# STORMWATER MANAGEMENT ORDINANCE

ORDINANCE NO. 01-2023

MUNICIPALITY OF

SPRING TOWNSHIP

CENTRE COUNTY, PENNSYLVANIA

Adopted at a Public Meeting Held on

August 7, 2023

## Table of Contents

# ARTICLE I – GENERAL PROVISIONS

### *Section 101. Short Title*

This ordinance shall be known and may be cited as the Spring Township Stormwater Management Ordinance.

### *Section 102. Statement of Findings*

The governing body of Spring Township 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

### *Section 103. Purpose*

The purpose of this Ordinance is to promote health, safety, and welfare within Spring Township and its 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.

***Section 105. Applicability***

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

***Section 106. Repealer***

Any ordinance or ordinance provision of the Township inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only. This ordinance shall repeal and replace in its entirety ordinance 2003-03 as enacted March 3, 2003.

***Section 107. Severability***

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

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

Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to comply with or to secure required permits or approvals for activities regulated by any other applicable codes, rules, statutes, or ordinances.

### *Section 109. Erroneous Permit*

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

### *Section 110. Waivers*

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

B. Waivers or modifications of the requirements of this Ordinance may be approved by the Municipality if enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that the modifications will not be contrary to the public interest and that the purpose of the Ordinance is preserved. Cost or financial burden shall not be considered a hardship. Modification may be considered if an alternative standard or approach will provide equal or better achievement of the purpose of the Ordinance. A request for modifications shall be in writing 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 Centre County Conservation District.

Specific methods and publications indicated in this Ordinance shall, in all cases, refer to the latest available edition and include revisions or amendments thereto.

### *Section 111. Exemptions*

Activities identified below are exempt from the requirement to submit a Stormwater management site plan to the Township for review. Exemption shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, and property. These measures include adequate and safe conveyance of stormwater on the site and as it leaves the site. This exemption shall not relieve the applicant from meeting the special requirements for water quality and groundwater recharge for high quality (HQ) and exceptional value (EV) watersheds (DEP Chapter 93 and anti-degradation requirement), and Sections 304 B of this ordinance relative to recharge and water quality volume requirements. Township may deny or

revoke any exception pursuant to this section at any time for any project that the Township believes may pose a threat to public health and safety or the environment.

A. All development activities having impervious surface or land disturbance of less than 10% of the total site area up to a maximum impervious area of 5,000 square feet. However, adequate and safe conveyance of stormwater from the site must be provided. For developments that are to be constructed in phases, the sum of all final phases must be considered in establishing exemption eligibility. Impervious cover shall include, but not be limited to, any roof, parking or driveway areas, and any new streets and sidewalks, or bikeways.

B. Land disturbance associated with the construction or alteration of a one- and two-family dwelling on an existing lot, provided that the total disturbance is less than one acre and does not alter any stormwater condition beyond the boundaries of the lot or alter provisions of a previously approved Stormwater management site plan for the lot or encompassing subdivision. Multiple (>2) lot subdivisions cannot be exempted.

C. Any site less than one (1) acre in size that decreases the total site impervious area following development, and:

- Is not located within a recognized sensitive area such as zone 1 of a wellhead protection area;
- Is not defined as a water quality sensitive (WQS) development (as defined in Article II, Definitions); or
- Is not located in an area where existing downstream stormwater problems are known to occur (the Township Engineer shall make the final determination as to pre-existing problems, but the Township must have supporting documentation of past problems).

D. In addition, the Township Engineer may waive the requirement to prepare a stormwater management site plan for sites larger than 1.0 acre for which the overall site impervious area is being decreased, and which meets the other conditions identified above. (Subject to prior approval by DEP)

E. Agriculture and Silviculture activities as defined in this ordinance that are conducted according to requirements of 25 Pa. Code 102.

In addition to the general exemptions identified above, exemptions for specific technical criteria are identified where applicable in Article III.

***Section 112. Municipal Liability***

The degree of stormwater management sought by the provisions of this Article is considered reasonable for regulatory purposes. This Article shall not create liability on the part of the Township, any appointed or elected official of the Township, the Centre County Conservation District, or any officer, engineer, or employee thereof for the erosion, sedimentation, or flood damages that result from reliance on this Article or any administrative decision lawfully made there under.

## ARTICLE II – DEFINITIONS

For the purposes of this ordinance, certain terms and words used herein shall be interpreted as presented below.

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 word "person" includes an individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity.

D. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.

E. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used, occupied or maintained".

**Agricultural Activities** – 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.

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

**Applicant** – A landowner or developer who has filed an application for approval to engage in any Regulated Activities as defined in Section 104 of this Ordinance.

**BMP (Best Management Practice)** – Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities, to meet state water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: "structural" or "nonstructural." In this Ordinance, nonstructural 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.
Stormwater structures, facilities and techniques to maintain or improve the water quality of surface runoff.

**Buffer Area** – Area that is protected from development in order to prevent degradation of the water body or water quality.

**Capture Depth** – Depth of runoff captured from a given area and either allowed to evaporate, infiltrate, or be discharged through a spillway at a negligible rate.

**Carbonate** – A sediment formed by the organic or inorganic precipitation of mineral compounds characterized by the fundamental chemical ion $CO_3$, the principal element in limestone and dolomite strata.

**Channel** – A perceptible natural or artificial waterway, which periodically or continuously contains moving water having a definite bed and banks, which confine the water.

**Closed Or Undrained Depression** – In a Karst geologic area a distinct bowl-shaped depression in the land surface; size and amplitude are variable; drainage is internal. It differs from a sinkhole in that the ground surface is unbroken and usually occurs in greater density per unit area.

**Conservation District** – The Centre County Conservation District.

**Credits** – A deduction from the required amount. In this ordinance, implies reduction of required water quality volumes due to using a recommended practice.

**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.

**Designee** – The agent of a Planning Commission and/or agent of the governing body involved with the administration, review or enforcement of any provisions of this ordinance by contract or memorandum of understanding.

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

**Development Site** – The specific tract of land for which a Regulated Activity is proposed.

**Dolomite** – (1) A mineral consisting of calcium magnesium carbonate found as compact lime stone; or (2) limestone or marble rich in magnesium carbonate.

**Downslope Property Line** – That portion of the property line of the lot, tract, or parcels of land being developed located such that all overland or pipe flow from the site would be directed towards it.

**Drainage Conveyance Facility** – A Stormwater Management Facility designed to transmit stormwater runoff and shall include streams, channels, swales, pipes, conduits, culverts, storm sewers, etc.

**Drainage Easement** – A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.

**Drainage-way** – The natural or man-made path of surface water from a given area.

**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 movement of soil particles by the action of water, wind, ice, or other natural forces.

**Erosion and Sediment Pollution Control Plan** – A plan that is designed to minimize accelerated erosion and sedimentation.

**Exfiltration** – The process by which water or moisture moves from a subsurface trench, bed, or other feature into the subsoil. Exfiltration is best measured by a soil's percolation rate.

**Existing Conditions** – The initial condition of a project site prior to the proposed construction.

**FEMA** – Federal Emergency Management Agency

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

**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.

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

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

**Freeboard** – A vertical distance between the elevation of the design high-water and the top of a dam, levee, tank, basin, or diversion ridge. The space is required as a safety margin in a pond or basin.

**Grassed Waterway** – A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water from cropland.

**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.

**Hydrologic Soil Group** - Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The NRCS defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of the development site may be identified from a soil survey report that can be obtained from local NRCS offices or conservation district offices. Soils become less pervious as the HSG varies from A to D (NRCS [3,4])

**Impervious Surface (Area)** – A surface that prevents the infiltration of water into the ground. Impervious surfaces (or areas) shall include, but not be limited to: roofs; additional indoor living spaces, patios, 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.

**Impoundment** – A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

**Infiltration Rate** – The infiltration rate of a soil is related to the soil's final infiltration capacity and represents the rate at which water enters the soil/air interface at the top of the soil profile. Infiltration rates are measured in units of length / time.

**Inlet** – A surface connection to a closed drain. A structure at the diversion end of a conduit. The upstream end of any structure through which water may flow.

**Interceptor** – A channel, berm, or dike constructed across a slope for the purpose of intercepting stormwater, reducing the velocity of flow, and diverting it to outlets where it may be disposed.

**Karst** – A type of topography that is formed over limestone, dolomite, or gypsum by bedrock solution, and that is characterized by closed depressions or sinkholes, caves, and underground drainage (from AGI, Glossary of Geology, 1972).

**Land 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 Pennsylvania Municipalities Planning Code.

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

**Land Use** – The primary application employed in an area.

**Limestone** – A rock that, by accumulation of organic remains, consists mainly of calcium carbonate.

**Lineaments** – Straight or gently curved, lengthy features frequently expressed topographically as depressions or lines on the earth's surface. They can be more easily observed at a height of 100 meters or more and are usually found by researching aerial photographs or satellite photography. They are usually located in areas of faulting or in dense jointing along some rock stratigraphy.

**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

**Main Stem (Main Channel)** – Any stream segment or other runoff conveyance facility used as a reach in the Spring Creek hydrologic model.

**Minimum Allowable Discharge** – In relation to this Stormwater Management Ordinance, the minimum rate that can be discharged for any drainage area for design storm events up to and including the 10-year event regardless of the modeled pre-development runoff estimate.

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

**Township** –Spring Township, Centre County, Pennsylvania.

**Township Engineer** – A professional engineer licensed in the Commonwealth of Pennsylvania and duly appointed by the subject Township as their representative.

**Natural Conservation Areas** – A natural area protected during development for its water quality or recharge enhancing abilities.

**Outfall** – Point where water flows from a conduit, stream, or drain.

**Outlet** – Points of water disposal from a stream, river, lake, tidewater or artificial drain.

**PA DEP** – Pennsylvania State Department of Environmental Protection.

**PA DOT** – Pennsylvania State Department of Transportation.

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

**Percolation Rate** – The rate at which water moves through a soil profile. Percolation rates are measured in units of time / length.

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

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

**Planning Commission** – The planning commission of the Township.

**Point Discharge** – The discharge from a pipe or channel that concentrates runoff at a single area.

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

**Qualified Professional** – An individual registered in and licensed by the State of Pennsylvania qualified to perform stormwater analysis and design.

**Recharge Volume** – The volume of water that is required to be recharged from developed sites.

**Regulated Activities** – Actions or proposed actions that have an impact on stormwater runoff and that are specified in Section 104 of this Ordinance.

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

**Retention Basin** – An impoundment in which stormwater is stored and not released during the storm event. Stored water may be released from the basin at some time after the end of the storm.

**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 recur. For example, the 25-year return period rainfall has a 4% probability of occurring in any given year.

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

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

**Safe Passage** – The routing of peak runoff events, usually the 100-year design event, safely through a structure without failure of that structure.

**Scour** – Generally refers to the change in a channel configuration provoked by sediment imbalance, due to natural or man made causes, between the supply and transport capacity of the channel.

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

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

**Sensitive (Water Quality) Area** – An area protected because development within that area could potentially cause contamination of groundwater reservoirs.

**Sheet Flow** – Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.

**Sinkhole** – A localized, gradual or rapid sinking of the land surface to a variable depth, occurring in areas of carbonate bedrock; generally characterized by a roughly circular outline, a distant breaking of the ground surface and downward movement of soil into bedrock voids.

**Spillway** – A depression in the embankment of a pond or basin which is used to pass peak discharge greater than the maximum design storm controlled by the pond.

**Stabilization** – The proper placing, grading and/or covering of soil, rock or earth to ensure their resistance to erosion, sliding or other movement.

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

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

**Storm Sewer** – A system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources, but excludes domestic sewage and industrial wastes.

**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 structures.

**Stormwater Management Plan** – The plan for managing stormwater runoff in the Spring Creek Watershed adopted by the Centre County Commissioners as required by the Act of October 4, 1978, P.L. 864, (Act 167), and known as the "Spring Creek Watershed Action 167 Stormwater Management Plan.

**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. Stormwater Management Site Plan will be designated as SWM Site Plan throughout this Ordinance.

**Strata** – Tabular or sheet-like mass, distinct layers of homogenous or gradational sedimentary material (consolidated rock or unconsolidated earth) of any thickness, visually separable from

other layers above and below by a discrete change in the character of the material deposited or by a sharp physical break deposition or both.

**Stratigraphic Unit** – A stratum or body of strata recognized as a unit in the classification of the rocks of the earth's crust with respect to any specific rock character, property, attribute or for any purpose such as description, mapping, and correlation.

**Structural Fill** – For the purposes of this ordinance, shall imply any soil mass that is compacted in lifts to some tested criteria (standard or modified proctor) such as those under foundations or adjacent to retaining walls. Areas that for several years after construction respond to precipitation events similar to impervious areas.

**Subarea** – The smallest drainage unit of a watershed for which stormwater management criteria have been established in the Stormwater Management Plan.

**Swale** – A natural low-lying stretch of land or minor man made conveyance channel, which gathers or carries surface water runoff.

**Subdivision** – As defined in The Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247.

**SWM** – Stormwater management.

**Topography** – The general configuration of a land surface or any part of the earth's surface, including its relief and position of its natural and man-made features. The natural or physical surface features of a region, considered collectively as to its form.

**Undetained Area** – An area of a site that cannot be routed to a stormwater management facility because of its location. Generally small areas around access drives or below stormwater management facilities.

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

**Water Quality Depth** – Depth of precipitation required to be used in computing the water quality volume based on the percentage of imperviousness of a site.

**Water Quality Sensitive (WQS) Development** – Land development projects that have a high potential to cause catastrophic loss to local water quality and could potentially threaten ground water reservoirs. See Section 302 for additional definition.

**Water Quality Volume** – Volume of runoff required to be controlled from a site in a water quality BMP.

**Watershed** – The entire region or area drained by a river or other body of water, whether natural or artificial, a drainage basin or sub-basin.

**Waters of this Commonwealth** – Any and all rivers, streams, creeks, rivulets, 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 Table** – Upper surface of a layer of saturated material in the soil.

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

# ARTICLE III – STORMWATER MANAGEMENT

## *Section 301. General Requirements*

A. All regulated activities in the Township which do not fall under the exemption criteria shown in Section 111 of this Ordinance shall submit a Stormwater Management Site Plan to the Township for review. This plan must be consistent with the Spring Township Stormwater Management Ordinance. These criteria shall apply to the total proposed development even if development is to take place in phases. Impervious cover shall include, but not be limited to, any roof, parking or driveway areas, and any new streets and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious for the purposes of comparison to the waiver criteria. The DEP Stormwater BMP Manual, as amended and updated, shall be used for design of stormwater management facilities. No disturbance may be performed prior to approval of a Stormwater Management Site Plan. All activities (especially earth disturbance activities) must comply with this ordinance, Title 25 of the PA Code and the Clean Streams Law.

B. Stormwater drainage systems shall be provided in order to permit unimpeded flow along natural watercourses, except as modified by stormwater management facilities or open channels consistent with this Ordinance.

1. Stormwater management facilities and related installations also shall be provided:

   a. To ensure adequate drainage of all low points along the curb line of streets.

   b. To intercept stormwater runoff along streets at intervals reasonably related to the extent and grade of the area drained, and to prevent substantial flow of water across intersections or flooded intersections during storms, in accordance with the procedures contained in Design Manual Part 2 (DM-2), Chapter 10, of the Pennsylvania Department of Transportation (PA DOT).

   c. To ensure adequate and unimpeded flow of stormwater under driveways in, near, or across natural watercourses or drainage swales. Suitable pipes or other waterways shall be provided as necessary.

   d. To properly drain stormwater runoff from all land development projects, except as required by recharge criteria. All lot and open areas shall be designed to drain to the nearest practical street or drainage system, existing or proposed, as defined by the Township Engineer, with no impact on adjoining properties, unless an area specifically designed for stormwater detention is provided.

C. The existing points of concentrated drainage that discharge onto adjacent property shall not be altered without permission of the altered property owner(s) and shall be subject to any applicable discharge criteria specified in this Ordinance.

D. Areas of existing diffused drainage discharge shall be subject to any applicable discharge criteria in the general direction of existing discharge, whether proposed to be concentrated or maintained as diffused drainage areas, except as otherwise provided by this Ordinance. If diffused flow is proposed to be concentrated and discharged onto adjacent property, the Developer must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other harm will result from the concentrated discharge. If, in the opinion of the Township Engineer, there will be an impact on the downstream adjacent property, the Township may require that the Developer obtain a stormwater easement.

Where a development site is traversed by watercourses, drainage easements shall be provided conforming to the line of such watercourses. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations that may adversely affect the flow of stormwater within any portion of the easement. Developers are encouraged to allow stormwater easements to revert to a natural condition. Mowing or similar types of vegetative control are discouraged while removal of invasive species are encouraged.

E. When it can be shown that, due to topographic conditions, natural drainage-ways on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainage-ways. Work within natural drainage-ways shall be subject to approval by PA DEP through the Joint Permit Application process, or, where deemed appropriate by PA DEP, through the General Permit process.

F. Any stormwater management facilities regulated by this Ordinance that would be located in or adjacent to waters of the Commonwealth (any and all rivers, streams, creeks, rivulets, 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) or wetlands shall be subject to approval by PA DEP through the Joint Permit Application process, or, where deemed appropriate by PA DEP, the General Permit process. When there is a question whether wetlands may be involved, it is the responsibility of the Developer or his agent to show that the land in question cannot be classified as wetlands, otherwise approval to work in the area must be obtained from PA DEP.

G. Any stormwater management facilities regulated by this Ordinance that would discharge to or be located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PA DOT).

H. Low Impact Development (LID) is to be used to the maximum extent practicable. Minimization of impervious surfaces and infiltration of runoff through seepage beds, recharge trenches, etc., are encouraged, where soil conditions permit, to reduce the size or eliminate the need for detention facilities. Infiltration BMP's should be spread out, made as shallow as possible, and maximize natural infiltration areas as possible.

I. To promote over-land flow and infiltration/percolation of stormwater, roof drains should not be connected to streets, sanitary or storm sewers, or roadside ditches unless approved by the Township Engineer on a case-by-case basis

J. Where deemed necessary by the Township Engineer, the applicant shall submit an analysis of the impacts of detained stormwater flows on downstream areas within the watershed. These impacts shall be identified with concurrence from the Township Engineer. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact peak discharge modifications from the proposed development have on critical locations such as dams, tributaries, existing developments, undersized culverts, floodprone areas, etc.

K. When stormwater management facilities are proposed within one thousand (1,000) feet of a downstream Municipality, the analysis of downstream impacts shall be submitted to the downstream municipality's engineer or designated representative for review and comment.

M. 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. Incroporate methods described in the *Pennsylvania Stormwater Best management Practices Manual* (BMP Manual[4]) to the greatest extent practicable.

N. Approved Stormwater Management Site Plans must be on site at all times during construction.

O. Use of Alternate and/or new Stormwater Management Controls will be considered by the Township. A description of the proposed alternate controls must be submitted to the Township, the Centre County Conservation District, and to DEP. The Township will coordinate any approvals with the CCCD and/or DEP.

P. The Stormwater Management Site Plan must contain a proper long term Ownership, Operation and Maintenance Plan in accordance with Article VII of this ordinance.

***Section 302. Sensitive Areas and Developments***

Sensitive areas and water quality sensitive developments have been identified which require special consideration with regard to stormwater management.

**Sensitive areas** are defined as those areas that, if developed, have the potential to cause catastrophic loss to a Water Authority well field. These areas consist of the delineated 1-year zone of contribution and direct upslope areas tributary to the wells (see Appendix B, Exhibit 1). Municipalities may update the sensitive area boundaries based on new research or studies as required.

**Water Quality Sensitive** (WQS) developments are defined as a land development project that has a high potential to cause catastrophic loss to local water quality, and could potentially threaten ground water reservoirs. The following is a provisional list of water quality sensitive developments. This list may be amended at the discretion of the local Township.

- Vehicle fueling stations
- Industrial manufacturing sites*
- Salvage yards
- Recycling centers
- Hazardous material storage areas*
- Interstate highways

* The Township Engineer will make the determination relative to what constitutes these classifications on a case-by-case basis. The Pennsylvania DEP wellhead protection contaminant source list shall be used as a guide in these determinations. Industrial manufacturing site and hazardous material storage areas must provide NPDES SIC codes.

***Section 303. Performance Standards***

A. **General** - Post-development rates of runoff from any regulated activity shall not exceed the peak release rates of runoff prior to development for the design storms specified.

B. **Sensitive Area District Boundaries** – The location of sensitive areas or sensitive area districts (SAD) within the watershed are to be obtained from the Township or appropriate water authority prior to development design. Township may require developer to obtain documentation from the water facility owner stating that they have no objections to the proposed development. Alternately, the water facility owner may provide a list of actions or items that must be incorporated into the design by in order for a determination of "no objections". If the project site is within the sensitive area (in whole or in part), 2-foot contour interval mapping shall be provided to define the limits of the sensitive area. If the project site is adjacent to but within 500 linear feet of a defined Sensitive Area, a 5-foot contour interval map defining the limits of the Sensitive Area shall be included in the Stormwater management site plan to document the site's location relative to the sensitive area.

C. **Sites Located in More Than One (1) District** - For a proposed development site which is traversed by a SAD boundary, the design criteria for sensitive areas must be applied if post-development runoff is directed towards the sensitive area.

D. **Off-Site Areas** - Off-site areas that drain from sensitive areas through a proposed development site that is located entirely in a non-sensitive area are not required to use or apply the sensitive area criteria.

E. **Site Areas** - 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 design criteria.

F. **"Downstream Hydraulic Capacity Analysis"** - Any downstream or off-site hydraulic capacity analysis conducted in accordance with these standards 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 post-development runoff associated with a 2-year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP *Erosion and Sediment Pollution Control Program Manual.*

2. Natural or man-made channels or swales must be able to convey the post-development 25-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 a minimum, pass the post-development 25-year return period runoff.

4. It must be demonstrated that the downstream conveyance channel, other stormwater facilities, roadways, or overland areas must be capable of safely conveying the 100-year design storm without causing damage to buildings or other infrastructure.

5. Where the downstream conveyance channel or other facility is located within a special flood hazard area (as documented on the Flood Insurance Rate Map), it must be demonstrated that the limits of said flood hazard area are not increased by the proposed activity.

6. Stormwater management ponds that fall under the DEP Chapter 105 Criteria of a "Dam" must meet the criteria within Chapter 105.

***Section 304. Calculation Methodologies***

Design criteria and calculation methodologies have been classified by functional group for presentation as follows: 304.A) **peak runoff rate discharge requirements**; 304.B) **water volumes**; and 304.C) **storm drain design including conveyance, channel protection, and stability**.
These criteria and calculation methodologies have been developed to simplify stormwater management designs, unify methods, remove model parameter subjectivity, remove improperly used methods, and to ensure stormwater management decisions are based more realistically on hydrologic processes. In addition, common sense should always be used as a controlling criteria.

These standards provide consistent and process oriented design procedures for application by land development professionals. It is recognized that in an attempt to generalize the

computational procedures, assumptions have been made which on some occasions may be violated. If such a violation is identified, alternate standards and procedures may be applied. Both the violation and the alternate procedures to be applied must be documented by a hydrologist or hydrogeologist. Any request for use of alternate standards or procedures under this provision must be agreed to by the local Township engineer and/or DEP prior to formal submission of plans for consideration by the Township.

## A. Peak Runoff Rate Control

1. Regulated Activities not specifically exempt from rate controls must meet the following:

2. Stormwater management analysis must be performed using the following models. The size criteria are based on drainage area size including site area and all off-site area draining across the development.

| | |
|---|---|
| Up to 100 acres in size | NRCS's TR-55 or TR-20 |
| Over 100 acres in size | NRCS's TR-20 or HEC-1 (HEC-HMS) |

The Modified Rational Method using the Gert Aron Curves may be used for any site less than or equal to two (2) acres in size without prior authorization from the Township Engineer. The Modified Rational Method may also be used for sites between two (2) and twenty (5) acres in size where the Township Engineer has approved the method's use. In this case the Design Engineer must make a written request to the Township Engineer explaining why the use of the Modified Rational Method is more appropriate than the NRCS's methods for the site in question. Use of the Modified Rational methodology should be limited to the special cases identified above. In addition, since the minimum discharge criteria are based on a calibration of the NRCS runoff mode, their use is not appropriate if the Modified Rational Method is used for runoff computations.

The Township Engineer has the right to reject any SWM design that uses hydrograph combinations with the Modified Rational Method where the designer has not validated that the effects of the timing differences are negligible. In addition, the Township Engineer has the right to reject any SWM design that improperly uses the method for determining runoff volumes or does not properly apply the method.

More intensive physically based models may be used at the discretion of the Township Engineer, but only for sites greater than 100 acres in size.

Commercial software packages that use the basic computational methods of TR-55 or TR-20 are permitted.

The NRCS models and methods recommended above are based on data collected from actual watersheds. In contrast to this, stormwater management

analysis for land development activities is often conducted using property lines to define drainage boundaries. Drainage areas based on property boundaries are not true watersheds and are referred to here as "hypothetical" drainage areas. It is known that these hypothetical drainage areas do not respond like natural watersheds. Peak runoff rates from hypothetical drainage areas are much smaller than comparable runoff rates from natural watersheds of the same size. Therefore, wherever possible, pre- and post-development stormwater analysis should be conducted for watersheds that are as nearly natural as possible. Also, conducting stormwater analysis for a lot by lot comparison, such as within residential developments is not permitted. Partitioning drainage areas into different sub-watersheds for the post-development scenarios is acceptable.

It is noted that natural watershed boundaries should not be used where the relative size of the watershed compared to the site size would inappropriately distort the pre- to post-development runoff comparison. In these cases a hypothetical drainage area defined by the property boundary should be used because it will allow for a better estimate of runoff changes directly downstream of the site. In addition, the designer should recognize that, within the Spring Creek Watershed, typical hypothetical drainage areas, in their pre-development or natural condition, do not produce surface runoff during minor to moderate rainfall events. Available hydrologic models do not accurately reflect this condition. This often results in post-development nuisance flooding since the models over-estimate the pre-development runoff magnitude.

3. Major natural drainage divides may not be altered without the prior consent of the Township Engineer.

4. Pre- and post-development stormwater management analysis shall be conducted using the following design storms:

| | |
|---|---|
| 1-year | 2-year |
| 5-year | 10-year |
| 25-year | 50-year |
| 100-year | |

5. The 24-hour precipitation depths as obtained from the latest version of the Precipitation-Frequency Atlas of the NOAA (Atlas 14) shall be used for stormwater management analysis.
6. The NRCS's Type II precipitation distribution is required for all stormwater management analyses.

7. The NRCS's dimensionless unit hydrograph "k" factor shall be 484 for both pre- and post-development stormwater analyses.

8. For existing conditions, all undeveloped areas are to be modeled as meadow or woods in good hydrologic condition and 20% of existing impervious is to be modeled as meadow in good condition.

9. The NRCS's curve number (CN) shall be used as the rainfall to runoff transformation parameter for all stormwater management analyses.

10. Curve numbers should be rounded to tenths for use in pre-packaged hydrologic models. It should be recognized that the CN is only a design tool with a large degree of statistical variability. For large sites, CN's should realistically be rounded to the nearest whole number.

11. The NRCS's method to determine unconnected impervious area adjustments for CN can be used for distinctly defined impervious land areas that flow onto pervious areas in a dispersed manner. The method may only be used to calculate runoff from site impervious areas that actually flow across pervious areas. The method cannot be applied to the entire site using average weighted CN values.

12. Soils underlain by carbonate geology (limestone or dolomite) shall have a hydrologic soil group (HSG) B used for both pre- and post-development conditions regardless of the NRCS or Soil Survey's description, except for the following two conditions:

    a. Compacted structural fill areas shall use a minimum of HSG C for post development conditions regardless of the NRCS or Centre County Soil Survey's description. For most developments compacted structural fill areas are under impervious surfaces, but may include islands within parking areas, fringe land, etc. A HSG C shall also be applied to large projects that clear and compact building pad areas for later phases of development under an initial phase. The Township Engineer shall make the final determination as to what areas of a land development site constitute compacted structural fill. The intent is to account for large compacted areas, and not minor grading within lawn areas.

    b. Soils identified as "on flood plains" or "on terraces above flood plains" in the Centre County Soil Survey will use the HSG as designated in the Soil Survey. Refer to Appendix A for a list of the soils.

13. Soils not underlain by carbonate geology shall use the HSG as specified by the NRCS or Soil Survey's description, except for the following two conditions:

    a. Wooded areas on HSG C and D soils shall be treated as HSG B for pre-development conditions. Disturbed post-development wooded areas shall carry the NRCS or Soil Survey's defined HSG with a minimum HSG of B.

    b. Highly compacted structural fill areas shall use a minimum of HSG C for post-development conditions regardless of the NRCS or Soil Survey's description. For most developments these areas are normally covered with impervious surfaces, but may include islands within parking areas, fringe land, etc. A HSG of C shall also be used for large projects that clear and grade land for later phases of development. The Township Engineer shall make the final determination as to what areas of a land development site constitute compacted structural fill. The intent is to

account for large compacted areas, and not minor grading within lawn areas or small areas around buildings, etc.

14. Areas draining to closed depressions must be modeled by removing the storage volume from the pre-development condition. The designer may assume that infiltration in the closed depression does not occur during a design runoff event. Areas draining to closed depressions may also be used to adjust peak runoff rates to stormwater management ponds for the post-development analysis. This allowance has been developed to entice designers to intentionally design or leave in place small closed depressions that can reduce the total volume required from a stormwater management pond. The site designer is responsible to document downstream impacts if the closed depression were removed.

15. Drainage areas tributary to sinkholes shall be excluded from the modeled point-of-interest drainage areas defining pre-development peak flows. Assumptions that sinkholes spill-over during some storm events must be supported by acceptable documentation (as determined by the Township Engineer). In addition, the design professional must be aware that bypassing or sealing sinkholes will frequently result in downstream flooding and should not be done if existing downstream flooding already occurs. The site designer is responsible to document downstream impacts if the sinkhole were to stop taking stormwater runoff.

16. Ponds or other permanent pools of water are to be modeled by the methods established in the NRCS's TR-55 manual (1986). However, more rigorous documented methods are acceptable (as determined by the Township Engineer).

17. The NRCS antecedent runoff condition II (ARC II, previously AMC II) must be used for all simulations. The use of continuous simulation models that vary the ARC are not permitted for stormwater management purposes. In addition, prior to any continuous simulation model being used in the Spring Creek Basin for any other purposes, the model unit hydrograph must be modified for common events in additional to extreme events based on an in depth analysis of historical data from the basin.

18. The following Time of Concentration (Tc) computational methodologies shall be used unless another method is pre-approved by the Township Engineer:

    - Pre-development – NRCS's Lag Equation.
    - Post-development; commercial, industrial, or other areas with large impervious areas (>20% impervious area) – NRCS's Segmental Method.
    - Post-development; residential, cluster, or other low impact designs less than or equal to 20% impervious area – NCRS's Lag Equation.

    The time of concentration is to represent the average condition that best reflects the hydrologic response of the area. For example, large impervious areas bordered by small pervious areas may not consider the effect of the pervious areas in the Tc computation. If the designer wants to consider the affect of the pervious area, runoff from the pervious and impervious areas must be computed

separately with the hydrographs being combined to determine the total runoff from the area.

Under no circumstance will the post-development Tc be greater than the pre-development Tc for any watershed or sub-watershed modeling purposes. This includes when the designer has specifically used swales to reduce flow velocities. In the event that the designer believes that the post-development Tc is greater, it will still be set by default equal to the pre-development Tc for modeling purposes.

* Refer to item number 28 regarding impervious area flashing (IAF).

19. The following post-development minimum discharges are permitted for use with the NRCS (CN) runoff model*:

| | |
|---|---|
| 1-year return period | $Qp_{min} = 0.018\ (DA) + 0.2$ |
| 2-year return period | $Qp_{min} = 0.03\ (DA) + 0.4$ |

where: DA = the drainage area in acres
$Qp_{min}$ = minimum allowable peak runoff rate in cfs

For return periods equal to or greater than 10 years, the minimum discharge shall be equal to the computed pre-development peak runoff rate.

The minimum discharge criteria above are not appropriate for use with the Rational Method. This is because these values were developed based on NRCS model corrections and do not actually represent a true physical process or discharge. However, common sense should be used by both the designer and reviewer in the evaluation of acceptable minimum discharges for use with the Rational Method.

The intent of the minimum discharge is to allow reasonable runoff release from a site when a hydrologic model has produced a pre-development runoff rate close to zero. The method is **NOT** permitted for areas that previously drained completely to sinkholes in order to bypass the sinkhole after development.

These minimum discharge values include the total of all stormwater management facilities discharges and undetained area discharges. Peak runoff rates for undetained fringe areas (where the designer has made a realistic effort to control all new impervious areas) will be computed using the pre-development time of concentration for the drainage areas tributary to them. Undetained areas are those portions of the site that cannot be routed to a stormwater management facility due to topography and typically include lower pond berms, or small areas around entrance drives. The site drainage areas used shall represent the pre-development condition, even if drainage areas are altered following development.

20. All lined stormwater management ponds in carbonate and non-carbonate areas must be considered impervious and may not be used as pervious areas for stormwater management computations. "Lined" here means lined with synthetic liners or Bentonite. All other compacted soil liners will be considered to be HSG D for hydrologic computations.

21. Stormwater management ponds that have a capture depth for the purposes of volume capture shall assume a negligible discharge from these structures during design event routing. Only discharges from the primary principal spillway or emergency spillway need to be considered. Discharges from subsurface drains that tie into a principal spillway should not be considered during design event routing. All subsurface drains are to be equipped with a restrictor plate with a 1" opening in order to prevent the subsurface drain from functioning as a primary orifice

22. Stormwater management ponds that are designed to address volume and rate components shall assume that the basin is full to the volume of 0.5" of runoff from all new impervious surface draining to the basin at the beginning of design event routing.

23. Stormwater management ponds must provide safe passage of the 100-year return period peak runoff rate assuming that all of the principal spillway orifices are fully clogged, and the principal spillway overflow is 50% clogged. A minimum of a 6-inch freeboard must also be maintained above the resulting "maximum" water surface elevations (W.S.E.). Any embankment emergency spillway can be assumed to be unclogged. SWM ponds with embankments completely made up of natural undisturbed soils (fully in "cut") or where roadways act as the emergency spillway, are permitted. However, the Design Engineer must verify downstream stability and control.

24. All pre- and post-development comparisons of peak flows shall be rounded to tenths of a cfs. The intent here is to recognize the accuracy and precision limitations of hydrologic modeling procedures. Again, small differences between pre- and post-development discharge rates should be permitted when no negative downstream impacts will result

25. The full Modified Puls routing method must be used for stormwater management pond analyses. Simplified methods of determining pond size requirements such as those in TR-55 (1986) can only be used for preliminary pond size estimates. The full Modified Puls routing method must be used for stormwater management pond analyses. Simplified methods of determining pond size requirements such as those in TR-55 (1986) can only be used for preliminary pond size estimates.

26. Pre-packaged hydraulic programs are not approved for the analysis of underground stormwater management facilities unless it can be verified that the program rounding subroutines used for the stage/storage data do not affect the results. This is because, for very small storage volumes, the program may round off the volume to a significant percentage.

27. Full supporting documentation must be provided for all stormwater management designs.

28. Designs must be checked for Impervious Area Flash (IAF). This check is used to determine if flooding may occur due to poor modeling choices specifically related to the time of concentration. This analysis requires that the watershed impervious area be modeled without the pervious areas. The time of

concentration should also be determined from the impervious areas only. If the IAF analysis results in a higher peak runoff rate at a culvert or discharge from a pond, this higher rate must be used for the final design/comparison. The check will frequently yield higher values if a watershed's impervious area is located primarily near the watershed outlet or point of interest.

## B. Volume Controls

The green infrastructure and low impact development practices provided in the BMP Manual[4] shall be utilized for all regulated activities wherever possible. Water volume controls shall be implemented using the following.

A. For regulated activities with new impervious equal to or greater than one acre do not increase the total runoff volume for all storms equal to or less than the 2 year storm.

B. For regulated activities with new impervious less than one acre do not increase the first one inch of runoff must be removed from the runoff volume.

The following design practices can be used as credits to reduce the recharge volume requirement:

1. Residential Roof Areas (detached, duplex, and townhome dwellings) and commercial /industrial buildings with roof areas less than 5,000 square feet can be removed from the computed impervious area when these roof areas are sumped to dry wells designed in accordance with the following minimum standard:

   SUMP DESIGN CRITERIA: To meet the recharge criteria, sump storage or voids volume shall be equal to 0.16 cubic feet per square foot of roof area. If sump stone has a voids ratio of 40%, the total sump volume will be 0.40 cubic feet per square foot of roof area. When designed only to meet this recharge criteria, the maximum size for a single sump is 100 cubic feet, and the minimum sump surface area (A) to depth (D) ratio (A/D) must be a minimum of 4/1. The sump depth less any freeboard should not exceed 24". This roof sump standard shall apply unless the Township has a separate roof sump standard for water quantity or peak control.

2. Impervious areas tributary to natural closed depressions can be subtracted from the total site impervious area used in the recharge volume calculation as long as a qualified geotechnical engineer or soil scientist certifies to the soundness of these site specific applications. Water quality pre-treatment may be necessary prior to the direct discharge of runoff to existing closed depressions or sinkholes.

3. Additional credits may apply for undisturbed land areas that are known to have high infiltration capacity and that are maintained or enhanced. These areas must be defined and quantified from actual site data collection.

After credits, the remaining water volume shall be directed to a infiltration BMP such as infiltration trenches, beds, etc. These facilities can be located in open areas or under pavement structures. The appropriateness of the particular infiltration practice

proposed, as well as the design parameters used, shall be supported by a geotechnical report certified by a qualified professional (soil scientist, geologist, hydrogeologist, geotechnical engineer, etc.).

Water Quality Sensitive (WQS) developments must use an acceptable pre-treatment BMP prior to recharge. Acceptable pre-treated BMPs for these developments include BMPs that are based on filtering, settling, or chemical reaction processes such as chemical coagulation.

Accounting for infiltration within lined stormwater management ponds is not permitted. However, if unlined, uncompacted ponds and/or depressed lawn areas may be used to satisfy water volume requirements as previously defined. Additional volume may be credited to these areas as long as it is demonstrated by a qualified professional that infiltration processes can naturally occur in these areas.

Finally, because this analysis is concerned with trying to adequately represent real processes that occur within the Watershed, there will be areas that cannot physically recharge stormwater. These areas include exfiltration areas that are commonly found at the base of wooded hillsides where clay pans exist, and saturation areas near major streams or floodplains. These areas may not accept recharge during most runoff events. These areas are exempt from recharge requirements when these conditions are documented and certified by a qualified professional (soil scientist, geologist, hydrogeologist, or geotechnical engineer). In addition, stormwater management techniques relying on infiltration techniques are not permitted in these areas.

**Sites where infiltration cannot be accomplished**:

For regulated activities with over 1 acre of new impervious where recharge (infiltration) cannot be accomplished the developer must obtain DEP approval of an alternate method of stormwater management such as use of the extended release concept.

For regulated activities with less than 1 acre of new impervious where recharge (infiltration) cannot be accomplished the following criteria applies:

1. The Township Engineer may waive the recharge requirement in highly developed areas or areas undergoing redevelopment where the Township Engineer has determined that forced recharge could have adverse impacts on adjacent landowner structures, property, or Township infrastructure. These waivers should be limited to small land areas (generally less than 5 acres in size), where the ability to place recharge beds may be limited or may hinder redevelopment.

2. The Township Engineer may waive the recharge requirement in areas where a qualified soils scientist or geologist has determined that none of the site soils are suitable for recharge, or that the location of the suitable soils is such that harm to adjoining properties could occur as stated under item 1 above.

3. The Township Engineer may waive the recharge requirement in areas where recharge can not physically occur as documented by a qualified soil scientist, geologist, or hydrologist. These areas include:

a. Exfiltration areas commonly found at the base of wooded hillsides where clay pans or fragipans exist; and

b. Saturation areas near major streams or floodplains.

As identified above, recharge analysis and/or waiver requests must be supported by a geotechnical report sealed by a qualified professional (soil scientist, geologist, hydrogeologist, or geotechnical engineer). The intent of this report will be to establish the suitability of a particular parcel of land or area for recharge, and to identify areas on a development site appropriate for recharge. It is recommended that the geotechnical / soils consultant discuss the extent and approach to the analysis with the Township Engineer prior to initiating the field investigation. At a minimum this report should include the following information:

1. A description of the geotechnical site investigation performed including the methods and procedures used;

2. Data presentation;

3. Analysis results including the following minimum information:

   a. A map identifying site areas inappropriate for recharge along with supporting justification. In addition to illustrating topographic features, significant geologic and hydrologic features should be identified (rock outcrops, sinkholes, closed depressions, etc.

   b. Determination of the permeability coefficient for potential recharge areas.

   c. Determination of the infiltration capacity of natural site soils.

   d. Location, depth, and permeability coefficient for any restrictive layers identified.

   e. Soil uniformity.

   f. Depth to bedrock in potential recharge areas, and a statement reflecting the uniformity of the depth to bedrock across the site.

   g. A statement relating to the site's proximity to fracture zones within the bedrock.

   h. Additional information deemed pertinent by the geotechnical engineer.

4. Recommendations for any special design considerations necessary for the design of recharge systems on the site. For example, required soil depth over bedrock, appropriate surface grades over recharge areas, appropriate hydraulic head over recharge areas, etc.

5. Justification as to why the site should be developed to a high impervious density if the site has adverse soil and geotechnical limitations, which prohibit the ability to induce natural recharge. Explain how these limitations will not create the

potential for undue harm to the environment and the Watershed when the site is developed.

6. Where it has been shown that recharge cannot be performed and a waiver of the recharge requirements is being requested, the Township shall require that the first one inch of runoff from all new impervious areas be treated through underdrained facilities. These facilities may include underdrained basins, rain gardens, and infiltration trenches. Treatment is to include use of an amended topsoil to provide filtration of the stormwater. All underdrain outlets are to include a restrictor plate to prevent the underdrain system from functioning as a primary outlet.

The following guidelines are provided relative to the use of subsurface exfiltration BMP's (often incorrectly referred to as engineered infiltration BMPs):

1. Soils should have a minimum percolation rate of 50 min/cm for effective operation of subsurface exfiltration BMPs. If no site soils have percolation rates of 50 min/cm, subsurface exfiltration BMPs should not be used.

2. A minimum of 30 inches of soil must be maintained between the bottom of a subsurface exfiltration BMP and the top of bedrock or seasonally high groundwater table. This statement is subject to the recommendation of a qualified Geotechnical Engineer.

3. If the minimum percolation rate is not met and/or the minimum soil depth can not be maintained on a site, recharge should be accommodated by directing shallow sheet flow from impervious areas across surface filter strips and/or undisturbed natural areas, or some other innovative surface infiltration feature should be used. Limiting subsurface percolation rates and/or depth to bedrock shall not by themselves warrant a recharge waiver.

In addition, since recharge is intended as a volume control, innovative or new methods that address the significant increase in the volume of runoff from sites having large impervious areas are encouraged These volume control alternatives can be used only if they can be shown to function with the original intent through sound engineering and science. The final determination of "original intent" shall always be the right of the Township Engineer.

## C. Storm Drain Conveyance System Design

Storm drainage conveyance systems consist of storm sewer pipes, swales, and open channels. Computational methods for design of storm drain conveyance systems shall be as follows:

1. Recommended computational methods (models) for storm drain design are based on site or watershed drainage area as follows:

| | |
|---|---|
| Up to 200 acres in size | Rational Method |
| Between 200 acres and 1.5 Square miles | HEC-1<br>PSRM<br>TR-20 |

| | |
|---|---|
| Over 1.5 square miles in size | PSU-IV with the carbonate adjustment factor at the discretion of the Township Engineer |
| | Other methods as approved by the Township Engineer such as SWMM, SWIRM-ROUTE, etc. |

2. Rational Coefficients used are to be from Rawls et al. (1981), PA DOT Design Manual 2-10 or using the Aron curves to convert CNs to C. If the Aron curves are used, all CNs must be applicable to the HSG as identified by the NRCS.

   The Design Engineer may choose to use the following Rational C coefficients without regard to soil HSG for small sites. However, it is recommended that they be used only for storm drains up to 24" in diameter. The use of these conservative values shall fully be the choice of the Design Engineer.

   All impervious areas: C = 0.95
   All pervious areas: C = 0.30

3. Storm drains shall be designed at a minimum using a 10-year runoff event without surcharging inlets. Storm drains tributary to a multiple site SWM facility across Township roads or crossing other properties must convey, at a minimum, a 25-year runoff event without surcharging inlets. Runoff events in excess of the indicated design event must be conveyed safely downstream.

4. Inlets on grade cannot assume a sumped condition for hydraulic modeling (i.e., top of inlet casting set below pavement surface in parking areas).

5. The Township Engineer may require the analysis of the 100-year peak runoff rates for conveyance purposes in some instances where regional SWM facilities are employed.

6. Any storm drain within State or Federal rights-of-ways or that falls under the design criteria of any higher authority must meet the requirements of that agency in addition to the minimum requirements of this ordinance.

7. The time of concentration (Tc) can be computed by any method which best represents the subject watershed. However, the NRCS's segmental method is not recommended for use with drainage areas that are predominately undeveloped and are greater than 100 acres in size. The NRCS Lag Equation or another more appropriate method should be used under these conditions.

8. For any drainage area smaller than 5 acres in size, a Tc of 5 minutes may always be assumed at the discretion of the Design Engineer (for the post-development condition), without needing to provide supporting documentation.

9. Precipitation values applicable to the entire Spring Creek Drainage Basin are those reflected in the PA DOT's IDF curves for Region 2, regardless if the area was formerly considered in Region 3.

10. Storm drain conveyance system stability (swales, open channels, and pipe discharge aprons) shall be computed using a 10-year return period peak runoff rate.

11. Storm sewers, where required by zoning and land use densities, shall be placed under or immediately adjacent to the roadway side of the curb, or as directed by the Township, when parallel to the street within the right-of-way.

12. When located in undedicated land, they shall be placed within a drainage easement not less than twenty (20) feet wide as approved by the Township Engineer.

13. The use of properly designed, graded and turfed drainage swales is encouraged in lieu of storm sewers in commercial and industrial areas and, where approved by the Township Engineer, in residential areas.

    Such swales shall be designed not only to carry the required discharge without excessive erosion, but also to increase the time of concentration, reduce the peak discharge and velocity, and permit the water to percolate into the soil, where appropriate.

14. Inlet types and inlet assemblies shall conform to the Pennsylvania Department of Transportation Standards for Roadway Construction as approved by the Township Engineer.

    a. Inlets shall, at a minimum, be located at the lowest point of street intersections to intercept the stormwater before it reaches pedestrian crossing; or at sag points of vertical curves in the street alignment which provide a natural point of ponding of surface stormwater.

    b. Where the Township deems it necessary because of special land requirements, special inlets may be approved.

    c. The interval between inlets collecting stormwater runoff shall be determined in accordance with DM-2, Chapter 10, Section 3, "Capacity of Roadway Hydraulic Facilities".

    In curbed sections, the maximum encroachment of water on the roadway pavement shall not exceed half of a through traffic lane or one (1) inch less than the depth of curb during the 10-year design storm of five (5) minute duration. Inlets shall be provided to control the encroachment of water on the pavement. When inlets are used in a storm system within the right-of-way limits of a street in lieu of manholes, the spacing of such inlets shall not exceed the maximum distance of four hundred fifty (450) feet.

15. Accessible drainage structures shall be located on a continuous storm sewer system at all vertical dislocations, at all locations where a transition in storm sewer pipe sizing is required, at all vertical and horizontal angle points exceeding five (5) degrees, and at all points of convergence of two or more influent storm sewer mains. The construction locations of accessible drainage structures shall

be as indicated on the land development SWM Site Plan or area SWM Site Plan approved by the Township.

16. When evidence available to the Township indicates that existing storm sewers have sufficient capacity as determined by hydrograph summation and are accessible, the subdivider may connect their stormwater facilities to the existing storm sewers so long as the peak rate of discharge does not exceed the amount permitted by this Ordinance.

17. All other storm drain design methods are to be the same as specified in existing local ordinances.

18. Computational procedures other than those indicated here should follow the methods of the Federal Highway Administration's Urban Drainage Design Manual [Hydraulic Engineering Circular No 22. (HEC-22)].

1. Where non-structural BMPs are unable to effectively treat all of the stormwater runoff generated from land development activities, structural BMPs shall be designed to capture and treat the computed water quality volume ($WQ_v$).

2. The priority pollutant source areas to be treated with BMPs are streets, parking lots, driveways, and roof areas.

3. Due to the karst nature of the Watershed, stormwater discharges from water quality sensitive developments and discharges to sensitive wellhead protection areas will require special consideration. In these instances the applicant shall provide water quality pre-treatment (use of a filtering BMP and/or special structural design features) to prevent the discharge of stormwater contaminants to groundwater resources. In addition, hydrogeologic studies may be required to document potential karst related impacts.

4. Prior to stormwater management and water quality design, applicants should consult with the Township Engineer to verify stormwater quality criteria and present proposed features and concepts for the treatment of stormwater runoff. Following this meeting, the Township Engineer shall define any needed support studies or documentation.

**Section 305. Erosion and Sedimentation Control Requirements**

A. Whenever the vegetation and topography are to be disturbed, such activity must be in conformance with Chapter 102, Title 25, Rules and Regulations, Part I, Commonwealth of Pennsylvania, Department of Environmental Protection, Subpart C, protection of Natural Resources, Article II, Water Resources, Chapter 102, "Erosion Control," and in accordance with the Centre County Conservation District and the standards and specifications of the appropriate Township government.

B. Additional erosion and sedimentation control design standards and criteria that must be or are recommended to be applied where recharge or water quality BMPs are proposed and include the following:

1. Areas proposed for these BMPs shall be protected from sedimentation and compaction during the construction phase, so as to maintain their maximum infiltration capacity.

2. These BMPs shall not be constructed nor receive runoff until the entire contributory drainage area to the BMP has received final stabilization.

C. Adequate erosion protection shall be provided along all open channels and at all points of discharge.

D. Per the requirements of this Spring Township Stormwater Management Ordinance an approved Erosion and Sediment Control Plan must be obtained prior to approval of the Post Construction Stomwater Management Plan by Spring Township.

***Section 306. Sinkhole Protection***

The use of sinkholes for stormwater management must be carefully planned, because discharging runoff directly into existing sinkholes is not an engineered stormwater solution. Aside from potential water quality effects, cover collapse sinkholes that exist throughout the watershed can be unstable, and it should be assumed that they could stop taking water at any time. Numerous sinkholes throughout the region already flood during larger runoff events. Nonetheless, in the watershed there are large drainage areas that completely drain to existing sinkholes and all upslope development tributary to them cannot be realistically stopped. Therefore the following sections have been developed.

A. Stormwater from roadways, parking lots, storm sewers, roof drains, or other concentrated runoff paths shall not be discharged directly into sinkholes without prior filtration in accordance with Section 306. B, below.

B. Sinkholes capable of absorbing substantial amounts of stormwater shall be protected by diverting such runoff around the sinkhole (refer to 306.F) or, upon recommended approval of the Township Engineer, by planting and maintaining a dense filter path of suitable vegetative material in such a manner and location to disperse and slow the runoff to a sheet flow condition to promote the maximum possible filtration and sedimentation of impurities.

The filter path must be at least one hundred (100) feet in length and twenty (20) feet in width. Ten-foot wide filter paths are acceptable if land slope is less than two (2) percent.

Filter paths shall be designed and installed so that they filter sheet flow rather than concentrated flow. If concentrated flow occurs, grading and shaping or the use of best management practices such as grass waterways or drop structures may be required.

Sedimentation basins designed to DEP Chapter 102 Standards or permanent stormwater storage criteria, whichever is larger, and proposed vegetative filter paths, in conjunction with temporary stone filter check dams, shall be installed prior to subdivision or land development construction activities, where sinkholes are used to accept stormwater discharges.

C. If increased runoff is to be discharged into a sinkhole, even in filtered conditions, a hydrogeologic assessment of the effects of such runoff on the increased risk of land subsidence and adverse impacts to existing sinkhole flood plains and groundwater quality shall be made by a qualified professional and submitted with the stormwater management site plan. Such discharge shall be prohibited if the Township Engineer determines that such poses a hazard to life, property or groundwater resources.

D. All sinkholes shall be posted by permanent on-site notices clearly visible at the sinkhole prohibiting any disposal of refuse, rubbish, hazardous wastes, organic matter or soil into the sinkhole. Rockfill may be permitted in the sinkhole for the purpose of preventing dumping of said materials.

E. To protect sensitive Karst areas, the Township Engineer may require basins to contain an impervious liner. The liner may be of the impervious membrane type, placed in accordance with the manufacturer's recommendations, or may be constructed by mixing Bentonite, or an approved alternative, with existing soil available at the site as approved by the Township Engineer.

F. If it is determined that runoff from upslope developing areas should be diverted around a sinkhole due to existing problems, the Township Engineer may require additional upstream volume controls as required to protect downstream areas.

### *Section 307. Design Criteria for Stormwater Management Facilities*

Materials, Workmanship and Methods: All materials, workmanship and methods of work shall comply at a minimum with the Pennsylvania Department of Transportation Form 408 specifications, as accepted and commonly used by the respective Township, and shall be considered to be incorporated into this article as if copied in full. In the event a conflict arises between the requirements of this article and the Form 408 Specifications, the Municipal Engineer shall resolve the difference, and his opinion shall be binding.

### A. General

1. Facilities in State Right-of-Ways – Any stormwater facility located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PA DOT). Any stormwater facility that discharges directly onto state highway rights-of-way shall be subject to review by the PA DOT.

2. Water Obstructions – Any facilities that constitute water obstructions (e.g., culverts, bridges, outfalls, or stream enclosures), and any work involving wetlands as directed in PA DEP Chapter 105 regulations (as amended or replaced from time-to-time by PA DEP), shall be designed in accordance with Chapter 105 and will require a permit from PA DEP. Any other drainage conveyance facility that does not fall under Chapter 105 regulations must be able to convey, without damage to the drainage structure or roadway, runoff from the 25-year design storm with a minimum of 1.0-foot of freeboard measured below the lowest point along the top of the roadway. Roadway crossings located within designated floodplain areas must be able to convey runoff from a 100-year

design storm with a minimum of 1.0-foot of freeboard measured below the lowest point along the top of roadway. Any facility that constitutes a dam as defined in PA DEP Chapter 105 regulations may require a permit under dam safety regulations. Any facility located within a PA DOT right-of-way must meet PA DOT minimum design standards and permit submission requirements.

3. Conveyance Facilities – Any drainage conveyance facility and/or channel that does not fall under Chapter 105 Regulations, must be able to convey, without damage to the drainage structure or roadway, runoff from the return period design storm as specified in Section 304.D.. Conveyance facilities to or exiting from stormwater management facilities (i.e., detention basins) shall be designed to convey the design flow to or from that structure. Roadway crossings located within designated floodplain areas must be able to convey runoff from a 100-year design storm. Any facility located within a PA DOT right-of-way must meet PA DOT minimum design standards and permit submission requirements.

## B. Stormwater Basin Design Considerations

Stormwater management basins for the control of stormwater peak discharges shall meet the following minimum requirements.

1. The design of all facilities over limestone formations shall include measures to prevent groundwater contamination and where required, sinkhole formation. Soils used for the construction of basins shall have moderate to low erodibility factors (i.e., "K" factors of 0.32 or less). Any basin greater than 4 feet in height, measured from the top of berm to the downslope toe of the abutment, must also contain:

    a. Berm soil specifications;

    b. A determination if site soils are available for the construction of the berm or cutoff trench;

    c. An impervious cutoff trench, which extends the full length of the downstream berm located in fill.

2. Energy dissipators and/or level spreaders shall be installed at points where pipes or drainageways discharge to or from basins. Generally, outlet pipes designed to carry the pre-development, 1-year storm flow will be permitted to discharge to a stream with only an energy dissipator. Discharges to drainage swales shall be spread with a level spreader or piped to an acceptable point.

3. Outlet structures:

    a. Outlet structures within detention/retention basins shall be constructed of reinforced concrete or an approved alternate. With the exception of those openings designed to carry perennial stream flows, design openings nine (9) inches or less shall have non clogging trash racks and all openings over twelve inches shall have childproof nonclogging trash racks. . Outlet aprons shall be designed and shall extend at a minimum to the toe of the basin slope. Where spillways will be used to control peak discharges in

excess of the 10-year storm, the control weirs shall be constructed to withstand the pressures of impounded waters and convey flows at computed outlet velocities without erosion.

b. All metal risers, where approved for use, shall be suitably coated to prevent corrosion. A trash rack or similar appurtenance shall be provided to prevent debris from entering the riser. All metal risers shall have a concrete base attached with a watertight connection. The base shall be sufficient weight to prevent flotation of the riser. An anti-vortex device, consisting of a thin vertical plate normal to the basin berm, shall be provided on the top of all metal risers.

4. Emergency Spillway:

a. Any stormwater management facility (i.e., detention basin) designed to store runoff and requiring a berm or earthen embankment required or regulated by this Part shall be designed to provide an emergency spillway to handle flow up to and including the 100-year post- development conditions. The height of embankment must be set as to provide a minimum 0.5 foot of freeboard above the elevation required to safely pass the 100-year post-development inflow. Should any stormwater management facility require a dam safety permit under PA DEP Chapter 105, the facility shall be designed in accordance with Chapter 105 and meet the regulations of Chapter 105 concerning dam safety which may be required to pass storms larger than a 100-year event.

Any underground stormwater management facility (pipe storage systems) must have a method to bypass flows higher than the required design (up to a 100-year post-development inflow) without structural failure or causing downstream harm or safety risks.

Any stormwater management facility that has a paved roadway as the lower berm should safely convey the 100 year storm under the paved roadway.

b. Emergency spillways shall be constructed of reinforced concrete, vegetated earth, or riprap in accordance with generally accepted engineering practices. All emergency spillways shall be constructed so that the detention basin berm is protected against erosion. The minimum capacity of all emergency spillways shall be the peak flow rate from the 100-year design storm. The dimensions of the emergency spillways can be determined from the Centre County Erosion and Sediment Control Handbook. Emergency spillways shall extend along the upstream and downstream berm embankment slopes. Protection should be provided on the upstream embankment a minimum of three (3) feet below the spillway crest elevation. Protection at the downstream slope of the spillway shall, as a minimum, extend to the toe of the berm embankment. The emergency spillway shall not be located on or discharge over uncompacted earthen fill and/or easily erodible material.

c. Rock-filled gabions may be used where combination berm and emergency spillway structures are required to prevent concentrated flows. The Township Engineer may require the use of open concrete lattice blocks, stone riprap, or concrete spillways when slopes would exceed four (4) feet horizontal to one (1) foot vertical and spillway velocities might exceed Soil Conservation Service standards for the particular soils involved.

5. Antiseep Collars: Antiseep collars shall be installed around the principal pipe barrel within the normal saturation zone of the detention basin berms. The antiseep collars and their connections to the pipe barrel shall be watertight. The antiseep collars shall extend a minimum of two (2) feet beyond the outside of the principal pipe barrel. The maximum spacing between collars shall be fourteen (14) times the minimum projection of the collar measured perpendicular to the pipe.

6. Slope of Detention Basin Embankment: The top or toe of any slope shall be located a minimum of ten (10) feet from any property line. Whenever possible the side slopes and basin shape shall be amenable to the natural topography. Straight side slopes and rectangular basins shall be avoided whenever possible.

   a. Exterior slopes of compacted soil shall not exceed three (3) feet horizontal to one (1) foot vertical, and may be further reduced if the soil has unstable characteristics.

   b. Interior slopes of the basin shall not exceed three (3) feet horizontal to one (1) foot vertical, except with approval of the Township. Retaining walls will be required if a stable slope cannot be maintained. All retaining walls shall be designed as per the procedures outlined in the American Association of State Highway Officials, Standard Specifications for Highway Bridges, 1973. Details and calculations prepared and stamped and signed by a registered professional engineer shall be submitted to the Township Engineer for any retaining walls greater than four and one half feet in height.

   c. Where concrete, stone or brick walls are used with side slopes proposed to be steeper than three (3) feet horizontal to one (1) foot vertical, the basin shall be fenced by a permanent wire (or other material approved by the Township) fence forty-two (42) inches in height and a ramp constructed of durable, non-slip material to a grade of less than ten (10) percent for maintenance vehicles shall be provided for access into the basin.

7. Width of Berm: The minimum top width of detention basin berms shall be ten (10) feet.

8. Slope of Basin Bottom: In order to ensure proper drainage of the detention basin, a minimum grade of two (2) percent shall be maintained for all basins used exclusively for peak runoff control. Water quality or recharge basins with filtration systems incorporated into them may have a minimum grade of 1/2 (0.5) percent.

9. The lowest floor elevation of any structure constructed within 50 feet to a detention basin or other stormwater facility shall be two (2) feet above the detention basin berm. The distance between any residential structure and any stormwater facility shall be a minimum of 50 feet. The distance between any non residential structure and any stormwater facility shall be a minimum of 25 feet. The Township may require fencing at the basin.

10. Landscaping and planting specifications must be provided for all stormwater management basins and be specific for each type of basin.

11. Basins should be lined with impervious liners only in areas with a high risk of sinkhole formation or potential groundwater contamination as determined by a geotechnical engineer. However, where a liner is deemed necessary or appropriate, the use of controlled, compacted natural clay liners, for SWM basins should be considered. Locally available clay, when properly installed, can provide near impervious conditions (approximately E-6 cm/s or less). Some of the advantages of using controlled, compacted, natural clay soil liners are:

    a. Can offer better long-term solution as a basin liner versus geosynthetics because of greater thickness and the ability to withstand settlement;

    b. Can be constructed to allow relatively uniform leakage rates to facilitate ground-water recharge but not to an excessive degree that overloads karst bedrock;

    c. When properly constructed in two or more 8- to 10-inch thick lifts, rapid movement of surface water through the clay liner is eliminated (rapid leaks can occur in geosynthetic lined basins due to poor seaming, punctures, or other factors);

    d. Cleaning/maintenance of clay-lined stormwater basins will be easier/safer versus geosynthetic liners which could easily be damaged during maintenance operations; and

    e. The abundance of clayey soils (derived from limestone residuum) within the Spring Creek Watershed can provide adequate, cost effective, soil resources for construction of clay liner systems at most development projects.

    However, the installation of any low permeability clay liner system needs to be carefully controlled and the designer needs to ensure that specifications meet standards to ensure integrity.

## C. Construction of Basins

1. Basins shall be installed prior to or concurrent with any earthmoving or land disturbances, which they will serve. The phasing of their construction shall be noted in the narrative and on the plan. Basins that include recharge components, shall have those components installed in such a manner as to not disturb or diminish their effectiveness.

2. Construction specifications in accordance with the minimum criteria of the Township must be provided for all embankments pursuant to Section 307.B.1 of this Ordinance.

3. Compaction test reports shall be kept on file at the site and be subject to review at all times with copies being forwarded to the Township Engineer upon request.

4. When rock is encountered during the excavation of a pond, it shall be removed to an elevation of at least twelve (12) inches below the proposed basin floor (for a manufactured liner, 24 to 30 inches). All exposed cracks and fissures are to be structurally filled.

5. Temporary and permanent grasses or stabilization measures shall be established on the sides and base of all earthen basins within 15 days of construction.

6. A quality control program is critical for embankment fills. Therefore, whenever embankment fill material in excess of three feet (3') is to be used, each layer of compacted fill shall be tested to determine its density per ASTM 2922 or ASTM 3017. The density of each layer shall be 98 percent (98%) of a Standard Proctor Density analysis per ASTM 698.

**D. Construction Inspection**

Inspections may be conducted by the Township Engineer during the construction of the stormwater management basin and facilities. Such inspections do not constitute approval of construction methods or materials. The design professional shall perform site inspections as may be necessary to ensure that all stormwater management facilities are constructed in accordance with the approved plans. The design professional shall be responsible for all construction inspections and certifications as may be required by a NPDES permit.

**E. Special Use Basins**

1. The design and construction of multiple use stormwater detention facilities are strongly encouraged. In addition to stormwater management, facilities should, where appropriate, allow for recreational uses including: ball fields, play areas, picnic grounds, etc. Provision for permanent wet ponds with stormwater management capabilities may also be appropriate. Prior approval and consultation with the Township are required before design. Multiple use basins should be constructed so that potentially dangerous conditions are not created.

   Water quality basins or recharge basins that are designed for a slow release of water or other extended detention ponds are not permitted for recreational uses, unless the ponded areas are clearly separated and secure.

2. Multiple Development Basins: Stormwater management facilities designed to serve more than one property or development in the same watershed are encouraged. Staged construction of existing or proposed multiple-use detention facilities by several developers in conjunction with watershed development is encouraged. Each developer shall be responsible for the incremental increase in

runoff generated by the respective development and incremental construction improvements necessary for the overall detention facility. Prior approval and consultation with the Township is required before design of such facilities.

3. Alternative Detention Facilities: Alternative stormwater detention facilities including rooftop, subsurface basins or tanks and in-pipe detention storage, or other approved alternative designs are permitted as determined by the Township Engineer.

### *Section 308. Easements*

Stormwater management facilities located outside of existing or proposed right-of-ways shall be located within and accessible by easements as follows:

A. Drainage Easements: Where a tract is traversed by a watercourse, drainage-way, channel or stream, there shall be provided a drainage easement paralleling the line of such watercourse, drainage-way, channel or stream. The width of the drainage easement will be adequate to preserve the unimpeded flow of natural drainage in the 100-year flood plain, in accordance with computed top widths for water surface elevations determined under Section 304.A.2.

B. Access Easements: Where proposed stormwater management facilities are not adjacent to proposed or existing public right-of-ways or are not accessible due to physical constraints, as determined by the Township Engineer, a twenty (20) foot wide passable access easement specifying rights of entry shall be provided. Access easements shall provide for vehicle ingress and egress on grades of less than ten (10) percent for carrying out inspection or maintenance activities.

C. Maintenance Easements: A maintenance easement shall be provided which encompasses the stormwater facility and appurtenances and provides for access for maintenance purposes. The maintenance easement must be located outside of 100-year surface elevation and the stormwater facility and appurtenances.

D. Easements shall stipulate that no trees, shrubs, structures, excavation or fill be placed and no regrading be performed within the area of the easement without written approval from the Township upon review by the Township Engineer. Upon approval of the Township Engineer, such landscaping may be placed in maintenance easements, provided it does not impede access.

E. Whenever practicable, easements shall be parallel with and conjunctive to property lines of the subdivision.

F. All easement agreements shall be recorded with a reference to the recorded easement indicated on the site plan. The format and content of the easement agreement shall be reviewed and approved by the Township Engineer and Solicitor. (See Section 704)

G. When stormwater conveyance pipes or channels are located in undedicated land, they shall be placed within a drainage easement not less than twenty (20) feet wide as approved by the Township Engineer.

***Section 309. Prohibited Discharges and Connections.***

Any drain or conveyance, whether on the surface or subsurface, that allows any non stormwater discharges including sewage, process wastewater, and wash water to enter a regulated small MS4 or to enter the surface waters of the Commonwealth of Pennsylvania is prohibited.

1. No person shall allow, or cause to allow, discharges into a regulated small MS4, or discharges into waters of this Commonwealth, which are not composed entirely of stormwater, except (1) as provided in paragraph C below and (2) discharges authorized under a state or federal permit.

2. The following discharges are authorized unless they are determined to be significant contributors to pollution a regulated small MS4 or to the waters of this Commonwealth:

   (a) Discharges from fire fighting activities.

   (b) 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).

   (c) Non-contaminated irrigation water, water from lawn maintenance, landscape drainage and flows from riparian habitats and wetlands.

   (d) Diverted stream flows and springs.

   (e) Non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps. These facilities shall be designed to discharge to infiltration or vegetative BMP's.

   (f) Non-contaminated HVAC condensation and water from geothermal systems.

   (g) Residential (i.e., not commercial) vehicle wash water where cleaning agents are not utilized.

   (h) Non-contaminated hydrostatic test water discharges, if such discharges do not contain detectable concentrations of TRC.

3. In the event that the Township or DEP determines that any of the discharges identified in Subsection 2 above significantly contribute pollutants to a regulated small MS4 or to waters of this Commonwealth, the Township or DEP will notify the responsible person(s) to cease the discharge.

4. Upon notice provided by the Township under Subsection 3 above, the discharger will have a reasonable time, as determined by the Township, to cease the discharge consistent with the degree of pollution caused by the discharge

5. Nothing in this Section shall affect a discharger's responsibilities under state law.

## ARTICLE IV – SWM SITE PLAN REQUIREMENTS

### *Section 401. General Requirements*

From and after the date of enactment of this Ordinance, a stormwater management site plan and other information specified herein, shall be submitted to the Township for all lands subdivided or for which land development plans are prepared after the enactment of this Ordinance. A stormwater management site plan and other information specified herein shall be submitted at the same time and together with submission of a preliminary subdivision or land development plan, along with a completed checklist supplied by the Township indicating the items contained within the submission.

Such plans and information shall be considered part of said zoning and subdivision documents and shall be reviewed in accordance with procedures established thereunder. Preliminary approval or final approval of a subdivision or land development plan, or the issuance of a zoning permit, shall be contingent upon submission of a stormwater management site plan and other materials specified herein, and approval of the stormwater management site plan in accordance with provisions of this Ordinance.

All stormwater management site plans shall be submitted to the Township Engineer for review and comment. Such review shall include a statement by the Township Engineer specifying the provisions of this Ordinance, which have not been met by the plan as submitted.

Once a stormwater management site plan has been approved together with a subdivision or land development plan approval, or together with the issuance of a zoning permit, said stormwater management site plan shall be valid only for the subdivision, land development, or zoning permit approved. Any further development on the lot or lots requiring a revision of the approved plan or other construction or activities as defined by Township Zoning Regulations shall require the submission of a new, amended, or revised stormwater management site plan and other information specified herein. A copy of the approved SWM plan must be on site at all times during contruction.

### Section 402. SWM Site Plan Contents

The SWM Site Plan shall consist of all applicable calculations, maps, and plans. A note on the maps shall refer to the associated computations and erosion and sediment pollution control plan by title and date. The cover sheet of the computations and erosion and sediment pollution control plan shall refer to the associated maps by title and date. All SWM Site Plan materials shall be submitted to the Township in a format that is clear, concise, legible, neat, and well organized; otherwise, the SWM Site Plan shall be disapproved and returned to the Applicant.

Said plan shall be prepared by a registered professional land surveyor, qualified geologist, landscape architect, architect, or engineer licensed in the State of Pennsylvania, with said preparer's seal and registration number affixed to the plan.

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

A. Stormwater Management Report

1. General description of project.

2. General description of permanent stormwater management techniques, including construction specifications and materials to be used for stormwater management facilities.

3. Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.

4. A written maintenance plan for all stormwater features including detention and retention facilities and other stormwater management elements.

5. Identification of ownership and maintenance responsibility for all permanent stormwater management facilities.

6. The stormwater management report must include a narrative which clearly discusses the project and summary tables which, at a minimum, provides the following information:

   a. Narrative

   - The overall stormwater management concept
   - The expected project schedule
   - Location map
   - Total site area – pre and post, which must be equal or have an explanation as to why it is not
   - Total site impervious area
   - Total off-site areas
   - Number of stormwater management facilities (ponds), if applicable
   - Type of development
   - Pre-development land use
   - Whether site is underlain by carbonate geology
   - Whether site is a water quality sensitive (WQS) development
   - Whether site is in a defined sensitive area
   - Types of water quality and recharge systems used, if applicable
   - Other pertinent information, as required

   b. Summary Tables

   - Pre-development
     - Hydrologic soil group (HSG) assumptions, curve numbers (CN)
     - Computation of average slope, hydraulic length, computed time of concentration
     - Required peak rate of runoff
   - Post-development

- Undetained areas, areas to ponds
- Land use for each subarea
- Hydrologic soil group (HSG) assumptions, curve numbers (CN)
- Time of concentration computed for each subarea
- Post-development peak rate of runoff routed to ponds and out
- Pond maximum return period design data including: maximum water surface elevation, berm elevation, and emergency spillway elevation
- Recharge volume requirements
- Morphology requirements

Reports that do not clearly indicate the above information may be rejected for review by the Township's Engineer or representative and will be returned to the applicant.

B. Plans for tracts of less than 20 acres shall be drawn at a scale of one inch equals no more than 50 feet; for tracts of 20 acres or more, plans shall be drawn at a scale of one inch equals no more than 100 feet. Plans shall be submitted on the following sheet sizes: 18' x 24", 24" x 36", or 36" x 42". All lettering shall be drawn to a size to be legible if the plans are reduced to half size. All sheets comprising a submission shall be on one size.

The following information, unless specifically exempted in writing by the Township Engineer, must be shown on the plans, prepared in a form which meets the requirements for recording in the Office of the Recorder of Deeds of Centre County, Pennsylvania. The contents of the map(s) shall include, but not be limited to:

1. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.

2. The date of submission and revision.

3. The location of the project relative to highways, municipalities or other identifiable landmarks.

4. Existing contours at intervals of two feet. In areas of steep slopes (greater than 15 percent), five-foot contour intervals may be used.

5. Existing streams, lakes, ponds, or other bodies of water within the project area.

6. Other physical features including flood hazard boundaries, sinkholes, closed depressions, wetlands, streams, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the site. In Addition, any areas necessary to determine downstream impacts, where required for proposed stormwater management facilities must be shown.

7. The locations of all existing and proposed utilities, sanitary sewers, and water lines within 20 feet of property lines.

8. An overlay showing soil names and boundaries, including rock outcrops.

9. Total area of impervious surfaces proposed.

10. Proposed structures, roads, paved areas, and buildings.

11. Final contours at intervals of two feet. In areas of steep slopes (greater than 15 percent), five-foot contour intervals may be used.

12. A graphic and written scale.

13. A North arrow.

14. The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.

15. Existing and proposed land use(s).

16. A key map showing all existing man-made features beyond the property boundary that would be affected by the project and the extent of the watershed or sub-area that drains through the project site.

17. Horizontal and vertical profiles of all open channels, including hydraulic capacity.

18. Overland drainage paths.

19. Access easements around all stormwater management facilities that would provide ingress to and egress from a public right-of-way.

20. A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off-site. All off-site facilities shall meet the performance standards and design criteria specified in this Ordinance.

21. A construction detail of any improvements made to sinkholes and the location of all notes to be posted, as specified in this Ordinance.

22. Complete drainage systems for the site, including details for construction. All existing drainage features, which are to be incorporated in the design, shall be so identified. If the site is to be developed in stages, a general SWM Site Plan for the entire site shall be presented with the first stage and appropriate development stages for the drainage system shall be indicated.

23. Location and selected plan material used for vegetative filter paths to sinkholes, and the location of all notices to be posted.

24. A statement, signed by the landowner, acknowledging the stormwater management system to be a permanent fixture that can be altered or removed only after approval of a revised plan by the Township.

25. A note indicating that As-Built drawings will be provided by the Developer for all stormwater facilities prior to occupancy, or the release of the surety bond.

26. The following signature block for the registered professional preparing the Stormwater management site plan:

"I, _____, hereby certify that the Stormwater management site plan meets all design standards and criteria of the Spring Township Stormwater Management Ordinance."

27. The following signature block for the Township Engineer reviewing the Stormwater management site plan:

"I, _____, have reviewed this Stormwater management site plan in accordance with the Design Standards and Criteria of the Spring Township Stormwater Management Ordinance.

28. The location of all erosion and sedimentation control facilities.

C. Supplemental Information

1. A soil erosion and sediment pollution control plan, where applicable, including all reviews and approvals, as required by PA DEP. Note that the an approved erosion and sediment control plan is required for all plans with over 5,000 sf of disturbance.

2. Soils investigation report, including boring logs, compaction requirements, and recommendations for construction of detention basins.

3. Karst Features Identification and Analysis Reports and a hydrogeologic assessment of the effects of runoff on sinkholes.

4. The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.

5. A Declaration of Adequacy and Highway Occupancy Permit from the PA DOT District Office when utilization of a PA DOT storm drainage system is proposed.

6. All permits required by the Pennsylvania Department of Environmental Protection, and Army Corps of Engineers and other regulatory agencies.

D. Stormwater Management Facilities

1. All stormwater management facilities must be located on a plan and described in detail.

2. When groundwater recharge methods such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown.

3. All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

   a. A sketch of the berm embankment and outlet structure indicating the embankment top elevation, embankment side slopes, top width of embankment, emergency spillway elevation, perforated riser dimensions, pipe barrel dimensions and dimensions and spacing of antiseep collars.

   b. Design computations for the pipe barrel and riser.

   c. A plot or table of the stage-storage (acre-feet vs. elevation) and all supporting computations.

   d. Flood routing computations.

   e. A detailed plan of the trash rack and anti-vortex device.

4. Record Set (As-Built) Plans: At the completion of the project, and as a prerequisite for the release of the guarantee or issuance of an occupancy permit, the owner or his representative shall:

   a. Provide certification of completion from a registered professional verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto; and

   b. Provide a set of approved stormwater management site plan drawings showing all approved revisions and elevations and inverts to all manholes, inlets, pipes, and stormwater control facilities.

***Section 403. Plan Submission***

For all activities regulated by this Ordinance, the steps below shall be followed for submission. For any activities that require a PA DEP Joint Permit Application and regulated under Chapter 105 (Dam Safety and Waterway Management) or Chapter 106 (Floodplain Management) of PA DEP's Rules and Regulations, require a PA DOT Highway Occupancy Permit, or require any other permit under applicable state or federal regulations, the permit(s) shall be part of the plan.

A. The SWM Site Plan shall be submitted by the Developer as part of the Preliminary Plan submission for the Regulated Activity.

B. Four (4) copies of the SWM Site Plan and Stormwater Management Report shall be submitted.

C. Distribution of the SWM Site Plan will be as follows:

   1. Two (2) copies to the Township accompanied by the requisite Municipal Review Fee, as specified in this Ordinance.

   2. One (1) copy to the Township Engineer.

3. One (1) copy to the County Planning Commission/Department.

***Section 404. SWM Site Plan Review***

A. The Township Engineer shall review the SWM Site Plan for consistency with the adopted Spring Creek Watershed Act 167 Stormwater Management Plan which shall be applicable throughout Spring Township. The Township shall require receipt of a complete plan, as specified in this Ordinance.

B. The Township Engineer shall review the SWM Site Plan for any submission or land development against the Township subdivision and land development ordinance provisions not superseded by this Ordinance.

C. For activities regulated by this Ordinance, the Township Engineer shall notify the Township in writing, within 45 calendar days, whether the SWM Site Plan is consistent with the Stormwater Management Plan. Should the SWM Site Plan be determined to be consistent with the Stormwater Management Plan, the Township Engineer will forward an approval letter to the Developer with a copy to the Township Secretary.

D. Should the SWM Site Plan be determined to be inconsistent with the Stormwater Management Plan, the Township Engineer will forward a disapproval letter to the Developer with a copy to the Township citing the reason(s) for the disapproval. Any disapproved SWM Site Plans may be revised by the Developer and resubmitted consistent with this Ordinance.

E. For Regulated Activities the Township Engineer shall notify the Township Zoning Officer in writing, within a time frame consistent with the Township Code and/or Township Subdivision Ordinance, whether the SWM Site Plan is consistent with the Stormwater Management Plan and forward a copy of the approval/disapproval letter to the Developer. Any disapproved SWM Site Plan may be revised by the Developer and resubmitted consistent with this Ordinance.

F. For Regulated Activities requiring a PA DEP Joint Permit Application, the Township Engineer shall notify PA DEP whether the SWM Site Plan is consistent with the Stormwater Management Plan and forward a copy of the review letter to the Township and the Developer. PA DEP may consider the Township Engineer's review comments in determining whether to issue a permit.

G. The Township shall not approve any subdivision or land development for Regulated Activities specified in the SWM Site Plan that has been found to be inconsistent with the Stormwater Management Plan, as determined by the Township Engineer. All required permits from PA DEP must be obtained prior to approval.

H. The Township Zoning Office shall not issue a zoning permit for any Regulated Activity if the SWM Site Plan has been found to be inconsistent with the Stormwater Management Plan, as determined by the Township Engineer, or without considering the comments of the Township Engineer. All required permits from PA DEP must be obtained prior to issuance of a building permit.

I. The Developer shall be responsible for completing an "As-Built Survey" of all stormwater management facilities included in the approved SWM Site Plan. The As-Built Survey and a certificate of completion stating that the stormwater facilities have been completed in accordance with the approved plans shall be submitted to the Township Engineer for final approval. As built survey to include latitude and longitude coordinates at the centroid of each BMP. In no case shall the Township approve the As-Built Survey until the Township receives a copy of an approved Declaration of Adequacy, Highway Occupancy Permit from the PA DOT District Office, and any applicable permits from PA DEP. Township Engineer shall perform an inspection of the BMP's after receipt of an acceptable as built survey.

J. The Township's approval of a SWM Site Plan shall be valid for a period not to exceed five years (5) years. This five-year time period shall commence on the date that the Township signs the approved SWM Site Plan. If stormwater management facilities included in the approved SWM Site Plan have not been constructed, or if an As-Built Survey of these facilities has not been approved within this five-year time period, then the Township may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the Township shall be resubmitted in accordance with Section 406 of this Ordinance.

### *Section 405. Modification of Plans*

A modification to a submitted SWM Site Plan for a development site that involves a change in stormwater management facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the Township Engineer, shall require a resubmission of the modified SWM Site Plan consistent with Section 403 of this Ordinance and be subject to review as specified in Section 404 of this Ordinance.

A modification to an already approved or disapproved SWM Site Plan shall be submitted to the Township, accompanied by the applicable review. A modification to a SWM Site Plan for which a formal action has not been taken by the Township shall be submitted to the Township, accompanied by the applicable Township Review Fee.

### *Section 406. Resubmission of Disapproved SWM Site Plans*

A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the Township Engineer's concerns documented in writing, to the Township Engineer in accordance with Section 403 of this Ordinance and be subject to review as specified in Section 404 of this Ordinance. The applicable Township Review Fee must accompany a resubmission of a disapproved SWM Site Plan.

## ARTICLE V – INSPECTIONS

### *Section 501. Schedule of Inspections*

A. The Township Engineer or his Township assignee shall inspect installation of the permanent stormwater management facilities.

B. During any stage of the work, if the Township Engineer determines that the permanent stormwater management facilities are not being installed in accordance with the approved Stormwater management site plan, the Township shall revoke any existing permits until a revised SWM Site Plan is submitted and approved, as specified in this Ordinance.

## ARTICLE VI – FEES AND EXPENSES

### *Section 601. General*

The fees required by this Ordinance are the Township Review Fee and the Township Review Fee. The Township Review fee shall be established by the Township to defray review costs incurred by the Township and the Township Engineer. All fees shall be paid by the Applicant.

### *Section 602. Township SWM Site Plan Review Fee*

The Township shall establish a Review Fee Schedule by resolution of the Township governing body based on the size of the Regulated Activity and based on the Township's costs for reviewing SWM Site Plans. The Township shall periodically update the Review Fee Schedule to ensure that review costs are adequately reimbursed.

### *Section 603. Expenses Covered by Fees*

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

A. Administrative Costs.

B. The review of the SWM Site Plan by the Township and the Township Engineer.

C. The site inspections.

D. The inspection of stormwater management facilities and drainage improvements during construction.

E. The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the SWM Site Plan.

F. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

G. Meetings

## ARTICLE VII – MAINTENANCE RESPONSIBILITIES

### *Section 701. Stormwater Management Controls and Facilities*

Stormwater management controls and facilities as defined here include all structural and non-structural stormwater conveyance and management controls including water quantity and quality Best Management Practices.

### *Section 702. Performance Guarantee*

The applicant shall provide a financial guarantee to the Township for the timely installation and proper construction of all stormwater management controls as required by the approved stormwater plan and this ordinance equal to 110% of the estimated full construction cost of the required controls.

### *Section 703. Maintenance Responsibilities*

A. The SWM Site Plan for the development site shall contain an operation and maintenance plan prepared by the developer and approved by the Township Engineer. The operation and maintenance plan shall outline required routine maintenance actions and schedules necessary to ensure proper operation and function of the facility(ies).

B. The responsible party or entity responsible for the maintenance must also be identified. The SWM Site Plan for the development site shall establish responsibilities for the continuing operation and maintenance of all proposed stormwater control facilities and temporary permanent erosion control facilities, consistent with the following principles:

1. If a development consists of structures or lots that are to be separately owned and in which streets, sewers and other public improvements are to be dedicated to the Township, stormwater control facilities within the dedicated areas may also be dedicated to and maintained by the Township upon acceptance by the Township.

2. If a development site is to be maintained in a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities shall be the responsibility of the owner or ~~private management entity~~ other responsible party or parties identified on the plan.

   (a) Facilities may be incorporated within individual lots so that the respective lot owners will own and be responsible for maintenance in accordance with recorded deed restriction. A description of the facility or system and the terms of the required maintenance shall be incorporated as part of the deed to the property.

   (b) Ownership and maintenance may be the responsibility of a Property Owners Association. The stated responsibilities of the Property Owners Association in terms of owning and maintaining the stormwater management facilities shall be submitted with final plans for determination of their adequacy, and upon their

approval shall be recorded with the approved subdivision plan among the deed records of Centre County, Pennsylvania. In addition, the approved subdivision plan and any deed written from said plan for a lot or lots shown herein shall contain a condition that it shall be mandatory for the owner or owners of said lot to be members of said Property Owners Association.

(c) For stormwater management facilities that are proposed as part of the site development plan, the developer will be required to execute a developer agreement and a maintenance agreement with the Township for the construction and continued maintenance of the facilities prior to the signature approval on the final plan. Access for inspection by the Township of all such facilities deemed critical to the public welfare at any reasonable time shall be provided.

C. The governing body, upon recommendation of the Township Engineer, shall make the final determination on the continuing maintenance responsibilities prior to final approval of the stormwater management site plan. The governing body reserves the right to accept the ownership and operating responsibility for any or all of the stormwater management controls.

D. Add the following note to plan, preferably on the same sheet as the Landowner's Stormwater Acknowledement: "Spring Township, its agents and assigns have the unimpeded right but shall have no obligation to enter onto and upon the property for the purpose of inspection of the stormwater facilities. Spring Township also has the right but not any obligation of maintenance of the stormwater facilities with notice to the facility owner in the event the facilities are not being properly maintained. The cost of said maintenance shall be the responsibility of the property owner and/or any responsible parties." This note applies to the entire property shown on these Plans and shall be in effect for perpetuity. (If easements are being shown on the plan the proceeding may be modified to state that access is limited to the easement area.)

### *Section 704. Declaration of Stormwater Access and Maintenance Easement for Privately Owned Stormwater Facilities*

A. Prior to final approval of the stormwater management site plan, the property owner shall sign and record a Declaration of Stormwater Access and Maintenance Easement (DSAME) covering all stormwater control facilities that are to be privately owned. The DSAME shall contain the following elements:

1. Name and address of the property owner
2. Name of Land Development for which the DSAME is required
3. Statement noting that as a condition of approval that a DSAME is required
4. Statement noting that the DSAME shall run in perpetuity with the land.
5. Statement that the property owner create an easement for the purpose of access to the stormwater facilities for ingress, egress, and regress.
6. Metes and bounds description of the Stormwater Access and Maintenance Easement.
7. Statement that heirs and assigns of the owner, by accepting a deed from the owner, agree to be subject to the conditions of the DSAME.
8. Statement that the stormwater easement shall be a permanent easement and that the stormwater management facilities located within the easement will be

maintained by the owner, their heirs and assigns and shall be responsible for repairs as may be required in accordance with the approved Stormwater Easement Maintenance Plan.

9. The creation of the stormwater easement shall be deemed an agreement by the Owner to maintain the stormwater management facilities with all costs of maintenance to be the responsibility of the owner. The agreement shall also state that no alteration of the facilities is permitted without formal plan approval by DEP, the Centre County Conservation District and the Township.
10. Statement noting that no structures or plantings are permitted within the easement and that no grading that will adversely impact the function of stormwater facilities within the easement.
11. A statement noting that no barriers, fences or other obstructions that may impede stormwater flow are permitted.
12. A statement noting that Owner will be responsible for maintenance of the easement including mowing and annual upkeep.
13. Statement noting that in case any provisions contained in this DSAME are for any reason declared invalid, that such invalidity shall not affect any other provision hereof.
14. Statement that the Owner their heirs, successors, and assigns agree to indemnify and hold harmless the Township, Centre County, and the Township Engineer from any and all claims, costs, damages, and expenses legally and reasonably incurred as a result of this DSAME and the easements hereby created.
15. Statement noting the following: "The Owner hereby acknowledges the Township's right to access the stormwater easements to inspect the stormwater management facilities. The Owner also acknowledges the Township'sright, upon notice to the Owner, to repair and or maintain the stormwater facilities in accordance with the Stormwater Access and Maintenance Plan. All costs, including materials, labor, engineering, and legal costs of any such repair or maintenance activities shall be the sole responsibility of the Owner." In the event of non-payment by the Owner and/or other responsible parties, the Township ~~shall seek legal options~~ may pursue remedies for receipt of payment including but not limited to money judgement, placement and enforcement of a Municipal Lien on the property.

### *Section 705. Post-Construction Maintenance Inspections*

A. Stormwater facilities should be inspected by the land owner/developer or responsible entity (including the Township Engineer for dedicated facilities) on the following basis:

   1. Annually for the first 5 years.

   2. Once every 3 years for after.

   3. During or immediately after every ten-year or greater storm event.

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

C. Maintenance inspections may be performed by the Township to ensure proper functioning of all stormwater facilities. These inspections may, at a minimum, be performed annually and/or following major storm events.

D. If the Township determines at any time that any permanent stormwater facility has been eliminated, altered or improperly maintained, the owner of the property shall be advised of corrective measures required and given three (3) days to initiate appropriate action in accordance with a time schedule dictated by the Township. If such action is not taken by the property owner, the Township may cause the work to be done and backcharge all costs to the property owners and/or other responsible parties consistent with remedies set forth in 704.A.15.

## ARTICLE VIII – ENFORCEMENT AND PENALTIES

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

Upon presentation of proper credentials, duly authorized representatives of the Township may enter, at reasonable times, upon any property within the Township to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

### *Section 802. Notification*

In the event that a person fails to comply with the requirements of this Ordinance, or fails to conform to the requirements of any permit issued hereunder, the Township shall provide written notification of the violation. The notice will direct the responsible party to comply with all the terms of this Ordinance within seven (7) days, or such additional period, not to exceed thirty (30) days, as the designated Township representative shall deem reasonable. In addition, the designated Township representative shall give notice to the owner, applicant, developer, property manager or other person responsible for the property or the violation that if the violation is not corrected, the Township may correct the same and charge the landowner or other person responsible the cost thereof plus penalties as specified herein for failure to comply.

Such notice may be delivered by the United States mail, first class, postage prepaid, and/or by certified or registered mail; and/or by personal service; and/or if the property is occupied, and/or by posting the notice at a conspicuous place upon the affected property and/or by advertising on one occasion in a newspaper of general circulation.

Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violations(s). Failure to comply within the time specified shall subject such person to the penalty provision of this Ordinance. All such penalties shall be deemed cumulative and resort by the Township from pursuing any and all other remedies. It shall be the responsibility of the owner of the real property on which any Regulated Activity is proposed to occur, is occurring, or has occurred, to comply with the terms and conditions of this Ordinance.

### *Section 803 Enforcement*

A. It shall be unlawful for a person to undertake any regulated activity except as provided in an approved SWM Site Plan, unless specifically exempted in Section 111.

B. It shall be unlawful to violate Section 401.B.24 of this Ordinance.

C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the Municipality.

### *Section 804 Suspension and Revocation*

A. Any approval or permit issued by the Municipality pursuant to this Ordinance may be suspended or revoked for:

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

2. A violation of any provision of this Ordinance or any other applicable law, ordinance, rule, or regulation relating to the Regulated Activity.

3. The creation of any condition or the commission of any act during the Regulated Activity which constitutes or creates a hazard, nuisance, pollution, or endangers the life or property of others.

B. A suspended approval may be reinstated by the Municipality when:

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

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

C. An approval that has been revoked by the Municipality cannot be reinstated. The applicant may apply for a new approval under the provisions of this Ordinance.

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

### *Section 805. Penalties*

A. Anyone violating the provisions of this Ordinance shall be guilty of a summary Offense, and upon conviction shall be subject to a fine of not more than $1,000 for each violation, recoverable with costs. Each day that the violation continues shall be a separate offense and penalties shall be cumulative.

B. In addition, the Township, 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 cost of ~~removal~~ remediation, fine and penalties hereinabove mentioned may be entered by the Township as a lien against such property, or properties of individual members of a Property Owners Association, in accordance with the existing provisions of the law.

### *Section 806. Appeals*

A. Any person aggrieved by any action of the Township or its designee, relevant to the provisions of this Ordinance, may appeal to the Township Zoning Hearing Board within thirty (30) days of that action.

B. Any person aggrieved by any decision of the Township Zoning Hearing Board, 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 thirty (30) days of the Township Zoning Hearing Board's decision.

## ARTICLE IX – REFERENCES


1. U.S. Department of Agriculture, National Resources Conservation Service (NRCS). *National Engineering Handbook.* Part 630: Hydrology, 1969-2001. Originally published as the *National Engineering Handbook*, Section 4: Hydrology. Available from the NRCS online at: http://www.nrcs.usda.gov/.

2. U.S. Department of Agriculture, Natural Resources Conservation Service. 1986. *Technical Release 55: Urban Hydrology for Small Watersheds*, 2nd Edition. Washington, D.C.

3. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual.* Harrisburg, PA.

4. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (March 31, 2012), as amended and updated. *Erosion and Sediment Pollution Control Program Manual.* Harrisburg, PA.

5. 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/

**ENACTED and ORDAINED** at a regular meeting of the Spring Township Board of Supervisors on the 7th day of Aug., 2023. This Ordinance shall take effect immediately.

_____, Chairman
[Name],[Title]

_____, Vice-Chairman
[Name],[Title]

_____, Supervisor
[Name],[Title]

ATTEST:

_____
[name], Secretary ( type or print )

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

_____
[name], Secretary

**LAST REVISED 6/23/23**