reason of, resulting from, or arising in connection with any result from carbonate site conditions.”

17. If an indemnification statement is required for the utilization of infiltration SWM BMPs per Section 403.C below, “The Applicant, including its agents, heirs, assigns and anyone on behalf of whom the application is submitted, does hereby indemnify, defend, and hold harmless Palmer Township and its respective assigns, officials, officers, employees, and agents, from and against any and all demands, claims, actions, or causes of action, assessments, losses, damages, liabilities, costs, and expenses, including reasonable fees and expenses of counsel, other expenses of investigation, handling, and litigation, and settlement amounts, together with interest and penalties asserted against, resulting to, imposed upon, or incurred by the Applicant and anyone on behalf of whom the application is submitted or raised against the Township, directly or indirectly, by reason of, resulting from, or arising in connection with the utilization of infiltration SWM BMPs.”

### **Section 401.b Minor SWM Site Plan Requirements**

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

A. Project information:

1. Project name
2. Project address
3. Name, address, telephone number, and email address of applicant and, if separate from applicant, property owner
4. Name, address, telephone number, and email address of the qualified professional responsible for project design
5. Project description

B. Date of submission, and the dates of all revisions

C. Graphical and written scale on all drawings, maps, details, profiles, and other items as necessary

D. North arrow

E. Location of all existing and proposed on-site improvements

F. Approximate location of all existing and proposed utilities and utility easements, including but not limited to on-lot wastewater facilities, water supply wells, sanitary sewers, water lines, gas lines, and electric lines

G. Location and clear identification of the type of permanent SWM Facilities

H. Proposed limit of disturbance line(s) and disturbed acres

I. An erosion and sediment control plan. Note that further review by the county conservation district/reviewing authority may be required per Subsection 301.N.

J. SWM Conservation Easements for all physical SWM Facilities, Conveyance Facilities, areas downstream of discharges and spillways, and designated meadows. When present, provisions for permanent access to SWM Conservation Easements shall also be granted to the Municipality via a note as listed in Subsection 401.X.10 below.

1. Easements shall be a minimum of 20' in width, and must extend at least 5' beyond the edge of any SWM facility.

2. Where possible, easements should be centered on the facilities within the easement.
  3. Nothing shall be placed, stored, erected, constructed over, planted, or otherwise located within an easement other than the SWM facilities within the easement. If SWM conservation easements are required on the site, provide a note stating such as listed in Subsection 401.X.11 below.
  4. Easements shall be identified with metes and bounds. In the case of conveyance facilities such as pipes and swales, and if desired by the applicant, a note as listed in Subsection 401.X.12 below may be added to the plan in lieu of metes and bounds stating that easements are to be located and offset from the center of the installed conveyance facility. Subterranean facilities utilizing this alternative easement identification method shall use metal marking tape – or other methods that provide simple identification from the surface as reviewed and accepted by the Municipal Engineer – in order to mark the location of said facilities; subsurface conveyance facilities shall add the identification method to the note required above, and the identification method shall be added to relevant construction details.
  5. Roof leader manifolds and discharges shall also require SWM conservation easements, but may be sized less than 20' in width, and are exempt from the requirements in Subsection 401.T.3 above so long as the items above the manifolds and/or discharges do not negatively affect their function.
- K. If stormwater BMP(s) described in Appendix C are proposed, the applicable worksheet(s) from Appendix C shall be submitted with the Minor SWM Site Plan. If a BMP type not described in Appendix C is used, a SWM Report conforming to the requirements of Section 402 shall be submitted with the Minor SWM Site Plan.

#### **Section 402. SWM Report Requirements**

The following items shall be included in the SWM Report:

- A. Project information:
  1. Project name
  2. Project address
  3. Name, address, telephone number, and email address of applicant and, if separate from applicant, property owner
  4. Name, address, telephone number, email address, seal, and dated signature of the qualified professional responsible for project design
- B. A narrative describing the pre-development conditions, post-development conditions, philosophy of SWM design, and project time schedule.
- C. A map identifying the Stormwater Management District boundaries applicable to the site according to the relevant Act 167 stormwater release rate map.
- D. Stormwater runoff design computations and documentation demonstrating that the requirements of this Ordinance have been met for all watersheds and sub-watersheds, including but not limited to the recommendations, standards, and calculation methodologies specified in Article III. This information shall also include but not be limited to the following:
  1. Summary tables of existing and proposed peak rates, and, where required, relevant Act 167 stormwater release rate reductions
  2. For applicable SWM Facilities, a plotting and tabulation of the storage volumes and discharge curves with corresponding water surface elevations, inflow hydrographs, and outflow hydrographs
  3. For applicable Conveyance Facilities, a tabulation of open or closed channel flow data, including but not limited to shear stress, erosion, provided freeboard, Manning's N values, etc. (open channel conveyance), and hydraulic grade lines, top of grate elevations, pipe sizes, crown and invert elevations, materials, etc. (closed channel flow)

4. Breakouts of Tc calculation segments and input data for each segment, including but not limited to slope, length, Manning's N values, etc.
  5. Summary tables of curve number (CN) or runoff coefficient (C) calculation averages for all watersheds and/or sub-watersheds
  6. Summary tables of TR-55 precipitation frequency estimates or Rational Method intensity values utilized for design
  7. A plotting or tabulation of the rainfall depths or intensities used in modeling
  8. Supporting calculations as necessary for any ESC Facilities
  9. For regulated activities utilizing multiple SWM BMPs in series and requiring SWM Permits in the Bushkill Creek, Nancy Run or Fry's Run watersheds, a narrative description of the required treatment train shall be provided within the SWM Report, and shall detail the total area of runoff received, total volume treated, the total pollutants removed by the SWM BMPs, and the location of the SWM BMPs within the treatment train.
  10. The Municipality has the authority to require that any calculations or modeling be reconciled with field observations, conditions, and site history.
  11. Applicable worksheets from other regulatory agencies and associated permits (BMP Manual, NPDES, etc.)
  12. Applicable loading rates
- E. Watershed/sub-watershed maps, which shall include:
1. All points of interests being used in modeling
  2. Existing and proposed watersheds and sub-watersheds, including labeling that matches calculations and designations within the SWM Report
  3. Time of concentration (Tc) paths
  4. Inlet drainage areas with labels corresponding to receiving inlets
  5. Facility labeling that matches calculations and designations within the SWM Site Plan and SWM Report

### **Section 403. Special SWM Site Plan and Report Submission Requirements**

#### **A. Carbonate Assessment Report**

1. For regulated activities requiring Major SWM Permits, a Carbonate Assessment Report shall be evaluated by a licensed professional civil engineer with expertise in geotechnical engineering or a licensed professional geologist. Each of said experts will be licensed in their field of expertise by the Commonwealth of Pennsylvania. A list of the engineer's/geologist's qualifications shall be submitted to the Municipality prior to the commencement of the site evaluation. The Municipality reserves the right to reject any report that in its opinion was authored by an individual or firm which does not possess the background to properly assess the site conditions as they relate to this chapter. Further, the carbonate assessment report submitted to the Municipality must be signed by the licensed professional civil engineer with expertise in geotechnical engineering and/or a licensed professional geologist.
2. The format and content of the Carbonate Assessment Report shall include but not be limited to the following:
  - a. Statement of purpose. This section shall indicate those standards being addressed in the report and whether the applicant is attempting to demonstrate compliance or justify noncompliance with those specific standards.

- b. Description of existing conditions. This section shall present a description of existing characteristics of the property with respect to geology, topography, groundwater and surface water hydrology, soils, vegetation and existing improvements and uses of property.
  - c. A map, at a scale no smaller than one inch equals 100 feet and a contour interval of two feet, indicating the location of the property and all proposed improvements.
  - d. The developer/applicant shall submit information for the affected properties, indicating the presence of any of the following carbonate features: depressions, fissures, lineaments, faults, ghost lakes, bedrock, outcrops, sinkholes, seasonal high-water levels, soil mottling, springs, surface drainage entering the ground, disappearing lakes or streams and caverns.
  - e. The professional shall prepare a map of the site showing all Karst features or feature indicators. The mapping shall indicate, but shall not be limited to, the following features: closed depressions, open sinkholes, seasonal high-water table indicators, outcrops of bedrock, unplowed areas in plowed fields, surface drainage into ground, and ghost lakes after rainfall.
  - f. A recommended plan for the repair or remediation of surface or subsurface features that may impact the proposed development as well as the adjacent improved or unimproved properties.
  - g. The information requested above shall be based upon previously published data and field surveys, which may include test boring, excavation of test pits, air-track probes, and geophysical methods.
  - h. Recommendations on SWM BMP types, whether infiltration is allowed as a SWM method, acceptable loading ratios, and/or an evaluation of measures to minimize adverse effects of stormwater management shall be required.
  - i. Recommendation for improvements and/or repairs made to sinkholes.
3. In addition to the carbonate assessment report, the developer shall also be required to provide the following information:
- a. A plan indicating the existing and proposed drainage conditions, locations of all proposed private and public sewage disposal systems, and the location of existing private and public water supplies on adjoining properties (within 1,000 feet of applicant's property).
  - b. Type, location and phasing of proposed site disturbance and construction, as well as proposed future ownership, utilization and maintenance of the property and the proposed improvements.
  - c. Proposed measures to control potential adverse environmental impacts on groundwater quality and stormwater management resulting from the development and utilization of the property to include the installation of a ground source heat pump system.
  - d. Plans describing the design and construction of the proposed stormwater management facilities proposed for the project.
  - e. A detail for improvements made to sinkholes.
- B. For regulated activities requiring Minor SWM Permits, detailed evidence provided as part of the SWM Report describing the carbonate conditions on site – including recommendations on SWM Facility types, whether infiltration is allowed as a SWM method, and/or an evaluation of measures to minimize adverse effects of stormwater management – shall be required. Acceptable evidence includes soil surveys and other desktop-level resources. A statement shall be added to the plan per Section 401.X.19 indemnifying the Municipality from any damages that may result from carbonate site conditions.
- C. Infiltration Testing
1. For regulated activities proposing to use infiltration SWM Facilities and requiring Major SWM Permits, infiltration testing shall be required.

2. For regulated activities proposing to use infiltration SWM Facilities and requiring Minor SWM Permits, other information – such as soil survey data – supporting the use of infiltration SWM Facilities shall be required as part of the SWM Report. A statement shall be added to the plan per Section 401.X.20 indemnifying the Municipality from any damages that may result from the utilization of infiltration SWM BMPs.

**D. Wetland Delineation Report**

1. For regulated activities requiring Major SWM Permits, a wetland delineation report shall be required. National Wetlands Inventory searches or other similar database queries are not valid methods for determining the presence of wetlands.
2. For regulated activities requiring Minor SWM Permits, other information – such as the National Wetlands Inventory or soil survey data displaying no hydric soils are present on the project site – showing that no wetland impacts are expected shall be required as part of the SWM Report.

**Section 404. Submission**

- A. One physical copy and one digital copy of the SWM Site Plan and Report (“Submission”) shall be submitted to the Municipality and Municipalities Engineer.
- B. The Submission shall also include the following components:
  1. SWM Permit application with applicable review fees
  2. Operation and Maintenance (O&M) Agreement in accordance with Article V of this Ordinance
  3. Financial security and guarantee for all improvements in accordance with the standards of the Subdivision and Land Development Ordinance
  4. As applicable, waiver requests in compliance with Subsection 110 of this Ordinance
  5. As applicable, carbonate assessment report
  6. As applicable, infiltration testing results
  7. As applicable, wetland delineation report
  8. As applicable, Stormwater Pollution and Prevention Plan
  9. As applicable, any permit or authorization copies related to stormwater management, erosion and sediment control, waterways and wetlands, or other relevant plan clearances other than those required by the Municipality, including but not limited to county conservation district adequacy letters, NPDES permits, PADEP/ACOE water obstruction and encroachments permits, FEMA CLOMR/LOMRs, PNDI clearances, PennDOT HOP approvals when the proposed project encroaches into or impacts a PennDOT right-of-way, and other appropriate permits as determined by the Municipality.



## SUBMISSION SUMMARY TABLE

Submission Items	Minor SWM Permit	Major SWM Permit	Major SWM Permit (5k)*
SWM Permit Application	✓	✓	✓
SWM Site Plan	✓	✓	✓
SWM Report (20% I=M)	✓	✓	
SWM Report (50% I=M)			✓
O&M Agreement	✓	✓	✓
Financial Security	✓	✓	✓
Waiver Requests	AA	AA	AA
Carbonate Assessment Report		✓	✓
Infiltration Testing Results	AA	AA	AA
Carbonate/Infiltration Soils Data	✓		
Wetland Delineation Report		✓	✓
Wetland Data	✓		
SWPP	AA	AA	AA
External Permitting	AA	AA	AA

\*Major SWM Permits with 5,000 SF of existing Impervious area per Article II

✓ = Required / AA = As Applicable / "I=M" = "Existing Impervious=Meadow"

### Section 405. Submission Review & SWM Site Plan Approval

- A. The Submission shall be reviewed by the Municipality and Municipalities Engineer for consistency with the provisions of this Ordinance.
- B. The Municipality shall notify the applicant in writing within 45 days whether the SWM Site Plan is approved or disapproved. If the Submission also involves a Subdivision and/or Land Development Plan, the notification shall occur within the time period allowed by the Municipalities Planning Code, and it shall further be coincident with any extensions, approvals, or other schedule changes with the Subdivision and/or Land Development Plan.
- C. The Municipality shall not approve any SWM Site Plan that is deficient in meeting the requirements of this Ordinance or has not received all other permits/authorizations. At its sole discretion, when a Submission is found to be deficient, the Municipality may either disapprove the SWM Site Plan and require a resubmission per Section 407 below, or in the case of minor deficiencies, the Municipality may accept submission of modifications per Section 406 below.
- D. If the Municipality disapproves the SWM Site Plan, the Municipality will state the reasons for the disapproval in writing. The Municipality may also approve the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing.
- E. If the Municipality approves the SWM Site Plan, or all the conditions of an approval per Subsection 405.D above are met, the Municipality shall promptly issue a SWM Permit to the applicant.

### Section 406. Modification of Submissions With Minor Deficiencies

A modification to a Submission with minor deficiencies shall require a resubmission of the modified SWM Site Plan and Report in full in accordance with this Article. If modifications require updates to other components of the Submission as determined by the Municipality, including but not limited to the O&M agreement or further waiver requests, said components shall also be submitted. Any modifications shall renew the 45-day notification timeline as listed in Subsection 405.B above.

#### **Section 407. Resubmission of Disapproved SWM Site Plans**

A disapproved SWM Site Plan may be resubmitted to the Municipality and Municipalities Engineer, with the revisions addressing the Municipality's concerns, in accordance with this Article. A resubmitted SWM Site Plan shall include all other Submission components in full, including applicable review fees.

#### **Section 408. Modification of Approved SWM Site Plans**

A request for modification to a SWM Site Plan that has already been approved shall be in writing. The written request shall provide specific details on what portions of the SWM Site Plan are being proposed for modification, and shall be accompanied by Submission components showing the proposed modifications as required by the Municipality. Any modifications within the updated Submission not matching the written request are considered void.

Requests for modification shall follow the Submission review process per Section 405 above, including the payment of applicable fees. Modifications may not alter stormwater management facilities in a manner which significantly affects the discharge of stormwater to an adjacent property and/or significantly relocates a stormwater management facility within the project site; requests for modifications of this nature shall be treated as new Submissions in accordance with this Article.

The Municipality reserves the sole right to deny requests for modification and require new Submissions in accordance with this Article upon review of the extent of the requested modifications.

#### **Section 409. Authorization to Construct and Term of Validity**

The Municipality's approval of a SWM Site Plan and issuance of a SWM Permit authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. Terms of validity shall commence on the date the Municipality issues the SWM Permit. If an approved SWM Site Plan is not completed according to Section 410 within the term of validity, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits without the necessity of any proceedings for revocation. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 407 of this Ordinance.

#### **Section 410. Project Closeout**

- A. After completing the improvements listed in the SWM Site Plan, confirming the site has achieved permanent stabilization, and removing or retrofitting any ESC Facilities, the applicant shall notify the Municipality in writing that the work is complete.
- B. In the case of Minor SWM Permits:
  1. After receipt of the written notification of completion, the Municipality shall conduct a final inspection for the purposes of determining the extent of project completion and the amount of release of financial security.
  2. If any deficiencies are noted by the Municipality, they shall be delivered to the Applicant in writing.
  3. Upon the correction of any deficiencies and determination of final completion, the Municipality shall notify the applicant of said determination in writing and release to the Applicant any remaining financial security.
- C. In the case of Major SWM Permits:
  1. The Applicant shall also submit to the Municipality with the written notification of completion and As-Built Plan for review. The As-Built Plan shall include the following items:
    - A. Depiction of all items required in the original SWM Site Plan per Section 401, including but not limited to profiles and construction details of improvements
    - B. Clear identification of all discrepancies alongside their original design criteria, dimensions, specifications, etc.
    - C. Latitude and longitude coordinates at the central location of all permanent SWM BMPs

- D. A note stating, "Qualified professional responsible for as-built plan composition, on this date, (signature date), certifies that all SWM and Conveyance Facilities have been constructed according to the approved plans and specifications."
  - E. A narrative explanation of any discrepancies with the approved SWM Site Plan.
2. After receipt of the written notification of completion and As-Built Plan, the Municipality shall: 1. conduct a final inspection for the purposes of determining the extent of project completion and the amount of release of financial security; and 2. review the As-Built Plan for acceptability and accuracy.
  3. If any deficiencies with either the work or the As-Built Plan are noted by the Municipality, they shall be delivered to the Applicant in writing.
  4. After the correction of any deficiencies and determination of final completion, the Municipality shall notify the applicant of said determination in writing.
  5. After receipt of the written notification of determination of final completion, the Applicant shall record the As-Built Plan in full within 90 days of receipt of said determination. Evidence of recording and a copy of the recorded As-Built Plan shall be provided by the Applicant to the Municipality.
  6. After receipt of the evidence of recording of the As-Built Plan and a copy of the recorded As-Built Plan itself, the Municipality shall release to the Applicant any remaining financial security. Occupancy and/or the release of financial security are prohibited until receipt of a copy of the recorded As-Built Plan is received, and a note per Subsection 401.X.14 shall be provided on the plan stating such.
- D. If the SWM Site Plan was submitted as part of a Subdivision and Land Development Plan, project closeout shall follow the process and requirements in the Subdivision and Land Development Ordinance. The entirety of the SWM Site Plan and Report including but not limited to grading plan, profiles, details, and calculations shall be recorded with the Subdivision and Land Development plan.
1. For Major SWM Permits, an As-Built Plan and as required above shall still be required or incorporated with the Subdivision and Land Development Plan's closeout process, and shall be recorded in full or incorporated in full with the Subdivision and Land Development As-Built Plan.
  2. For Major SWM Permits, an As-Built SWM Report meeting the requirements of section 402 shall also be provided with the As-Built Plan, reviewed by the Municipalities Engineer for conformance with the original design, and recorded once reviewed.

## **ARTICLE V – OPERATION AND MAINTENANCE**

### **Section 501. Responsibilities of Developers and Landowners**

- A. The Municipality shall make the final determination on the continuing maintenance responsibilities prior to final approval of the SWM Site Plan. The Municipality may require a dedication of such facilities as part of the requirements for approval of the SWM Site Plan. Such a requirement is not an indication that the Municipality will accept the facilities. The Municipality reserves the right to accept or reject the ownership and operating responsibility for any portion of the stormwater management controls.
- B. SWM and Conveyance Facilities shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions and conservation easements that run with the land.
- C. The O&M plan shall be recorded as a restrictive deed covenant that runs with the land.
- D. The Municipality may take enforcement actions against an owner for any failure to satisfy the provisions of this Article.

### **Section 502. Operation and Maintenance Agreements**

- A. Prior to final approval of the SWM Site Plan, the property owner shall sign and record as a restrictive deed covenant that runs with the land an Operation and Maintenance Agreement (see Appendix A) covering all stormwater control facilities which are to be privately owned.
  - 1. Prior to recording, the O&M Agreement shall be submitted to the Municipality and Municipalities Engineer for review and approval.
  - 2. The owner, successor and assigns shall maintain all facilities in accordance with the approved maintenance schedule in the O&M Agreement.
  - 3. The owner shall convey to the Municipality conservation easements to assure access for periodic inspections by the Municipality and maintenance, as necessary.
  - 4. The owner 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 shall be submitted by the owner to the Municipality within ten (10) working days of the change.
  - 5. Other items may be included in the O&M Agreement where determined necessary to guarantee the satisfactory operation and maintenance of all SWM BMP facilities.
- B. The owner is responsible for operation and maintenance of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the Municipality may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.

## ARTICLE VI – FEES AND EXPENSES

### Section 601. General

The Municipality may include all costs incurred in the review fee charged to an applicant. The review fee may include, but not be limited to, costs for the following:

- A. Administrative/clerical processing
- B. Review of the SWM Site Plan
- C. Attendance at meetings
- D. Inspections.

If costs exceed the review fee, the Municipality may charge the owner appropriate fees for the balance.

## ARTICLE VII – PROHIBITIONS

### Section 701. Prohibited Discharges and Connections

- A. 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 regulated small MS4 or to enter the surface waters of this Commonwealth is prohibited.
- B. No person shall allow, or cause to allow, discharges into a regulated small MS4, or discharges into waters of this Commonwealth, which are not composed entirely of stormwater, except (1) as provided in paragraph C below and (2) discharges authorized under a state or federal permit.
- C. The following discharges are authorized unless they are determined to be significant contributors of pollution to a regulated small MS4 or to the waters of this Commonwealth:
1. Discharges or flows from firefighting activities
  2. Discharges from potable water sources including water line flushing and fire hydrant flushing, if such discharges do not contain detectable concentrations of Total Residual Chlorine (TRC)
  3. Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands
  4. Diverted stream flows and springs
  5. Non-contaminated pumped groundwater and water from foundation and footing drains and crawl space pumps
  6. Non-contaminated HVAC condensation and water from geothermal systems
  7. Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized
  8. Non-contaminated hydrostatic test water discharges, if such discharges do not contain detectable concentrations of TRC
  9. Dechlorinated swimming pool discharges
- D. In the event that the Municipality or DEP determines that any of the discharges identified in Subsection 701.C significantly contribute pollutants to a regulated small MS4 or to the waters of this Commonwealth, the Municipality or DEP will notify the responsible person(s) to cease the discharge.

### Section 702. Roof Drains and Sump Pumps

Roof drains and sump pumps shall discharge to infiltration or vegetative SWM BMPs wherever feasible.

### Section 703. Dumping

"Dumping" and/or unregulated disposal of waste, including but not limited to yard waste, construction refuse, paint, petrochemicals, domestic solid waste, etc., is prohibited. The activity of dumping does not need to directly drain into a concentrated discharge or collection system to be prohibited. Dumping prohibitions do not include incidental, short-term, temporary storage of soon-to-be-used materials that pose a low risk for stormwater runoff pollution (e.g., mulch piles for domestic gardening, stone piles for driveway sub-base, brick pallets for home construction, etc.), nor agricultural activity or forest management and timber operations provided that the activities are performed according to the requirements of 25 Pa. Code Chapter 102.

### Section 704. Open Storage

Open storage of pollutants, including but not limited to uncapped barrels, leaking containers, chemical tank drainage, etc., is prohibited. The activity of openly storing pollutants does not need to directly drain into a concentrated discharge or collection system to be prohibited. Open storage prohibitions do not include agricultural activity or forest

management and timber operations provided that the activities are performed according to the requirements of 25 Pa. Code Chapter 102

**Section 705. Alteration of SWM BMPs**

No person shall modify, remove, fill, landscape, or otherwise alter any SWM or Conveyance Facilities that were installed as a requirement of this Ordinance or previous Stormwater Management Ordinances without the written approval of the Municipality. A note shall be provided on the SWM Site Plan stating as such as listed in Subsection 401.X.2.

## **ARTICLE VIII – ENFORCEMENT AND PENALTIES**

### **Section 801. Right-of-Entry**

Upon presentation of proper credentials, the Municipality or its designated agent may enter at reasonable times upon any property within the Municipality to inspect the condition of items required by this Ordinance in regard to any aspect regulated by this Ordinance.

### **Section 802. Inspection**

The landowner or the owner's designee (including the Municipality for dedicated and owned facilities) shall inspect SWM and Conveyance Facilities installed under this Ordinance according to the following frequencies, at a minimum, to ensure the Facilities continue to function as intended:

1. Annually for NPDES permittees (even if terminated), and for the first 5 years for all others.
2. Once every 3 years thereafter.
3. During or immediately after the cessation of a 4.57 inch (10-year) or greater storm.

Inspections should be conducted during or immediately following precipitation events. A written inspection report shall be created to document each inspection. The inspection report shall contain the date and time of the inspection, the individual(s) who completed the inspection, the location of the SWM BMP, facility or structure inspected, observations on performance, and recommendations for improving performance, if applicable. Inspection reports shall be submitted to the Municipality within 30 days following completion of the inspection. A template inspection report is available from the Municipality and is attached in Appendix G.

### **Section 803. Enforcement**

- A. It shall be unlawful for a person to undertake any regulated activity except as provided in an approved SWM Site Plan, unless specifically exempted in Section 302 of this Ordinance.
- B. It shall be unlawful to violate Article VII of this Ordinance.
- C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the Municipality, and therefore may not be unreasonably denied.

### **Section 804. Suspension and Revocation**

- A. Any approval or permit issued by the Municipality pursuant to this Ordinance may be suspended or revoked for:
  1. Non-compliance with or failure to implement any provision of the approved SWM Site Plan or O&M Agreement.
  2. A violation of any provision 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 the Regulated Activity which constitutes or creates a hazard, nuisance, pollution, or endangers the life or property of others.
- B. A suspended approval may be reinstated by the Municipality when:
  1. The Municipality has inspected and approved the corrections to the violations that caused the suspension.
  2. The Municipality is satisfied that the violation has been corrected.
- C. An approval that has been revoked by the Municipality cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.



- D. If a violation causes no immediate danger to life, public health, or property, at its sole discretion, the Municipality may provide a limited time period for the owner to correct the violation. In these cases, the Municipality will provide the owner, or the owner's designee, with a written notice of the violation and the time period allowed for the owner to correct the violation. If the owner does not correct the violation within the allowed time period, the Municipality may revoke or suspend any, or all, applicable approvals and permits pertaining to any provision of this Ordinance.

**Section 805. Penalties**

- A. Anyone violating the provisions of this Ordinance shall be guilty of a summary offense, and upon conviction, shall be subject to a fine of not more than \$500 for each violation, recoverable with costs. Each day that the violation continues shall be a separate offense and penalties shall be cumulative.
- B. In addition, the Municipality may institute injunctive, mandamus, or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.

**Section 806. Appeals**

- A. Any person aggrieved by any action of the Municipality or its designee, relevant to the provisions of this Ordinance, may appeal to the Municipality within 30 days of that action.
- B. Any person aggrieved by any decision of the Municipality, relevant to the provisions of this Ordinance, may appeal to the County Court of Common Pleas in the county where the activity has taken place within 30 days of the Municipality's decision.

## ARTICLE IX – REFERENCES

1. U.S. Department of Agriculture, National Resources Conservation Service (NRCS). *National Engineering Handbook*. Part 630: Hydrology, 1969-2001. Originally published as the *National Engineering Handbook*, Section 4: Hydrology. Available from the NRCS online at: <http://www.nrcs.usda.gov/>.
2. U.S. Department of Agriculture, Natural Resources Conservation Service. (1986) *Technical Release 55: Urban Hydrology for Small Watersheds*, 2nd Edition. Washington, D.C.
3. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual*. Harrisburg, PA.
4. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (March 31, 2012), as amended and updated. *Erosion and Sediment Pollution Control Program Manual*. Harrisburg, PA.
5. Northampton County, Pennsylvania. Ordinance No. 629 (February 4, 2018), as amended and updated. *Monocacy Creek Watershed Act 167 Stormwater Management Plan*. Easton, PA. Available at: <https://www.northamptoncounty.org/COUNCIL/Documents/Ordinance%20Adoption/2018/Ord629-2017%20-%20ACT%20167%20Stormwater%20Management%20Plan.pdf>
6. U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). *NOAA Atlas 14 Point Precipitation Frequency Estimates: PA*, as amended and updated. Silver Spring, Maryland. Available from NOAA online at: [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html)
7. Pennsylvania Department of Transportation. Publication 584, Chapter 7A (2010), as amended and updated. *Field Manual for Pennsylvania Design Rainfall Intensity Charts*. Harrisburg, PA. Available from PennDOT online at: <https://www.dot.state.pa.us/public/bureaus/design/PUB584/PDMChapter07A.pdf>

## APPENDIX A

### **OPERATION AND MAINTENANCE (O&M) AGREEMENT STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (SWM BMPs)**

**THIS AGREEMENT**, made and entered into this day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_ (hereinafter the "Landowner"), and \_\_\_\_\_, \_\_\_\_\_ County, Pennsylvania (hereinafter "Municipality");

#### **WITNESSETH**

**WHEREAS**, the Landowner is the owner of certain real property as recorded by deed in the land records of \_\_\_\_\_ County, Pennsylvania, Deed Book \_\_\_\_\_ at page \_\_\_\_\_ (hereinafter "Property").

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

**WHEREAS**, the SWM BMP 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 SWM 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 BMPs be constructed and maintained on the Property; and

**WHEREAS**, the Municipality requires, through the implementation of the SWM Site Plan, that SWM BMPs 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 BMPs in accordance with the plans and specifications identified in the SWM Site Plan.
2. The Landowner shall operate and maintain the SWM BMPs as shown on the SWM Site 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 BMPs 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 BMPs per paragraph 2, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said SWM BMP(s). 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 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 on-site SWM BMPs by the Landowner; provided, however, that this Agreement shall not be deemed to create 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 SWM BMP(s) by the Landowner or Municipality.
8. The Municipality intends to inspect the SWM BMPs 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 \_\_\_\_\_, 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 B

### RATIONAL METHOD 'C' VALUES

	Min	Max	Percent Impervious
Construction Sites			
Bare Packed Soil, smooth	0.30	0.60	0
Bare Packed Soil, rough	0.20	0.50	0
Wooded Areas			
Heavy Ground Litter	0.10	0.20	0
Light Ground Litter	0.15	0.30	0
Steep Rocky Slopes	0.20	0.50	0
Reverting Farmland/Meadow			
100% Vegetative Cover	0.10	0.20	0
80% Vegetative Cover	0.15	0.30	0
50% Vegetative Cover	0.25	0.60	0
Rural Homes			
1 home per 10 acres	0.15	0.30	1
Residential			
1-acre lots	0.15	0.40	20
½-acre lots	0.25	0.50	25
¼-acre lots	0.40	0.60	36
Multi-units (attached)	0.60	0.75	65
Industrial Area			
Light to Medium Density	0.50	0.80	
High Density	0.60	0.95	
Streets and Parking Lots			
Asphalt	0.70	0.95	
Concrete	0.80	0.95	
Gravel	0.45	0.60	
Open Space, parks, golf courses	0.15	0.30	
Meadow	0.10	0.20	
Cultivated Land	0.10	0.40	
Pasture	0.15	0.50	

Minimum values to be used for flatter slopes and soils with better drainage characteristics.

Maximum values to be used for steeper slopes and soils with worse drainage characteristics.

## TR-55 RUNOFF COEFFICIENTS

Cover Type	Avg. Percent Impervious Area	HYDROLOGIC SOIL CLASSIFICATION			
		A	B	C	D
Open Space (Lawns, parks, golf courses, cemeteries, etc.)					
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.		98	98	98	98
Streets and Roads:					
Paved, curbs and storm sewers (excl. 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
Urban Districts					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential Areas by average lot size					
1/8-acre or less (townhouses)	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
Pasture, grassland, or range					
	Poor (<50%)	68	79	86	89
	Fair (50%-75%)	49	69	79	84
	Good (>75%)	39	61	74	80
Meadow					
		30	58	71	78
Brush (brush-weed-grass mixture with brush as the major component)					
	Poor (<50%)	48	67	77	83
	Fair (50%-75%)	35	56	70	77
	Good (>75%)	30	48	65	73
Woods-grass combination (orchard or tree farm)					
	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods					
	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77

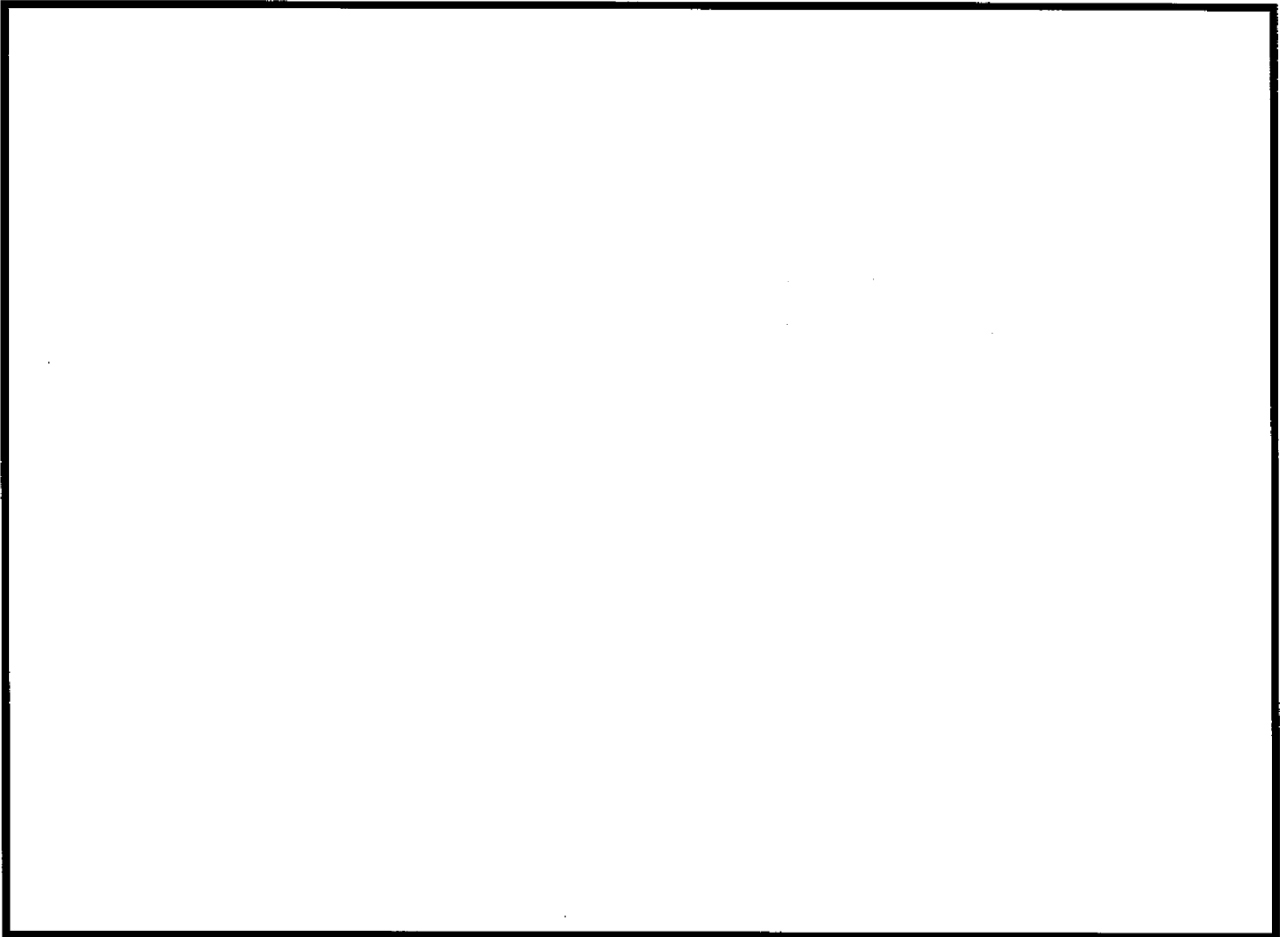
Poor – forest litter, small trees, and brush are destroyed by heavy grazing or regular burning

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

For additional cover types not listed, see appropriate table in TR-55

**APPENDIX C**  
**MINOR SWM PERMIT SITE DESIGN WORKSHEET**



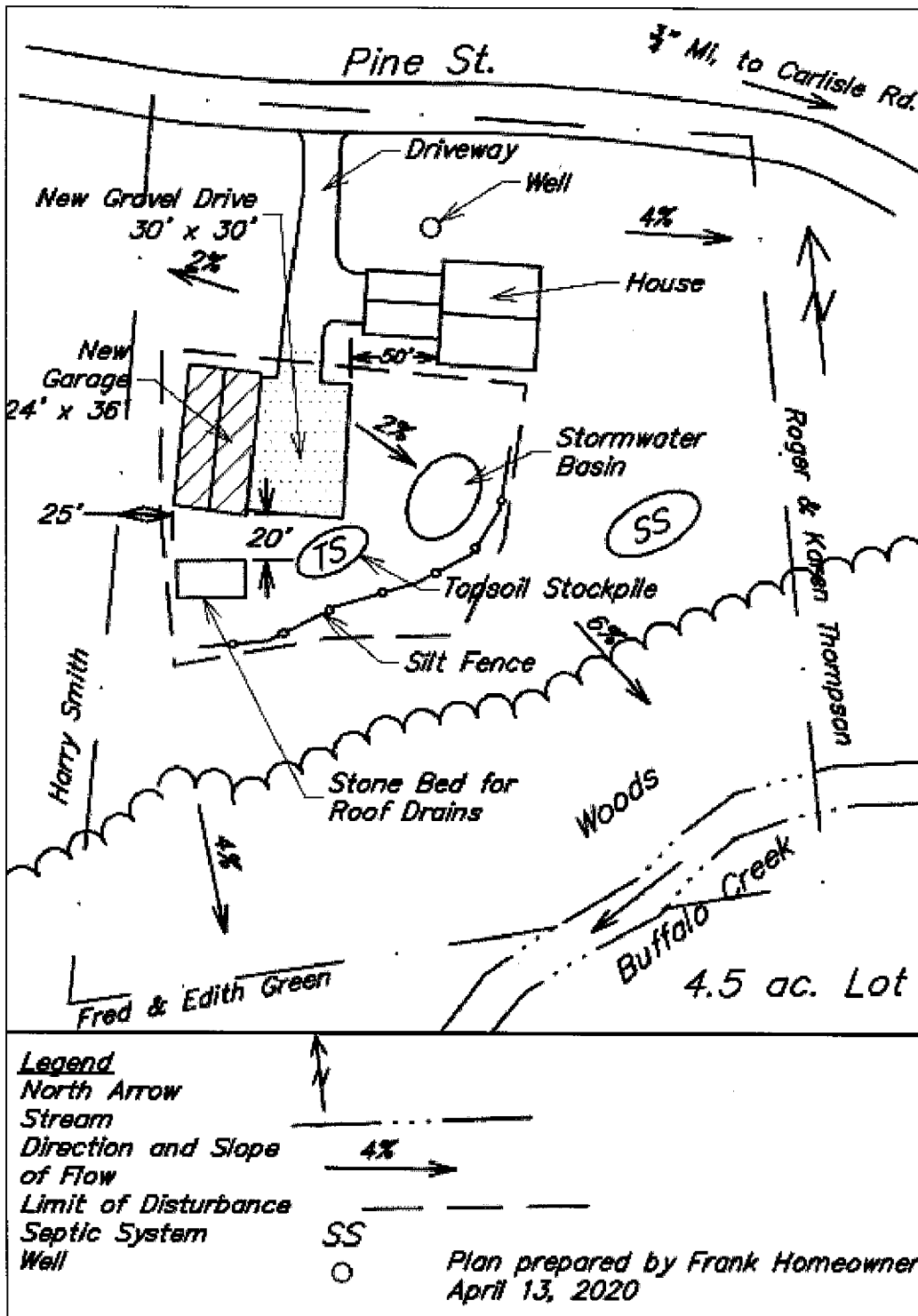
*Draw a general site plan including the following: 1. The general layout of the property, including approximate lot lines and existing improvements; 2. All proposed improvements; 3. Flow arrows showing the direction of runoff; 4. The location of the proposed stormwater facilities. An example site plan is available on the following page.*

**By submitting this worksheet, the Applicant agrees:**

1. To submit a Minor SWM Permit for Municipal approval with this Site Design Worksheet.
2. To direct **all** runoff from proposed impervious areas to the proposed stormwater facilities.
3. To construct the stormwater facilities in conformance with the details and calculations within this worksheet.
4. That the proposed regulated activity conforms to the requirements of the Palmer Township Stormwater Management Ordinance, including but not limited to the setback provisions for stormwater facilities, and an O&M agreement.
5. That stormwater flows onto adjacent properties shall not be created, increased, relocated, significantly concentrated, or otherwise detrimentally altered without written approval from the affected property owner(s).
6. That stormwater management facilities are permanent fixtures and may not be modified, removed, filled, landscaped, have improvements placed within them, or otherwise be altered without written approval of Palmer Township.
7. To provide Palmer Township or its representatives access to the property for the purposes of inspecting SWM and ESC facilities.
8. That all construction shall follow the PADEP BMP Manual and E&S Manual, and that an E&S plan will be sent to the Northampton County Conservation District for review of adequacy if earth disturbance is equal to or greater than 5,000 square feet.
9. That identification of sensitive natural features, such as wetlands or karst features, is the Applicant's responsibility, and that sensitive natural features on the site will not be encroached upon without proper permitting and/or Municipal approval.
10. That Palmer Township and its representatives bear no design responsibility for the proposed improvements, including proposed SWM facilities. All design responsibility is borne by the Applicant. It is recommended the Applicant consult with a certified professional.
11. That the designs produced by utilizing this worksheet are likely conservative in nature.
12. To indemnify Palmer Township and its representatives from any damage that may result from the proposed improvements, including stormwater management facilities.

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

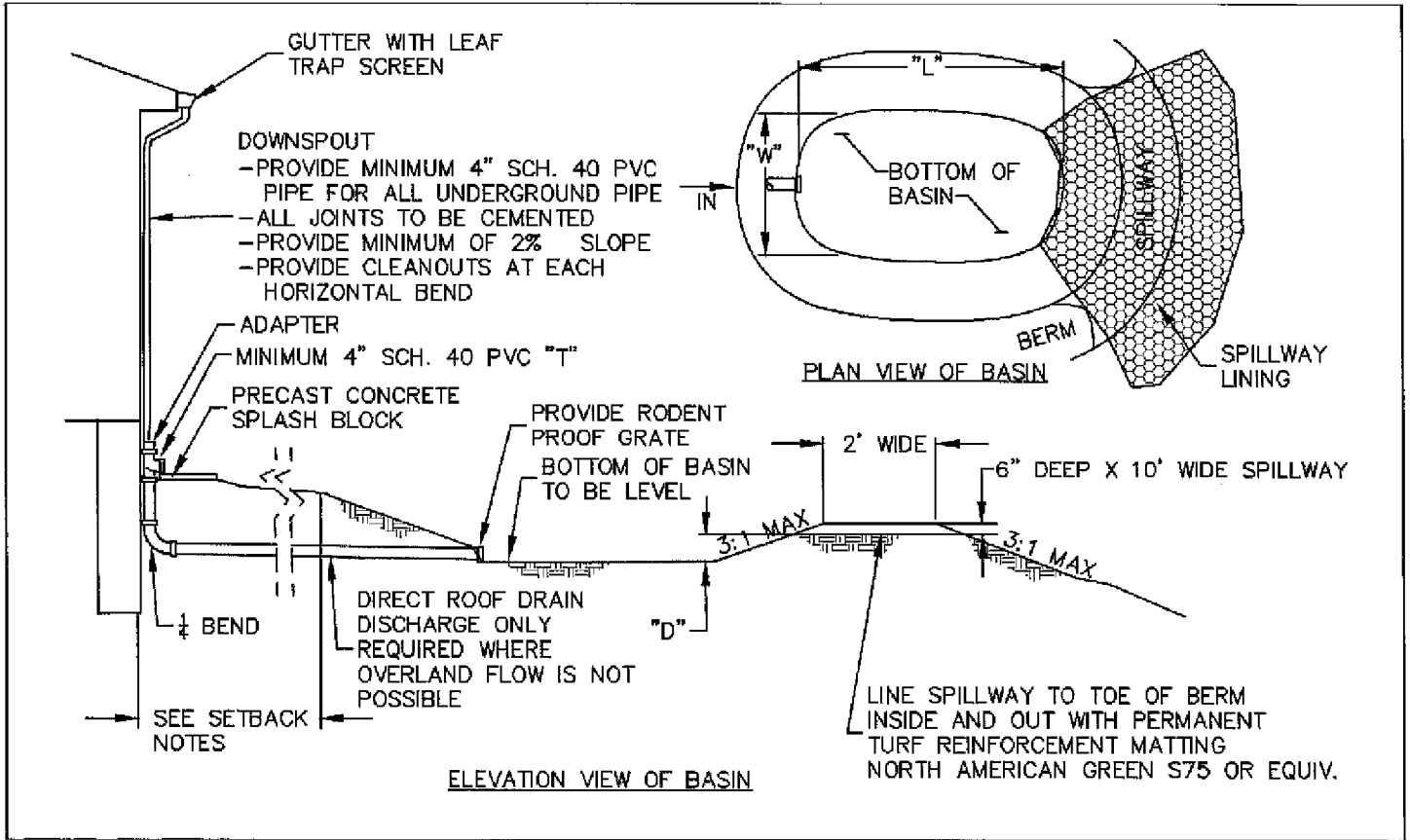
Example Minor SWM Permit Site Plan





## Stormwater Facility Standard Details

### Rain Garden



#### Notes

NOTE 1: Infiltration trenches may only be used for structures; infiltration basins may be used for all surfaces, including structures.

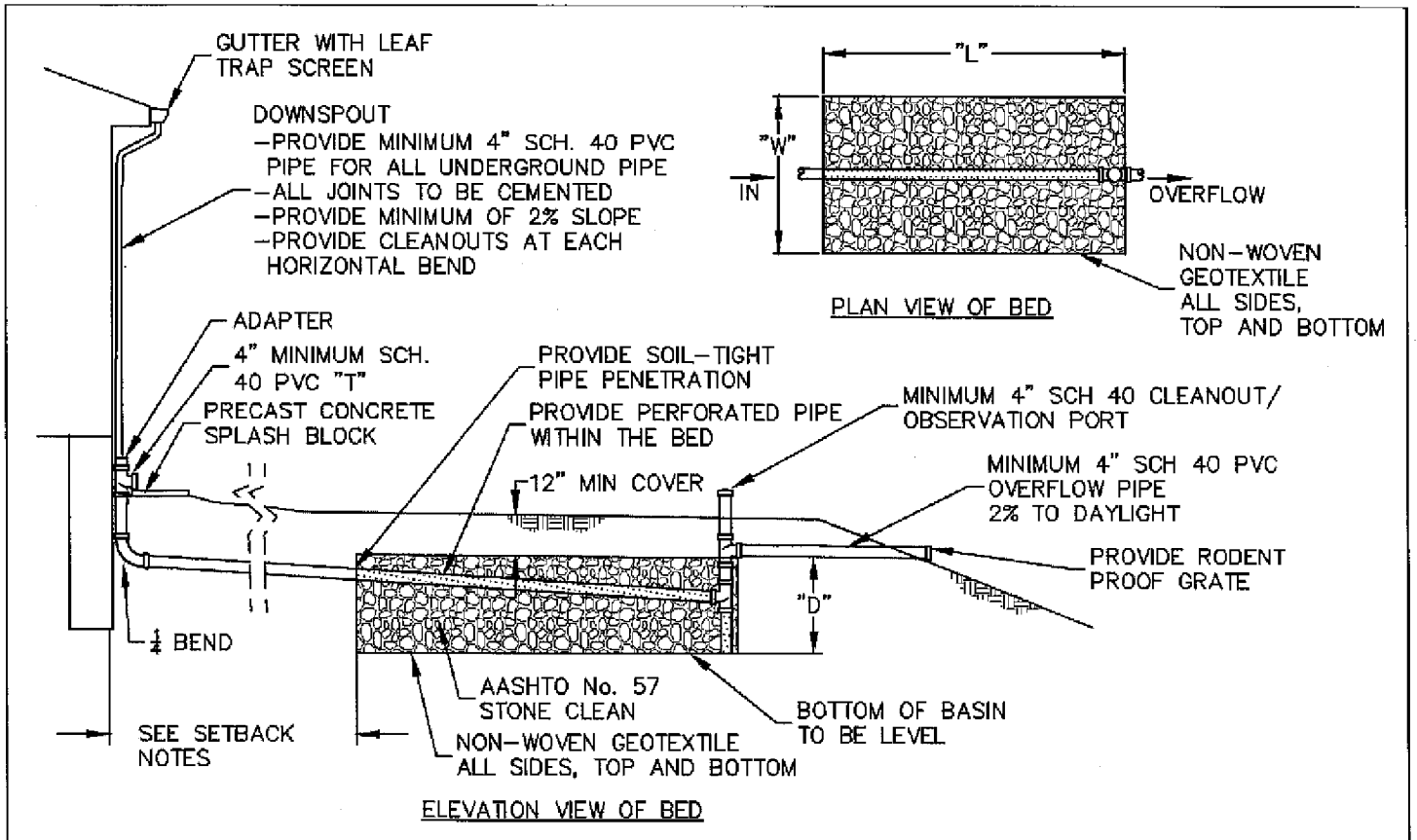
NOTE 2: Infiltration basins deeper than 3 feet may be required to be fenced upon guidance from the Township.

NOTE 3: No stormwater facility may be deeper than 6 feet.

NOTE 4: Any infiltration facilities located within HSG D, Applicant shall provide infiltration testing results that show adequate infiltration rates. See Appendix E for HSG map.

# Stormwater Facility Standard Details

## Infiltration Trench



NOTE 1: Infiltration trenches may only be used for structures; infiltration basins may be used for all surfaces, including structures.

NOTE 2: Infiltration basins deeper than 3 feet may be required to be fenced upon guidance from the Township.

NOTE 3: No stormwater facility may be deeper than 6 feet.

NOTE 4: Any infiltration facilities located within HSG D, Applicant shall provide infiltration testing results that show adequate infiltration rates (minimum 0.5 inches per hour). See Appendix E for HSG map.

## **Disconnected Impervious Area (DIA)**

When rooftop or pavement runoff is directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, the contributing rooftop or pavement area may qualify as a Disconnected Impervious Area (DIA). A rooftop or pavement area is considered to be a DIA if it meets the requirements listed below:

- The soil in proximity of the discharge area, is not designated as hydrologic soil group "D" or equivalent (see Appendix E – Hydrologic Soil Group Map).
- The overland flow path (pervious area serving as BMP) from discharge area has a positive slope of 10% or less.
- The length of overland flow path (pervious area serving as BMP) is greater than or equal to the contributing rooftop or pavement length.
- The length of overland flow path (pervious area serving as BMP) is greater than 25 feet.

If the discharge is concentrated at one or more discrete points, no more than 1,000 square feet of impervious area may discharge to any one point. In addition, a gravel strip or other spreading device is required for concentrated discharges. For non-concentrated discharges along the edge of pavement, this requirement is waived; however, there must be a provision for the establishment of vegetation along the pavement edge and temporary stabilization of the area until vegetation becomes stabilized.

If rainspouts are discharged underground to provide infiltration, the portion of the impervious area draining to those rainspouts is waived from the DIA discharge requirements. Rainspouts discharged underground which are directly connected to a storm sewer system are not waived from the DIA requirements.

See Attached Disconnected Impervious Area worksheet.

## Disconnected Impervious Area (DIA) Worksheet

<b>Applicant Address:</b>	<b>Brief Description of Project:</b>				
<b>Nearest Waterbody:</b>	No more than 1,000 sq. ft can discharge to one point on the surface.  Number of discharge points required:				
<b>Total Proposed Impervious Area(A):</b>	<b>Discharge Point 1</b>	<b>Discharge Point 2</b>	<b>Discharge Point 3</b>	<b>Discharge Point 4</b>	<b>Discharge Point 5</b>
	Area:	Area:	Area:	Area:	Area:
<b>Total Earth Disturbance:</b>					
<b>Are rainspouts discharged underground? (Y/N)</b>  <b>If yes, contributing impervious area (B):</b>	<b>Impervious Path Length:</b>	<b>Impervious Path Length:</b>	<b>Impervious Path Length:</b>	<b>Impervious Path Length:</b>	<b>Impervious Path Length:</b>
	<b>Pervious Path Length:</b>	<b>Pervious Path Length:</b>	<b>Pervious Path Length:</b>	<b>Pervious Path Length:</b>	<b>Pervious Path Length:</b>
<b>Total Impervious Area Discharged on Surface (A) – (B)</b>	<b>Pervious Path Slope &lt;10%? (Y/N)</b>	<b>Pervious Path Slope &lt;10%? (Y/N)</b>	<b>Pervious Path Slope &lt;10%? (Y/N)</b>	<b>Pervious Path Slope &lt;10%? (Y/N)</b>	<b>Pervious Path Slope &lt;10%? (Y/N)</b>
<b>HSG Soil Group from Appendix E – Hydrologic Soils Group Map (Cannot be “D” Soils):</b>					
<b>Project Sketch: Only show discharge points, slopes, and pervious flow path lengths:</b>					

## Stormwater Facility Calculations

*(The following worksheets is only applicable to Minor SWM Permits)*

How to calculate the size of your stormwater facility

1. Determine the area of your property available for the installation of stormwater facilities in terms of length and width (in feet). If large areas of your property are available, determine how much you would like to dedicate to the installation of stormwater facilities in terms of length and width.
2. Enter the length and width chosen into #1: (Facility Area) in the table below, and multiply them together. This will tell you the area (in square feet) that your stormwater facility will take up.
3. Determine the area of impervious surfaces you are proposing to construct that will discharge into the stormwater facility. For example, a 30 foot x 40 foot garage would be 1200 square feet. For surfaces that are not simple geometric shapes, you may need to get the area of impervious surfaces from your contractor.
4. Enter the area of impervious surfaces into #2: (Runoff Volume) in the table below, and multiply this by 0.2. This will tell you the volume of stormwater runoff the impervious surfaces are generating (in cubic feet).
5. Enter the runoff volume (#2 below) and the stormwater facility area (#1 below) into #3: (Facility Depth) in the table below. Divide #2 by #1. This will tell you how deep (in feet) your stormwater facility will need to be if it is an infiltration basin. **If you are proposing to construct an infiltration basin, skip step 6 and proceed to step 7.**
6. **If you are proposing to construct an infiltration trench**, enter the facility depth (#3 below) into #4: (Depth w/ Stone) in the table below, and divide by 0.4. This will tell you how deep (in feet) your stormwater facility will need to be since it is using stone. Stone takes up approximately 60% of the volume within an infiltration trench, so only 40% of the volume of the infiltration trench is available to actually store stormwater. Dividing by 0.4 compensates for this loss of runoff storage.
7. If your stormwater facility depth is greater than 6 feet, you will need to expand the area for the stormwater facility determined in #1 above, and repeat the above process until the depth is equal to or lesser than 6 feet.

Facility Name or #	1: Facility Area	_____ (L) x _____ (W)	SF
	2: Runoff Volume	_____ (Imp. Area to Facility) x 0.2	CF
	3: Facility Depth	_____ (#2) / _____ (#1)	F
	4: Depth w/ Stone	(TRENCHES ONLY) _____ (#3) / 0.4	F

*NOTE: Extra tables provided below for repeat calculations or for extra facilities.*

Facility Name or #	1: Facility Area	_____ (L) x _____ (W)	SF
	2: Runoff Volume	_____ (Imp. Area to Facility) x 0.2	CF
	3: Facility Depth	_____ (#2) / _____ (#1)	F
	4: Depth w/ Stone	(TRENCHES ONLY) _____ (#3) / 0.4	F

Facility Name or #	1: Facility Area	_____ (L) x _____ (W)	SF
	2: Runoff Volume	_____ (Imp. Area to Facility) x 0.2	CF
	3: Facility Depth	_____ (#2) / _____ (#1)	F
	4: Depth w/ Stone	(TRENCHES ONLY) _____ (#3) / 0.4	F

Facility Name or #	1: Facility Area	_____ (L) x _____ (W)	SF
	2: Runoff Volume	_____ (Imp. Area to Facility) x 0.2	CF
	3: Facility Depth	_____ (#2) / _____ (#1)	F
	4: Depth w/ Stone	(TRENCHES ONLY) _____ (#3) / 0.4	F

APPENDIX D

Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock\*

SITE RISK FACTORS		Geology Type	CARBONATE BEDROCK															
		Effective Soil Thickness	Less than 2 feet	2 to 4 Feet					Over 4 Feet to 8 Feet					Over 8 Feet				
		Special Geological Features**	Low/Med/High Buffer	Low Buffer	Medium Buffer	High Buffer	Low Buffer	Medium Buffer	High Buffer	Low Buffer	Medium Buffer	High Buffer	Low Buffer	Medium Buffer	High Buffer			
SITE INVESTIGATION RECOMMENDED		{Unacceptable}	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	Preliminary	
DESIGN FACTORS		Infiltration Loading Rates (% Increase)***	{Unacceptable}	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%	0-100%	100-300%	300-500%
PROGRAM SUMMARY GUIDANCE****				1	1			1	2				1	2			1	



NOT RECOMMENDED



RECOMMENDED

\* Source: Developed by Cahill Associates based on information in "Technical Best Management Practice Manual & Infiltration Feasibility Report", November 2002 and input from the LVPC, 2003.

\*\* Special Geologic Feature Buffer widths are as follows:

- Low Buffer is less than 50 feet
- Medium Buffer is 50 feet to 100 feet
- High Buffer is greater than 100 feet

\*\*\* Rates greater than 500% not recommended.

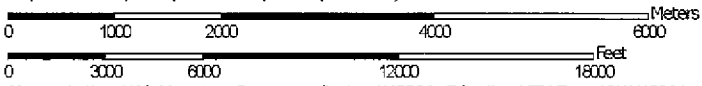
\*\*\*\* Assumes adequately permeable soils and lack of natural constraints as required for all infiltration systems.

1. Infiltration systems may be allowed at the determination of the Engineer and/or Geologist, provided that a Detailed Site Investigation is undertaken which confirms nature of rock, location of Special Geologic Features, and adequacy of the buffer between the SGF and the proposed stormwater system(s).
2. In those Special Geologic Features Low Buffer situations, infiltration systems may be allowed at the determination of the Engineer and/or Geologist, provided that a Detailed Site Investigation is undertaken and a 25-foot buffer from SGFs is maintained.

Appendix E  
Custom Soil Resource Report  
Map—Hydrologic Soil Group



























Map Scale: 1:70,500 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Custom Soil Resource Report

**MAP LEGEND**

<b>Area of Interest (AOI)</b>		C
Area of Interest (AOI)		C/D
<b>Soils</b>		D
<b>Soil Rating Polygons</b>		Not rated or not available
	A	
	A/D	
	B	
	B/D	
	C	
	C/D	
	D	
	Not rated or not available	
<b>Soil Rating Lines</b>		
	A	
	A/D	
	B	
	B/D	
	C	
	C/D	
	D	
	Not rated or not available	
<b>Soil Rating Points</b>		
	A	
	A/D	
	B	
	B/D	

**MAP INFORMATION**

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northampton County, Pennsylvania  
 Survey Area Data: Version 15, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2022—Jul 20, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



Custom Soil Resource Report

**Table—Hydrologic Soil Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CaB	Califon loam, 3 to 8 percent slopes	D	0.9	0.0%
CIA	Clarksburg silt loam, 0 to 3 percent slopes	C	123.0	1.8%
CIB	Clarksburg silt loam, 3 to 8 percent slopes	C	183.4	2.7%
CpA	Comly silt loam, 0 to 3 percent slopes	C	0.9	0.0%
CtB	Conotton gravelly loam, 3 to 8 percent slopes	A	1.8	0.0%
DaA	Delaware fine sandy loam, 0 to 3 percent slopes	A	35.8	0.5%
Gb	Gibraltar silt loam	B	13.3	0.2%
GnD	Gladstone-Parker gravelly loams, 15 to 25 percent slopes	A	5.9	0.1%
Ho	Holly silt loam	B/D	103.5	1.5%
Mb	Middlebury silt loam	B/D	23.3	0.3%
PQ	Pits, quarry		24.7	0.4%
RyB	Ryder-Duffield silt loams, 3 to 8 percent slopes	B	0.7	0.0%
RzF	Ryder-Rock outcrop complex, 25 to 75 percent slopes	B	140.1	2.1%
UbB	Udorthents, limestone, 0 to 8 percent slopes	D	142.5	2.1%
UkaB	Urban land, 0 to 8 percent slopes		480.4	7.2%
Ukb	Urban land, occasionally flooded		8.3	0.1%
UoB	Urban land-Duffield complex, 0 to 8 percent slopes		2,008.7	29.9%
UoD	Urban land-Duffield complex, 8 to 25 percent slopes		484.8	7.2%
UudB	Urban land-Udorthents, limestone complex, 0 to 8 percent slopes		803.5	12.0%
UudD	Urban land-Udorthents, limestone complex, 8 to 25 percent slopes		192.3	2.9%
W	Water		26.8	0.4%
WaA	Washington silt loam, 0 to 3 percent slopes	B	374.6	5.6%

## Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WaB	Washington silt loam, 3 to 8 percent slopes	B	1,119.9	16.7%
WaC	Washington silt loam, 8 to 15 percent slopes	B	300.7	4.5%
WaD	Washington silt loam, 15 to 25 percent slopes	B	117.6	1.8%
<b>Totals for Area of Interest</b>			<b>6,717.4</b>	<b>100.0%</b>

### Rating Options—Hydrologic Soil Group

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

**APPENDIX F**  
**STORMWATER MANAGEMENT PERMIT APPLICATION**

*The Pennsylvania Department of Environmental Protection (PADEP) requires all municipalities enact a Stormwater Management Ordinance (SWMO) meeting PADEP's requirements. Palmer Townships's full SWMO can be reviewed on the Township's website ([www.palmertwp.com](http://www.palmertwp.com)) under Codes & Permits. This guidance is intended to assist you in determining what level of stormwater management will be required for your project in accordance with the Township's SWMO. If there are any conflicts between this Guidance and the SWMO, the provisions of the SWMO will govern.*

**Applicant:**

Name:

Project Address:

Tax Map Reference:

Mailing Address:

Phone #:

Email Address:

**Assisting Professional (Professional Engineer, Landscaper, Builder, Pool Company, etc.)  
(If Applicable)**

Name:

Mailing Address:

Phone #:

Email Address:

**Description of Project:**

**Estimated Total Project Cost:**

**Is a Stormwater Management Permit required?**

**Proposed Impervious Area on Your Project:**

1. Previous impervious surface installed since 12/19/20xx	_____	sq. ft.
2. Proposed new pavement (parking, driveway, etc.)	_____	sq. ft.
3. Proposed Building (new building, addition, garage, shed, etc.)	_____	sq. ft.
4. Proposed sidewalk or patio (gravel, concrete, brick, pavers, etc.)	_____	sq. ft.
5. TOTAL ADDED IMPERVIOUS AREA (1+2+3+4-5)	_____	sq. ft.

**Impervious Square Footage Stormwater Permit Tiers:**

- If the Total Added Impervious is between 0-999 sq. ft, a Stormwater Permit is not required.
- If the Total Added Impervious is between 1,000-4,999 sq. ft., a Minor Stormwater Permit is required.
- If the Total Added Impervious is 5,000 sq. ft. or greater, a Major Stormwater Permit is required.

**\*Refer to Palmer Townships SWMO for additional disturbances that would require a Stormwater Permit.**

**As applicable, provide latitude and longitude of proposed Stormwater Management Facilities:**

- 
- 
- 
- 

**Stormwater Management Permit Options:**

- Exemption – Refer to Section 302 of the SWMO
- Minor SWM Permit – Refer to Section 401.b of the SWMO
- Major SWM Permit – Refer to Section 402.a of the SWMO



**APPENDIX G  
PALMER TOWNSHIP  
POST CONSTRUCTION BMP INSPECTION REPORT**

Date: \_\_\_\_\_

**Owner Information**

1. Name: \_\_\_\_\_ 2. Account Number: \_\_\_\_\_  
3. Email: \_\_\_\_\_ 4. Phone: \_\_\_\_\_  
5. Address: \_\_\_\_\_

**Inspector Information (If Different from Owner)**

1. Name: \_\_\_\_\_ 2. Phone: \_\_\_\_\_  
3. Email: \_\_\_\_\_  
4. Address: \_\_\_\_\_

**BMP Information**

1. Address \_\_\_\_\_  
2. Property Type (Circle One): Residential Commercial Industrial Institutional Other  
If Other, Please Describe: \_\_\_\_\_  
3. Installation Date: \_\_\_\_\_  
4. Type of BMP, If More Than One BMP Please Provide Information on All BMPs  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
5. Is Maintenance Needed at This Time (Circle One)? Yes No  
6. Comments/Notes: \_\_\_\_\_  
\_\_\_\_\_  
7. Attach Maintenance Documentation and Photographs of BMP (Required)

**FOLLOW-UP AND ENFORCEMENT ACTIONS (FOR  
INTERNAL USE ONLY)**

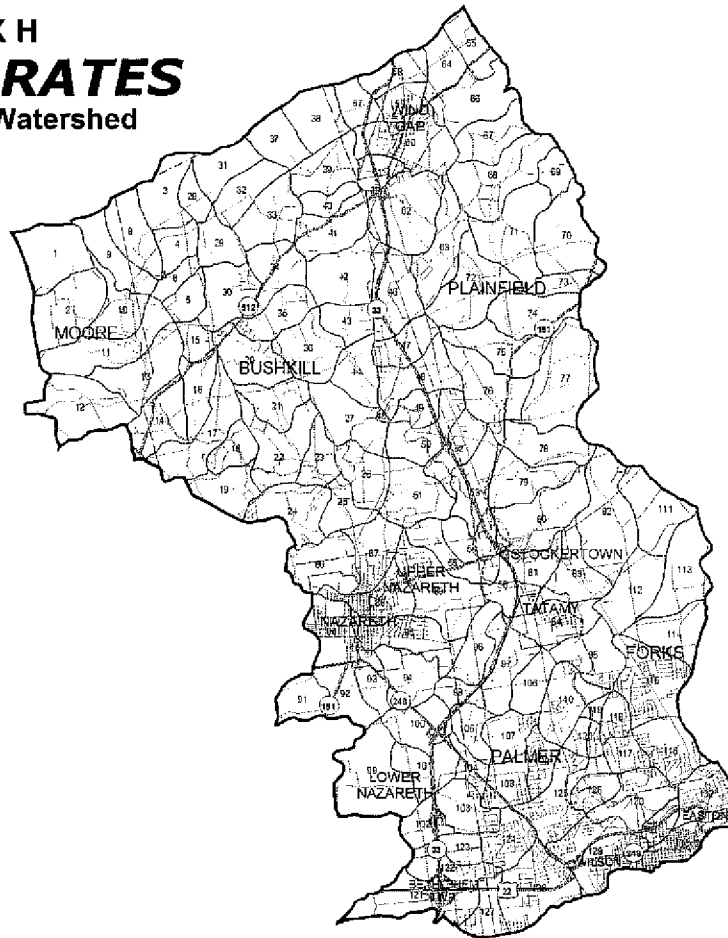
1. Describe corrective actions needed: \_\_\_\_\_  
\_\_\_\_\_  
2. Describe Enforcement Action: \_\_\_\_\_  
3. Follow-up required?  Yes  No  
Comments: \_\_\_\_\_  
4. Return inspection needed?  Yes  No  
Comments: \_\_\_\_\_  
5. Required Compliance Date: \_\_\_\_\_ 6. Date Corrected: \_\_\_\_\_







Representative: \_\_\_\_\_

# APPENDIX H

## RELEASE RATES

### Bushkill Creek Watershed

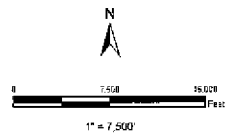



-  Subarea Boundaries
-  Watershed Boundary
-  Municipal Boundaries
-  Streams
-  Major Roads
-  Minor/Other Roads

**RELEASE RATE SUMMARY TABLE**  
 Dual Release Rate Categories (30/-) define a 30% Release Rate for the 2-Year storm and the Indicated Release Rate for the 10-, 25- and 100-Year storms.

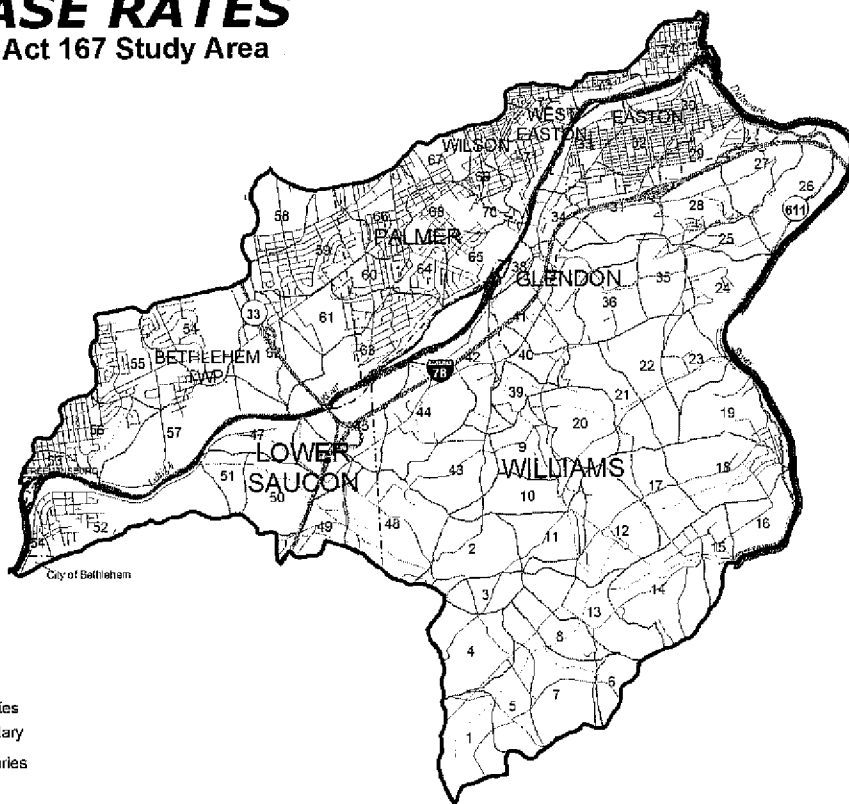
BUSHKILL CREEK			
Subarea	Release Rate (%)	Subarea	Release Rate (%)
1 - 38	30/100	85 - 93	30/100
38 - 42	30/50	94 - 98	30/PND*
43 - 48	30/100	97	30/100
49 - 50	30/PND*	98	30/PND*
51	30/100	99 - 103	30/100
52 - 56	30/PND*	104 - 105	30/PND*
57 - 58	30/100	106	30/100
59 - 63	30/50	107	30/PND*
64 - 67	30/100	108	30/100
69	30/50	109 - 110	30/PND*
69 - 70	30/100	111 - 116	30/100
71	30/50	117 - 120	30/PND*
72 - 73	30/100	121 - 124	30/100
74 - 81	30/PND*	125 - 126	30/PND*
82	30/100	127 - 128	30/100
83 - 85	30/PND*	129 - 133	30/PND*

\*Conditional/Provisional: No Detention Areas do not need detention controls for the 10-, 25-, or 100-year storms provided that adequate downstream capacity can be shown for increased peak flows. (See Plan Update for additional data.)



Source: Lehigh Valley Planning Commission  
 LEHIGH VALLEY PLANNING COMMISSION  
 961 Maroon Boulevard, Suite 310  
 Allentown, PA 18109-9368  
 (610) 264-4644

# APPENDIX H RELEASE RATES Fry's Run Act 167 Study Area

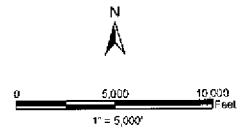



- 23 Subarea Boundaries
- Watershed Boundary
- - - Municipal Boundaries
- Streams/Rivers
- Major Roads
- Minor/Other Roads

**RELEASE RATE SUMMARY TABLES**  
Dual Release Rate Categories (30%...) define a 30% Release Rate for the 2-Year storm and the indicated Release Rate for the 10-, 25- and 100-Year storms.

FRY'S RUN STUDY AREA			
Subarea	Release Rate (%)	Subarea	Release Rate (%)
1 - 13	30/100	42	30/CND II*
14 - 16	30/CND I*	43 - 44	30/100
16	30/CND II*	45 - 47	30/CND I*
17 - 18	30/100	48 - 50	30/100
19	30/CND I*	51	30/CND I*
20 - 23	30/100	52 - 53	30/CND I*
24 - 27	30/CND II*	54 - 56	30/100
28 - 29	30/100	57	30/CND I*
30	30/CND II*	57	30/CND I*
31 - 32	30/100	58 - 62	30/100
33 - 34	30/CND I*	63 - 65	30/CND I*
35 - 37	30/100	66 - 70	30/100
38	30/CND II*	71 - 74	30/CND I*
39 - 41	30/100		

\*Conditional: No Detention Areas do not need detention controls for the 10-, 25- or 100-year storm's provided that adequate downstream capacity can be shown for increased peak flows. (See Plan Update for additional details)



Source: Lehigh Valley Planning Commission  

**LEHIGH VALLEY PLANNING COMMISSION**  
 561 Marcon Boulevard, Suite 310  
 Allentown, PA 18109-8358  
 (610) 284-4544