

BARRETT TOWNSHIP
Monroe County, Pennsylvania

ORDINANCE NO. 205

[Duly Adopted January 2, 2024]

AN ORDINANCE OF BARRETT TOWNSHIP, MONROE COUNTY, PENNSYLVANIA, AMENDING AND REPLACING IN ITS ENTIRETY BARRETT TOWNSHIP'S STORMWATER MANAGEMENT ORDINANCE, ORDINANCE 150 OF APRIL 24, 2007, CODIFIED AT PART II (GENERAL LEGISLATION), CHAPTER 425 (§425-1 THROUGH §425-39), OF BARRETT TOWNSHIP'S CODE OF ORDINANCES.

WHEREAS, the Board of Supervisors of Barrett Township (the "Board") adopted Ordinance No. 150 on April 24, 2007 ("Ordinance 150"), which is now codified at Chapter 425 (§425-1 through §425-39) of Barrett Township's Code of Ordinances (the "Code") governing stormwater runoff in Barrett Township ("Township"); and,

WHEREAS, on April 20, 2022, the County of Monroe adopted a revised and updated Brodhead-McMichaels Creek Act 167 Plan (the "Plan") and submitted that Plan to the Pennsylvania Department of Environmental Protection (PADEP) for review and approval;

WHEREAS, by letter dated December 2, 2022, PADEP notified the County of Monroe that the Plan is consistent with municipal floodplain management plans, state programs that regulate dams, encroachments and water obstructions, and state and federal flood control programs; and

WHEREAS, under Section 11(b) of the Act of October 4, 1978, 32 P.S., P.L. 864 ("Act 167"), municipalities subject to the Plan must enact or amend and implement such ordinances as necessary to regulate development in a manner consistent with the Plan; and

WHEREAS, the Board desires to amend and replace Ordinance 150 in its entirety with the stormwater management provisions attached hereto, which are consistent with Monroe County's approved Plan.

NOW, THEREFORE, BE IT ORDAINED AND ENACTED, by the Board of Supervisors of Barrett Township as follows:

SECTION 1: AMENDMENT. Part II (General Legislation), Chapter 425 (Stormwater Management), Sections 425-1 through 425-39 are amended and replaced in their entirety with the provisions attached hereto as Exhibit A and incorporated here by reference.

SECTION 2: REPEALER. Except as amended hereby, all provisions of the Code will remain in full force and effect. All ordinances or parts of ordinances conflicting or

inconsistent with the provisions of this ordinance are hereby repealed.

SECTION 3: SEVERABILITY. The provisions of this Ordinance are severable and if any provision thereof is declared unconstitutional, illegal, or invalid, such decision will not affect the validity of any of the remaining provisions of this Ordinance. It is hereby declared as a legislative intent of the Township that this Ordinance would have been enacted had such unconstitutional, illegal, or invalid provisions not been included herein.

SECTION 4: AUTHORITY. This Ordinance is enacted under the authority conferred upon municipalities to regulate land use activities that affect runoff, surface water and groundwater quality and quantity by the authority of Act 167, 32 P.S. § 680.1 et seq., as amended, the "Storm Water Management Act," and the Water Resources Management Act of 2002, as amended, Municipalities Planning Code, Act of 1968, P.L. 805, No. 247, as amended, 53 P.S. § 10101 et seq., and the Second Class Township Code, 53 P.S. §65101 et seq.

SECTION 5: EFFECTIVE DATE. This Ordinance Amendment will take effect 5 days after its adoption.

ENACTED and ORDAINED this 2nd day of January, 2024, by the Board of Supervisors of Barrett Township, Monroe County, Pennsylvania.

**BOARD OF SUPERVISORS OF
BARRETT TOWNSHIP**

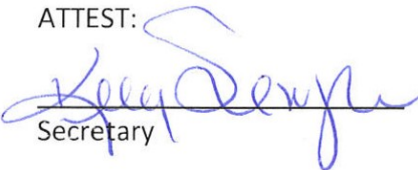


Pamela Gardsy, Chair



Patti O'Keefe, Vice Chair

ATTEST:



Secretary



Kelly Slinger, Secretary/Supervisor

(TOWNSHIP SEAL)



John Seese, Supervisor



Darryl Speicher, Supervisor

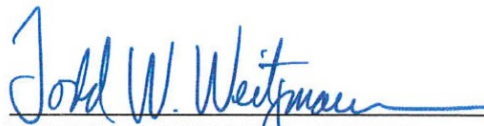
**BARRETT TOWNSHIP
Monroe County, Pennsylvania**

ORDINANCE NO. 205

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CERTIFICATION

I hereby certify that the attached Ordinance is a true and correct copy of the *proposed* Ordinance by the Board of Supervisors of Barrett Township, Monroe County, Pennsylvania, which will be considered for enactment at a regular public meeting to be held at the Barrett Administrative & Recreation Complex at 1200 Route 390, Cresco, PA 18326, on **January 2, 2024, at 9:00 a.m.**



TODD W. WEITZMANN, ESQUIRE
WEITZMANN, WEITZMANN & HUFFMAN, LLC
700 Monroe Street
Stroudsburg, PA 18360
(570) 421-8550
Barrett Township Solicitors

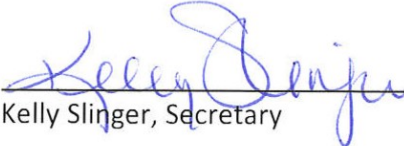
SECRETARY'S CERTIFICATE

I hereby certify that the foregoing is a true and correct copy of Ordinance No. 204 enacted by a majority vote of the Board of Supervisors of Barrett Township at a properly advertised meeting of such Supervisors duly held on January 2, 2024. Present at the meeting were, and a record of their vote was, as follows:

Name	Present	Aye	Nay
Pam Gardsy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Patti O'Keefe	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Kelly Slinger	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
John Seese	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Darryl Speicher	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Further, be it certified that public notice of said meeting was given in the manner provided by law; that said Ordinance shall be duly recorded upon the Minutes of Barrett Township, has not been amended or rescinded, and is in full force and effect this 2nd day of January, 2024.

Dated: January 2, 2024



Kelly Slinger, Secretary

EXHIBIT A

**BARRETT TOWNSHIP
STORMWATER MANAGEMENT ORDINANCE**

ORDINANCE NO. _____

Adopted at a Public Meeting Held on

January 2, 2024

Article I – General Provisions

Section 101.	Short Title
Section 102.	Statement of Findings
Section 103.	Purpose
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Article II – Definitions

Article III – Stormwater Management Standards

Section 301.	General Requirements
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Section 303.	Volume Controls
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Section 405.	Resubmission of Disapproved SWM Site Plans
Section 406.	Authorization to Construct and Term of Validity
Section 407.	As-Built Plans, Completion Certificate and Final Inspection

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Section 501.	Responsibilities of Developers and Landowners
Section 502.	Operation and Maintenance Agreements
Section 503.	Performance Guarantee

Article VI – Fees and Expenses

Section 601.	SWM Site Plan Review and Inspection Fee
Section 602.	Expenses Covered by Fees

Article VII – Prohibitions

Section 701.	Prohibited Discharges and Connections
Section 702.	Roof Drains and Sump Pumps
Section 703.	Alteration of SWM BMPs

Article VIII – Enforcement and Penalties

Section 801.	Right-of-Entry
Section 802.	Inspection
Section 803.	Enforcement
Section 804.	Suspension and Revocation
Section 805.	Penalties and Remedies for Violation
Section 806.	Township Liability
Section 807.	Appeals
Section 808.	Effective Date

Appendix A – Operation and Maintenance Agreement
Appendix B – Stormwater Management Design Criteria
Appendix C – Drainage Plan Application
Appendix D – Stormwater Management District Map
Appendix E – West Nile Virus Guidance

ARTICLE I – GENERAL PROVISIONS

Section 101. Short Title

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

Section 102. Statement of Findings

The governing body of the municipality finds that:

- A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases runoff volumes, flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines 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 Chapter is to promote health, safety, and welfare within the Brodhead/McMichaels Creek, Bushkill & Wallenpaupack Watersheds by minimizing the harms and maximizing the benefits described in Section 102 of this Chapter, 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 township 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

1. All regulated activities and all activities that may affect stormwater runoff that are located within the Brodhead Creek/Bushkill Creek and Wallenpaupack Creek Watersheds, including land development and earth disturbance activity, are subject to regulation by this Chapter.
2. This Chapter contains only the stormwater management performance standards and design criteria that are necessary or desirable from a watershed-wide perspective. Local stormwater management design (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.) shall continue to be regulated by the applicable Township Ordinances and applicable State Regulations.
3. The provisions, regulations, limitations, and restrictions of this Chapter governing maintenance of storm water management facilities shall apply to all storm water management facilities existing on the date of this Chapter or installed after the date of this Chapter and shall apply to all persons responsible for maintenance of such storm water management facilities and all persons who own or occupy the land upon such storm water management facilities are located.
4. It shall be the responsibility of the developer and, if different, the landowner, to ensure that all contractors, agents, or other persons comply with all requirements of the Ordinance and with any approved SWM Site Plan.

Section 106. Repealer

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

Section 107. Severability

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

Section 108. Compatibility with Other Requirements

Approvals issued and actions taken under this Chapter do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, law, regulation or ordinance.

Section 109. Erroneous Permit

Any permit or authorization issued or approved based on false, misleading or erroneous information provided by an applicant is void without the necessity of any proceedings for revocation. Any work 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 Township purporting to validate such a violation.

Section 110. Waivers

- A. If the Board of Supervisors determines that any requirement under this Chapter cannot be achieved for a particular regulated activity, the Board of Supervisors may, after an evaluation of alternatives, approve measures other than those in this Chapter, subject to Section 110, paragraph B.
- B. Waivers or modifications of the requirements of this Chapter may be approved by the Board of Supervisors 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.

ARTICLE II – DEFINITIONS

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

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

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

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

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

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

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

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

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

DEP – The Pennsylvania Department of Environmental Protection.

Development Site (Site) – See Project Site.

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

Earth Disturbance Activity – A construction or other human activity which disturbs the surface of the land, including, but not limited to: clearing and grubbing; grading; excavations; embankments; road maintenance; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.

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

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

FEMA – Federal Emergency Management Agency.

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

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

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

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

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

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

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

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

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

Municipality – Barrett Township, Monroe County, Pennsylvania.

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

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

Pervious Area – Any area not defined as impervious.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

USDA – United States Department of Agriculture.

Waters of this Commonwealth – Any and all rivers, streams, creeks, rivulets, impoundments, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

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

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

ARTICLE III – STORMWATER MANAGEMENT STANDARDS

Section 301. General Requirements

- A. For all regulated activities, unless preparation of an SWM Site Plan is specifically exempted in Section 302:
 - 1. Preparation and implementation of an approved SWM Site Plan is required.
 - 2. No regulated activities shall commence until the township issues written approval of an SWM Site Plan, which demonstrates compliance with the requirements of this Ordinance.
- B. SWM Site Plans approved by the township, in accordance with Section 406, shall be on site throughout the duration of the regulated activity.
- C. The township may approve measures for meeting the state water quality requirements other than those in this Chapter, provided that they meet the minimum requirements of, and do not conflict with, state law including, but not limited to, the Clean Streams Law.
- D. 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 chapter. If diffused drainage discharge is proposed to be concentrated and discharged onto adjacent property, the applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other impacts will result from the concentrated discharge.
- E. Where a development site is traversed by existing watercourses, drainage easements shall be provided conforming to the line of such watercourses. The terms of the easement shall conform to the stream buffer requirements contained in Section 305.
- F. Any stormwater management facilities regulated by this chapter that would be located in or adjacent to waters of the commonwealth or wetlands shall be subject to approval by PADEP, and shall be designed in accordance with Chapter 105. When there is a question whether wetlands may be involved, it is the responsibility of the applicant 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 PADEP.
- G. Any stormwater management facilities regulated by this chapter that would be located on state highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation (PennDOT).
- H. All stormwater runoff, other than roof top runoff shall be treated for water quality prior to discharge to surface or groundwater.
- I. For all regulated earth disturbance activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained during the regulated earth disturbance activities (e.g., during construction) to meet the purposes and requirements of this Chapter and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual (E&S Manual³)*, No. 363-2134-008, as amended and updated.
- J. Impervious areas:
 - 1. The measurement of impervious areas shall include all of the impervious areas in the total proposed development even if development is to take place in stages.
 - 2. For development taking place in stages, the entire development plan must be used in determining conformance with this chapter.
 - 3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this chapter; except that the volume controls in Section 303 and the peak rate controls of Section 304 do not need to be retrofitted to existing impervious areas that are not being altered by the proposed regulated activity.

- K. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification to the adjacent property owner(s). Such stormwater flows shall be subject to the requirements of this chapter.
- L. All regulated activities shall include such measures as necessary to:
1. Protect health, safety, and property.
 2. Meet the water quality goals of this Chapter 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 the Commonwealth.
 - e. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.
 3. Incorporate methods described in the *Pennsylvania Stormwater Best Management Practices Manual* (BMP Manual⁴). If methods other than green infrastructure and LID methods are proposed to achieve the volume and rate controls required under this Chapter, the SWM Site Plan must include a detailed justification demonstrating that the use of LID and green infrastructure is not practicable.
- M. The design of all facilities over karst shall include an evaluation of measures to minimize adverse effects.
- N. Infiltration BMPs should be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Chapter.
- O. Normally dry, open top, storage facilities should completely drain both the volume control and rate control capacities over a period of time not less than 24 and not more than 72 hours from the end of the design storm.
- P. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the latest version of the Precipitation-Frequency Atlas of the United States, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland.
- NOAA's Atlas 14⁵ can be accessed at: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.
- Q. For all regulated activities, SWM BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Chapter and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Storm Water Management Act.
- R. Various BMPs and their design standards are listed in the BMP Manual.
- S. All wet basin designs shall incorporate biologic controls consistent with the West Nile guidance found in Appendix E.
- T. Stormwater conveyance facilities that do 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. Stormwater conveyance facilities may be required to convey larger design storms based on individual drainage/sub-drainage area characteristics as recommended by the Township Engineer and approved at the discretion of the Board of Supervisors. Stormwater conveyance facilities to or exiting from stormwater management facilities (i.e. detention basins) shall be designed to convey the design flow to or from the structure. Open channels must be able to convey at a minimum, without damage to the drainage structure or roadway, runoff from the 25-year design storm with a minimum 1.0 foot of freeboard measured below the lowest point along the top of the roadway.
- U. Any stormwater management facility (i.e., BMP, detention basin) designed to store runoff and requiring a berm or earthen embankment required or regulated by this chapter shall be designed to provide an emergency spillway to handle flow up to and including the 100-year proposed conditions. The height of embankment must provide a

minimum 1.0 foot of freeboard above the maximum pool elevation computed when the facility functions for the 100-year proposed conditions inflow. Should any stormwater management facility require a dam safety permit under PADEP 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 the 100-year event.

- V. The design of all stormwater management facilities shall incorporate sound engineering principles and practices. The township reserves the right to disapprove any design that would result in the construction of a continuation of a stormwater problem area.

Section 302. Exemptions

- A. Regulated activities that result in cumulative earth disturbances less than one acre and less than 5,000 square feet of new impervious surface are exempt from the requirements in Section 303, Section 304, and Article IV of this chapter. This criterion shall apply to the total development even if the development is to take place in phases. The date of the adoption of the original Brodhead and McMichaels Creek Stormwater Management Ordinance shall be the starting point from which to consider tracts as "parent tracts" in which future subdivisions and respective impervious area computations shall be cumulatively considered. Impervious areas existing on the "parent tract" prior to adoption of the original ordinance shall not be considered in cumulative impervious area calculations for exemption purposes.
- B. Agricultural activity is exempt from the SWM Site Plan preparation requirements of this Chapter provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
- C. Forest management and timber operations are exempt from the SWM Site Plan preparation requirements of this chapter provided the activities are performed according to the requirements of 25 Pa. Code Chapter 102.
- D. Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Sections 301.J through V.
- E. The township may deny or revoke any exemption 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.
- F. Drainage problems. If a drainage problem is documented or known to exist downstream of or expected from the proposed activity, then the township may require a drainage plan submittal.

Section 303. Volume Controls

The green infrastructure and low impact development practices provided in the BMP Manual shall be utilized for all regulated activities wherever possible. Water volume controls shall be implemented using the *Design Storm Method* in Subsection A or the *Simplified Method* in Subsection B below. For regulated activity areas equal or less than one acre that do not require hydrologic routing to design the stormwater facilities, this chapter establishes no preference for either methodology; therefore, the applicant may select either methodology on the basis of economic considerations, the intrinsic limitations on applicability of the analytical procedures associated with each methodology and other factors.

- A. The *Design Storm Method* (CG-1 in the BMP Manual⁴) is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.
 - 1. Do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation.
 - 2. For modeling purposes:
 - a. Existing (predevelopment) non-forested pervious areas must be considered meadow in good condition.
 - b. A percentage of no less than 20% of existing impervious area, when present, shall be considered meadow in good condition in the model for existing conditions.

B. The *Simplified Method* (CG-2 in the BMP Manual) provided below is independent of site conditions and should be used if the *Design Storm Method* is not followed. This method is not applicable to regulated activities greater than one acre or for projects that require hydrologic routing to design the stormwater storage facilities. For new impervious surfaces:

1. Stormwater facilities shall capture at least the first two (2) inches of runoff from all new impervious surfaces.
2. At least the first one inch of runoff from new impervious surfaces shall be permanently removed from the runoff flow, i.e., it shall not be released into the surface waters of this Commonwealth. Removal options include reuse, evaporation, transpiration, and infiltration.
3. Wherever possible, infiltration facilities should be designed to accommodate infiltration of the entire permanently removed runoff; however, in all cases at least the first 0.5 inch of the permanently removed runoff should be infiltrated.

Section 304. Rate Controls

A. Proposed conditions rates of runoff from any Regulated Activity shall not exceed the peak release rates of runoff prior to development for the design storms as specified on the Brodhead/McMichaels Creek Stormwater Management District Watershed Map (Appendix D) and Table 304.A.1. Areas located outside of the Brodhead-McMichaels Creek Watershed are subject to the same requirements as if they were located in Stormwater Management District A.

TABLE 304.A.1 – Rate Control Requirements.

District	Proposed conditions 24-hour storm event	(reduce to)	Existing conditions 24-hour storm event
A	2-year		1-year
	5-year		5-year
	10-year		10-year
	25-year		25-year
	50-year		50-year
	100-year		100-year
B-1	2-year		1-year
	5-year		2-year
	10-year		5-year
	25-year		10-year
	50-year		25-year
	100-year		100-year
B-2	2-year		1-year
	5-year		2-year
	25-year		5-year
	50-year		10-year
	100-year		50-year
B-3	50-year		10-year
	100-year		50-year
	Due to the effect of the Leavitt Branch Dam, detention of storms less than the 50 year are not required in District B-3		
C	Provisional Direct Discharge District - <i>Development sites</i> which can discharge directly to the main channel or major tributaries or indirectly to the main channel through an existing <i>stormwater</i> drainage system (i.e., <i>storm sewer</i> or tributary) which meets the "Downstream Hydraulic Capacity Analysis" in Section 304.G of <i>this Chapter</i> and is shown by the <i>qualified professional</i> to not cause a downstream problem, may allow an increase in flow as long as no downstream harm is demonstrated. However, <i>sites</i> in District C shall comply with the criteria for water quality; and volume control, Section 303 of <i>this Chapter</i> . If the proposed conditions <i>runoff</i> is intended to		

	be conveyed by an existing <i>stormwater</i> drainage system to the main channel, assurance must be provided that such system has adequate capacity to convey the increased peak flows or will be provided with improvements to furnish the required capacity. When adequate capacity of the downstream system does not exist and will not be provided through improvements, the proposed conditions peak rate of <i>runoff</i> must be controlled to the <i>existing conditions</i> peak rate as required in District A provisions for the specified <i>design storms</i> .
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- B. District Boundaries - The boundaries of the Stormwater Management Districts are shown on an official map included in Appendix D of the Brodhead Creek and McMichael Creek Act 167 Stormwater Management Plan, available at the Monroe County Conservation District website. A copy of the official map at a reduced scale is included in Appendix D of *this Chapter*. The exact location of the Storm-water Management District boundaries as they apply to a given *development site* shall be determined by mapping the boundaries using the two-foot topographic contours (or most accurate data required) provided as part of the *SWM Site Plan*.
- C. Sites Located in More Than One District - If a Development Site is located within two or more *stormwater* management district category *subareas*, the *peak discharge* rate from any *subarea* shall be the *existing conditions peak discharge* for that *subarea*. The calculated *peak discharges* shall apply regardless of whether the grading plan changes the drainage area by *subarea*. The *Board of Supervisors* may grant a Waiver if discharges from multiple *subareas* recombine in proximity to the Development Site. In this case, *peak discharge* in any direction may be a 100% *release rate* provided that the overall *site discharge* meets the weighted average *release rate*.
- D. Off-Site Areas - Off-site areas that drain through a Development Site are not subject to *release rate* criteria when determining allowable peak *runoff* rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the Development Site.
- E. Where the Development Site area differs significantly from the total Property area, only the proposed impact area utilizing *stormwater* management measures shall be subject to the Management District Criteria. In other words, unimpacted areas bypassing the *stormwater* management facilities would not be subject to the Management District Criteria.
- F. "No Harm" Option - For any proposed *development site* not located in a provisional direct discharge district, the *Applicant* has the option of using a less restrictive *runoff* control (including no detention) if the *Applicant* can prove that "no harm" would be caused by discharging at a higher *runoff* rate than that specified by the *applicable Act 167 Plan*. The "no harm" option is used when an *Applicant* can prove that the proposed hydrographs can match existing hydrographs, or if it can be proved that the proposed conditions will not cause increases in peaks at all points downstream. Proof of "no harm" must be shown based upon the following "Downstream Impact Evaluation" which shall include a "downstream hydraulic capacity analysis" consistent with Section 304.G of *this Chapter* to determine if adequate hydraulic capacity exists. The *Applicant* shall submit this evaluation of the impacts due to increased downstream *stormwater* flows in the *watershed* to the *Township*.
1. The Hydrologic Regime of the *site* must be maintained.
 2. The "Downstream Impact Evaluation" shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications due to the proposed development upon a dam, highway, structure, natural point of restricted *streamflow* or any *stream* channel section, established with the concurrence of the *Township*.
 3. The evaluation shall continue downstream until the increase in flow diminishes due to additional flow from tributaries and/or *stream* attenuation.
 4. The peak flow values to be used for downstream areas for the design *return period* storms (2, 5, 10, 25, 50, and 100-year) for the 24-hour storm event shall be the values from the calibrated models in the original Act 167 Plans for the Brodhead Creek Watershed and the McMichaels Creek Watershed.
 5. Proposed *BMPs* which would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no-harm", except in conjunction with proposed capacity improvements for the problem areas consistent with Section 304.F.8.

6. A financial distress shall not constitute grounds for the *Township* to approve the use of the “no-harm” option.
 7. Downstream capacity improvements may be provided as necessary to achieve the “no harm” option.
 8. Any “no harm” justifications shall be submitted by the *Applicant* as part of the *SWM Site Plan* submission per Part 4 of *this Chapter*.
- G. “Downstream Hydraulic Capacity Analysis” - Any downstream hydraulic capacity analysis conducted in accordance with *this Chapter* shall use the following criteria for determining adequacy for accepting increased peak flow rates:
1. Existing natural or man-made channels or *swales* must be able to convey the increased *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. Existing natural or man-made channels or *swales* must be able to convey increased 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 *Chapter 105* (if applicable) and, at minimum, pass the increased 25-year *return period runoff*.
- H. Hardship Option - The *applicable Act 167 Plan* and its standards and criteria are designed to maintain *existing conditions* peak flows and volumes throughout the *watershed* as the *watershed* becomes developed. There may be certain instances, however, where the standards and criteria established are too restrictive for a particular *Applicant*. The existing drainage network in some areas may be capable of safely transporting slight increases in flows without causing a problem or increasing flows elsewhere. If an *Applicant* cannot meet the Stormwater standards due to lot conditions or if conformance would become a hardship to an *Applicant*, the hardship option may be applied. A financial distress shall not constitute grounds for the *Township* to approve the use of the hardship option. The *Applicant* would have to plead its case to the *Board of Supervisors* with the final determination made by the *Township*. Any *Applicant's* pleading the “hardship option” will assume all liabilities that may arise due to exercising this option.

Section 305. Riparian Buffers

- A. Riparian Buffer Establishment. In order to protect and improve water quality, riparian buffers are required adjacent to streams, wetlands, lakes, and ponds.
1. Wetlands and Vernal Ponds
 - A. Wetland Identification. Wetlands shall be identified in accord with the 1987 U.S. Army Corps of Engineers Manual for Identifying and Delineating Wetlands, and properly flagged and surveyed on site to ensure they are protected.
 1. Wetlands in an artificial watercourse. Wetlands contained within the banks of an artificial watercourse shall not be considered for buffer delineation purposes.
 2. Wetlands in a natural watercourse. Wetlands contained within the banks of a natural watercourse, only the stream buffer shall apply.
 - B. Wetland and vernal pond buffer delineation. A fifty-foot inner buffer and 100-foot outer buffer, measured perpendicular to and horizontally from the edge of the delineated wetland or vernal pond for a total distance of 150 feet, shall be maintained for all wetlands and vernal ponds.
 1. Inner buffer. Measured perpendicular to and horizontally from the edge of the delineated wetland or vernal pond, for a distance of 50 feet.

(a). Stormwater conveyance required to the Township, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP and passive unpaved stable trails shall be permitted. No other earth disturbance, grading, filling, buildings, structures, new construction, or development shall be permitted.

(b). The area of the inner buffer altered by activities permitted in accordance with Section 305.A.1.B.1.(a) shall be minimized to the greatest extent practicable.

2. Outer buffer. Measured perpendicular to and horizontally from the outer edge of the inner buffer for a distance of 100 feet, resulting in a total buffer of 150 feet.

(a). Stormwater conveyance required by the Township, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP, roads constructed to existing grade, unpaved trails, and limited forestry activities that do not clear cut the buffer (e.g., selective regeneration harvest) in accord with a forestry management plan shall be permitted, provided no buildings are involved, and those activities permitted under 305.D and E.

(b). No more than 20% of the cumulative outer buffer on the subject parcel shall be altered by the activities permitted in accord with 305.A.1.B.2.(a).

2. Lakes and Ponds

A. There is no outer buffer around lakes and ponds.

B. Lake and pond buffer delineation. A fifty-foot buffer measured perpendicular to and horizontally from the edge of any water body, shall be maintained around any water body.

C. Permitted activities/development. Stormwater conveyance required by the Township, buffer maintenance and restoration, the correction of hazardous conditions, lakefront views, boat docks and unpaved trails shall be permitted, provided no buildings are involved.

D. The area of the buffer impacted by activities permitted in Section 305.A.2.C shall not exceed 35% of the buffer on the subject parcel.

3. Streams.

A. Stream buffer delineation. A fifty-foot inner buffer and 100-foot outer buffer, measured perpendicular to and horizontally from the top-of-bank on both sides of any stream for a total distance of 150 feet, shall be maintained on both sides of any stream.

1. Inner buffer. Measured perpendicular to and horizontally from the top-of-bank of the stream for a distance of 50 feet.

(a). Stormwater conveyance required by the Township, buffer maintenance and restoration, the correction of hazardous conditions, stream crossings permitted by DEP, wildlife sanctuaries and boat launch sites constructed so as not to alter the floodplain cross section, and unpaved trails shall be permitted, providing no buildings are involved. No other earth disturbance, grading, filling, buildings, structures, new construction, or development shall be permitted.

(b). The area of the inner buffer altered by activities permitted in accord with Section 305.A.3.A.1.(a) shall be minimized to the greatest extent practicable.

2. Outer buffer. Measured perpendicular to and horizontally from the outer edge of the inner buffer for a distance of 100 feet resulting in a total buffer of 150 feet.

(a). Stormwater conveyance required by the Township, buffer maintenance and restoration, the correction of hazardous conditions, wildlife sanctuaries, boat launch sites, roads constructed to existing grade, stream crossings permitted by DEP and unpaved trails and limited forestry activities that do not clear-cut the buffer (e.g., selective regeneration harvest) in accord with a forestry management plan shall be permitted, provided no buildings are involved.

(b). In areas of the outer buffer which are not wetlands, vernal ponds or slopes of more than 15%, stormwater management facilities which improve water quality of stormwater discharge shall be permitted unless prohibited by other township or state requirements. No other earth disturbance, grading, filling, buildings, structures, new construction, or development shall be permitted.

(c). No more than 20% of the cumulative outer buffer on the subject parcel shall be altered by the activities permitted in accord with Section 305.A.3.A.2.(a).

B. Where resource buffers overlap, the more restrictive requirements shall apply.

C. Any permitted use within the riparian buffer shall be conducted in a manner that will maintain the extent of the 100-year floodplain, improve or maintain stream stability, and preserve and protect the ecological function of the floodplain.

D. Pre-existing Lots or Parcels/Development in Outer Buffers. In the case of legally pre-existing lots (approved prior to the effective date of this chapter) where the useable area of a lot lies within an outer buffer area; the Applicant may apply for a Waiver from the Board of Supervisors in accordance with Section 110 of this Chapter. In considering a waiver application, the Board of Supervisors shall determine whether the Applicant has presented evidence of hardship in addition to the standards for Waivers set forth in Section 110 of this Chapter.

E. Improvements to existing structures in outer buffers. The provisions of this Section 305.A do not require any changes or improvements to be made to lawfully existing structures in buffers. However, when any improvement to a structure is proposed which results in a horizontal expansion of that structure, the improvement may only be permitted by granting of a Waiver from the requirements of this Chapter. In considering a waiver application, the Board of Supervisors shall determine whether the Applicant has presented evidence of hardship in addition to the standards for Waivers set forth in Section 110 of this Chapter.

F. Minimum Management Requirements for Riparian Buffers.

1. Existing native vegetation shall be protected and maintained within the Riparian Buffer Easement.

2. Whenever practicable invasive vegetation shall be actively removed, and the Riparian Buffer shall be planted with native trees, shrubs, and other vegetation to create a diverse native plant community appropriate to the intended ecological context of the site.

G. The Riparian Buffer shall be enforceable by the Township and shall be recorded in the Monroe County Recorder of Deeds office, so that it shall run with the land and limit the use of the property located therein. The buffer shall allow for the continued private ownership and shall count toward the minimum lot area required by Zoning, unless otherwise specified in the Township Zoning Ordinance.

ARTICLE IV – STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS

Section 401. Plan Requirements

1. 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 not be accepted for review and shall be returned to the *Applicant*. The following items shall be included in the *SWM Site Plan*:
 - A. Written Description. A written description of the following information shall be submitted:
 - (1) General description of the project and the overall *stormwater* management concept for the project designed.
 - (2) General description of permanent Stormwater management techniques, including construction specifications of the materials to be used for Stormwater Management Facilities.
 - (3) Complete hydrologic, hydraulic, and structural computations for all *stormwater management facilities* and assumptions and criteria used in the design of the *stormwater management facilities*.
 - (4) A determination of site conditions in accordance with the *BMP Manual*. A detailed site evaluation shall be completed for projects proposed in areas of carbonate geology or *karst* topography, and other environmentally sensitive areas, such as Brownfields.
 - (5) Stormwater *runoff* design computations and documentation as specified in *this Chapter*, or as otherwise necessary to demonstrate that the maximum practicable measures have been taken to meet the requirements of *this Chapter*, including the recommendations and general requirements in Section 301 of *this Chapter*.
 - (6) 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 *development site*.
 - (7) Expected project time schedule.
 - (8) Development stages (project phases) if so proposed.
 - (9) An operation and maintenance (O&M) plan for all existing and proposed physical *stormwater management facilities*. This plan shall address long-term ownership and responsibilities for O&M as well as schedules and costs for O&M activities.
 - (10) A justification must be included if *BMPs* other than *green infrastructure* methods and LID practices are proposed to achieve the volume, rate, and water quality controls under *this Chapter*.
 - (11) Provisions for permanent access and/or maintenance easements for all physical *SWM BMPs*, such as ponds and *infiltration* structures, as necessary to implement the Operation and Maintenance (O&M) Plan.
 - B. Maps. Map(s) of the project area shall be submitted on 24-inch x 36-inch sheets and/or shall be prepared in a form that meets the requirements for recording at the Offices of the Recorder of Deeds of Monroe County. The contents of the map(s) shall include, but not be limited to:
 - (1) A location map at a scale of 1" = 2000' or less showing the location of the project relative to highways, municipalities, or other identifiable landmarks.
 - (2) The name of the development, the name and address of the *Applicant*, the address of the property, and the name and address of the individual or firm preparing the *SWM Site Plan*.

- (3) The date of submission.
- (4) A graphic and written scale of one (1) inch equals no more than fifty (50) feet; for tracts of twenty (20) acres or more, the scale shall be one (1) inch equals no more than one hundred (100) feet.
- (5) A north arrow, with a notation of whether it is true or magnetic.
- (6) The boundaries of the total Property and, if different, Development Site boundary and size with distances marked to the nearest foot and bearings to the nearest degree.
- (7) Names, numbers and rights-of-way widths of adjoining roads.
- (8) Locations of existing *streams*, lakes, ponds, *wetlands* or other Waters of this Commonwealth within the Development Site.
- (9) Locations of wooded areas and tree masses, buildings and structures, rock outcrops, paved areas, sidewalks, *culverts*, *storm sewers*, *swales*, utilities, and all other significant man-made features.
- (10) The locations of existing and proposed on-lot wastewater facilities and water supply wells.
- (11) *Floodplain* and *floodway* boundaries, *riparian buffers*, existing drainage courses, areas of natural vegetation to be preserved, the total extent of the *upstream* area draining through the *site*, and Pre- and post-development drainage areas,
- (12) Existing and proposed contours at intervals of two feet. In areas of steep slopes (greater than 15 percent), five-foot contour intervals may be used.
- (13) The locations of all existing and proposed utilities, sanitary sewers, and water lines within fifty (50) feet of property lines.
- (14) The location(s) of public water supply wells and surface water intakes as well as their source water protection areas.
- (15) Soil names, boundaries, hydrologic group, and limitations.
- (16) Limits of Earth Disturbance, including the type and amount of *impervious area* that would be added.
- (17) Proposed structures, roads, paved areas, *impervious surfaces*, buildings and other land cover.
- (18) Existing and proposed land use(s).
- (19) A key map showing all existing man-made features beyond the Development Site boundary that would be affected by the project.
- (20) Location of all Open Channels.
- (21) Overland drainage patterns and *swales*.
- (22) The location of all Erosion and Sediment Control Facilities.
- (23) The location of permanent access and/or maintenance easements for all physical *SWM BMPs* (a minimum 15-foot wide access easement is required around all stormwater management facilities that would provide ingress to and egress from a public right-of-way).

- (24) Plans, profiles, and details of all *SWM BMPs*, including, but not limited to drainage structures, *pipes, open channels, and swales*.
- (25) A note on the plan indicating the location and responsibility for maintenance of *stormwater management facilities* that would be located off-site.
- (26) A statement, signed by the *Applicant*, acknowledging that any revision to the approved *SWM Site Plan* must be approved by the *Township* and that a revised Erosion and Sediment Control Plan must be submitted to the Conservation District for a determination of adequacy.
- (27) The following signature block for the *qualified professional*.

I, [*qualified professional*], on this date, [*date of signature*], hereby certify that the *SWM Site Plan* meets all design standards and criteria of the Brodhead/McMichaels Watershed Act 167 Plan and Barrett Township Stormwater Management Ordinance."

- (28) Isolation distances from wells, buildings, septic systems, as noted in the Pennsylvania Stormwater Best Management Practices (BMP) Manual.

C. Supplemental Information.

- (1) A soil *erosion and sediment control plan*, where applicable, and letter of adequacy from the Conservation District.
- (2) A Declaration of Adequacy and Highway Occupancy Permit from the *PennDOT* District Office when utilization of a *PennDOT* storm drainage system is proposed.
- (3) *Wetland Delineation Report* and/or a Jurisdictional Determination from the US Army Corps of Engineers.
- (4) For any activities that require an NPDES Permit for Stormwater Discharges from Construction Activities, or a *DEP* Joint Permit Application, a *PennDOT* Highway Occupancy Permit, or any other permit under applicable state or federal regulations, or are regulated under *Chapter 105* or *Chapter 106*, the proof of application for said permit(s) or approvals shall be submitted.

Section 402. Plan Submission

- 1. The *Applicant* shall submit a complete Drainage Plan application, with all required plans and supplemental materials, as specified in *this Chapter*. No application is complete without the required fee. The application shall be coordinated with the state and federal permit process and the SALDO review process.
 - A. For those Regulated Activities which require SALDO approval, the *SWM Site Plan* shall be submitted by the *Applicant* as part of the Preliminary Plan submission.
 - B. Three (3) copies of the *SWM Site Plan* shall be submitted along with the required application fee.
 - C. Any submissions found incomplete shall not be accepted for review and shall be returned to the *Applicant* with a notification in writing of the specific manner in which the submission is incomplete.
 - D. Complete applications shall be distributed as follows:
 - (1) Two (2) copies to the *Township*.
 - (2) Two (2) copies to the *Conservation District*.
 - (3) One (1) copy to the *Township Engineer*.

(4) One (1) copy to the Monroe County Planning Commission.

Section 403. Plan Review

1. The *Township* shall review the *SWM Site Plan* for consistency with the provisions of *this Chapter*.
2. The *Township* shall notify the *Applicant* in writing within 45 days whether the *SWM Site Plan* is approved, approved with conditions or disapproved. If the *SWM Site Plan* involves a Subdivision and Land Development Plan, the notification shall occur within the time period allowed by the Municipalities Planning Code (90 days) unless the time requirement is waived in writing by the *Applicant*. If a longer notification period is provided by other statute, regulation, or ordinance, the *Applicant* will be so notified by the *Township*.
3. The *Township* shall not unconditionally approve a *SWM Site Plan* until the *Applicant* presents evidence that the *Conservation District* has found the Erosion and Sediment Control Plan adequate to meet the requirements of *Chapter 102*.
4. If the *Township* disapproves the *SWM Site Plan*, the *Township* shall state the reasons for the disapproval in the written notice. If the *Township* approves the *SWM Site Plan* with conditions, the *Township* shall state the conditions in the written notice.

Section 404. Modification of SWM Site Plans

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

Section 405. Resubmission of Disapproved SWM Site Plans

A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the Township's concerns, to the Township in accordance with this Article. The applicable review fee must accompany a resubmission of a disapproved SWM Site Plan.

Section 406. Authorization to Construct and Term of Validity

The Township's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Township may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Township signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 407 within the term of validity, then the Township may consider the SWM Site Plan disapproved and may revoke any and all permits.

Section 407. As-Built Plans, Completion Certificate, and Final Inspection

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

ARTICLE V – OPERATION AND MAINTENANCE

Section 501. Responsibilities of Developers and Landowners

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

Section 502. Operation and Maintenance Agreements

- A. Prior to final approval of the SWM Site Plan, the property owner shall sign and record an Operation and Maintenance (O&M) Agreement (see Appendix A) covering all stormwater control facilities which are to be privately owned.
 - 1. The owner, successor and assigns shall maintain all facilities in accordance with the approved maintenance schedule in the O&M Agreement.
 - 2. The owner shall convey to the Township conservation easements to assure access for periodic inspections by the Township and maintenance, as necessary.
 - 3. The owner shall keep on file with the Township the name, address, and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information shall be submitted by the owner to the Township within ten (10) working days of the change.
- B. The owner is responsible for operation and maintenance (O&M) of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the Township may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.

Section 503. Performance Guarantee

For SWM Site Plans that involve subdivision and land development, 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 SWM Site Plan and this Chapter.

ARTICLE VI – FEES AND EXPENSES

Section 601. SWM Site Plan Review and Inspection Fee.

1. The *Board of Supervisors* shall establish fees by ordinance for resolution to defray plan review and construction inspection costs incurred by the *Township*. All application fees shall be paid by the *Applicant* at the time of Drainage Plan submission.
2. The *Applicant* shall reimburse the *Township* for all legal and engineering fees incurred in the review of the Drainage Plan or permit application and supporting documents, review of agreements for maintenance of Stormwater Management Facilities, review of Easement agreements, and inspection of Stormwater Management Facilities. If required by applicable ordinance or resolution, the *Applicant* shall deposit the estimated review and inspection fees with the *Township* at the time of application.
3. In the event that *Applicant* disputes the amount of such review fees, the *Applicant* shall, within ten (10) days of the date of an invoice for the review or inspection fees, notify the *Township* in writing that such fees are disputed, in which case the *Township* shall not delay or disapprove a Drainage Plan or permit application due to the *Applicant's* request over disputed fees.
4. In the event the *Township* and the *Applicant* cannot agree on the amount of review and/or inspection fees which are reasonable and necessary, then the *Applicant* and the *Township* shall follow the procedure for dispute resolution set forth in *MPC* Section 503.

Section 602. Expenses Covered by Fees.

The fees required by *this Chapter* shall at a minimum cover:

1. Administrative costs.
2. The review of the Drainage Plan by the *Township* and the *Township Engineer*.
3. Attendance at meetings.
4. Site inspections during construction and upon completion of construction.
5. Any additional work required to enforce any permit provisions regulated by *this Chapter*, correct violations, and assure proper completion of stipulated remedial actions.

ARTICLE VII – PROHIBITIONS

Section 701. Prohibited Discharges and Connections

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

Section 702. Roof Drains and Sump Pumps

Roof drains and sump pumps shall discharge to infiltration or vegetative BMPs wherever feasible. Only non-contaminated pumped ground water and water from foundation and footing drains and crawl space pumps shall be discharged from the sump pumps.

Section 703. Alteration of SWM BMPs

No person shall modify, remove, fill, landscape, or alter any SWM BMPs, facilities, areas, or structures that were installed as a requirement of this Chapter without the written approval of the Township.

ARTICLE VIII – ENFORCEMENT AND PENALTIES

Section 801. Right-of-Entry

Upon presentation of proper credentials, the township or its designated agent 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 Chapter.

Section 802. Inspection

- A. The landowner or the owner's designee (including the township for dedicated and owned facilities) shall inspect SWM BMPs, facilities and/or structures installed under this Chapter annually and during or immediately after cessation of a 10-year or greater storm, at a minimum, to ensure the BMPs, facilities and/or structures continue to function as intended.
- B. 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 Township within 30 days following completion of the inspection.

Section 803. Enforcement

- A. It shall be unlawful for a person to undertake any regulated activity except as provided in an approved SWM Site Plan, unless specifically exempted in Section 302 of this Chapter.
- B. It shall be unlawful to violate Section 703 of this Chapter.
- C. Inspections regarding compliance with the SWM Site Plan are a responsibility of the Township.

Section 804. Suspension and Revocation

- A. Any approval or permit issued by the Township pursuant to this Chapter 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 Chapter 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 township when:
 1. The Township has inspected and approved the corrections to the violations that caused the suspension.
 2. The Township is satisfied that the violation has been corrected.
- C. An approval that has been revoked by the Township cannot be reinstated. The applicant may apply for a new approval under the provisions of this Chapter.
- D. If a violation causes no immediate danger to life, public health, or property, at its sole discretion, the Township may provide a limited time period for the owner to correct the violation. In these cases, the Township 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 township may revoke or suspend any, or all, applicable approvals and permits pertaining to any provision of this Chapter.

Section 805. Penalties and Remedies for Violation

- 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 \$1,000.00 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 may institute injunctive, mandamus, or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.

Section 806. Township Liability

Except as specifically provided by the Act 167, the making of any administrative decision by the *Township* or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the *Township* of the practicability or safety of any proposed structure or use with respect to damage from Erosion, Sedimentation, Storm Water *Runoff*, Flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the *Township* and its officials and employees. The *Board of Supervisors*, by enacting *this Chapter*, does not waive or limit any immunity granted to the *Township* and its officials and employees by the Governmental Immunity Act of October 5, 1980, P.L. 693, No. 142, as amended, 42 Pa. C.S. §8541 et seq., and does not assume any liabilities or obligations.

Section 807. Appeals

- A. Any person aggrieved by any action of the Township or its designee, relevant to the provisions of this Chapter, may appeal to the Board of Supervisors within 30 days of that action.
- B. Any person aggrieved by any decision of the Township, relevant to the provisions of this Chapter, may appeal to the Monroe County Court of Common Pleas within 30 days of the Township's decision.

Section 808. Effective Date

This Chapter shall become effective following its enactment by the *Board of Supervisors* of Barrett Township, Monroe County, Pennsylvania, as provided by law.

ORDAINED AND ENACTED by the *Board of Supervisors* of the Township of Barrett this _____ day of _____, 2024.

**BOARD OF SUPERVISORS OF
BARRETT TOWNSHIP**

Pamela Gardsy, Chair

Patti O'Keefe, Vice Chair

Kelly Slinger, Secretary/Supervisor

John Seese, Supervisor

Darryl Speicher, Supervisor

ATTEST:

Secretary

(TOWNSHIP SEAL)

APPENDIX A
[STORMWATER FACILITIES MAINTENANCE AGREEMENT]

Parcel ID No. [Number(s)]

STORMWATER FACILITIES MAINTENANCE AGREEMENT

This Agreement, effective _____, 20__, is between **[NAME]** a Pennsylvania corporation OR an individual ("Developer") and the **BARRETT TOWNSHIP**, a second class township organized and existing under the laws of the Commonwealth of Pennsylvania ("Township").

Background

- A. Developer owns and wants to develop the real property located at [street address], in Barrett Township, Monroe County, Pennsylvania, bearing Monroe County Parcel ID # [number] and Map # [number] (the "Property").
- B. The Township's Code of Ordinances, at §§ 425-1 through 425-39, provides for management of stormwater within the confines of the Property through the use of certain Best Management Practices ("BMPs"), which are activities, facilities, designs, measures, or procedures used to manage stormwater impacts from development and other regulated activities.
- C. Developer acknowledges that properly constructed and adequately operated and maintained BMPs on the Property are necessary to preserve water quality and protect the health, safety, and welfare of the residents of the Township.
- D. Through this Agreement and a separate Operation and Maintenance Plan ("O&M Plan"), the Township requires that the BMPs be constructed on the Property and adequately operated and maintained by Developer, and its successors and assigns, in perpetuity.

Agreement

In consideration of the promises stated in this Agreement, the parties, intending to be legally bound, agree as follows:

- 1. **Background.** The background recited above is incorporated as part of this Agreement.
- 2. **Construction of BMPs.** Developer must construct the BMPs on the Property in accordance with the plans and specifications identified in the Stormwater Management Site Plan (the "SWM Site Plan"), a copy of which is on file with the Township.
- 3. **Operation and Maintenance of BMPs.** Developer will operate and maintain the BMPs as shown on the SWM Site Plan in good working order in accordance with the specific operation and maintenance requirements noted in the approved O&M Plan marked as Exhibit A (attached and incorporated into this Agreement).
- 4. **Right of Entry.** Developer grants permission to the Township and its authorized agents and employees, to enter on the Property, at reasonable times and upon presentation of proper credentials, to inspect the BMPs whenever necessary. Except for emergencies, the Township will notify Developer before entering the Property.
- 5. **Township's Right to Enforce.** The Township may enforce this Agreement as follows:
 - 5.1. **Notice.** If Developer fails to operate and maintain the BMPs per § 3, it will be in default. The Township may give notice detailing the default and specifying all corrective measures required.

- 5.2. **Cure Period.** If Developer does not fully cure the default within 20 days after receiving the Township's notice, the Township immediately and without further notice may take exercise the remedies in § 5.3. The Township has sole discretion to determine if a default is "fully cured."
- 5.3. **Remedies.** If Developer does not fully cure the default within the cure period, the Township or its representatives may enter upon the Property and take whatever action the Township deems necessary to maintain the BMPs.
- 5.4. **No Obligation to Enforce.** The Township is under no obligation to maintain or repair the BMPs, and this Agreement may not be construed to impose any such obligation on the Township.
6. **Reimbursement of Expenses.** If the Township relies on this Agreement to perform work of any nature, or expends any funds for labor, use of equipment, supplies, materials, and the like, to perform that work, Developer must reimburse the Township for all expenses (direct and indirect) incurred within 10 days after receiving the Township's invoice. If Developer fails to timely pay the Township's invoice, the Township may claim a municipal lien for the unpaid expenses, including collection costs and attorney's fees.
7. **Limitation of Liability.** The intent and purpose of this Agreement is to ensure the Developer's proper maintenance of the on-site BMPs; however, this Agreement shall not be deemed to create any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
8. **Indemnification.** Developer indemnifies and will defend the Township and its supervisors, employees, and agents against any loss, cost, expense, claim, or liability (including attorney's fees and court costs) resulting from anyone's personal injury or loss of life, or the loss of or damage to any property, that arises from, is incident to, or occurs in connection with the construction, presence, existence, or maintenance of the BMPs by the Developer or the Township.
9. **Inspections.** The Township intends to inspect the BMPs at least once every 3 years to ensure their continued functioning. Developer is responsible for the Township's reasonable inspection costs and will pay them within 20 days of invoicing.
10. **Recording and Binding Effect.** The Agreement will be recorded at the Monroe County Office of the Recorder of Deeds, and constitutes a covenant running with the Property. This Agreement is binding on Developer, its successors and assigns [their heirs and administrators], and any other successors in interest, in perpetuity.
11. **Deed Restriction.** All future conveyances of the Property must include a specific deed reference to this Agreement and the Property owner's responsibilities to operate and maintain the BMPs in accordance with the O&M Plan.

This Agreement is effective on the date when both parties have signed it, as indicated by the last date in the signature blocks below.

BARRETT TOWNSHIP

(Township Seal)

 [Name], Chair
 Board of Supervisors

Attest / Witness:

[NAME]

 [Name]
 [Title]

[attach Exhibit A – O&M Plan]

STORMWATER MANAGEMENT

425 Attachment 2

Township of Barrett

**Ordinance Appendix B
Stormwater Management Design Criteria**

TABLE B-1

DESIGN STORM RAINFALL AMOUNT

Source: "Field Manual of Pennsylvania Department of Transportation"
STORM INTENSITY-DURATION-FREQUENCY CHARTS
PDT-1D F May 1986,

FIGURE B-1

**SCS TYPE II RAINFALL DISTRIBUTION
S-CURVE**

FIGURE B-2

PENNDOT DELINEATED REGIONS

Source: "Field Manual of Pennsylvania Department of Transportation"
STORM INTENSITY-DURATION-FREQUENCY CHARTS
P D T -I D F May 1986.

FIGURE B-3

REGION 4 PENNDOT STORM INTENSITY-DURATION-FREQUENCY CURVE

Source: "Field Manual of Pennsylvania Department of Transportation"
STORM INTENSITY-DURATION-FREQUENCY CHARTS
P D T -I D F May 1986.

FIGURE B-4

REGION 5 PENNDOT STORM INTENSITY-DURATION-FREQUENCY CURVE

Source: "Field Manual of Pennsylvania Department of Transportation"
STORM INTENSITY-DURATION-FREQUENCY CHARTS
P D T -I D F May 1986.

TABLE B-2

RUNOFF CURVE NUMBERS

Source: NRCS (SCS) TR-55

TABLE B-3

RATIONAL RUNOFF COEFFICIENTS

TABLE B-4

MANNING ROUGHNESS COEFFICIENTS

TABLE B-5

**TWENTY-FOUR-HOUR STORM VALUES REPRESENTING 90% OF ANNUAL
RAINFALL**

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**TABLE B-1
DESIGN STORM RAINFALL AMOUNT (INCHES)**

The design storm rainfall amount chosen for design should be obtained from the PennDOT region in which the site is located according to Figure B-2.

Source: "Field Manual of Pennsylvania Department of Transportation"
STORM INTENSITY-DURATION-FREQUENCY CHARTS
P D T -I D F May 1986.

**Region 4
Precipitation Depth (inches)**

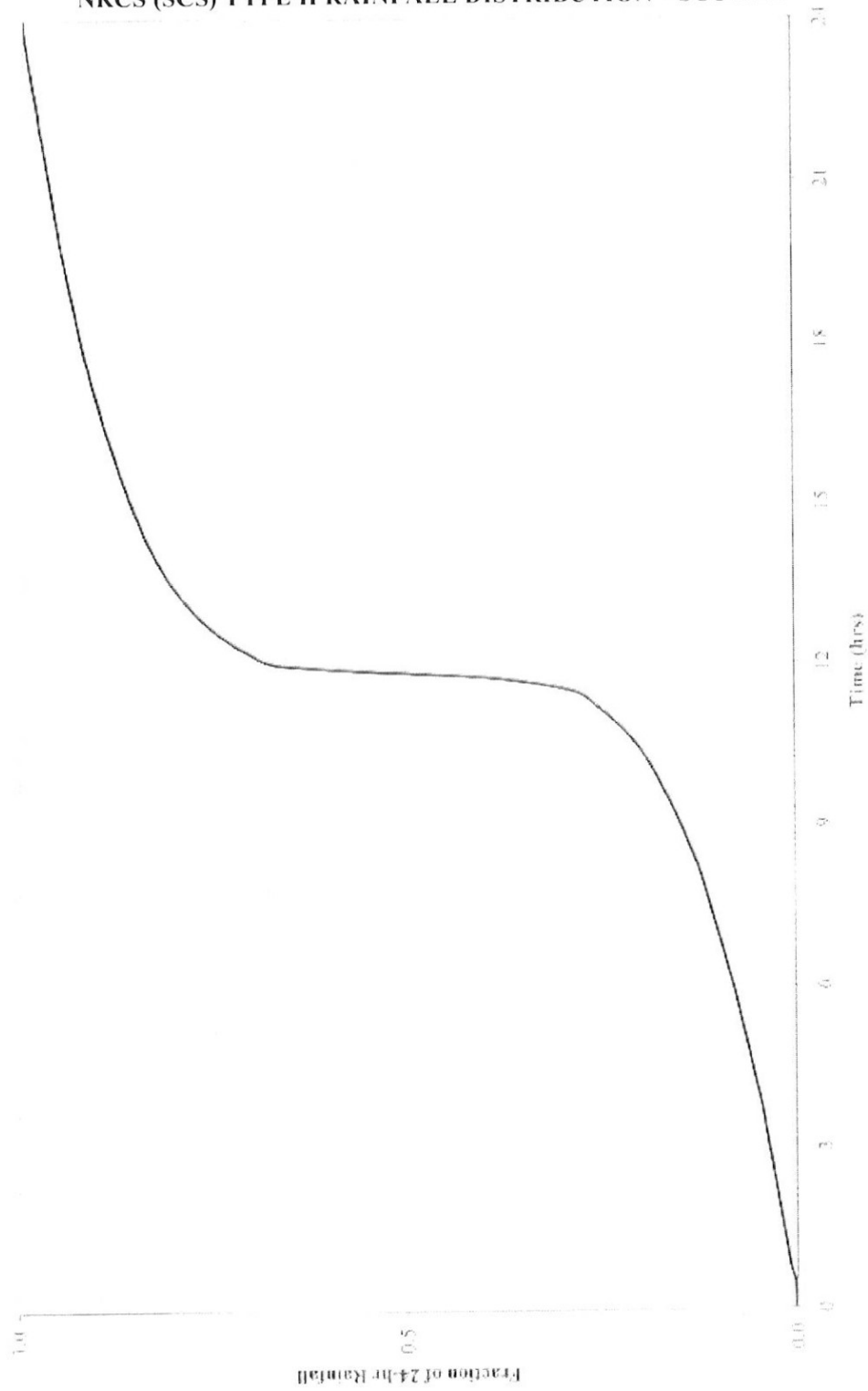
Duration	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5 minutes	0.30	0.35	0.41	0.45	0.50	0.55	0.61
15 minutes	0.58	0.68	0.80	0.93	1.03	1.13	1.25
1 hours	1.01	1.22	1.48	1.70	1.91	2.16	2.41
2 hours	1.24	1.50	1.84	2.14	2.46	2.80	3.18
3 hours	1.38	1.71	2.10	2.43	2.82	3.24	3.69
6 hours	1.68	2.04	2.52	3.06	3.60	4.14	4.74
12 hours	2.04	2.52	3.00	3.84	4.56	5.16	6.00
24 hours	2.40	2.88	3.60	4.56	5.76	6.48	7.44

**Region 5
Precipitation Depth (inches)**

Duration	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
5 minutes	0.33	0.38	0.45	0.50	0.56	0.63	0.68
15 minutes	0.64	0.75	0.90	1.00	1.15	1.35	1.50
1 hours	1.10	1.35	1.61	1.85	2.15	2.60	2.98
2 hours	1.34	1.66	2.00	2.34	2.70	3.26	3.76
3 hours	1.50	1.86	2.28	2.67	3.09	3.69	4.29
6 hours	1.86	2.28	2.82	3.36	3.90	4.62	5.40
12 hours	2.28	2.76	3.48	4.20	4.92	5.76	6.72
24 hours	2.64	3.36	4.32	5.28	6.24	7.20	8.40

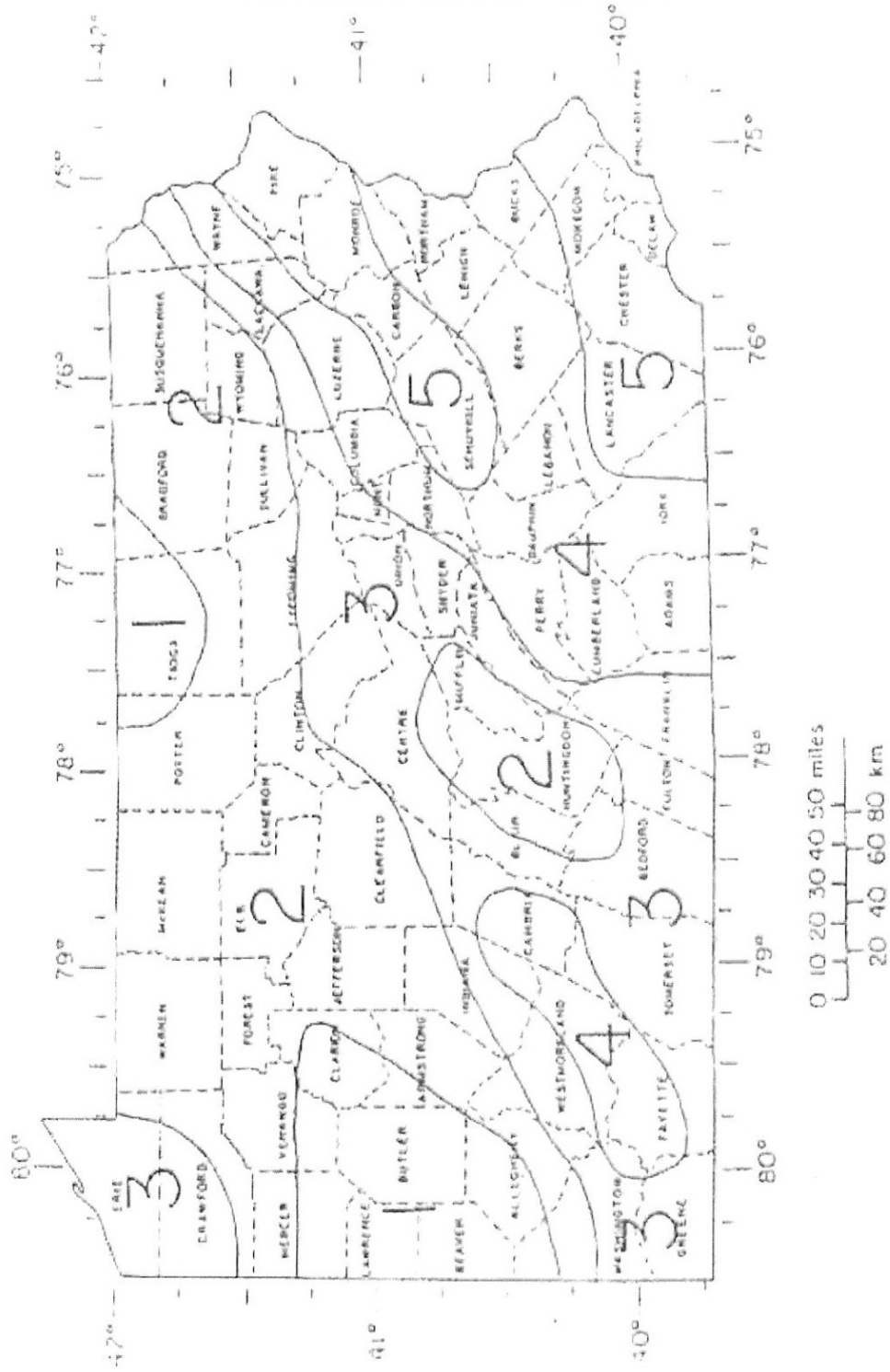
STORMWATER MANAGEMENT

FIGURE B-1
NRCS (SCS) TYPE II RAINFALL DISTRIBUTION – SCURVE



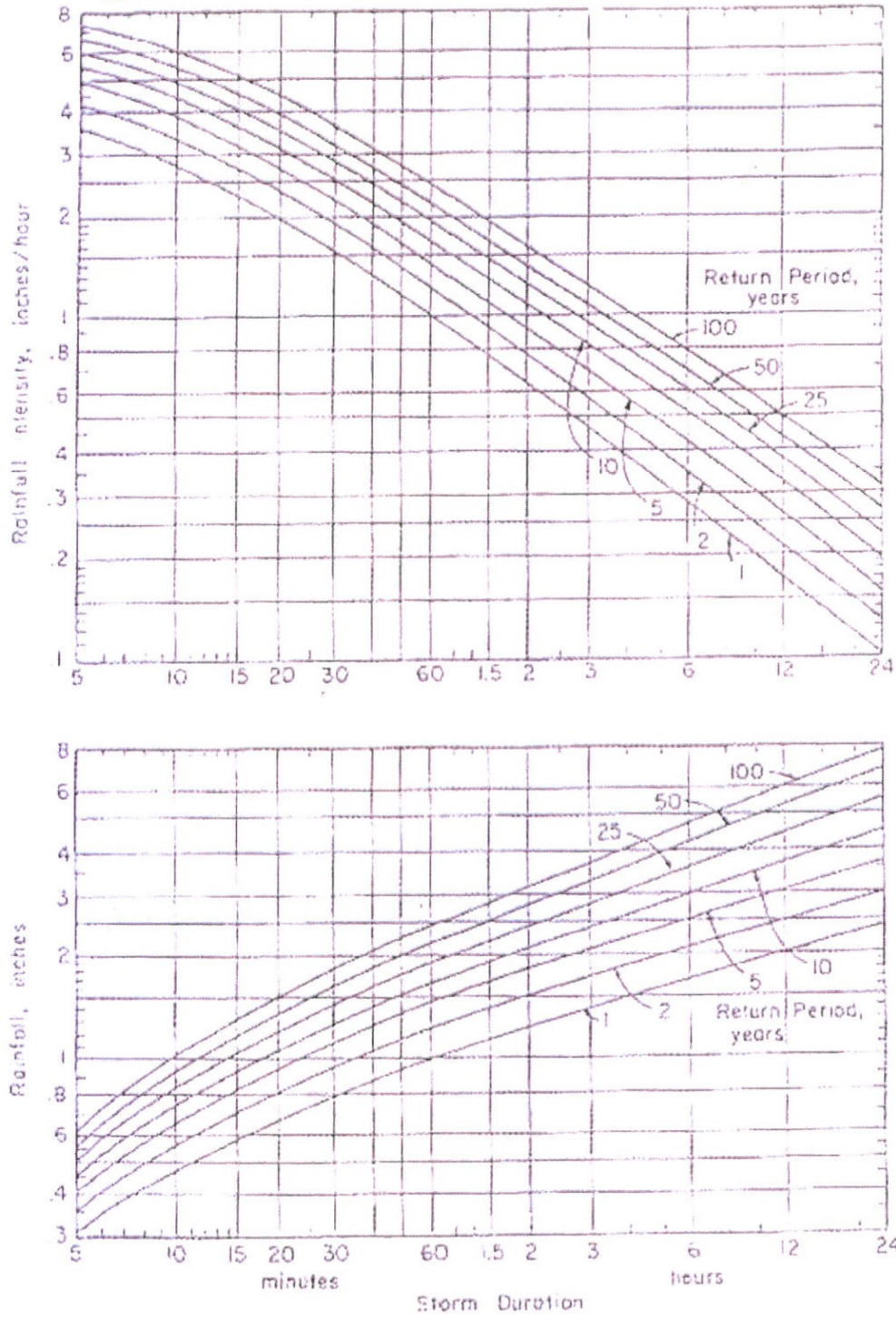
BARRETT CODE

FIGURE B-2
PENNDOT DELINEATED REGIONS



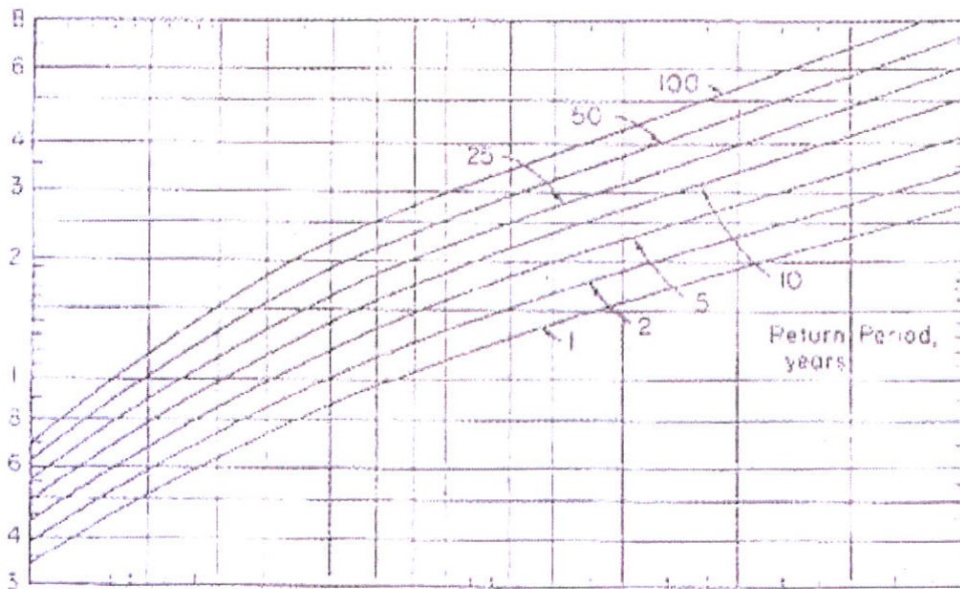
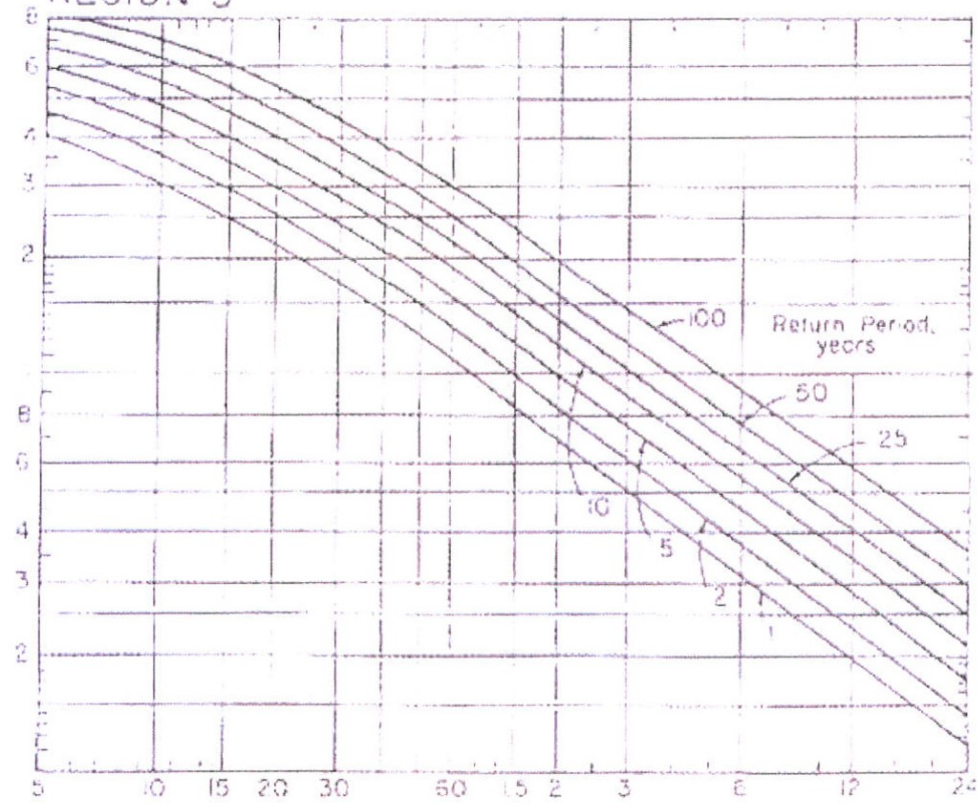
STORMWATER MANAGEMENT

FIGURE B-3
PENNDOT STORM INTENSITY-DURATION-FREQUENCY CURVE
REGION 4



BARRETT CODE

FIGURE B-4
PENNDOT STORM INTENSITY-DURATION-FREQUENCY CURVE
REGION 5



STORMWATER MANAGEMENT

Table B-2
Runoff Curve Numbers
(From NRCS (SCS) TR-55)

Land Use Description	Hydrologic Condition	Hydrologic Soil Group			
		A	B	C	D
Open Space					
Grass cover < 50%	Poor	68	79	86	89
Grass cover 50% to 75%	Fair	49	69	79	84
Grass cover > 75%	Good	39	61	74	80
Meadow		30	58	71	78
Agricultural					
Pasture, grassland, or range - Continuous forage for grazing	Poor	68	79	86	89
Pasture, grassland, or range - Continuous forage for grazing.	Fair	49	69	79	84
Pasture, grassland, or range - Continuous forage for grazing	Good	39	61	74	80
Brush-brush-weed-grass mixture with brush the major element.	Poor	48	67	77	83
Brush-brush-weed-grass mixture with brush the major element	Fair	35	56	70	77
Brush-brush-weed-grass mixture with brush the major element	Good	30	48	65	73
Fallow bare soil	—	77	86	91	94
Crop residue cover (CR)	Poor	76	85	90	93
	Good	74	83	88	90
Woods -grass combination (orchard or tree farm)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77
Commercial	(85% Impervious)	89	92	94	95
Industrial	(72% Impervious)	81	88	91	93
Institutional	(50% Impervious)	71	82	88	90
Residential districts by average lot size:					
	% Impervious				
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Farmstead		59	74	82	86
Smooth surfaces (concrete, asphalt,	98	98	98	98	

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Land Use Description	Hydrologic Condition	Hydrologic Soil Group			
		A	B	C	D
gravel or bare compacted soil)					
Water	98	98	98	98	
Minutensing/newly graded areas (pervious areas only)	77	86	91	94	

* Includes Multifamily housing unless justified lower density can be provided.

Note: Existing site conditions of bare earth or fallow ground shall be considered as meadow when choosing a CN value.

**TABLE B-3
RATIONAL RUNOFF COEFFICIENTS**

Land Use Description	Hydrologic Soil Group			
	A	B	C	D
Cultivated Land: without conservation treatment	.49	.67	.81	.88
:with conservation treatment	.27	.43	.61	.67
Pasture or range land: poor condition	.38	.63	.78	.84
:good condition	—*	.25	.51	.65
Meadow : good condition	—*	—*	.44	.61
Woodland or forestland: thin stand, poor cover, no mulch	—*	.34	.59	.70
:good cover	—*	—*	.45	.59
Open spaces, lawns, parks, golf courses, cemeteries				
Good condition: grass cover on 75% or more of the area	—*	.25	.51	.65
Fair condition: grass cover on 50% to 75% of the area	—*	.45	.63	.74
Commercial and business areas (85% impervious)	.84	.90	.93	.96
Industrial districts (72% impervious)	.67	.81	.88	.92
Residential:				
Average lot size	Average Percentage Impervious			
1/8 acre or less	65%	.59	.76	.86
1/4 acre	38%	.25	.49	.67
1/3 acre	30%	—*	.49	.67
1/2 acre	25%	—*	.45	.65
1 acre	20%	—*	.41	.63
Paved parking lots, roofs, driveways, etc.	.99	.99	.99	.99
Streets and roads:				
Paved with curbs and storm sewers	.99	.99	.99	.99
Gravel	.57	.76	.84	.88
Dirt	.49	.69	.80	.84

Notes: Values are based on NRCS definitions and are average values. Values indicated by “—” should be determined by the design engineer based on site characteristics.

Source: New Jersey Department of Transportation, Technical Manual for Stream Encroachment, August, 1984

Table B-4

STORMWATER MANAGEMENT

**Roughness Coefficients (Manning's "n") For Overland Flow
(U.S. Army Corps Of Engineers, HEC-1 Users Manual)**

Surface Description	n
Dense growth	0.4 - 0.5
Pasture	0.3 - 0.4
Lawns	0.2 - 0.3
Bluegrass sod	0.2 - 0.5
Short grass prairie	0.1 - 0.2
Sparse vegetation	0.05 - 0.13
Bare clay-loam soil (eroded)	0.01 - 0.03
Concrete/asphalt - very shallow depths (less than 1/4 inch)	0.10 - 0.15
- small depths (1/4 inch to several inches)	0.05 - 0.10

Roughness Coefficients (Mannings's "n") For Channel Flow

Reach Description	n
Natural stream, clean, straight, no rifts or pools	0.03
Natural stream, clean, winding, some pools or shoals	0.04
Natural stream, winding, pools, shoals, stony with some weeds	0.05
Natural stream, sluggish deep pools and weeds	0.07
Natural stream or swale, very weedy or with timber underbrush	0.10
Concrete pipe, culvert or channel	0.012
Corrugated metal pipe	0.012-0.027 ⁽¹⁾
High-density polyethylene (HDPE) pipe	
Corrugated	0.021-0.029 ⁽²⁾
Smooth lined	0.012-0.020 ⁽²⁾
(1) Depending upon type, coating and diameter	
(2) Values recommended by the American Concrete Pipe Association, check manufacturer's recommended value.	

**TABLE B-5
Twenty-Four-Hour Storm Values Representing 90% of Annual Rainfall**

PennDOT Rainfall Region	P inches
1	1.13
2	1.48
3	1.60
4	1.95
5	2.04

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TABLE B-6
Nonstandard Stormwater Management
Stormwater Credits for Computing Proposed Conditions Hydrograph

The developer may, subject to approval of the Municipal Engineer, use the stormwater credits, described in the following table, in computing proposed conditions hydrograph:

Nonstructural Stormwater Measure	Description
Natural area conservation	Conservation of natural areas such as forest, wetlands, or other sensitive areas in a protected easement thereby retaining their existing hydrologic and water quality characteristics.
Disconnection of rooftop runoff	Rooftop runoff is disconnected and then directed over a pervious area where it may either infiltrate into the soil or filter over it. This is typically obtained by grading the site to promote overland flow or by providing bioretention on single-family residential lots.
Disconnection of nonrooftop runoff	Disconnect surface impervious cover by directing it to pervious areas where it is either infiltrated or filtered through the soil.
Buffers	Buffers effectively treat stormwater runoff. Effective treatment constitutes capturing runoff from pervious and impervious areas adjacent to the buffer and treating the runoff through overland flow across a grass or forested area.
Grass channel (open section roads)	Open grass channels are used to reduce the volume of runoff and pollutant during smaller storms.
Environmentally sensitive rural development	Environmental site design techniques are applied to low-density or rural residential development.

STORMWATER MANAGEMENT

425 Attachment 3

Township of Barrett

Ordinance Appendix C
Sample Drainage Plan Application And Fee Schedule

(To be attached to the "land subdivision plan or development plan review application or "minor land subdivision plan review application.")

Application is hereby made for review of the stormwater management and erosion and sedimentation control plan and related data as submitted herewith in accordance with the Chapter 425, Stormwater Management.

_____ Final Plan _____ Preliminary Plan _____ Sketch Plan

Date of submission _____ Submission No. _____

1. Name of subdivision or development _____

2. Name of applicant _____ Telephone No. _____

(If corporation, list the corporation's name and the names of two officers of the corporation)

Officer 1
Officer 2

Address _____
Zip _____

Applicants interest in subdivision or development
(if other than property owner, give owner's name and address)

3. Name of property owner _____ Telephone No. _____

Address _____
Zip _____

4. Name of engineer or surveyor _____ Telephone No _____

Address _____
Zip _____

5. Type of subdivision or development proposed:

_____ Single-Family Lots	_____ Townhouses	_____ Commercial (Multilot)
_____ Two-Family Lots	_____ Garden Apartments	_____ Commercial (One Lot)
_____ Multifamily Lots	_____ Mobile Home Park	_____ Industrial (Multilot)
_____ Cluster-Type Lots	_____ Campground	_____ Industrial (One Lot)

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_____ Planned Residential Development _____ Other (_____)

6. Linear feet of new road proposed _____ L.F.

7. Area of proposed and existing conditions impervious area on entire tract.

a. Existing (to remain) _____ S.F. _____ % of property

b. Proposed _____ S.F. _____ % of property

8. Stormwater:

a. Does the peak rate of runoff from proposed conditions exceed that flow which occurred for existing conditions for the designated design storm? _____

b. Design storm utilized (on-site conveyance systems) (24 hr.) _____
No. of Subarea _____
Watershed Name _____

Explain: _____

c. Does the submission and/or district meet the release rate criteria for the applicable subarea? _____

d. Number of subarea(s) from Ordinance Appendix D of the Brodhead and McMichaels Creek Watershed Stormwater Management Plan. _____

e. Type of proposed runoff control _____

f. Do the proposed stormwater control criteria meet the requirement/guidelines of the Stormwater Ordinances? _____

If not, what variances/waivers are requested? _____

Reasons _____

g. Does the plan meet the requirements of Article III of the Stormwater Ordinances? _____

If not, what variances/waivers are requested? _____
Reasons why _____

h. Was TR-55, June 1986 utilized in determining the time of concentration? _____

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- i. What hydrologic method was used in the stormwater computations? _____

- j. Is a hydraulic routing through the stormwater control structure submitted? _____

- k. Is a construction schedule or staging attached? _____
- l. Is a recommended maintenance program attached? _____
- 9. erosion and sediment pollution control (E&S):
 - a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the [County Name] County Conservation District?

 - b. Total area of earth disturbance _____ S.F.
- 10. Wetlands:
 - a. Have the wetlands been delineated by someone trained in wetland delineation? _____
 - b. Have the wetland lines been verified by a state or federal permitting authority? _____
 - c. Have the wetland lines been surveyed? _____
 - d. Total acreage of wetland within the property _____
 - e. Total acreage of wetland disturbed _____
 - f. Supporting documentation _____
- 11. Filing:
 - a. Has the required fee been submitted? _____
Amount _____
 - b. Has the proposed schedule of construction inspection to be performed by the applicant's engineer been submitted? _____
 - c. Name of individual who will be making the inspections _____
 - d. General comments about stormwater management at the development _____

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CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF [County Name].

On this the _____ day of _____, 20 ____, before me, the undersigned officer, personally appeared _____ who being duly sworn, according to law, deposes and says that _____ owners of the property described in this application and that the application was made with _____ knowledge and/or direction and does hereby agree with the said application and to the submission of the same.

_____ Property Owner

My Commission Expires _____ 20 _____
Notary Public _____

THE UNDERSIGNED HEREBY CERTIFIES THAT TO THE BEST OF HIS KNOWLEDGE AND BELIEF THE INFORMATION AND STATEMENTS GIVEN ABOVE ARE TRUE AND CORRECT.

SIGNATURE OF APPLICANT _____



(Information Below This Line To Be Completed By The Municipality)

_____ (Name of) Municipality official submission receipt:

Date complete application received _____ Plan Number _____

Fees _____ date fees paid _____ received by _____

Official submission receipt date _____

Received by _____

Municipality

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**Drainage Plan
Proposed Schedule Of Fees**

Subdivision name _____ Submittal No. _____

Owner _____ Date _____

Engineer _____

- 1. Filing fee \$ _____
- 2. Land use
 - 2a. Subdivision, campgrounds, mobile home parks, and multi-family dwelling where the units are located in the same local watershed. \$ _____
 - 2b. Multi-family dwelling where the designated open space is located in a different local watershed from the proposed units. \$ _____
 - 2c. Commercial/industrial. \$ _____
- 3. Relative amount of earth disturbance
 - 3a. Residential
 - road <500 l.f. \$ _____
 - road 500-2,640 l.f. \$ _____
 - road >2,640 l.f. \$ _____
 - 3b. Commercial/industrial and other impervious area <3,500 s.f. \$ _____
 - impervious area 3,500-43,460 s.f. \$ _____
 - impervious area >43,560 s.f. \$ _____
- 4. Relative size of project
 - 4a. Total tract area < 1 ac \$ _____
 - 1-5 ac \$ _____
 - 5-25 ac \$ _____
 - 25-100 ac \$ _____
 - 100-200 ac \$ _____
 - >200 ac \$ _____
- 5. Stormwater control measures
 - 5a. Detention basins and other controls which require a review of hydraulic routings (\$ per control). \$ _____
 - 5b. Other control facilities which require storage volume calculations but no hydraulic routings. (\$ per control) \$ _____
- 6. Site inspection (\$ per inspection) \$ _____
- Total \$ _____

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All subsequent reviews shall be 1/4 the amount of the initial review fee unless a new application is required as per Section 406 of the stormwater ordinance. A new fee shall be submitted with each revision in accordance with this schedule.

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425 Attachment 4

Township of Barrett

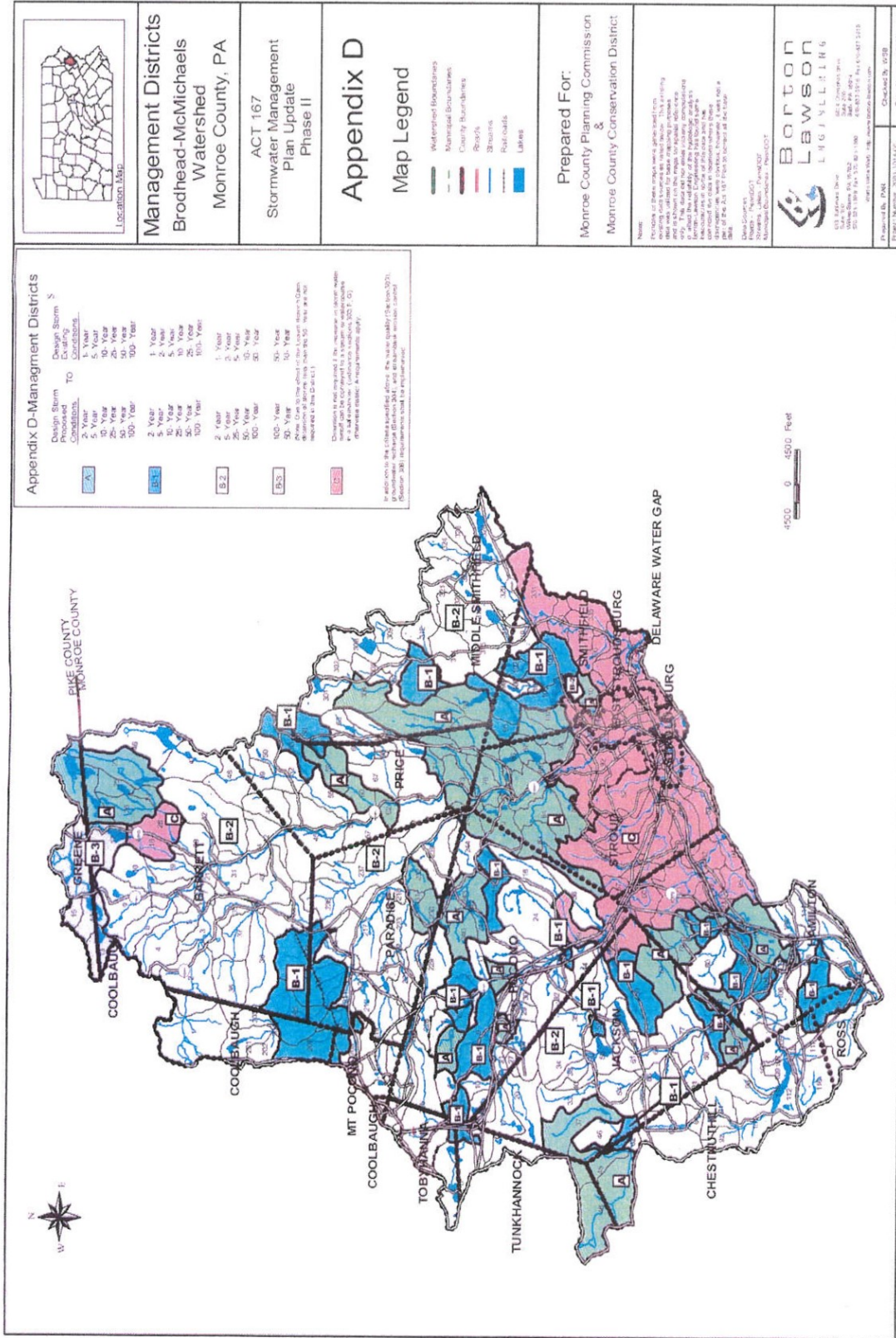
Ordinance Appendix D

Stormwater Management District Watershed Map

425 Attachment 4:1

Publication, Jun 2022

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STORMWATER MANAGEMENT

425 Attachment 5

Township of Barrett

Ordinance Appendix E West Nile Virus Guidance

Monroe County Conservation District Guidance: Stormwater Management and West Nile Virus

The Monroe County Conservation District recognizes the need to address the problem of nonpoint source pollution impacts caused by runoff from impervious surfaces. The new stormwater policy being integrated into Act 167 stormwater management regulations by the PA Department of Environmental Protection (DEP) will make nonpoint pollution controls an important component of all future plans and updates to existing plans. In addition, to meet post-construction antidegradation standards under the state National Pollution Discharge Elimination System (NPDES) permitting program, applicants will be required to employ best management practices (BMPs) to address nonpoint pollution concerns.

Studies conducted throughout the United States have shown that wet basins and in particular constructed wetlands are effective in traditional stormwater management areas such as channel stability and flood control, and are one of the most effective ways to remove stormwater pollutants (United States Environmental Protection Agency 1991, Center for Watershed Protection 2000). From Maryland to Oregon, studies have shown that as urbanization and impervious surface increase in a watershed, the streams in those watersheds become degraded (CWP 2000). Although there is debate over the threshold of impervious cover when degradation becomes apparent (some studies show as little as 6% while others show closer to 20%), there is agreement that impervious surfaces cause nonpoint pollution in urban and urbanizing watersheds, and that degradation is ensured if stormwater BMPs are not implemented.

Although constructed wetlands and ponds are desirable from a water quality perspective there may be concerns about the possibility of these stormwater management structures becoming breeding grounds for mosquitoes. The Conservation District feels that although it may be a valid concern, municipalities should not adopt ordinance provisions prohibiting wet basins for stormwater management.

Mosquitoes

The questions surrounding mosquito production in wetlands and ponds have intensified in recent years by the outbreak of the mosquito-borne West Nile virus. As is the case with all vector-borne maladies, the life cycle of West Nile virus is complicated, traveling from mosquito to bird, back to mosquito and then to other animals including humans. *Culex pipiens* was identified as the vector species in the first documented cases from New York in 1999. This species is still considered the primary transmitter of the disease across its range. Today there are some 60 species of mosquitoes that inhabit Pennsylvania. Along with *C. pipiens*, three other species have been identified as vectors of West Nile virus while four more have been identified as potential vectors.

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The four known vectors in NE Pennsylvania are *Culex pipiens*, *C. restuans*, *C. salinarius* and *Ochlerotatus japonicus*. All four of these species prefer, and almost exclusively use, artificial containers (old tires, rain gutters, birdbaths, etc.) as larval habitats. In the case of *C. pipiens*, the most notorious of the vector mosquitoes, the dirtier the water, the better they like it. The important factor is that these species do not thrive in functioning wetlands where competition for resources and predation by larger aquatic and terrestrial organisms is high.

The remaining four species, *Aedes vexans*, *Ochlerotatus Canadensis*, *O. triseriatus* and *O. trivittatus* are currently considered potential vectors due to laboratory tests (except the *O. trivittatus*, which did have one confirmed vector pool for West Nile virus in PA during 2002). All four of these species prefer vernal habitats and ponded woodland areas following heavy summer rains. These species may be the greatest threat of disease transmission around stormwater basins that pond water for more than four days. This can be mitigated, however, by establishing ecologically functioning wetlands.

Stormwater Facilities

If a stormwater wetland or pond is constructed properly and a diverse ecological community develops, mosquitoes should not become a problem. Wet basins and wetlands constructed as stormwater management facilities, should be designed to attract a diverse wildlife community. If a wetland is planned, proper hydrologic soil conditions and the establishment of hydrophytic vegetation will promote the population of the wetland by amphibians and other mosquito predators. In natural wetlands, predatory insects and amphibians are effective at keeping mosquito populations in check during the larval stage of development while birds and bats prey on adult mosquitoes.

The design of a stormwater wetland must include the selection of hydrophytic plant species for their pollutant uptake capabilities and for not contributing to the potential for vector mosquito breeding. In particular, species of emergent vegetation with little submerged growth are preferable. By limiting the vegetation growing below the water surface, larvae lose protective cover and there is less chance of anaerobic conditions occurring in the water.

Stormwater ponds can be designed for multiple purposes. When incorporated into an open space design a pond can serve as a stormwater management facility and a community amenity. Aeration fountains and stocked fish should be added to keep larval mosquito populations in check.

Publications from the PA Department of Health and the Penn State Cooperative Extension concerning West Nile Virus identify aggressive public education about the risks posed by standing water in artificial containers (tires, trash cans, rain gutters, bird baths) as the most effective method to control vector mosquitoes.

Conclusion

The Conservation District understands the pressure faced by municipalities when dealing with multifaceted issues such as stormwater management and encourages the incorporation of water quality management techniques into stormwater designs. As Monroe County continues to grow,

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conservation design, groundwater recharge and constructed wetlands and ponds should be among the preferred design options to reduce the impacts of increases in impervious surfaces. When designed and constructed appropriately, the runoff mitigation benefits to the community from these design options will far out weigh their potential to become breeding grounds for mosquitoes.