

**BUSHKILL CREEK WATERSHED STORMWATER  
MANAGEMENT ORDINANCE**

ORDINANCE NO. ~~2022~~ 242-11-22

MUNICIPALITY OF

LOWER NAZARETH TOWNSHIP

NORTHAMPTON COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

November 9, 2022

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## **Article I. General Provisions**

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

This chapter shall be known and may be cited as the “Bushkill Creek Watershed Stormwater Management Ordinance” which satisfies regulatory requirements of the NPDES MS4 program as well as Act 167 requirements for the Bushkill Creek Watershed.

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

Lower Nazareth Township Board of Supervisors 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 flood plain management and flood control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases nonpoint source pollution of water resources.
- B. A comprehensive program of 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. Stormwater is an important water resource that provides groundwater recharge for water supplies and supports the base flow of streams.
- D. 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 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.
- E. 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.
- F. Nonstormwater 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 Lower Nazareth Township and the Bushkill Creek Watershed by minimizing the harms

and maximizing the benefits described in Section 102 of this Ordinance, through provisions designed to:

- A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code 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 of all stormwater best management practices (BMPs) that are implemented within the municipality.
- H. Provide standards to meet NPDES permit requirements.

#### **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, and/or 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 the Township Code, as amended.

#### **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 including those areas of the municipality which are located within the Bushkill Creek Watershed as delineated on an official map available for inspection at the municipal office. A map of the Bushkill Creek Watershed at a reduced scale is included in Appendix A for general reference. Where necessary, NPDES Phase II regulations ensure that all of the ordinance provisions required to meet the MS4 NPDES requirements apply across the entire municipality. The following activities are defined as regulated activities and shall be governed by this chapter:

- A. Land development.

- B. Subdivision.
- C. Construction of new or additional impervious surfaces (driveways, parking lots, etc.).
- D. Construction of new buildings or additions to existing buildings.
- E. Diversion or piping of any natural or man-made stream channel.
- F. Installation of stormwater systems or appurtenances thereto.
- G. Regulated earth disturbance activities. \*

### **Section 106. Exemptions**

- A. Impervious cover. Any proposed regulated activity, except those defined in Section 105.E. and Section 105.F., which would create 10,000 square feet or less of additional impervious cover is exempt from the drainage plan preparation provisions of this chapter. All of the impervious cover added incrementally to a site above the initial 10,000 square feet shall be subject to the drainage plan preparation provisions of this chapter. If a site has previously received an exemption and is proposing additional development such that the total impervious cover on the site exceeds 10,000 square feet, the total impervious cover on the site proposed since the original ordinance date must meet the provisions of this chapter.
  - 1. The date of the municipal Ordinance adoption of the original Bushkill Creek Watershed Act 167 Stormwater Management Ordinance, shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered.
  - 2. For development taking place in stages, the entire development plan must be used in determining conformance with these criteria.
  - 3. Additional impervious cover shall include, but not be limited to, additional indoor living spaces, decks, patios, garages, driveways, storage sheds and similar structures, any roof, parking or driveway areas and any new streets and sidewalks constructed as part of or for the proposed regulated activity.
  - 4. Any additional areas proposed to initially be gravel, crushed stone, porous pavement, etc., shall be assumed to be impervious for the purposes of comparison to the exemption criteria. Any existing gravel, crushed stone or hard packed

soil areas on a site shall be considered as pervious cover for the purpose of exemption evaluation.

- B. Prior drainage plan approval. Any regulated activity for which a drainage plan was previously prepared as part of a subdivision or land development proposal that received preliminary plan approval from the municipality prior to the effective date of this chapter is exempt from the drainage plan preparation provisions of this chapter, except as cited in Section 106.C., provided that the approved drainage plan included design of stormwater facilities to control runoff from the site currently proposed for regulated activities consistent with ordinance provisions in effect at the time of approval and the approval has not lapsed under the Municipalities Planning Code. If significant revisions are made to the drainage plan after both the preliminary plan approval and the effective date of this chapter, preparation of a new drainage plan, subject to the provisions of this chapter, shall be required. Significant revisions would include a change in control methods or techniques, relocation or redesign of control measures or changes necessary because soil or other conditions are not as stated on the original drainage plan.
- C. These exemptions shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, property, and state water quality requirements. These measures include adequate and safe conveyance of stormwater on the site and as it leaves the site. These exemptions do not relieve the applicant from the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act or ordinance.
- D. No exemptions shall be provided for regulated activities as defined in Section 105.E. and 105.F.

#### **Section 107. 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 108. 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 109. Compatibility with Other Ordinance Requirements**

Approvals issued and actions taken under this Ordinance do not relieve the applicant of the responsibility to secure required permits or approvals for activities

regulated by any other code, law, regulation or ordinance.

### **Section 110. Duty of Persons Engaged in Development of Land**

Notwithstanding any provisions of this chapter, including exemption and waiver provisions, any landowner and any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety or other property. Such measures shall include such actions as are required to manage the rate, volume, direction and quality of resulting stormwater runoff in a manner which otherwise adequately protects health and property from possible injury.

### **Section 111. 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 112. 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 112, 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 and accompany the Stormwater Management Site Plan submission. The request shall provide the facts on which the request is based, the provision(s) of the Ordinance involved and the proposed modification.
- 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**

### **Section 201. Definitions**

For the purposes of this chapter, 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 word "includes" or "including" shall not limit the term to the specific example but is intended to extend its 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.

**ACCELERATED EROSION** — The removal of the surface of the land through the combined action of human activities and natural processes, at a rate greater than would occur because of the natural processes alone.

**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 or pasturing and raising of livestock and installation of conservation measures. Construction of new buildings or impervious area is not considered an agricultural activity.

**APPLICANT** – A landowner, developer, or other person who has filed an application to the municipality for approval to engage in any regulated activity at a project site in the municipality.

**BEST MANAGEMENT PRACTICE (BMP)** – Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities listed in Section 105, 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, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the project site.

#### BEST MANAGEMENT PRACTICE OPERATIONS AND MAINTENANCE PLAN

— Documentation, included as part of a drainage plan, detailing the proposed BMPs, how they will be operated and maintained and who will be responsible.

**BIORETENTION** — Densely vegetated, depressed features that store stormwater and filter it through vegetation, mulch, planting soil, etc. Ultimately stormwater is evapotranspired, infiltrated, or discharged. Optimal bioretention areas mimic natural forest ecosystems in terms of species diversity, density, distribution, use of native plants, etc.

#### BUFFER —

- A. **STREAMSIDE BUFFER** — A zone of variable width located along a stream that is vegetated and is designed to filter pollutants from runoff.
- B. **SPECIAL GEOLOGIC FEATURE BUFFER** — A required isolation distance from a special geologic feature to a proposed BMP needed to reduce the risk of sinkhole formation due to stormwater management activities.

**CAPTURE/REUSE** — Stormwater management techniques such as cisterns and rain barrels which direct runoff into storage devices, surface or subsurface, for later reuse, such as for irrigation of gardens and other planted areas. Because this stormwater is utilized and no pollutant discharge results, water quality performance is superior to other noninfiltration BMPs.

**CARBONATE BEDROCK** — Rock consisting chiefly of carbonate minerals, such as limestone and dolomite; specifically a sedimentary rock composed of more than 50% by weight of carbonate minerals that underlies soil or other unconsolidated, superficial material.

**CISTERN** — An underground reservoir or tank for storing rainwater.

**CLOSED DEPRESSION** — A distinctive bowl-shaped depression in the land surface. It is characterized by internal drainage, varying magnitude, and an unbroken ground surface.

**CONSERVATION DISTRICT** — The Northampton County Conservation District, as applicable and as defined in Section 3(c) of the Conservation District Law (3 P. S. Section 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.

**CONSTRUCTED WETLANDS** — Constructed wetlands are similar to wet ponds (see below) and consist of a basin which provides for necessary stormwater storage as well

as a permanent pool or water level, planted with wetland vegetation. To be successful, constructed wetlands must have adequate natural hydrology (both runoff inputs as well as soils and water table which allow for maintenance of a permanent pool of water). In these cases, the permanent pool must be designed carefully, usually with shallow edge benches, so that water levels are appropriate to support carefully selected wetland vegetation.

**CULVERT** — A pipe, conduit or similar structure including appurtenant works which carries surface water.

**DAM** — An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid or a refuse bank, fill or structure for highway, railroad or other purposes which does or may impound water or another fluid or semifluid.

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

**DESIGN STORM** — The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24 hours) used in the design and evaluation of stormwater management systems. Also see Return Period.

**DETENTION BASIN** — A basin designed to retard stormwater runoff by temporarily storing the runoff and releasing it at the appropriate release rate.

**DETENTION VOLUME** — The volume of runoff that is captured and released into the waters of the Commonwealth at a controlled rate.

**DEVELOPER** — A person, partnership, association, corporation or other entity, or any responsible person therein or agent thereof, that undertakes any regulated activity of this chapter.

**DEVELOPMENT SITE (SITE)** — The specific tract of land for which a regulated activity is proposed. See Project Site.

**DIFFUSED DRAINAGE** — See "sheet flow."

**DISTURBED AREA** — An unstabilized land area where an earth disturbance activity is occurring or has occurred.

**DRAINAGE EASEMENT** — A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.

**DRAINAGE PLAN** — The documentation of the proposed stormwater quantity and quality management controls to be used for a given development site, including a BMP operations and maintenance plan, the contents of which are established in Section 403.

**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, 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 USES** — Those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards (25 Pa. Code Section 93.1).

**FEMA** – Federal Emergency Management Agency.

**FILL** — Man-made deposits of natural soils or rock products and waste materials.

**FILTER STRIPS** — See "vegetated buffers."

**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.

**FREEBOARD** — The incremental depth in a stormwater management structure, provided as a safety factor of design, above that required to convey the design runoff event.

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

**GROUNDWATER RECHARGE** — Replenishment of existing natural underground water supplies.

**HARDSHIP WAIVER REQUEST** — A written request for a waiver alleging that the

provisions of this chapter inflict unnecessary hardship upon the applicant. A hardship waiver does not apply to and is not available from the water quality provisions of this chapter and should not be granted.

**HOT SPOT LAND USES** — A land use or activity that generates higher concentrations of hydrocarbons, trace metals or other toxic substances than typically found in stormwater runoff. These land uses are listed in Section 304.P.

**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 (NRCS1,2).

**IMPERVIOUS SURFACE (IMPERVIOUS COVER)** — 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, garages, storage sheds and similar structures; and any new streets or sidewalks. Decks, parking areas, and driveway areas are not counted as impervious areas if they do not prevent infiltration.

**INFILTRATION PRACTICE** — A practice designed to direct runoff into the ground, e.g., French drain, seepage pit, seepage trench or bioretention area.

**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)** — Inclusive of any or all of the following meanings: (i) the improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving (a) a group of two or more buildings or (b) the division or allocation of land or space between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features; (ii) any subdivision of land; (iii) development in accordance with Section 503(1.1) of the PA Municipalities Planning Code, including any of the following activities:

- (1) The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:
  - A group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or
  - The division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of

streets, common areas, leaseholds, condominiums, building groups or other features.

- (2) A subdivision of land.
- (3) Development in accordance with Section 503(1.1) of the Pennsylvania Municipalities Planning Code. (see See 53 P.S. Section 10503(1.1).)

**LOADING RATE** — The ratio of the land area draining to the system, as modified by the weighting factors in Section 306, compared to the base area of the infiltration system.

**LOCAL RUNOFF CONVEYANCE FACILITIES** — Any natural channel or man-made conveyance system which has the purpose of transporting runoff from the site to the mainstem.

**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.

**MAINSTEM (MAIN CHANNEL)** — Any stream segment or other conveyance used as a reach in the Bushkill Creek Watershed hydrologic model.

**MANNING EQUATION (MANNING FORMULA)** — A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. "Open channels" may include closed conduits so long as the flow is not under pressure.

**MARYLAND STORMWATER DESIGN MANUAL** — A stormwater design manual written by the Maryland Department of the Environment and the Center for Watershed Protection. As of January 2004, the Manual can be obtained through the following website: [www.mde.state.md.us](http://www.mde.state.md.us).

**MINIMUM DISTURBANCE/MINIMUM MAINTENANCE PRACTICES (MD/MM)** — Site design practices in which careful limits are placed on site clearance prior to development allowing for maximum retention of existing vegetation (woodlands and other), minimum disturbance and compaction of existing soil mantle and minimum site application of chemicals post-development. Typically, MD/MM includes disturbance setback criteria from buildings as well as related site improvements such as walkways, driveways, roadways, and any other improvements. These criteria may vary by community context as well as by type of development being proposed. Additionally, MD/MM also shall include provisions (e.g., deed restrictions, conservation easements) to protect these areas from future disturbance and from application of fertilizers, pesticides, and herbicides.

**MUNICIPALITY** — Lower Nazareth Township, Northampton County, Pennsylvania.

**NO HARM OPTION** — The option of using a less restrictive runoff quantity control if it can be shown that adequate and safe runoff conveyance exists and that the less restrictive control would not adversely affect health, safety and property.

**NPDES** — National Pollutant Discharge Elimination System.

**NRCS or NATURAL RESOURCES CONSERVATION SERVICE** — USDA Natural Resources Conservation Service (previously SCS).

**OIL/WATER SEPARATOR** — A structural mechanism designed to remove free oil and grease (and possibly solids) from stormwater runoff.

**OUTFALL** — "Point source" as described in 40 CFR 122.2 at the point where the municipality's storm sewer system discharges to surface waters of the commonwealth.

**OWNER** — One with an interest in and often dominion over a property.

**PEAK DISCHARGE** — The maximum rate of stormwater runoff from a specific storm event.

**PENN STATE RUNOFF MODEL (PSRM)** — The computer-based hydrologic modeling technique adapted to each watershed for the Act 167 Plans. The model was calibrated to reflect actual flow values by adjusting key model input parameters.

**PERSON** — An individual, partnership, public or private association or corporation, firm, trust, estate, municipality, governmental unit, public utility or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

**PERVIOUS AREA** — Any area not defined as impervious.

**PROJECT SITE** — The specific area of land where any regulated activities in the municipality are planned, conducted, or maintained.

**POINT SOURCE** — Any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel or conduit from which stormwater is or may be discharged, as defined in state regulations at 25 Pa. Code Section 92a.2

**PRELIMINARY SITE INVESTIGATION** — The determination of the depth to bedrock, the depth to the seasonal high water table and the soil permeability for a possible infiltration location on a site through the use of published data and on-site surveys. In carbonate bedrock areas, the location of special geologic features must also be determined along with the associated buffer distance to the possible infiltration area. See Appendix G.

**PUBLIC WATER SUPPLIER** — A person who owns or operates a public water system.

**PUBLIC WATER SYSTEM** — A system which provides water to the public for human consumption which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. (See 25 Pa. Code Chapter 109.)

**QUALIFIED GEOTECHNICAL PROFESSIONAL** — A licensed professional geologist or a licensed professional engineer who has a background or expertise in geology or hydrogeology.

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

**RATIONAL METHOD** — A method of peak runoff calculation using a standardized runoff coefficient (rational 'c'), acreage of tract and rainfall intensity determined by return period and by the time necessary for the entire tract to contribute runoff. The rational method formula is stated as follows:  $Q = ciA$ , where "Q" is the calculated peak flow rate in cubic feet per second, "c" is the dimensionless runoff coefficient (see Appendix C<sup>6</sup>), "i" is the rainfall intensity in inches per hour, and "A" is the area of the tract in acres.

**REACH** — Any of the natural or man-made runoff conveyance channels used for watershed runoff modeling purposes to connect the subareas and transport flows downstream.

**RECHARGE VOLUME (REV)** — The portion of the water quality volume (WQv) used to maintain groundwater recharge rates at development sites. (See Section 303.)

**REGULATED ACTIVITIES** — Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff, governed by this chapter as specified in Section 105.

**REGULATED EARTH DISTURBANCE ACTIVITIES** — Activity involving earth disturbance subject to regulation under 25 Pa. Code 92, 25 Pa. Code 102, or the Clean Streams Law.

**RELEASE RATE** — The percentage of the predevelopment peak rate of runoff for a development site to which the post-development peak rate of runoff must be controlled to avoid peak flow increases throughout the watershed.

**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; or 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.

**ROAD MAINTENANCE** — Earth disturbance activities within the existing road cross section such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches and other similar activities.

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

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

**SEDIMENT TRAPS/CATCH BASIN SUMPS** — Chambers which provide storage below the outlet in a storm inlet to collect sediment, debris and associated pollutants, typically requiring periodic cleanout.

**SEEPAGE PIT/SEEPAGE TRENCH** — An area of excavated earth filled with loose stone or similar material and into which surface water is directed for infiltration into the ground.

**SEPARATE STORM SEWER SYSTEM** — A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) primarily used for collecting and conveying stormwater runoff.

**SHEET FLOW** — Stormwater runoff flowing in a thin layer over the ground surface.

**SOIL-COVER-COMPLEX METHOD** — A method of runoff computation developed by NRCS which is based upon relating soil type and land use/cover to a runoff parameter called a "curve number."

**SPECIAL GEOLOGIC FEATURES** — Carbonate bedrock features, including but not limited to closed depressions, existing sinkholes, fracture traces, lineaments, joints, faults, caves, pinnacles, and geologic contacts between carbonate and noncarbonate bedrock which may exist and must be identified on a site when stormwater management BMPs are being considered.

**SPILL PREVENTION AND RESPONSE PROGRAM** — A program that identifies procedures for preventing and as needed, cleaning up potential spills and makes such procedures known and the necessary equipment available to appropriate personnel.

**STATE WATER QUALITY REQUIREMENTS** — The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code (Chapters 93 and 96) and the Clean Streams Law, including:

- A. Each stream segment in Pennsylvania has a designated use, such as "cold water fishes" or "potable water supply," which is listed in Chapter 93. These uses must be protected and maintained, under state regulations.

- B. "Existing uses" are those attained as of November 1975, regardless whether they have been designated in Chapter 93. Regulated earth disturbance activities must be designed to protect and maintain existing uses and maintain the level of water quality necessary to protect those uses in all streams, and to protect and maintain water quality in special protection streams.
- C. Water quality involves the chemical, biological and physical characteristics of surface water bodies. After regulated earth disturbance activities are complete, these characteristics can be impacted by addition of pollutants such as sediment, and changes in habitat through increased flow volumes and/or rates as a result of changes in land surface area from those activities. Therefore, permanent discharges to surface waters must be managed to protect the stream bank, streambed and structural integrity of the waterway, to prevent these impacts.

**STORAGE INDICATION METHOD** — A method of routing or moving an inflow hydrograph through a reservoir or detention structure. The method solves the mass conservation equation to determine an outflow hydrograph as it leaves the storage facility.

**STORM DRAINAGE PROBLEM AREAS** — Areas which lack adequate stormwater collection and/or conveyance facilities and which present a hazard to persons or property. These areas are either documented in Appendix B of this chapter or identified by the municipality or Municipal Engineer.

**STORM SEWER** — A system of pipes or other conduits which carries intercepted surface runoff, street water and other wash waters, or drainage, but excludes domestic sewage and industrial wastes.

**STORMWATER** — Drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

**STORMWATER FILTERS** — Any number of structural mechanisms such as multichamber catch basins, sand/peat filters, sand filters, and so forth which are installed to intercept stormwater flow and remove pollutants prior to discharge. Typically, these systems require periodic maintenance and cleanout.

**STORMWATER MANAGEMENT FACILITY** – Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to: detention and retention basins; open channels; storm sewers; pipes; and infiltration facilities.

**STORMWATER MANAGEMENT SITE PLAN** — The plan prepared by the developer or his representative indicating how stormwater runoff will be managed at the development site in accordance with this Ordinance, adopted by Northampton County for the Bushkill

Creek Watershed, as required by the Act of October 4, 1978, P.L. 864, (Act 167), as amended, and known as the "Storm Water Management Act.". Stormwater Management Site Plan will be designated as SWM Site Plan throughout this Ordinance.

**STREAM** — A watercourse.

**SUBAREA** — The smallest unit of watershed breakdown for hydrologic modeling purposes for which the runoff control criteria have been established in the stormwater management plan.

**SUBDIVISION** — As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247, The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building or lot development; provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

**SWALE** — A low-lying stretch of land which gathers or carries surface water runoff. See also "vegetated swale."

**TECHNICAL BEST MANAGEMENT PRACTICE MANUAL AND INFILTRATION FEASIBILITY REPORT, NOVEMBER 2002** — The report written by Cahill Associates that addresses the feasibility of infiltration in carbonate bedrock areas in the Little Lehigh Creek Watershed. The report is available at the Lehigh Valley Planning Commission offices.

**TRASH/DEBRIS COLLECTORS** — Racks, screens or other similar devices installed in a storm drainage system to capture coarse pollutants (trash, leaves, etc.).

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

**VEGETATED BUFFERS** — Gently sloping areas that convey stormwater as sheet flow over a broad, densely vegetated earthen area, possibly coupled with the use of level spreading devices. Vegetated buffers should be situated on minimally disturbed soils, have low-flow velocities and extended residence times.

**VEGETATED ROOFS** — Vegetated systems installed on roofs that generally consist of a waterproof layer, a root-barrier, drainage layer (optional), growth media, and suitable vegetation. Vegetated roofs store and eventually evapotranspire the collected rooftop rainfall; overflows may be provided for larger storms.

**VEGETATED SWALES** —

- A. Vegetated earthen channels designed to convey stormwater. These swales are not considered to be water quality BMPs.

- B. Broad, shallow, densely vegetated, earthen channels designed to treat stormwater while slowly infiltrating, evapotranspiring, and conveying it. Swales should be gently sloping with low flow velocities to prevent erosion. Check dams may be added to enhance performance.

**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.

**WATER QUALITY INSERTS** — Any number of commercially available devices that are inserted into storm inlets to capture sediment, oil, grease, metals, trash, debris, etc.

**WATER QUALITY VOLUME (WQV)** — The volume needed to capture and treat 90% of the average annual rainfall volume. (See Section 304.)

**WATERCOURSE** — Any channel of conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

**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 Requirements

### Section 301. General Requirements

- A. For all regulated activities, unless preparation of an SWM Site Plan is specifically exempted in Section 302:
  - 1. Preparation and implementation of an approved SWM Site Plan is required.
  - 2. No regulated activities shall commence until the municipality issues written approval of an SWM Site Plan, which demonstrates compliance with the requirements of this Ordinance.
- B. SWM Site Plans approved by the municipality, in accordance with Section 409, shall be on site throughout the duration of the regulated activity.
- C. The municipality may, after consultation with DEP, approve measures for meeting the state water quality requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, state law including, but not limited to, the Clean Streams Law.
- D. For all regulated earth disturbance activities, erosion and sediment control BMPs 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 BMPs and their design standards are listed in the Erosion and Sediment Pollution Control Program Manual (E&S Manual3), No. 363-2134-008, as amended and updated.
- E. 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; except that the volume controls in Section 308 and the peak rate controls of Section 309 do not need to be retrofitted to existing impervious areas that are not being altered by the proposed regulated activity.

- F. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification to the adjacent property owner(s). Such stormwater flows shall be subject to the requirements of this Ordinance.
- G. 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.
  3. Incorporate methods described in the Pennsylvania Stormwater Best Management Practices Manual (BMP Manual4). If methods other than green infrastructure and LID methods are proposed to achieve the volume and rate controls required under this Ordinance, the SWM Site Plan must include a detailed justification demonstrating that the use of LID and green infrastructure is not practicable.
- H. The design of all facilities over karst shall include an evaluation of measures to minimize adverse effects.
- I. Infiltration BMPs should 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.
- J. Normally dry, open top, storage facilities should completely drain both the volume control and rate control capacities over a period of time not less than 24 and not more than 72 hours from the end of the design storm.
- K. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the latest version of the Precipitation-Frequency Atlas of the United States, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland.

NOAA's Atlas 145 can be accessed at:  
<http://hdsc.nws.noaa.gov/hdsc/pfds/>.

- L. For all regulated activities, SWM BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Storm Water Management Act.
- M. Various BMPs and their design standards are listed in the BMP Manual 4.
- N. Where a site is traversed by watercourses other than those for which a 100-year floodplain is defined by the municipality, there shall be provided drainage easements conforming substantially with the line of such watercourses. The width of any easement shall be adequate to provide for unobstructed flow of storm runoff based on calculations made in conformance with Section 306 for the 100-year return period runoff and to provide a freeboard allowance of 0.5 foot above the design water surface level. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations which may adversely affect the flow of stormwater within any portion of the easement. Also, periodic maintenance of the easement to ensure proper runoff conveyance shall be required. Watercourses for which the 100-year floodplain is formally defined are subject to the applicable municipal floodplain regulations.
- O. When it can be shown that, due to topographic conditions, natural drainage swales on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainage swales. Capacities of open channels shall be calculated using the Manning Equation.
- P. Techniques described in Appendix F (Low-Impact Development) of this chapter are encouraged because they reduce the costs of complying with the requirements of this chapter and the state water quality requirements.
- Q. Infiltration for stormwater management is encouraged where soils and geology permit, consistent with the provisions of this Chapter and, where appropriate, the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D. Infiltration is encouraged for capturing and treating the water quality volume (as calculated in Section 304) any part of the water quality volume or for otherwise meeting the purposes of this Chapter.

### **Section 302. Permit Requirements by Other Government Entities**

The following permit requirements apply to certain regulated and earth disturbance activities and must be met prior to commencement of regulated and earth disturbance activities, as applicable:

- A. All regulated and earth disturbance activities subject to permit requirements by DEP under regulations at 25 Pa. Code Chapter 102.
- B. Work within natural drainageways subject to permit by DEP under 25 Pa. Code Chapter 102 and Chapter 105.
- C. Any stormwater management facility that would be located in or adjacent to surface waters of the commonwealth, including wetlands, subject to permit by DEP under 25 Pa. Code Chapter 105.
- D. Any stormwater management facility that would be located on a state highway right-of-way or require access from a state highway shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).
- E. Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area and any facility which may constitute a dam subject to permit by DEP under 25 Pa. Code Chapter 105.

**Section 303. Erosion and Sediment Control During Regulated Earth Disturbance Activities**

- A. No regulated earth disturbance activities within the municipality shall commence until approval by the municipality of an erosion and sediment control plan for construction activities. Written approval by DEP or a delegated County Conservation District shall satisfy this requirement.
- B. An erosion and sediment control plan is required by DEP regulations for any earth disturbance activity of 5,000 square feet or more under 25 Pa. Code Section 102.4(b).
- C. A DEP NPDES stormwater discharges associated with construction activities permit is required for regulated earth disturbance activities under 25 Pa. Code Chapter 92a.
- D. Evidence of any necessary permit(s) for Regulated Earth Disturbance activities from the appropriate DEP regional office or County Conservation District must be provided to the municipality before the commencement of an Earth Disturbance Activity.
- E. A copy of the erosion and sediment control plan and any permit, as required by DEP regulations, shall be available at the project site at all times.

**Section 304. Post-construction water quality criteria**

- A. No regulated earth disturbance activities within the municipality shall commence until approval by the municipality of a drainage plan which



demonstrates compliance with this chapter. This chapter provides standards to meet NPDES permit requirements associated with construction activities and MS4 permit requirements.

B. The water quality volume (WQv) shall be captured and treated. The WQv shall be calculated two ways.

1. First, WQv shall be calculated using the following formula:

$$WQv = \frac{(c)(P)(A)}{12}$$

Where WQv = Water quality volume in acre feet  
c = Rational Method post-development runoff coefficient for the two-year storm  
P = 1.25 inches  
A = Area in acres of proposed regulated activity

2. Second, the WQv shall be calculated as the difference in runoff volume from predevelopment to post-development for the two-year return period storm. The effect of closed depressions on the site shall be considered in this calculation. The larger of these two calculated volumes shall be used as the WQv to be captured and treated, except that in no case shall the WQv be permitted to exceed 1.25 inches of runoff over the site area. This standard does not limit the volume of infiltration an applicant may propose for purposes of water quantity/ peak rate control.

C. The WQv shall be calculated for each post-development drainage direction on a site for sizing BMPs. Site areas having no impervious cover and no proposed disturbance during development may be excluded from the WQv calculations and do not require treatment.

D. If an applicant is proposing to use a dry extended detention basin, wet pond, constructed wetland or other BMP that ponds water on the land surface and may receive direct sunlight, the discharge from that BMP must be treated by infiltration, a vegetated buffer, filter strip, bioretention, vegetated swale or other BMP that provides a thermal benefit to protect the high quality waters of the Bushkill Creek Watershed, from thermal impacts.

E. The WQv for a site as a result of the regulated activities must either be treated with infiltration or two acceptable BMPs such as those listed in Section 303, except for minor areas on the periphery of the site that cannot reasonably be drained to an infiltration facility or other BMP.

F. Infiltration BMPs shall not be constructed on fill unless the applicant demonstrates that the fill is stable and otherwise meets the infiltration

BMP standards of this chapter.

- G. The applicant shall document the bedrock type(s) present on the site from published sources. Any apparent boundaries between carbonate and noncarbonate bedrock shall be verified through more detailed site evaluations by a qualified geotechnical professional.
- H. For each proposed regulated activity in the watershed where an applicant intends to use infiltration BMPs, the applicant shall conduct a preliminary site investigation, including gathering data from published sources, a field inspection of the site, a minimum of one test pit and a minimum of two percolation tests, as outlined in Appendix G.<sup>12</sup> This investigation will determine depth to bedrock, depth to the seasonal high water table, soil permeability and location of special geologic features, if applicable. This investigation may be done by a certified Sewage Enforcement Officer (SEO) except that the location(s) of special geologic features shall be verified by a qualified geotechnical professional.
- I. Sites where applicants intend to use infiltration BMPs must meet the following criteria:
  - 1. Depth to bedrock below the invert of the BMP greater than or equal to two feet.
  - 2. Depth to seasonal high water table below the invert of the BMP greater than or equal to three feet; except for infiltration of residential roof runoff where the seasonal high water table must be below the invert of the BMP. (If the depth to bedrock is between two feet and three feet and the evidence of the seasonal high water table is not found in the soil, no further testing to locate the depth to seasonal high water table is required.)
  - 3. Soil permeability (as measured by the adapted 25 Pa. Code Section 73.15 percolation test in Appendix G) greater than or equal to 0.5 inches/hour and less than or equal to 12 inches per hour.
  - 4. Setback distances or buffers as follows:
    - a. One hundred feet from water supply wells.
    - b. Fifteen feet downgradient or 100 feet upgradient from building foundations; except for residential development where the required set back is 15 feet downgradient or 40 feet upgradient from building foundations.
    - c. Fifty feet from septic system drainfields; except for residential development where the required setback is 25 feet from septic system drainfields.

- d. Fifty feet from a geologic contact with carbonate bedrock unless a preliminary site investigation is done in the carbonate bedrock to show the absence of special geologic features within 50 feet of the proposed infiltration area.
  - e. One hundred feet from the property line unless documentation is provided to show that all setbacks from existing or potential future wells, foundations and drainfields on neighboring properties will be met; except for one and two family residential dwellings where the required setback is 40 feet unless documentation is provided to show that all setbacks from existing or potential future wells, foundations and drainfields on neighboring properties will be met.
- J. For entirely noncarbonate sites, the recharge volume (REv) shall be infiltrated unless the applicant demonstrates that it is infeasible to infiltrate the REv for reasons of seasonal high water table, permeability rate, soil depth or setback distances; or except as provided in Section 303.

- 1. The REv shall be calculated as follows:

$$REv = (0.25) * (I)/12$$

Where:

REv = Recharge volume in acre-feet  
 I = Impervious area in acres

- 2. The preliminary site investigation described in Section 303.H. is required and shall continue on different areas of the site until a potentially suitable infiltration location is found or the entire site is determined to be infeasible for infiltration. For infiltration areas that appear to be feasible based on the preliminary site investigation, the Additional Site Investigation and Testing as outlined in Appendix G shall be completed.
- 3. If an applicant proposes infiltration, the municipality may determine infiltration to be infeasible if there are known existing conditions or problems that may be worsened by the use of infiltration.
- 4. The site must meet the conditions listed in Section 304.I.
- 5. If it is not feasible to infiltrate the full REv, the applicant shall infiltrate that portion of the REv that is feasible based on the site characteristics. If none of the REv can be infiltrated, REv shall be considered as part of the WQv and shall be captured

and treated as described in Section 304.O.

6. If REv is infiltrated, it may be subtracted from the WQV required to be captured and treated.

K Entirely carbonate areas.

1. In entirely carbonate areas, where the applicant intends to use infiltration BMPs, the preliminary site investigation described in Section 304.H. shall be conducted. For infiltration areas that appear feasible based on the preliminary site investigation, the applicant shall conduct the additional site investigation and testing as outlined in Appendix G. The soil depth, percolation rate and proposed loading rate, each weighted as described in Section 307, along with the buffer from special geologic features shall be compared to the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D<sup>14</sup> to determine if the site is recommended for infiltration. In addition to the recommendation from Appendix D, the conditions listed in Section 304.I. are required for infiltration in carbonate areas.
2. Applicants are encouraged to infiltrate the REv, as calculated in Section 304.J., but are not required to use infiltration BMPs on a carbonate site even if the site falls in the recommended range on the chart in Appendix D. Any amount of volume infiltrated can be subtracted from the WQV to be treated by noninfiltration BMPs. If infiltration is not proposed, the full WQV shall be treated by two acceptable BMPs, as specified in Section 304.O.

- L If a site has both carbonate and noncarbonate areas, the applicant shall investigate the ability of the noncarbonate portion of the site to fully meet this chapter to meet the requirements for REv for the whole site through infiltration. If that proves infeasible, infiltration in the carbonate area as described in Section 304.K. or two other noninfiltration BMPs as described in Section 304.O. must be used. No infiltration structure in the noncarbonate area shall be located within 50 feet of a boundary with carbonate bedrock, except when a preliminary site investigation has been done showing the absence of special geologic features within 50 feet of the proposed infiltration area.

- M. If infiltration BMPs are proposed in carbonate areas, the post-development two- year runoff volume leaving the site shall be 80% or more of the predevelopment runoff volume for the carbonate portion of the site to prevent infiltration of volumes far in excess of the predevelopment infiltration volume.

- N. Site areas proposed for infiltration shall be protected from disturbance and compaction except as necessary for construction of infiltration BMPs.
- O. If infiltration of the entire WQv is not proposed, the remainder of the WQv shall be treated by two acceptable BMPs in series for each discharge location. Sheet flow draining across a pervious area can be considered as one BMP. Sheet flow across impervious areas and concentrated flow shall flow through two BMPs. If sheet flow from an impervious area is to be drained across a pervious area as one BMP, the length of the pervious area must be equal to or greater than the length of impervious area. In no case may the same BMP be employed consecutively to meet the requirement of this section. Acceptable BMPs are listed below along with the recommended reference for design.

<b>Best Management Practice</b>	<b>Design Reference Number<sup>c</sup></b>
Bioretention <sup>A</sup>	4, 5, 11, 16
Capture/reuse <sup>B</sup>	4, 14
Constructed wetlands	4, 5, 8, 10, 16
Dry extended detention ponds	4, 5, 8, 12, 18
Minimum disturbance/minimum maintenance practices	1, 9
Significant reduction of existing impervious cover	N/A
Stormwater filters <sup>A</sup> (sand, peat, compost, etc.)	4, 5, 10, 16
Vegetated buffers/filter strips	2, 3, 5, 11, 16, 17
Vegetated roofs	4, 13
Vegetated swales <sup>A</sup>	2, 3, 5, 11, 16, 17
Water quality inlets <sup>D</sup>	4, 7, 15, 16, 19
Wet detention ponds	4, 5, 6, 8

**NOTES:**

- <sup>A</sup> This BMP could be designed with or without an infiltration component. If infiltration is proposed, the site and BMP will be subject to the testing and other infiltration requirements in this chapter.
- <sup>B</sup> If this BMP is used to treat the entire WQv then it is the only BMP required because of this BMPs superior water quality performance.
- <sup>C</sup> See table below.
- <sup>D</sup> Water quality inlets include such BMPs as oil/water separators, sediment traps/catch basin sumps, and trash/debris collectors in

catch basins.

<b>Number</b>	<b>Design Reference Title</b>
1	"Conservation Design For Stormwater Management - A Design Approach to Reduce Stormwater Impacts From Land Development and Achieve Multiple Objectives Related to Land Use," Delaware Department of Natural Resources and Environmental Control, The Environmental Management Center of the Brandywine Conservancy, September 1997.
2	"A Current Assessment of Urban Best Management Practices: Techniques for Reducing Nonpoint Source Pollution in the Coastal Zone," Schueler, T. R., Kumble, P. and Heraty, M., Metropolitan Washington Board of Supervisors of Governments, 1992.
3	"Design of Roadside Channels with Flexible Linings," Federal Highway Administration, Chen, Y. H. and Cotton, G. K., Hydraulic Engineering Circular 15, FHWA-IP-87-7, McLean Virginia, 1988.
4	"Draft Stormwater Best Management Practices Manual," Pennsylvania Department of Environmental Protection, January 2005.
5	"Evaluation and Management of Highway Runoff Water Quality," Federal Highway Administration, FHWA-PD-96-032, Washington, D.C., 1996.
6	"Evaporation Maps of the United States," U.S. Weather Bureau (now NOAA/National Weather Service) Technical Paper 37, Published by Department of Commerce, Washington D.C., 1959.
7	"Georgia Stormwater Manual," AMEC Earth and Environmental, Center for Watershed Protection, Debo and Associates, Jordan Jones and Goulding, Atlanta Regional Commission, Atlanta, Georgia, 2001.
8	"Hydraulic Design of Highway Culverts," Federal Highway Administration, FHWA HDS 5, Washington, D.C., 1985 (revised May 2005).
9	"Low Impact Development Design Strategies An Integrated Design Approach, Prince Georges County, Maryland Department of Environmental Resources, June 1999.
10	"Maryland Stormwater Design Manual," Maryland Department of the Environment, Baltimore, Maryland, 2000.
11	"Pennsylvania Handbook of Best Management Practices for Developing Areas," Pennsylvania Department of Environmental Protection, 1998.

Number	Design Reference Title
12	"Recommended Procedures for Act 167 Drainage Plan Design," LVPC, revised 1997.
13	"Roof Gardens History, Design, and Construction," Osmundson, Theodore. New York: W.W. Norton and Company, 1999.
14	"The Texas Manual on Rainwater Harvesting," Texas Water Development Board, Austin, Texas, Third Edition, 2005.
15	"VDOT Manual of Practice for Stormwater Management," Virginia Transportation Research Board of Supervisors, Charlottesville, Virginia, 2004.
16	"Virginia Stormwater Management Handbook," Virginia Department of Conservation and Recreation, Richmond, Virginia, 1999.
17	"Water Resources Engineering," Mays, L. W., John Wiley and Sons, Inc., 2005.
18	"Urban Hydrology for Small Watersheds," Technical Report 55, US Department of Agriculture, Natural Resources Conservation Service, 1986.
19	US EPA, Region 1 New England website (as of August 2005) <a href="http://www.epa.gov/NE/assistance/ceitts/stormwater/techs/html">http://www.epa.gov/NE/assistance/ceitts/stormwater/techs/html</a> .

P. Stormwater runoff from hot spot land uses shall be pretreated. In no case may the same BMP be employed consecutively to meet this requirement and the requirement in Section 304.O.

1. Acceptable methods of pretreatment are listed below.

Hot Spot Land Use	Pretreatment Method(s)
Vehicle maintenance and repair facilities including auto parts stores	Water quality inlets  Use of drip pans and/or dry sweep material under vehicles/equipment  Use of absorbent devices to reduce liquid releases  Spill prevention and response program
Vehicle fueling stations	Water quality inlets  Spill prevention and response program
Hot Spot Land Use	Pretreatment Method(s)

Storage areas for public works	Water quality inlets  Use of drip pans and/or dry sweep material under vehicles/equipment  Use of absorbent devices to reduce liquid releases  Spill prevention and response program  Diversion of stormwater away from potential contamination areas
Outdoor storage of liquids	Spill prevention and response program
Commercial nursery operations	Vegetated swales/filter strips  Constructed wetlands  Stormwater collection and reuse
Salvage yards and recycling facilities*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Fleet storage yards and vehicle cleaning facilities*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Facilities that store or generate regulated substances*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Marinas*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit
Certain industrial uses (listed under NPDES)*	BMPs that are a part of a stormwater pollution prevention plan under an NPDES permit

**NOTES:**

\* Regulated under the NPDES stormwater program.

2. Design references for the pretreatment methods, as necessary, are listed below. If the applicant can demonstrate to the satisfaction of the municipality that the proposed land use is not a hot spot, then the pretreatment requirement would not apply.



<b>Pretreatment Method</b>	<b>Design Reference<sup>A</sup></b>
Constructed wetlands	4, 5, 8, 10, 16
Diversion of stormwater away from potential contamination areas	4, 11
Stormwater collection and reuse (especially for irrigation)	4, 14
Stormwater filters (sand, peat, compost, etc.)	4, 5, 10, 16
Vegetated swales	2, 3, 5, 11, 16, 17
Water quality inlets	4, 7, 15, 16, 19

**NOTES:**

<sup>A</sup> These numbers refer to the Design Reference Title Chart in Section 304.O. above.

- Q. The use of infiltration BMPs is prohibited on hot spot land use areas.
- R. Stormwater infiltration BMPs shall not be placed in or on a special geologic feature(s). Additionally, stormwater runoff shall not be discharged into existing on- site sinkholes.
- S. Applicants shall request, in writing, public water suppliers to provide the Zone I wellhead protection radius, as calculated by the method outlined in the Pennsylvania Department of Environmental Protection wellhead protection regulations, for any public water supply well within 400 feet of the site. In addition to the setback distances specified in Section 304.I., infiltration is prohibited in the Zone I radius as defined and substantiated by the public water supplier in writing. If the applicant does not receive a response from the public water supplier, the Zone I radius is assumed to be 100 feet.
- T. The volume and rate of the net increase in stormwater runoff from the regulated activities must be managed to prevent the physical degradation of receiving waters from such effects as scour and stream bank destabilization, to satisfy state water quality requirements, by controlling the two-year post-development runoff to a 30% release rate.
- U. The municipality may, after consultation with DEP, approve alternative methods for meeting the state water quality requirements other than those in this section, 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 305. Stormwater Management Districts

- A. Mapping of stormwater management districts. To implement the provisions of the Bushkill Creek Watershed Stormwater Management Plan, the municipality is hereby divided into Stormwater Management Districts consistent with the Bushkill Creek Watershed Release Rate Map presented in the Plan Update. The boundaries of the stormwater management districts are shown on an official map which is available for inspection at the municipal office. A copy of the Official Map at a reduced scale is included in Appendix A for general reference.
- B. Description of stormwater management districts. Two types of stormwater management districts may be applicable to the municipality, namely conditional/ provisional no detention districts and dual release rate districts, as described below.
1. Conditional/provisional no detention districts. Within these districts, the capacity of the local runoff conveyance facilities (as defined in Article II) must be calculated to determine if adequate capacity exists. For this determination, the developer must calculate peak flows assuming that the site is developed as proposed and that the remainder of the local watershed is in the existing condition. The developer must also calculate peak flows assuming that the entire local watershed is developed per current zoning and that all new development would use the runoff controls specified by this chapter. The larger of the two peak flows calculated will be used in determining if adequate capacity exists. If adequate capacity exists to safely transport runoff from the site to the main channel (as defined in Article II), these watershed areas may discharge post-development peak runoff without detention facilities. If the capacity calculations show that the local runoff conveyance facilities lack adequate capacity, the developer shall either use a 100% release rate control or provide increased capacity of downstream elements to convey increased peak flows consistent with Section 305.P. Any capacity improvements must be designed to convey runoff from development of all areas tributary to the improvement consistent with the capacity criteria specified in By definition, a storm drainage problem area associated with the local runoff conveyance facilities indicates that adequate capacity does not exist. Sites in these districts are still required to meet all of the water quality requirements in Section 304.
  2. Dual release rate districts. Within these districts, the two-year post- development peak discharge must be controlled to 30% of the predevelopment two-year runoff peak. Further, the ten-, twenty-five- and 100-year post- development peak runoff must be

controlled to the stated percentage of the predevelopment peak. Release rates associated with the ten- through 100-year events vary from 50% to 100% depending upon location in the watershed.

### **Section 306. Stormwater Management District Implementation Provisions**

- A. Applicants shall provide a comparative pre- and post-construction stormwater management hydrograph analysis for each direction of discharge and for the site overall to demonstrate compliance with the provisions of this chapter.
- B. Any stormwater management controls required by this chapter and subject to a dual release rate criteria shall meet the applicable release rate criteria for each of the two-, ten-, twenty-five- and 100-year return period runoff events consistent with the calculation methodology specified in Section 307.
- C. The exact location of the stormwater management district boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours provided as part of the drainage plan. The district boundaries as originally drawn coincide with topographic divides or, in certain instances, are drawn from the intersection of the watercourse and a physical feature such as the confluence with another watercourse or a potential flow obstruction (e.g., road, culvert, bridge, etc.). The physical feature is the downstream limit of the subarea and the subarea boundary is drawn from that point up slope to each topographic divide along the path perpendicular to the contour lines.
- D. Any downstream capacity analysis conducted in accordance with this chapter shall use the following criteria for determining adequacy for accepting increased peak flow rates:
  - 1. Natural or man-made channels or swales must be able to convey the increased runoff associated with a two-year return period event within their banks at velocities consistent with protection of the channels from erosion.
  - 2. Natural or man-made channels or swales must be able to convey the increased twenty-five-year return period runoff without creating any hazard to persons or property.
  - 3. Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area must be designed in accordance with DEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased twenty-five-year return period runoff.

- E. For a proposed development site located within one release rate category subarea, the total runoff from the site shall meet the applicable release rate criteria. For development sites with multiple directions of runoff discharge, individual drainage directions may be designed for up to a 100% release rate so long as the total runoff from the site is controlled to the applicable release rate.
- F. For a proposed development site located within two or more release category subareas, the peak discharge rate from any subarea shall be the predevelopment peak discharge for that subarea multiplied by the applicable release rate. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea. An exception to the above may be granted if discharges from multiple subareas recombine in proximity to the site. In this case, peak discharge in any direction may be a 100% release rate provided that the overall site discharge meets the weighted average release rate.
- G. For a proposed development site located partially within a release rate category subarea and partially within a conditional/provisional no detention subarea, the size of the predevelopment drainage area on a site may not be changed post-development to create potentially adverse conditions on downstream properties except as part of a no harm or hardship waiver procedure.
- H. No portion of a site may be regraded between any Lower Nazareth Township watershed, and any adjacent watershed except as part of a "no harm" or hardship waiver procedure.
- I. Within a release rate category area, for a proposed development site which has areas which drain to a closed depression(s), the design release from the site will be the lesser of a) the applicable release rate flow assuming no closed depression(s) or b) the existing peak flow actually leaving the site. In cases where b) would result in an unreasonably small design release, the design discharge of less than or equal to the release rate will be determined by the available downstream conveyance capacity to the main channel calculated using Section 306.D. and the minimum orifice criteria.
- J. Off-site areas which drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site using the capacity criteria in Section 306.D. and the detention criteria in Section 307.
- K. For development sites proposed to take place in phases, all detention ponds shall be designed to meet the applicable release rate(s) applied to all site areas tributary to the proposed pond discharge direction. All site tributary areas will be assumed as developed, regardless of whether all

site tributary acres are proposed for development at that time. An exception shall be sites with multiple detention ponds in series where only the downstream pond must be designed to the stated release rate.

- L. Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area shall be subject to the release rate criteria. The impact area includes any proposed cover or grading changes.
- M. Development proposals which, through groundwater recharge or other means, do not increase either the rate or volume of runoff discharged from the site compared to predevelopment are not subject to the release rate provisions of this chapter.
- N. No harm water quantity option. For any proposed development site not located in a conditional/provisional no detention district, the developer has the option of using a less restrictive runoff control (including no detention) if the developer can prove that special circumstances exist for the proposed development site and that no harm would be caused by discharging at a higher runoff rate than that specified by the plan. Special circumstances are defined as any hydrologic or hydraulic aspects of the development itself not specifically considered in the development of the plan runoff control strategy. Proof of no harm would have to be shown from the development site through the remainder of the downstream drainage network to the confluence of the creek with the Delaware or Lehigh River. Proof of no harm must be shown using the capacity criteria specified in Section 306 if downstream capacity analysis is a part of the no harm justification.
  - 1. Attempts to prove no harm based upon downstream peak flow versus capacity analysis shall be governed by the following provisions:
    - a. The peak flow values to be used for downstream areas for the design return period storms (two-, ten-, twenty-five- and 100-year) shall be the values from the calibrated PSRM Model for the Bushkill Creek Watershed or as calculated by an applicant using an alternate method acceptable to the municipality. The flow values from the PSRM Model would be supplied to the developer by the municipality upon request.
    - b. Any available capacity in the downstream conveyance system as documented by a developer may be used by the developer only in proportion to his development site acreage relative to the total upstream undeveloped acreage from the identified capacity (i.e., if his site is 10% of the upstream undeveloped acreage, he may use up to 10% of

the documented downstream available capacity).

- c. Developer-proposed runoff controls which would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove no harm, except in conjunction with proposed capacity improvements for the problem areas consistent with Section 306.P.
  2. Any no harm justifications shall be submitted by the developer as part of the drainage plan submission per Article IV. Developers submitting no harm justifications must still meet all of the water quality requirements in Section 304.
- O. Regional detention alternatives. For certain areas within the study area, it may be more cost-effective to provide one control facility for more than one development site than to provide an individual control facility for each development site. The initiative and funding for any regional runoff control alternatives are the responsibility of prospective developers. The design of any regional control basins must incorporate reasonable development of the entire upstream watershed. The peak outflow of a regional basin would be determined based on the required release rate at the point of discharge.
- P. Capacity improvements. In certain instances, primarily within the conditional/ provisional no detention areas, local drainage conditions may dictate more stringent levels of runoff control than those based upon protection of the entire watershed. In these instances, if the developer could prove that it would be feasible to provide capacity improvements to relieve the capacity deficiency in the local drainage network, then the capacity improvements could be provided by the developer in lieu of runoff controls on the development site. Peak flow calculations shall be done assuming that the local watershed is in the existing condition and then assuming that the local watershed is developed per current zoning and using the specified runoff controls. Any capacity improvements would be designed using the larger of the above peak flows and the capacity criteria specified in Section 306. All new development in the entire subarea(s) within which the proposed development site is located shall be assumed to implement the developer's proposed discharge control, if any. Capacity improvements may also be provided as necessary to implement any regional detention alternatives or to implement a modified no harm option which proposes specific capacity improvements to provide that a less stringent discharge control would not create any harm downstream.

## Section 307. Calculation Methodology

- A. Stormwater runoff from all development sites shall be calculated using either the rational method or the soil-cover-complex methodology.
- B. Infiltration BMP loading rate percentages.

- 1. Infiltration BMP loading rate percentages in the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D<sup>17</sup> shall be calculated as follows:

$$\left( \frac{\text{(Area tributary to infiltration BMP)}}{\text{(Base area of infiltration BMP)}} \right) *100\%$$

- 2. The area tributary to the infiltration BMP shall be weighted as follows:
  - a. All disturbed areas to be made impervious: weight at 100%.
  - b. All disturbed areas to be made pervious: weight at 50%.
  - c. All undisturbed pervious areas: weight at 0%.
  - d. All existing impervious areas: weight at 100%.

- C. Soil thickness.

- 1. Soil thickness is to be measured from the bottom of any proposed infiltration system. The effective soil thickness in the Recommendation Chart for Infiltration Stormwater Management BMPs in Carbonate Bedrock in Appendix D is the measured soil thickness multiplied by the thickness factor based on soil permeability (as measured by the adapted 25 Pa. Code Section 73.15 percolation test in Appendix G<sup>18</sup>), as follows:

<b>Permeability Range*</b>	<b>Thickness Factor</b>
6.0 to 12.0 inches/hour	0.8
2.0 to 6.0 inches/hour	1.0
1.0 to 2.0 inches/hour	1.4
0.75 to 1.0 inches/hour	1.2
0.5 to 0.75 inches/hour	1.0

### NOTES:

\* If the permeability rate (as measured by the adapted 25 Pa. Code

Section 73.15 percolation test in Appendix G) falls on a break between two thickness factors, the smaller thickness factor shall be used.

2. Sites with soil permeability greater than 12.0 in/hr or less than 0.5 in/hr, as measured by the adapted 25 PA\ a. Code Section 73.15 percolation test in Appendix G, are not recommended for infiltration.
- D. The design of any detention basin intended to meet the requirements of this chapter shall be verified by routing the design storm hydrograph through the proposed basin using the storage indication method or other methodology demonstrated to be more appropriate. For basins designed using the Rational Method technique, the design hydrograph for routing shall be either the Universal Rational Hydrograph or the Modified Rational Method trapezoidal hydrograph which maximizes detention volume. Use of the Modified Rational hydrograph shall be consistent with the procedure described in Section PIPE.RAT of the Users' Manual for the Penn State Urban Hydrology Model (1987).
- E. BMPs designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall be routed using the storage indication method.
- F. BMPs designed to store or infiltrate runoff and discharge to surface runoff or pipe flow shall provide storage volume for the full WQv below the lowest outlet invert.
- G. Wet detention ponds designed to have a permanent pool for the WQv shall assume that the permanent pool volume below the primary outlet is full at the beginning of design event routing for the purposes of evaluating peak outflows.
- H. All stormwater detention facilities shall provide a minimum 1.0 foot freeboard above the maximum pool elevation associated with the two-through twenty-five- year runoff events. A 0.5 foot freeboard shall be provided above the maximum pool elevation of the 100-year runoff event. The freeboard shall be measured from the maximum pool elevation to the invert of the emergency spillway. The two- through 100-year storm events shall be controlled by the primary outlet structure. An emergency spillway for each basin shall be designed to pass the 100-year return frequency storm peak basin inflow rate with a minimum 0.5 foot freeboard measured to the top of basin. The freeboard criteria shall be met considering any off-site areas tributary to the basin as developed, as applicable. If this detention facility is considered to be a dam as per DEP Chapter 105, the design of the facility must be consistent with the Chapter 105 regulations and may be required to pass a storm greater than the 100-year event.
- I. The minimum circular orifice diameter for controlling discharge rates from detention facilities shall be three inches. Designs where a lesser size orifice



would be required to fully meet release rates shall be acceptable with a three-inch orifice, provided that as much of the site runoff as practical is directed to the detention facilities. The minimum three-inch diameter does not apply to the control of the WQv.

- J. Runoff calculations using the Soil-Cover-Complex Method shall use the Natural Resources Conservation Service Type II twenty-four-hour rainfall distribution. The twenty-four-hour rainfall depths for the various return periods to be used consistent with this Chapter shall be taken from the latest version of the Precipitation-Frequency Atlas of the United States, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland. A graphical and tabular presentation of the Type II-24 hour distribution is included in Appendix C.
- K. Runoff calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration and return periods and NOAA Atlas 14, Volume 2 Version 2.1, 2004 or the Intensity-Duration-Frequency Curves as presented in Appendix C.
- L. Runoff curve numbers (CNs) to be used in the Soil-Cover-Complex Method shall be based upon the matrix presented in Appendix C.
- M. Runoff coefficients for use in the Rational Method shall be based upon the table presented in Appendix C.
- N. All time of concentration calculations shall use a segmental approach which may include one or all of the flow types below:
  - 1. Sheet flow (overland flow) calculations shall use either the NRCS average velocity chart (Figure 3-1, Technical Release-55, 1975) or the modified kinematic wave travel time equation (Equation 3-3, NRCS TR-55, June 1986). If using the modified kinematic wave travel time equation, the sheet flow length shall be limited to 50 feet for designs using the Rational Method and limited to 150 feet for designs using the Soil-Cover-Complex Method.
  - 2. Shallow concentrated flow travel times shall be determined from the watercourse slope, type of surface and the velocity from Figure 3-1 of TR-55, June 1986.
  - 3. Open channel flow travel times shall be determined from velocities calculated by the Manning Equation. Bankfull flows shall be used for determining velocities. Manning 'n' values shall be based on the table presented in Appendix C.
  - 4. Pipe flow travel times shall be determined from velocities calculated using the Manning Equation assuming full flow and the Manning 'n'

values from Appendix C.

- O. If using the Rational Method, all predevelopment calculations for a given discharge direction shall be based on a common time of concentration considering both on- site and any off-site drainage areas. If using the Rational Method, all post- development calculations for a given discharge direction shall be based on a common time of concentration considering both on-site and any off-site drainage areas.
- P. The Manning Equation shall be used to calculate the capacity of watercourses. Manning 'n' values used in the calculations shall be consistent with the table presented in Appendix C<sup>20</sup> or other appropriate standard engineering 'n' value resources. Pipe capacities shall be determined by methods acceptable to the municipality.
- Q. The Pennsylvania DEP Chapter 105 rules and regulations apply to the construction, modification, operation or maintenance of both existing and proposed dams, water obstructions and encroachments throughout the watershed. Criteria for design and construction of stormwater management facilities according to this chapter may differ from the criteria that are used in the permitting of dams under the Dam Safety Program.

### **Section 308. Volume Controls**

The green infrastructure and low impact development practices provided in the Pennsylvania Department of Environmental Protection's Pennsylvania Stormwater Best Management Practices Manual (December 2006), as amended and updated, shall be utilized for all regulated activities wherever possible. Water volume controls shall be implemented using the Design Storm Method in Subsection A or the Simplified Method in Subsection B below. For regulated activity areas equal or less than one acre that do not require hydrologic routing to design the stormwater facilities, this Ordinance establishes no preference for either methodology; therefore, the applicant may select either methodology on the basis of economic considerations, the intrinsic limitations on applicability of the analytical procedures associated with each methodology and other factors.

- A. The Design Storm Method [CG-1 in the Pennsylvania Department of Environmental Protection's Pennsylvania Stormwater Best Management Practices Manual (December 2006), as amended and updated] is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.
  - 1. Do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24 hour duration precipitation.
  - 2. For modeling purposes:

- a. Existing (predevelopment) non-forested pervious areas must be considered meadow in good condition.
  - b. 20% of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions.
- B. The Simplified Method [CG-2 in the Pennsylvania Department of Environmental Protection's Pennsylvania Stormwater Best Management Practices Manual (December 2006), as amended and updated] provided below is independent of site conditions and should be used if the Design Storm Method is not followed. This method is not applicable to regulated activities greater than one acre or for projects that require design of stormwater storage facilities. For new impervious surfaces:
1. Stormwater facilities shall capture at least the first two (2) inches of runoff from all new impervious surfaces.
  2. At least the first one inch of runoff from new impervious surfaces shall be permanently removed from the runoff flow, i.e., it shall not be released into the surface waters of this Commonwealth. Removal options include reuse, evaporation, transpiration, and infiltration.
  3. Wherever possible, infiltration facilities should be designed to accommodate infiltration of the entire permanently removed runoff; however, in all cases at least the first 0.5 inch of the permanently removed runoff should be infiltrated.
  4. This method is exempt from the requirements of Section 307.

#### **Section 309. Rate Controls**

- A. See Section 306. for details on Rate Controls.

#### **Section 310. Riparian Buffers**

- A. In order to protect and improve water quality, a Riparian Buffer Easement shall be created and recorded as part of any subdivision or land development that encompasses a 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 35 feet from the top of the streambank (on each side).
- C. Minimum Management Requirements for Riparian Buffers.

1. Existing native vegetation shall be protected and maintained within the Riparian Buffer Easement.
  2. Whenever practicable invasive vegetation shall be actively removed and the Riparian Buffer Easement shall be planted with native trees, shrubs and other vegetation to create a diverse native plant community appropriate to the intended ecological context of the site.
- D. The Riparian 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 the continued private ownership and shall count toward the minimum lot area a required by Zoning, unless otherwise specified in the municipal Zoning Ordinance.
- E. 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, and preserve and protect the ecological function of the floodplain.
- F. The following conditions shall apply when public and/or private recreation trails are permitted within Riparian Buffers:
1. Trails shall be for non-motorized use only.
  2. Trails shall be designed to have the least impact on native plant species and other sensitive environmental features.
- G. Septic drainfields and sewage disposal systems shall not be permitted within the Riparian Buffer Easement and shall comply with setback requirements established under 25 Pa. Code Chapter 73.

#### **Article IV. Drainage Plan Requirements.**

##### **Section 401. General requirements**

For any of the regulated activities of this chapter, prior to the final approval of subdivision and/or land development plans or the issuance of any permit or the commencement of any regulated earth disturbance activity, the owner, subdivider, developer or his agent shall submit a drainage plan and receive municipal approval of the plan.

##### **Section 402. Exemptions**

Exemptions from the drainage plan requirements are as specified in Section 106.

## Section 403. Drainage Plan Contents

The following items shall be included in the drainage plan:

- A. General.
  - 1. General description of project.
  - 2. General description of proposed permanent stormwater controls.
  - 3. The name and address of the project site, the name and address of the owner of the property and the name of the individual or firm preparing the drainage plan.
  
- B. Map(s) of the project area showing:
  - 1. The location of the project relative to highways, municipalities or other identifiable landmarks.
  - 2. Existing contours at intervals of two feet. In areas of steep slopes (greater than 15%), five-foot contour intervals may be used. Off-site drainage areas impacting the project including topographic detail.
  - 3. Streams, lakes, ponds or other bodies of water within the project area.
  - 4. Other features including flood hazard boundaries, existing drainage swales, wetlands, closed depressions, sinkholes and areas of natural vegetation to be preserved.
  - 5. Locations of proposed underground utilities, sewers and water lines. The locations of all existing and proposed utilities, sanitary sewers and water lines within 50 feet of property lines of the project site.
  - 6. An overlay showing soil types and boundaries based on the Lehigh or Northampton County Soil Survey, as applicable, latest edition. Any hydric soils present on the site should be identified as such.  
  
An overlay showing geologic types, boundaries and any special geologic features present on the site.
  - 7. Proposed changes to land surface and vegetative cover.
  - 8. Proposed structures, roads, paved areas and buildings.
  - 9. Final contours at intervals of two feet. In areas of steep slopes (greater than 15%), five-foot contour intervals may be used.

10. Stormwater management district boundaries applicable to the site.
11. Clear identification of the location and nature of permanent stormwater BMPs.
12. An adequate access easement around all stormwater BMPs that would provide municipal ingress to and egress from a public right-of-way.
13. A schematic showing all tributaries contributing flow to the site and all existing man-made features beyond the property boundary that would be affected by the project.
14. The location of all public water supply wells within 400 feet of the project and all private water supply wells within 100 feet of the project.

C. Stormwater management controls and BMPs.

1. All stormwater management controls and BMPs shall be shown on a map and described, including:
  - a. Groundwater recharge methods such as seepage pits, beds or trenches. When these structures are used, the locations of septic tank infiltration areas and wells shall be shown.
  - b. Other control devices or methods such as rooftop storage, semipervious paving materials, grass swales, parking lot ponding, vegetated strips, detention or retention ponds, storm sewers, etc.
2. All calculations, assumptions and criteria used in the design of the BMPs shall be shown.
3. All site testing data used to determine the feasibility of infiltration on a site.
4. All details and specifications for the construction of the stormwater management controls and BMPs.

- D. The BMP operations and management plan, as required in Article VII, describing how each permanent stormwater BMP will be operated and maintained and the identity of the person(s) responsible for operations and maintenance. A statement must be included, signed by the landowner, acknowledging that the stormwater BMPs are fixtures that cannot be altered or removed without approval by the municipality.

- E. Environmental resources site design assessment.
1. An environmental resources site design assessment that describes the following:
    - a. The extent to which the proposed grading and impervious cover avoid disturbance of significant environmental resources and preserve existing site hydrology.
    - b. An assessment of whether alternative grading and impervious cover site design could lessen the disturbance of significant environmental resources and/or make better use of the site hydrologic resources.
    - c. A description of how the proposed stormwater management controls and BMPs serve to mitigate any adverse impacts on environmental resources on the site.
  2. Significant environmental resources considered in the site design assessment include, but are not limited to, steep slopes, ponds, lakes, streams, wetlands, hydric soils, floodplains, riparian vegetation, native vegetation and special geologic features.

#### **Section 404. Plan Submission**

- A. For regulated activities specified in Section 105.A. and Section 105.B.:
1. The drainage plan shall be submitted by the developer to the municipal secretary (or other appropriate person) as part of the preliminary plan submission for the subdivision or land development.
  2. Four copies of the drainage plan shall be submitted.
  3. Distribution of the drainage plan will be as follows:
    - a. One copy to the municipal governing body.
    - b. One copy to the Municipal Engineer.
    - c. Two copies to the Lehigh Valley Planning Commission, except for drainage plans involving less than 10,000 square feet of additional impervious cover and less than one acre in cumulative earth disturbances.
  4. Drainage plans involving more than 10,000 square feet of additional impervious cover and one acre or more in cumulative earth disturbances shall be submitted by the developer (possibly through the municipality) to the Lehigh Valley Planning Commission as part of the preliminary plan submission. The Lehigh Valley Planning

Commission will conduct an advisory review of the drainage plan for consistency with the Bushkill Creek Watershed Stormwater Management Plan. The LVPC will not review details of the erosion and sedimentation plan or the BMP operations and maintenance plan.

- a. Two copies of the drainage plan shall be submitted.
  - b. The LVPC will provide written comments to the developer and the municipality, within a time frame consistent with established procedures under the Municipalities Planning Code, as to whether the drainage plan has been found to be consistent with the stormwater management plan.
- B. For regulated activities specified in Section 105.C. and 105.D., the drainage plan shall be submitted by the developer to the Zoning and/or Code Enforcement Officer as part of the building permit application.
- C. For regulated activities specified in Section 105.E., 105.F. and 105.G.:
1. The drainage plan shall be submitted by the developer to the Lehigh Valley Planning Commission for coordination with the DEP permit application process under Chapter 105 (Dam Safety and Waterway Management), Chapter 106 (Floodplain Management) of DEP's rules and regulations and the NPDES regulations.
  2. One copy of the drainage plan shall be submitted.
- D. Earthmoving for all regulated activities under Section 105 shall be conducted in accordance with the current federal and state regulations relative to the NPDES and DEP Chapter 102 regulations.

#### **Section 405. Drainage Plan Review**

- A. The municipality shall review the drainage plan, including the BMP operations and maintenance plan, for consistency with the provisions of this Ordinance and with any permits issued by DEP. The municipality shall also review the drainage plan against any additional storm drainage provisions contained in the municipal subdivision and land development or zoning ordinance, as applicable.
- B. The Municipality shall notify the applicant in writing within 45 days whether the SWM Site Plan is approved or disapproved. If the SWM Site Plan involves a Subdivision and Land Development Plan, the notification shall occur within the time period allowed by the Municipalities Planning Code (90 days). If a longer notification period is provided by other statute, regulation, or ordinance, the applicant will be so notified by the municipality



- C. The municipality shall not approve any subdivision or land development (regulated activities Section 105.A. and B.) or building permit application (regulated activities Section 105.C. and D.) if the drainage plan has been found to be inconsistent with the stormwater management plan.
- D. The municipality may require an as-built survey of all stormwater BMPs and an explanation of any discrepancies with the drainage plan.
- E. For any SWM Site Plan that proposes to use any BMPs other than green infrastructure and LID practices to achieve the volume and rate controls required under this Ordinance, the Municipality will not approve the SWM Site Plan unless it determines that green infrastructure and LID practices are not practicable.
- F. If the Municipality disapproves the SWM Site Plan, the Municipality will state the reasons for the disapproval in writing. The Municipality also may approve the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing.

#### **Section 406. Modification of Plans**

A modification to a submitted drainage plan for a proposed development site which involves a change in control methods or techniques, or which involves the relocation or redesign of control measures, or which is necessary because soil or other conditions are not as stated on the drainage plan (as determined by the municipality) shall require a resubmission of the modified drainage plan consistent with Section 404 subject to review per Section 405 of this chapter.

#### **Section 407. Hardship Waiver Procedure**

- A. The municipality may hear requests for waivers where it is alleged that the provisions of this chapter inflict unnecessary hardship upon the applicant. The waiver request shall be in writing and accompanied by the requisite fee based upon a fee schedule adopted by the municipality. A copy of the waiver request shall be provided to each of the following: municipality, Municipal Engineer, Municipal Solicitor and Lehigh Valley Planning Commission. The request shall fully document the nature of the alleged hardship.
- B. The municipality may grant a waiver, provided that all of the following findings are made in a given case:
  - 1. That there are unique physical circumstances or conditions, including irregularity of lot size or shape, or exceptional topographical or other physical conditions peculiar to the particular property, and that the unnecessary hardship is due to such conditions, and not the circumstances or conditions generally created by the provisions of this chapter in the stormwater

management district in which the property is located;

2. That because of such physical circumstances or conditions, there is no possibility that the property can be developed in strict conformity with the provisions of this chapter, including the no harm provisions, and that the authorization of a waiver is therefore necessary to enable the reasonable use of the property;
  3. 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 Environment Protection (DEP) or the delegated county conservation district.
  4. That such unnecessary hardship has not been created by the applicant;
  5. That the waiver, if authorized, will represent the minimum waiver that will afford relief and will represent the least modification possible of the regulation in issue; and
  6. That financial hardship is not the criteria for granting of a hardship waiver.
- C. In granting any waiver, the municipality may attach such conditions and safeguards as it may deem necessary to implement the purposes of this chapter. If a hardship waiver is granted, the applicant must still manage the quantity, velocity, direction and quality of resulting storm runoff as is necessary to prevent injury to health, safety or other property.
- D. For regulated activities described in Section 105.A. and B., the Lower Nazareth Township Board of Supervisors shall hear requests for and decide on hardship waiver requests on behalf of the municipality.
- E. For regulated activities in Section 105.C., D., E., F. and G. the Zoning Hearing Board shall hear requests for and decide on hardship waiver requests on behalf of the municipality.
- F. The municipality shall not waive the water quality provisions of this chapter.

#### **Section 408. Resubmission of Disapproved SWM Site Plans**

A modification to a submitted SWM Site Plan that involves a change in SWM BMPs or techniques, or that involves the relocation or redesign of SWM BMPs, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the Municipality shall require a resubmission of the modified SWM Site Plan in accordance with this Article.

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

The Municipality's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Municipality may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 407 within the term of validity, then the Municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Municipality shall be resubmitted in accordance with Section 405 of this Ordinance.

## **Section 410. As-Built Plans, Completion Certificate, and Final Inspection**

- A. The developer shall be responsible for providing as-built plans of all SWM BMPs included in the approved SWM Site Plan. The as-built plans and an explanation of any discrepancies with the construction plans shall be submitted to the Municipality.
- B. The as-built submission shall include a certification of completion signed by a qualified professional verifying that all permanent SWM BMPs have been constructed according to the approved plans and specifications. The latitude and longitude coordinates for all permanent SWM BMPs must also be submitted, at the central location of the BMPs. If any licensed qualified professionals contributed to the construction plans, then a licensed qualified professional must sign the completion certificate.
- C. After receipt of the completion certification by the Municipality, the Municipality may conduct a final inspection.

## **Article V. Inspections**

### **Section 501. Schedule of Inspections**

- A. DEP or its designees (e.g., County Conservation District) normally ensure compliance with any permits issued, including those for stormwater management. In addition to DEP compliance programs, the municipality or its designee may inspect all phases of the construction, operations, maintenance and any other implementation of stormwater BMPs.
- B. During any stage of the regulated earth disturbance activities, if the municipality or its designee determines that any BMPs are not being implemented in accordance with this chapter, the municipality may suspend or revoke any existing permits issued by the municipality or other approvals issued by the municipality until the deficiencies are corrected.

## **Article VI. Fees and Expenses.**

### **Section 601. General**

The municipality may charge a reasonable fee for review of the drainage plan, including the BMP operations and maintenance plan, to defray review costs incurred by the municipality. The applicant shall pay all such fees.

### **Section 602. Expenses Covered by Fees**

The fees required by this chapter shall at a minimum cover:

- A. The review of the drainage plan, including the BMP operations and maintenance plan, by the municipality.
- B. The site inspection.
- C. The inspection of required controls and improvements during construction.
- D. The final inspection upon completion of the controls and improvements required in the plan.
- E. Any additional work required to monitor and enforce any permit provisions, regulated by this chapter, correct violations, and assure the completion of stipulated remedial actions.
- F. Administrative and clerical costs.

## **Article VII. Stormwater BMP Operations and Maintenance Plan Requirements**

### **Section 701. General Requirements**

No regulated earth disturbance activities within the municipality shall commence until approval by the municipality of the BMP operations and maintenance plan which describes how the permanent (e.g., post-construction) stormwater BMPs will be properly operated and maintained.

### **Section 702. 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. The Facilities, areas, or structures used as SWM BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or 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 703. Adherence to Approved BMP Operations and Maintenance Plan**

It shall be unlawful to alter or remove any permanent stormwater BMP required by an approved BMP operations and maintenance plan or to allow the property to remain in a condition which does not conform to an approved BMP operations and maintenance plan unless an exception is granted, in writing, by the municipality.

**Section 704. Operations and Maintenance Agreement for Privately Owned Stormwater BMPs**

- A. The property owner shall sign an operations and maintenance agreement with the municipality covering all stormwater BMPs that are to be privately owned. The agreement shall include the terms of the format agreement referenced in Appendix E of this Chapter.
- B. The owner, successor and assigns shall maintain all facilities in accordance with the approved maintenance schedule in the O&M Agreement.
- C. The owner shall convey to the Municipality conservation easements to assure access for periodic inspections by the Municipality and maintenance, as necessary.
- D. 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.
- E. Other items may be included in the agreement where determined by the municipality to be reasonable or necessary to guarantee the satisfactory operation and maintenance of all permanent stormwater BMPs. The agreement shall be subject to the review and approval of the municipality.
- F. The owner is responsible for operation and maintenance (O&M) 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.

## **Section 705. Stormwater Management Easements**

Stormwater management easements shall be provided by the property owner if necessary for access for inspections and maintenance or for preservation of stormwater conveyance, infiltration, detention areas and other BMPs by persons other than the property owner. The purpose of the easement shall be specified in any agreement under Section 704.

## **Section 706. Recording of Approved BMP Operations and Maintenance Plan and Related Agreements**

- A. The owner of any land upon which permanent BMPs will be placed, constructed or implemented, as described in the BMP operations and maintenance plan, shall record the following documents in the office of the Recorder of Deeds for Lehigh or Northampton County, as applicable, within 90 days of approval of the BMP operations and maintenance plan by the municipality:
  - 1. The operations and maintenance plan or a summary thereof.
  - 2. Operations and maintenance agreements under Section 704.
  - 3. Easements under Section 705.
- B. The municipality may suspend or revoke any approvals granted for the project site upon discovery of the failure of the owner to comply with this section.

## **Section 707. Municipal Stormwater BMP Operations and Maintenance Fund**

- A. If stormwater BMPs are accepted by the municipality for dedication, the municipality may require the applicant to pay a specified amount to the municipal stormwater BMP operations and maintenance fund to help defray costs of operations and maintenance activities. The amount may be determined as follows:
  - 1. If the BMP is to be owned and maintained by the municipality, the amount shall cover the estimated costs for operation and maintenance in perpetuity, as determined by the municipality.
  - 2. The amount shall then be converted to present worth of the annual series values.
- B. If a BMP is proposed that also serves as a recreation facility (e.g., ball field, lake), the municipality may adjust the amount due accordingly.

## **Section 708. Performance Guarantee**

For SWM Site Plans that involve subdivision and land development, the applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as required by the approved SWM Site Plan and this Ordinance in accordance with the provisions of Sections 509, 510, and 511 of the Pennsylvania Municipalities Planning Code.

## **Article VIII. Prohibitions**

### **Section 801. Prohibited Discharges**

- 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 in the municipality shall allow or cause to allow stormwater discharges into the municipality's separate storm sewer system which are not composed entirely of stormwater except as provided in Section 801.B. below or as allowed under a state or federal permit.
- C. Discharges that may be allowed based on the municipality finding that the discharge(s) do not significantly contribute pollution to surface waters of the commonwealth are listed below.
  - 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 drainage. water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.
  - 4. Routine external building washdown which does not use detergents or other compounds.
  - 5. Non-contaminated HVAC condensation and water from geothermal systems.
  - 6. Water from individual residential (i.e. not commercial) vehicle wash water where cleaning agents are not utilized. car washing.
  - 7. Diverted stream flows and springs.
  - 8. Dechlorinated swimming pool discharges.

9. Non-contaminated hydrostatic test water discharges, if such discharges do not contain detectable concentrations of TRC.
10. In the event that the municipality determines that any of the discharges identified in Section 901 significantly contribute to pollution of waters of the commonwealth or is so notified by DEP, the municipality will notify the responsible person to cease the discharge.
11. Upon notice provided by the municipality under Section 901, the discharger will have a reasonable time, as determined by the municipality, to cease the discharge consistent with the degree of pollution caused by the discharge.
12. Nothing in this Section shall affect a discharger's responsibilities under state law.

### **Section 802. Prohibited Connections**

The following connections are prohibited, except as provided in Section 801.C. above:

- A. Any drain or conveyance, whether on the surface or subsurface, which allows any non-stormwater discharge including sewage, process wastewater and wash water to enter the separate storm sewer system and any connections to the storm drain system from indoor drains and sinks.
- B. Any drain or conveyance connected from a commercial or industrial land use to the separate storm sewer system which has not been documented in plans, maps or equivalent records and approved by the municipality.

### **Section 803. Roof Drains**

- A. Roof drains shall not be connected to streets, sanitary or storm sewers or roadside ditches, except as provided in Section 803.B.
- B. When it is more advantageous to connect directly to streets or storm sewers, connections of roof drains to streets or roadside ditches may be permitted by the municipality.
- C. Roof drains shall discharge to infiltration areas or vegetative BMPs to the maximum extent practicable.

### **Section 804. Alteration of BMPS**

- A. No person shall modify, remove, fill, landscape or alter any existing stormwater BMP without the written approval of the municipality unless it



is part of an approved maintenance program.

- B. No person shall place any structure, fill, landscaping or vegetation into a stormwater BMP or within a drainage easement, which would limit or alter the functioning of the BMP, without the written approval of the municipality.

## **Article IX. Right of Entry, Notification and Enforcement**

### **Section 901. Right of Entry**

- A. Upon presentation of proper credentials and with the consent of the landowner, duly authorized representatives of the municipality may enter at reasonable times upon any property within the municipality to inspect the implementation, condition or operation and maintenance of the stormwater BMPs or to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this chapter.
- B. In the event that the landowner refuses admission to the property, duly authorized representatives of the municipality may seek an administrative search warrant issued by a Magisterial District Judge to gain access to the property.
- C. Persons working on behalf of the municipality shall have the right to temporarily locate on any BMP in the municipality such devices as are necessary to conduct monitoring and/or sampling of the discharges from such BMPs.
- D. Unreasonable delays in allowing the municipality access to a BMP is a violation of this Article.

### **Section 902. Notification**

- A. Whenever the municipality finds that a person has violated a prohibition or failed to meet a requirement of this chapter, the municipality may order compliance by written notice to the responsible person. Such notice may require, without limitation:
  - 1. The name of the owner of record and any other person against whom the municipality intends to take action.
  - 2. The location of the property in violation.
  - 3. The performance of monitoring, analyses and reporting.
  - 4. The elimination of prohibited connections or discharges.
  - 5. Cessation of any violating discharges, practices or operations.

6. The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property.
  7. Payment of a fine to cover administrative and remediation costs.
  8. The implementation of stormwater BMPs.
  9. Operation and maintenance of stormwater BMPs.
- B. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of the violation(s). Said notice may further advise that should the violator fail to take the required action within the established deadline, the work will be done by the municipality or designee and the expense thereof, together with all related lien and enforcement fees, charges and expenses, shall be charged to the violator.
- C. Failure to comply within the time specified shall also subject such person to the penalty provisions of this chapter. All such penalties shall be deemed cumulative and shall not prevent the municipality from pursuing any and all other remedies available in law or equity.

### **Section 903. Inspection**

- A. The landowner or the owner's designee (including the Municipality for dedicated and owned facilities) shall inspect SWM BMPs, facilities and/or structures installed under this Ordinance according to the following frequencies, at a minimum, to ensure the BMPs, facilities and/or structures continue to function as intended:
1. Annually for the first 5 years
  2. Once every 3 years thereafter
  3. During or immediately after the cessation of a 10-year or greater storm.
- B. 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 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.

#### **Section 904. 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 106.
- B. It shall be unlawful to violate Section 804 of this Ordinance.
- C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the Municipality.

#### **Section 905. Public Nuisance**

- A. The violation of any provision of this chapter is hereby deemed a public nuisance.
- B. Each day that an offense continues shall constitute a separate violation.

#### **Section 906. Suspension and Revocation of Permits and Approvals**

- A. Any building, land development or other permit or approval issued by the Municipality may be suspended or revoked by the municipality for:
  - 1. Noncompliance with or failure to implement any provision of the approved SWM Site Plan or O&M Agreement.
  - 2. A violation of any 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 or nuisance, pollution or which endangers the life or property of others.
- B. A suspended permit or approval shall be reinstated by the municipality when:
  - 1. The municipality or designee has inspected and approved the corrections to the stormwater BMPs or the elimination of the hazard or nuisance that caused the suspension.
  - 2. The municipality is satisfied that the violation of the ordinance, law or rule and regulation has been corrected.
  - 3. Payment of all municipal fees, costs and expenses related to or arising from the violation has been made.
- C. A permit or approval which has been revoked by the municipality cannot be reinstated. The applicant may apply for a new permit under the

procedures outlined in this chapter.

- 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 907. Penalties**

- A. Any person, partnership or corporation who or which has violated the provisions of this Chapter shall be guilty of a summary offense and, upon conviction, shall be subject to a fine of not more than \$1,000 plus court costs, including reasonable attorney's fees incurred by the Municipality as a result thereof, for each violation, recoverable with costs, or imprisonment to the extent allowed by law for the punishment of summary offense, or both. Each day that the violation continues shall be a separate offense and penalties shall be cumulative. No judgment shall commence or be imposed, levied or payable until the date of the determination of a violation by the Magisterial District Judge. If the defendant neither pays nor timely appeals the judgment, the municipality may enforce the judgment pursuant to a separate violation, unless the Magisterial District Judge determining that there has been a violation further determines that there was a good-faith basis for the person, partnership, or corporation violating this chapter to have believed that there was no such violation, in which event there shall be deemed to have been only one such violation until the fifth day following the date of the determination of a violation by the Magisterial District Judge and, thereafter, each day that a violation continues shall constitute a separate violation.
- B. In addition, the municipality, through its Solicitor, 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.
- C. The court of common pleas, upon petition, may grant an order of stay upon cause shown, tolling the per diem judgment pending a final adjudication of the violation and judgment.
- D. Nothing contained in this section shall be construed or interpreted to grant to any person or entity other than the municipality the right to commence any action for enforcement pursuant to this section.
- E. Magisterial District Judges shall have initial jurisdiction in proceedings

brought under this section.

- F. In addition, the municipality, through its solicitor, may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this chapter. 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 908. Appeals**

Any person aggrieved by any action of the municipality or its designee relevant to the provisions of this Chapter may appeal using the appeal procedures established in the Pennsylvania Municipalities Planning Code.

- A. Any person aggrieved by any action of the Municipality or its designee, relevant to the provisions of the 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' decision.

**Section 909. Effective Date**

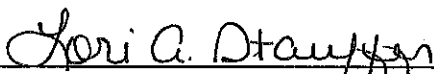
This ordinance shall become effective five (5) days from the date of its adoption.

ENACTED AND ORDAINED on this the 9 day of NOVEMBER 2022, by a majority of the Board of Supervisors of Lower Nazareth Township, Northampton County, Commonwealth of Pennsylvania, at a duly advertised meeting.

**LOWER NAZARETH TOWNSHIP  
BOARD OF SUPERVISORS**

  
\_\_\_\_\_  
James Pennington, Chairman

ATTEST:

  
\_\_\_\_\_  
~~Tammi Dravec~~, Secretary/Treasurer

## 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. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center. 2004-2006. *Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0*, Silver Spring, Maryland. Internet address: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.

**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 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 BMPs in accordance with the plans and specifications identified in the SWM Site Plan.
2. The Landowner shall operate and maintain the 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 BMPs per paragraph 2, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said 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 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 BMP(s) by the Landowner or Municipality.
- 8. The Municipality intends to inspect the 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)