

Chapter 17

Stormwater Management

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Part 1**General Provisions****§17-101. Short Title.**

This Chapter shall be enacted as a substitute for current Chapter 17 of the Borough of Akron Code of Ordinances and may hereinafter be known and may be cited as the “Akron Borough Stormwater Management Ordinance” (“SWMO”).

(*Ord. 00075, 4/14/2014, §17-101*)

§17-102. Statement of Findings.

Council of the Borough of Akron finds that:

A. Inadequate management of accelerated stormwater runoff resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of existing streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge, threatens public health and safety, and increases nonpoint source pollution of water resources.

B. A comprehensive program of stormwater management (“SWM”), including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, welfare, and the protection of the people of the Municipality and all the people of the Commonwealth, their resources, and the environment.

C. Stormwater is an important water resource, which provides groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.

D. Federal and State regulations require certain municipalities to implement a program of stormwater controls. Akron Borough is required to obtain a permit for stormwater discharges from its municipal separate storm sewer systems (MS4) under the National Pollutant Discharge Elimination System (NPDES).

E. Riparian forest buffers enhance water quality by filtering pollutants in runoff, providing light control and temperature moderation, processing pollutants, increasing infiltration and providing channel and shoreline stability thus decreasing erosion.

(*Ord. 00075, 4/14/2014, §17-102*)

§17-103. Purpose.

The purpose of this Chapter is to promote health, safety, and welfare by minimizing the harm and maximizing the benefits described in §17-102 of this Chapter through provisions designed to:

A. Meet legal water quality requirements under State law, including regulations at 25 Pa.Code, Chapter 93 to protect, maintain, reclaim, and restore the

existing and designated uses of the waters of this Commonwealth.

- B. Preserve the natural drainage systems as much as practicable.
- C. Manage stormwater runoff close to the source.
- D. Provide procedures and performance standards for stormwater planning and management.
- E. Maintain groundwater recharge to prevent degradation of surface and groundwater quality and to otherwise protect water resources.
- F. Prevent scour and erosion of stream banks and streambeds.
- G. Provide proper operation and maintenance of all stormwater management best management practices (SWM BMPs) that are implemented within the Borough.
- H. Provide standards to meet NPDES permit requirements.
- I. Promote stormwater runoff prevention through the use of nonstructural best management practices (BMPs).
- J. Provide a regulatory environment that supports the proportion, density and intensity of development called for in the Borough's comprehensive plan; allow for creative methods of improving water quality and managing stormwater runoff; and promote a regional approach to water resource management.
- K. Help preserve and protect exceptional natural resources, and conserve and restore natural resource systems.
- L. Promote stormwater management practices that emphasize infiltration, evaporation, and transpiration.

(Ord. 00075, 4/14/2014, §17-103)

§17-104. Statutory Authority.

1. *Primary Authority.* The Borough is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), 32 P.S. §680.1, *et seq.*, as amended, the "Storm Water Management Act" and Act 394 of 1937, as amended, 35 P.S. §6911 *et seq.*, the Pennsylvania Clean Streams Law. The Borough also is empowered to regulate the Borough Code, 53 P.S. §45101 *et seq.*, including, but not limited to, Article XXII thereof.

2. *Secondary Authority.* The Borough also is empowered to regulate land use activities that affect runoff by the authority of the Act of July 31, 1968, P.L. 805, No. 247, the Pennsylvania Municipalities Planning Code, as amended (hereinafter "PMPC"). However, in the case of the PMPC, administrative and related provisions not specifically referenced in this Chapter shall not be considered adopted by reference. Ordinances adopted pursuant to the PMPC, including, but not limited to, Chapters 22 and 27 of the Borough of Akron Code of Ordinances, respectively covering subdivision and land development and zoning, shall continue to apply as amended.

(Ord. 00075, 4/14/2014, §17-104)

§17-105. Applicability.

The provisions, regulations, limitations, and restrictions of this Chapter shall apply

to regulated activities, as defined in this Chapter.

(*Ord. 00075, 4/14/2014, §17-105*)

§17-106. Repeals and Continuation of Prior Regulations.

1. Except as hereinafter provided, all of current Chapter 17 of the Borough of Akron Code of Ordinances shall be repealed on the effective date hereof. Notwithstanding the foregoing, except as otherwise required by law, this Chapter 17 is intended as a continuation of, and not a repeal of, existing regulations governing the subject matter. To the extent that this Chapter restates regulations contained in Chapter 17 previously enacted by the Borough, this Chapter shall be considered a restatement and not a repeal of such regulations. It is the specific intent of the Borough that all provisions of this Chapter shall be considered in full force and effect as of the date such regulations were initially enacted. All ordinances or parts of ordinances inconsistent with the provisions of this Chapter are hereby repealed. It is expressly provided that the provisions of this Chapter shall not affect any act done, contract executed or liability incurred prior to its effective date, or affect any suit or prosecution pending or to be instituted to enforce any rights, rule, regulation or ordinance, or part thereof, or to punish any violation which occurred under any prior stormwater regulation or Chapter. In the event any violation has occurred under any prior stormwater regulation or Chapter of the Borough's Code of Ordinances prosecution may be initiated against the alleged offender pursuant to the provisions of said prior stormwater regulation or Chapter, and the provisions and penalties provided in said prior stormwater regulation or Chapter shall remain effective as to said violation.

2. Any plan (hereinafter defined) pending at the time of the effective date of this Chapter shall be allowed to proceed with revisions, finalization and implementation in accordance with any ordinance in effect prior hereto. Any subdivision and land development plan filed pursuant to the provisions of the Pennsylvania Municipalities, and pursuant to the law and ordinances in effect in effect at the time of the effective date of this Chapter may proceed with development in accordance with the filing at the time of the effective date of this Chapter, consistent with §508(4) of the PMPC.

(*Ord. 00075, 4/14/2014, §17-106*)

§17-107. Compatibility with Other Ordinance Requirements.

Approvals issued pursuant to this Chapter do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

(*Ord. 00075, 4/14/2014, §17-108*)

§17-108. 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 permits or other authorization is unlawful. No action may be taken by a board, agency or employee of the Borough purporting to validate such a violation.

(*Ord. 00075, 4/14/2014, §17-109*)

§17-709. Borough Liability.

1. Except as specifically provided by the Pennsylvania Storm Water Management Act, Act of October 4, 1978, P.L. 864, No. 167, as amended, 32 P.S. §680.1 *et seq.*, the making of any administrative decision by the Borough or any of its officials or employees shall not constitute a representation, guarantee or warranty of any kind by the Borough of the practicability or safety of any proposed structure or use with respect to damage from erosion, sedimentation, stormwater runoff, flood, or any other matter, and shall create no liability upon or give rise to any cause of action against the Borough and its officials and employees. Borough, by enacting and amending this Chapter, does not waive or limit any immunity granted to the Borough and its officials and employees by the Governmental Immunity Act, 42 Pa.C.S. §8541 *et seq.*, and does not assume any liabilities or obligations.

2. Nothing contained in this Chapter and no review by the Borough or any of its agents or officials shall be construed by any person to be (unless specifically applied for and granted in writing, in advance, by the Borough Council), a waiver of any term or condition of this Chapter.

3. Borough shall not be held liable for lack of compliance with the terms and conditions of this Chapter by any person or for the mistakes of any person in complying with or implementing the terms and conditions of this Chapter.

4. All approvals are subject to all other laws, ordinances, rules and regulations then in effect applicable to all applications, which said other rules, ordinances and regulations are adopted herein by reference.

5. All applicants agree to and shall indemnify, defend and save harmless the Borough from any and all costs incurred by Borough (including its reasonable attorneys fees) arising out of intentional action or negligent action by applicants and/or their agents or employees.

(Ord. 00075, 4/14/2014, §17-110)

§17-110. Duty of Persons Engaged in the Development of Land.

Notwithstanding any provision(s) of this Chapter, including exemptions, any landowner or any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety, or other property. Such measures also shall include actions as are required to manage the rate, volume, direction, and quality of resulting stormwater runoff in a manner which otherwise adequately protects health, property, and water quality.

(Ord. 00075, 4/14/2014, §17-111)

§17-111. Financial Security.

1. A financial security (bond, restricted account or letter of credit) for stormwater related improvements shall be supplied by the developer or owner in conjunction with the subdivision/land development approval, or in conjunction with the SWM site plan approval if no subdivision/land development plan is required.

2. The applicant shall provide a financial security to the Borough for the timely installation and proper construction of all SWM facilities, including E&S BMPs, as

required by the approved SWM site plan and this Chapter and, as applicable, in accordance with the provisions of §§509, 510, and 511 of the MPC.

3. An improvement security (bond or letter of credit) for stormwater related improvements may be supplied by the developer or owner in conjunction with any subdivision or land development plan approval.

An applicant for subdivision or land development plan approval shall provide an improvement security to the Borough for the timely installation and proper construction of all stormwater management facilities as required by the approved stormwater management plan and this Chapter equal to 110 percent of the construction cost of the required controls.

The amount of financial security must be established based on the Borough's review and approval of an "opinion of probable cost" of the required improvements submitted by the developer's engineer. The opinion shall be signed, sealed, and dated by the registered professional engineer responsible for the opinion.

4. In the event that any SWM facilities which may be required have not been installed as provided in the approved SWM site plan the Council of the Borough is hereby granted the power to enforce any corporate bond, or other security by appropriate legal and equitable remedies. If proceeds of such bond, or other security are insufficient to pay the cost of installing or making repairs or corrections to all the SWM facilities covered by said security, the Council of the Borough may, at its option, install part of such SWM facilities and may institute appropriate legal or equitable action to recover the monies necessary to complete the remainder of the SWM facilities. All of the proceeds, whether resulting from the security or from any legal or equitable action brought against the Developer, or both, shall be used solely for the installation of the SWM facilities covered by such security, and not for any other municipal purpose.

(Ord. 00075, 4/14/2014, §17-112)

§17-112. Administration of Security.

1. Except as otherwise specifically herein provided, all issues associated with improvement security, shall be governed by the provisions of §§509, 510, and 511 of the PMPC, as amended 53 P.S. §§10509, 10510, 10511, which provisions, to the extent applicable, are adopted herein by reference.

2. If an irrevocable letter of credit from a financial institution is submitted as security, it shall not expire without the Borough being notified at least 60 days in advance.

(Ord. 00075, 4/14/2014, §17-113)

Part 2**Definitions of Terms****§17-201. Interpretation and Word Usage.**

The language set forth in the text of this Part shall be interpreted in accordance with the following rules of construction:

A. Words used or defined in one tense or form shall include other tenses or derivative forms.

B. Words in the singular number shall include the plural number, and words in the plural number shall include the singular number.

C. The masculine gender shall include the feminine and neuter. The feminine gender shall include the masculine and neuter. The neuter gender shall include the masculine and feminine.

D. The word “person” includes individuals, firms, partnerships, joint ventures, trusts, trustees, estates, corporations, associations and any other similar entities.

E. The word “lot” includes the words “plot,” “tract,” and “parcel.”

F. The words “shall,” “must” and “will” are mandatory in nature and establish an obligation or duty to comply with the particular provision. The words “may” and “should” are permissive.

G. The time, within which any act required by this Chapter is to be performed, shall be computed by excluding the first day and including the last day. However, if the last day is a Saturday or Sunday or a holiday declared by the United States Congress or the Pennsylvania General Assembly, it shall also be excluded. The word “day” shall mean a calendar day, unless otherwise indicated.

H. Words not defined herein shall first be defined by definitions contained in the PMPC and then by definitions contained in Chapter 22 of the Borough of Akron Code of Ordinances known as the “Akron Borough Subdivision and Land Development Ordinance” and Chapter 27 of the Borough of Akron Code of Ordinances known as the “Akron Borough Zoning Ordinance.”

I. Any words not defined in this Part, the above or in §107 of the MPC shall be construed as defined in New International Webster’s Dictionary of the English Language—Deluxe Encyclopedic Edition (1995 Edition).

J. References to officially adopted regulations, standards, or publications of DEP or other governmental agencies shall include the regulation, publication, or standard in effect on the date when a SWM site plan is first filed. It is the intent of Council in enacting this Section to incorporate such changes to statutes, regulations, and publications to the extent authorized by 1 Pa.C.S. §1937.

K. In interpreting and applying the provisions of this Chapter, they shall be held to be the minimum requirements for the promotion of public health, safety, comfort, convenience and general welfare. When the provisions of this Chapter impose greater restrictions than those of any other statute, ordinance or regulations, the provisions of this Chapter shall be controlling. Where the provisions of

any statute, other ordinance, or regulations impose greater restrictions than this Chapter, the provisions of such statute or other ordinance or regulations shall be controlling. This Chapter is not intended to interfere with, abrogate or annul any easement, covenant, or other agreement between private parties. However, where this Chapter imposes greater restrictions than those imposed upon such easement, covenant or agreement, the provisions of this Chapter shall apply. The provisions of this Chapter and those of Chapters 22 and 27 of the Borough of Akron Code of Ordinances shall be read together, so to give a logical interpretation of the integration of their various requirements.

(Ord. 00075, 4/14/2014, §17-201)

§17-202. Definitions of Terms.

Accelerated erosion—the removal of the surface of the land through the combined action of man’s activity and the natural processes at a rate greater than would occur because of the natural process alone.

Access easement—a right granted by a landowner to a grantee (including the Borough and its designees), allowing entry for the purpose of inspecting, maintaining and repairing SWM facilities.

Act 167 Plan—a plan prepared under the authority of Pennsylvania’s Storm Water Management Act of October 4, 1978.

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

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

Animal heavy use areas—a barnyard, feedlot, loafing area, exercise lot, or other similar area on an agricultural operation where due to the concentration of animals, it is not possible to establish and maintain vegetative cover of a density capable of minimizing accelerated erosion and sedimentation by usual planting methods. The term does not include entrances, pathways and walkways between areas where animals are housed or kept in concentration.

Applicant—a landowner and/or developer, as hereinafter defined, including his heirs, successors and assigns, who has filed an application (with the written permission of all land owners) to the Borough for approval to engage in any regulated activity at a development site located within the Borough.

As-built—a plan prepared by a property owner or their representatives.

As-built survey and plan—a record survey and plan, including, but not limited to, performing a survey upon completion of the construction of improvements within or adjacent to a development site for the purpose of verifying compliance with the approved stormwater management plan and also sufficient information so that the

Borough may monitor maintenance of the facilities in the future, including topographic survey of final land contouring, storm sewer facility locations and pipe grades, and related facilities. As part of the as-built survey and plan, the developer shall be responsible for verifying the adequacy of all stormwater facilities by submitting hydraulic and hydrologic calculations, as necessary, to confirm compliance with the approved design and plan. All plans and calculations must include the seal, date and signature of the qualified registered professional(s) responsible for the as-built survey and plan and calculations.

BMP (best management practice)—activities, facilities, control measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during and after earth disturbance activities.¹ See also nonstructural BMP and structural BMP.

BMP Manual—the *Pennsylvania Stormwater Best Management Practices Manual* of December 2006, or most recent version thereof.

Building—any enclosed or open structure, other than a boundary wall or fence, occupying more than 4 square feet of area and/or having a roof supported by columns, piers, or walls.

Carbonate geology—limestone or dolomite bedrock. Carbonate geology is often associated with karst topography.

Certificate of completion—documentation verifying that all permanent SWM facilities have been constructed according to the plans and specifications and approved revisions thereto.

Chapter 102—25 Pa.Code, Chapter 102, Erosion and Sediment Control.

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

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

Cistern—a reservoir or tank for storing rainwater.

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

Conservation plan—a plan written by an NRCS certified planner that identifies conservation practices and includes site specific BMPs for agricultural plowing or tilling activities and animal heavy use areas.

Conservation practices—practices installed on agricultural lands to improve farmland, soil and/or water quality which have been identified in a current conservation plan.

Conveyance—(n) any structure that carries a flow. (v) The ability of a pipe, culvert, swale or similar facility to carry the peak flow from the design storm.

Culvert—a structure with appurtenant works which can convey a stream under or through an embankment or fill.

DEP also PA DEP or PADEP—the Pennsylvania Department of Environmental Protection or any agency successor to the Pennsylvania Department of Environmental Protection.

Deck—an extension from a building without solid walls or a roof to be used for recreational purposes. Any deck wherein there is at least a 1/8 inch gap at least every

8 inches between decking material shall not be considered a regulated activity for the purpose of this Chapter, if in fact the surface below the deck is pervious.

Design storm—the magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of SWM systems.

Designee—the agent of the Borough involved with the administration, review or enforcement of any provisions of this Chapter by contract or memorandum of understanding.

Detention basin—an impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a controlled rate.

Developer—a person who undertakes any regulated activity of this Chapter.

Development site (site)—the specific area of land where regulated activities in the Borough are planned, conducted or maintained.

Disappearing stream—a stream in an area underlain by limestone or dolomite that flows underground for a portion of its length.

Disturbed area—an land area where an earth disturbance activity is occurring or has occurred.

Drainage easement—rights to occupy and use another person’s real property for the installation and operation of stormwater management facilities, or for the maintenance of natural drainageways to preserve and maintain a channel for the flow of stormwater therein, or to safeguard health, safety, property, and facilities, approved in advance by a Borough designee and recorded in the Office of the Recorder of Deeds in and for Lancaster County, superior to any lien of record.

E&S—erosion and sediment.

E&S Plan (also erosion and sediment control plan)—a site-specific plan consisting of both drawings and a narrative that identifies BMPs to minimize accelerated erosion and sedimentation before, during and after earth disturbance activities.

Earth disturbance activity—a construction or other human activity which disturbs the surface of the land, including, but not limited to: clearing and grubbing; grading; excavations; embankments; land development; agricultural plowing or tilling; operation of animal heavy use areas; timber harvesting activities; road maintenance activities; oil and gas activities; well drilling; mineral extraction; building construction; and the moving, depositing, stockpiling, or storing of soil, rock, or earth materials.¹

Environmentally sensitive area—slopes greater than 15 percent, shallow bedrock (located within 6 feet of ground surface²), wetlands, natural heritage areas and other areas designated as Conservation or Preservation in Greenscapes, the Green Infrastructure Element of the County Comprehensive Plan, where encroachment by land development or land disturbance results in degradation of the natural resource.

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

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

FEMA—the Federal Emergency Management Agency.

Flood—a general but temporary condition of partial or complete inundation of

normally dry land areas from the overflow of streams, rivers, and other waters of this Commonwealth.

Flood fringe—that portion of the floodplain outside of the floodway.³

Flood Plain Management Act—Act of October 4, 1978, P.L. 851, No. 166, as amended 32 P.S. §679.101 *et seq.*

Floodplain—any land area susceptible to inundation by water from any natural source or delineated by applicable Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary—Mapped as being a special flood hazard area. Also, the area of inundation that functions as a storage or holding area for floodwater to a width required to contain a base flood of which there is a 1 percent chance of occurrence in any given year. The floodplain contains both the floodway and the flood fringe.

Floodway—that portion of the floodplain which is effective in carrying flow, within which this carrying capacity must be preserved and where the flood hazard is generally highest, i.e., where water depths and velocities are the greatest. It is that area which provides for the discharge of the base flood so the cumulative increase in water surface elevation is no more than 1 foot.³

Forest management / timber operations—planning and activities necessary for the management of forest land. These include conducting a timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

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

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

Groundwater recharge—the process by which water from above the ground surface is added to the saturated zone of an aquifer, either directly or indirectly.

Hydrologic Soil Group (HSG)—refers to soils grouped according to their runoff-producing characteristics by NRCS. There are four (4) runoff potential groups ranging from A to D.

A. (Low runoff potential) soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission (greater than 0.30 inches/hour).

B. Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well-to-well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (from 0.15 to 0.30 inches/hour).

C. Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission (from 0.05 to 0.15 inches/hour).

D. (High runoff potential) Soils having very slow infiltration rates when

thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission (from 0 to 0.05 inches/hour).

Impervious surface (impervious area)—surfaces which prevent the infiltration of water into the ground. All structures, buildings, parking areas, driveways, roads, streets, sidewalks, and any areas of concrete, asphalt, packed stone, and compacted soil shall be considered impervious surface if they prevent infiltration.

Impoundment—a retention or detention facility designed to retain stormwater runoff and infiltrate it into the ground (in the case of a retention basin) or release it at a controlled rate (in the case of a detention basin).

Infiltration structures—a structure designed to direct runoff into the ground (e.g., french drains, seepage pits, seepage trench, rain gardens, vegetated swales, pervious paving, infiltration basins, etc.).

Inlet—a surface connection to a closed drain. The upstream end of any structure through which water may flow.

Intermittent—a natural, transient body or conveyance of water that exists for a relatively long time, but for weeks or months of the year is below the local water table and obtains its flow from both surface runoff and groundwater discharges.

Invasive vegetation (invasives)—plants which grow quickly and aggressively, spreading, and displacing other plants. Invasives typically are introduced into a region far from their native habitat. See invasive plants in Pennsylvania by the Department of Conservation and Natural Resources.

Karst—a type of topography or landscape characterized by features including, but not limited to, surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

Land development—any of the following activities:

A. The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:

(1) A group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure.

(2) The division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.

B. Any subdivision of land.

C. Development in accordance with §503(1.1) of the Pennsylvania Municipalities Planning Code.

Landowner—the legal or beneficial owner or owners of land including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if he is authorized under the lease to exercise the rights of the landowner, or other person having a proprietary interest in land.

Limiting zone—a rock formation, other stratum, or soil condition which is so slowly permeable that it effectively limits downward passage of effluent. Season high water tables, whether perched or regional also constitute a limiting zone.¹²

Lineament—a linear feature in a landscape which is an expression of an underlying geological structure such as a fault.

Manning's equation—an equation for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. Manning's equation assumes steady, gradually varied flow.

Maximum extent practicable (MEP)—applies when the applicant demonstrates to the Borough's satisfaction that the performance standard is not achievable. The applicant shall take into account the best available technology, cost effectiveness, geographic features, and other competing interests such as protection of human safety and welfare, protection of endangered and threatened resources, and preservation of historic properties in making the assertion that the performance standard cannot be met and that a different means of control is appropriate.⁵

MPC—the Pennsylvania Municipalities Planning Code, Act of 1968, P.L. 805, No. 247, as reenacted and amended, 53 P.S. §10101 *et seq.*

Municipal separate storm sewer—a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), which is all of the following: (A) owned or operated by a State, City, Town, Borough, Township, County, District, association or other public body (created under State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater or other wastes; (B) designed or used for collecting or conveying stormwater; (C) not a combined sewer; and (D) not part of a publicly owned treatment works as defined at 40 CFR §122.2.

Municipal separate storm sewer system (MS4)—all separate storm sewers that are defined as “large” or “medium” or “small” municipal separate storm sewer systems pursuant to 40 CFR §122.26(b)(18), or designated as regulated under 40 CFR §122.26(a)(1)(v).

Municipality—the Borough of Akron, Lancaster County, Pennsylvania.

NRCS—Natural Resources Conservation Service (previously Soil Conservation Service, or SCS).

National Pollution Discharge Elimination System (NPDES)—a permit issued under 25 Pa.Code, Chapter 92a (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance) for the discharge or potential discharge of pollutants from a point source to surface waters.

Native vegetation—plant species that have evolved or are indigenous to a specific geographical area. These plants are adapted to local soil and weather conditions as well as pests and diseases.

Natural drainageway—an existing channel for water runoff that was formed by natural processes.

Natural ground cover—ground cover which mimics the infiltration characteristics of predominant hydrologic soil group found at the site.

Nonpoint source pollution—any source of water pollution that does not meet the

legal definition of “point source” in §502(14) of the Clean Water Act.

Nonstructural BMPs—planning and design approaches, operational and/or behavior-related practices which minimize stormwater runoff generation resulting from an alteration of the land surface or limit contact of pollutants with stormwater runoff.

Open channel—a drainage element in which stormwater flows with an open surface. Open channels include, but shall not be limited to, natural and man-made drainage ways, swales, streams, ditches, canals, and pipes flowing partly full. Open channels may include closed conduits so long as the flow is not under pressure.

Outfall—point where water flows from a conduit, stream, pipe, or drain.

Peak discharge—the maximum rate of stormwater runoff from a specific storm event.

PennDOT—the Pennsylvania Department of Transportation or any agency successor thereto.

Pervious area—any material/surface that allows water to pass through at a rate equal to or greater than natural ground cover.

Pipe—a culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Plans—the SWM and erosion and sediment control plans and narratives.

Planning Commission—the Planning Commission of the Borough of Akron, Lancaster County, Pennsylvania.

Process wastewater—water that comes in contact with any raw material, product, byproduct, or waste during any production or industrial process.

Qualified person—any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by this Chapter.

Rate control—SWM controls used to manage the peak flows for the purposes of channel protection and flood mitigation.

Rational formula (rational method)—a rainfall-runoff relation used to estimate peak flow.

Redevelopment—any physical improvement to a previously developed lot that involves earthmoving, removal, or addition of impervious surfaces.

Regional Stormwater Management Plan—a plan to manage stormwater runoff from an area larger than a single development site. A Regional Stormwater Management Plan could include two adjacent parcels, an entire watershed, or some defined area in between. Regional Stormwater Management Plans can be prepared for new development, or as a retrofit to manage runoff from already developed areas.

Regulated activities—activities, including earth disturbance activities that involve the alteration or development of land in a manner that may affect stormwater runoff. Regulated activities shall include, but not be limited to:

- A. Land development subject to the requirements of the Borough’s Subdivision and Land Development Ordinance [Chapter 22].
- B. Removal of ground cover, grading, filling or excavation.
- C. Construction of new or additional impervious or semi-impervious surfaces (driveways, parking lots, etc.), and associated improvements.

D. Construction of new buildings or additions to existing buildings.

E. Installation or alteration of stormwater management facilities and appurtenances thereto.

F. Diversion or piping of any watercourse.

G. Any other regulated activities where the Borough determines that said activities may affect any existing watercourse's stormwater management facilities, or stormwater drainage patterns.

Release rate—for a specific design storm or list of design storms, the percentage of peak flow rate for existing conditions which may not be exceeded for the proposed conditions.

Release rate map—a graphical representation of the release rates for a specific area.

Retention basin—a stormwater management facility that includes a permanent pool for water quality treatment and additional capacity above the permanent pool for temporary runoff storage.

Riparian—pertaining to a stream, river or other watercourse. Also, plant communities occurring in association with any spring, lake, river, stream or creek through which waters flow at least periodically.⁶

Riparian buffer—a BMP that is an area of permanent vegetation along a watercourse.

Riparian corridor—a narrow strip of land, centered on a stream or river that includes the floodplain as well as related riparian habitats adjacent to the floodplain.⁶

Riparian corridor easement—an easement created for the purpose of protecting and preserving a riparian corridor.

Riparian forest buffer—a type of riparian buffer that consists of permanent vegetation that is predominantly native trees, shrubs and forbs along a watercourse that is maintained in a natural state or sustainably managed to protect and enhance water quality, stabilize stream channels and banks, and separate land use activities from surface waters.

Rooftop detention—temporary ponding and gradual release of stormwater falling directly onto roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff—any part of precipitation that flows over the land surface.

SCS—U.S. Department of Agriculture, Soil Conservation Service (now known as NRCS).

Sediment—soils or other materials transported by stormwater as a product of erosion.¹

Sediment basin—a barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other material transported by water.

Sediment pollution—the placement, discharge or any other introduction of sediment into the waters of the Commonwealth occurring from the failure to design, construct, implement or maintain control measures and control facilities in accordance with the requirements of this Chapter.

Sedimentation—the action or process of forming or depositing sediment in waters

of this Commonwealth.¹

Seepage pit / seepage trench—an area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the ground.

Semi-impervious / semi-perilous surface—a surface which prevents some infiltration of water into the ground.

Sheet flow—runoff which flows over the ground surface as a thin, even layer, riot concentrated in a channel.

Small project—regulated activities that, measured on a cumulative basis from the effective date of this Chapter, create additional impervious areas of more than 1,000 square feet and less than 5,000 square feet, or involve removal of ground cover, grading, filling, or excavation of an area less than 5,000 square feet and do not involve the alteration of stormwater facilities or watercourses. Domestic landscape and/or vegetable gardening is exempt from specific approval and permitting under this Chapter.

Small storm event—a storm having a frequency of recurrence of once every 2 years or smaller.

Soil-cover complex method—a method of runoff computation developed by the SCS (now NRCS) that is based on relating soil type and land use/cover to a runoff parameter called curve number (CN). For more information, see “Urban Hydrology for Small Watersheds,” Second Edition, Technical Release No. 55, SCS, June 1986 (or most current edition).

Soil group, hydrologic—see “hydrologic soil group.”

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

Storage—a volume above or below ground that is available to hold stormwater.

Storm event—a storm of a specific duration, intensity, and frequency.⁷

storm sewer—a system of pipes and/or open channels designed to convey stormwater.

Stormwater—drainage runoff from the surface of the land resulting from precipitation or snow or ice melt.

Storm Water Management Act—Act of October 4, 1978, P.L. 864, No. 167, as amended 32 P.S. §680.1 *et seq.*

Stormwater management best management practices (SWM BMP)—see “BMPs.”

Stormwater management facility (SWM facility)—any structure, natural or manmade, that, due to its condition, design, or construction, conveys, stores, infiltrates/evaporates/transpires, cleans or otherwise affects stormwater runoff. Typical SWM facilities include, but are not limited to, detention and retention basins, open channels, watercourses, road gutters, swales, storm sewers, pipes, BMPs, and infiltration structures.

Stormwater management operation and maintenance plan (O&M plan)—a plan, including a narrative, to ensure proper functioning of the SWM facilities in accordance with Part 6 of this Chapter.

Stormwater management site plan (SWM site plan)—the plan prepared by the developer or his representative indicating how stormwater runoff will be managed at

a particular development site according to this Chapter.

Stream—a watercourse.

Structural BMPs—physical devices and practices that capture and treat stormwater runoff. Structural stormwater BMPs are permanent appurtenances to the development site.

Structure—any man-made object having an ascertainable stationary location on or in land or water, whether or not affixed to the land.⁸

Subdivision—the division or re-division of a single lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land, including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership, or building, or lot development, or as defined in the MPC.

Swale—a low lying stretch of land which gathers or carries surface water runoff.

SWM—stormwater management.

SWM site plan—a stormwater management site plan.

Timber operations—see “forest management.”

Time of concentration (T_c)—the time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

Top of streambank—first substantial break in slope between the edge of the bed of the stream and the surrounding terrain. The top of streambank can either be a natural or constructed (that is, road or railroad grade) feature, lying generally parallel to the watercourse.

Treatment train—the sequencing of structural best management practices to achieve optimal flow management and pollutant removal from urban stormwater.

USDA—United States Department of Agriculture.

Volume control—SWM controls, or BMPs, used to remove a predetermined amount of runoff or the increase in volume between the pre- and post-development design storm.

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

Watershed—the entire region or area drained by a watercourse.

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

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

Woodland—land predominantly covered with trees and shrubs. Without limiting the

foregoing, Woodlands include all land areas of 10,000 square feet or greater, supporting at least 100 trees per acre, so that either (A) at least 50 trees are 2 inches or greater in [diameter at breast height] [(DBH)], or (B) 50 trees are at least 12 feet in height.

(Ord. 00075, 4/14/2014, §17-202)

Part 3**Stormwater Management Standards****§17-301. General Requirements.**

1. Preparation of a SWM site plan is required for all regulated activities, unless preparation and submission of the SWM site plan is specifically exempted according to §17-502 or the activity qualifies as a small project.

2. No regulated activities shall commence until the Borough issues unconditional written approval of a SWM site plan or stormwater permit. The Borough's approval shall not constitute a warranty by the Borough to the owner, developer or any third party that the plan or permit is in conformance with the laws of this Commonwealth or this Chapter.

3. SWM site plans approved by the Borough, in accordance with §17-505, shall be on site throughout the duration of the regulated activity.

4. The Borough may, after consultation with DEP, 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. The Borough shall maintain a record of consultations with DEP pursuant to this subsection. Where an NPDES permit for stormwater discharges associated with construction activities is required, issuance of an NPDES permit shall constitute satisfaction of consultation with DEP.

5. For all regulated activities, erosion and sediment control and stormwater management BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this 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 Manual),⁹ No. 363-2134-008 (March 2012), as amended and updated, and the BMP Manual.

6. Developers have the option to propose a Regional Stormwater Management Plan or participate in a Regional Stormwater Management Plan developed by others. A Regional Stormwater Management Plan may include offsite volume and rate control, as appropriate and supported by a detailed design approved by the Municipality in accordance with subsection .4. A Regional Stormwater Management Plan must meet all of the volume and rate control standards required by this Chapter for the area defined by the Regional Stormwater Management Plan, but not necessarily for each individual development site. Appropriate agreements must be established to ensure the requirements of this Chapter and the requirements of the Regional Stormwater Management Plan are met.

7. Unless prohibited by Akron Borough.

8. Zoning Ordinance [Chapter 27] or any ordinance which regulates construction and development within the areas of the Borough subject to flooding, and any other applicable requirements of the Flood Plain Management Act, stormwater management facilities located in the floodplain are permitted when designed and constructed in accordance with the more strict provisions of Chapter 27 of the Akron Borough Code of

Ordinances and the BMP Manual, regulatory requirements and the requirements of this Chapter.

9. *Impervious Areas.*

A. The measurement of impervious area shall include all of the impervious areas in the total proposed development even if development is to take place in stages or phases.

B. For development taking place in stages or phases, the entire development plan must be used in determining conformance with this Chapter.

C. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious.

10. All regulated activities shall include such measures as necessary to:

A. Protect health, safety, and property.

B. Meet the water quality goals of this Chapter by implementing measures to:

(1) Protect and/or improve the function of floodplains, wetlands, and wooded areas.

(2) Protect and/or improve native plant communities including those within the riparian corridor.

(3) Protect and/or improve natural drainageways from erosion.

(4) Minimize thermal impacts to waters of this Commonwealth.

(5) Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible.

11. The design of all stormwater management facilities over karst shall include an evaluation of measures to minimize adverse effects.

12. Infiltration BMPs shall be spread out, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Chapter. Infiltration BMPs shall include pretreatment BMPs unless shown to be unnecessary.

13. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and development site conditions and shall be constructed on soils that have the following characteristics:

A. A minimum depth of 24 inches between the bottom of the facility and the limiting zone, unless it is demonstrated to the satisfaction of the Borough that the selected BMP has design criteria which allow for a smaller separation.

B. A stabilized infiltration rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the applicant's professional designer.

(1) The stabilized infiltration rate is to be determined in the same location and within the same soil horizon as the bottom of the infiltration facility.

(2) The stabilized infiltration rate is to be determined as specified in the BMP Manual.

14. The calculation methodology to be used in the analysis of volume and peak

rates of discharge shall be as required in §17-305.

15. A planting plan is required for all vegetated stormwater BMPs.

A. Native or naturalized/noninvasive vegetation suitable to the soil and hydrologic conditions of the development site shall be used unless otherwise specified in the BMP Manual.

B. Invasive vegetation may not be included in any planting schedule. (See invasive plants in Pennsylvania by the Department of Conservation and Natural Resources (DCNR)).

C. The limit of existing, native vegetation to remain shall be delineated on the plan along with proposed construction protection measures.

D. Prior to construction, a tree protection zone shall be delineated at the dripline of the tree canopy. All trees scheduled to remain during construction shall be marked; however, where groups of trees exist, only the trees on the outside edge need to be marked. A 48-inch high snow fence or 48-inch high construction fence mounted on steel posts located 8 feet on center shall be placed along the tree protection boundary. No construction, storage of material, temporary parking, pollution of soil, or regrading shall occur within the tree protection zone.

E. All planting shall be performed in conformance with good nursery and landscape practice. Plant materials shall conform to the standards recommended by the American Association of Nurseryman, Inc., in the American Standard of Nursery Stock.

(1) Planting designs are encouraged to share planting space for optimal root growth whenever possible.

(2) No staking or wiring of trees shall be allowed without a maintenance note for the stake and/or wire removal within one year of planting.

16. Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase to maintain maximum infiltration capacity. Staging of earthmoving activities and selection of construction equipment should consider this protection.

17. Infiltration BMPs shall not be constructed nor receive runoff from disturbed areas until the entire contributory drainage area to the infiltration BMP has achieved final stabilization.

18. A minimum 10-foot wide access easement shall be provided for all stormwater facilities with tributary areas equal or greater than 1,000 sq. ft. and not located within a public right-of-way. Easements shall provide for ingress and egress to a public right-of-way.

19. Drainage easements shall be provided where the conveyance, treatment, or storage of stormwater, either existing or proposed, is identified on the SWM site plan. Drainage easements shall be provided to contain and convey the 100-year frequency flood.

20. The Borough may require additional stormwater control measures for stormwater discharges to special management areas including, but not limited to:

A. Water bodies listed as “impaired” on Pennsylvania’s Clean Water Act 303(d/305(b)) Integrated List.

B. Any water body or watershed with an approved total maximum daily load (TMDL).

C. Critical areas with sensitive resources (e.g., State designated special protection waters, cold water fisheries, carbonate or other groundwater recharge areas highly vulnerable to contamination, drainage areas to water supply reservoirs, source water protection zones, etc.)

21. Roof drains and sump pumps shall be tributary to infiltration or vegetative BMPs. Use of catchment facilities for the purpose of reuse is also permitted.

22. Nonstructural BMPs shall be utilized for all regulated activities unless proven to be impractical.

(Ord. 00075, 4/14/2014, §17-301)

§17-302. Volume Controls.

Volume control BMPs are intended to maintain existing hydrologic conditions for small storm events by promoting groundwater recharge and/or evapotranspiration as described in this Section. Runoff volume controls shall be implemented using the design storm method described in paragraph .A below, or through continuous modeling approaches or other means as described in the BMP Manual. Small projects may use the method described in paragraph .B to design volume control BMPs.

A. The design storm method is applicable to any size of regulated activity. This method requires detailed modeling based on site conditions.

(1) Do not increase the post development total runoff volume for all storms equal to or less than the 2-year 24-hour storm event.

(2) For modeling purposes:

(a) Existing (predevelopment) non-forested pervious areas must be considered meadow in good condition.

(b) When the existing project site contains impervious area, 20 percent of existing impervious area to be disturbed shall be considered meadow in good condition in the model for existing conditions.

(c) The maximum loading ratio for volume control facilities in Karst areas shall be 3:1 impervious drainage area to infiltration area and 5:1 total drainage area to infiltration area. The maximum loading ratio for volume control facilities in non-Karst areas shall be 5:1 impervious drainage area to infiltration area and 8:1 total drainage area to infiltration area. A higher ratio may be approved by the Borough if justification is provided. Hydraulic depth may be used as an alternative to an area based loading ratio if the design hydraulic depth is shown to be less than the depth that could result from the maximum area loading ratio.

B. *Volume Control for Small Projects.*

(1) At least the first 1 inch of runoff from new impervious surfaces or an equivalent volume shall be permanently removed from the runoff flow—i.e., it shall not be released into the surface waters of this Commonwealth. Removal options include reuse, evaporation, transpiration and infiltration.

C. A detailed geologic evaluation of the development site shall be performed

in areas of carbonate geology to determine the design parameters of recharge facilities. A report shall be prepared in accordance with §17-405.1 of this Borough.

D. Storage facilities, including normally dry, open top facilities, shall completely drain the volume control storage over a period of time not less than 24 hours and not more than 72 hours from the end of the design storm. Any designed infiltration at such facilities is exempt from the minimum 24 hour standard, i.e., may infiltrate in a shorter period of time, provided that none of this water will be discharged into waters of this Commonwealth.

E. Any portion of the volume control storage that meets the following criteria may also be used as rate control storage:

(1) Volume control storage that depends on infiltration is designed according to the infiltration standards in §17-301.

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

F. Volume control storage facilities designed to infiltrate shall avoid the least permeable hydrologic soil group(s) at the development site.

(Ord. 00075, 4/14/2014, §17-302)

§17-303. Rate Controls.

Rate control for large storms, up to the 100-year event, is essential to protect against immediate downstream erosion and flooding.

A. *Match Pre-development Hydrograph.* Applicants shall provide infiltration facilities or utilize other techniques which will allow the post-development 100-year hydrograph to match the pre-development 100-year hydrograph, along all parts of the hydrograph, for the development site. To match the pre-development hydrograph, the post development peak rate must be less than or equal to the pre-development peak rate, and the post development runoff volume must be less than or equal to the pre-development volume for the same storm event. A shift in hydrograph peak time of up to 5 minutes and a rate variation of up to 5 percent at a given time may be allowable to account for the timing affect of BMPs used to manage the peak rate and runoff volume. "Volume control" volumes as given in §17-302 above may be used as part of this option.

B. Where the pre-development hydrograph cannot be matched, one of the following shall apply:

(1) For areas not covered by a release rate map from an approved Act 167 Plan:

Post development discharge rates shall not exceed the predevelopment discharge rates for the 2-, 10-, 25-, 50-, and 100-year 24-hour storm events.* If it is shown that the peak rates of discharge indicated by the post development analysis are less than or equal to the peak rates of discharge indicated by the predevelopment analysis for 2-, 10-, 25-, 50-, and 100-year, 24-hour storms,* then the requirements of this Section have been met. Otherwise, the applicant shall provide additional controls as necessary to satisfy the peak rate of discharge requirement.

* A 24-hour SCS type II storm or an IDF curve rational method storm. See Table 17-3-1 in §17-305.

(2) For areas covered by a release rate map from an approved Act 167 Plan:

For the 2-, 10-, 25-, 50-, and 100-year storm events,* the post development peak discharge rates will follow the applicable approved release rate maps.

*A 24-hour SCS type II storm or an IDF curve rational method storm. See Table 17-3-1 in §17-305.

C. Normally dry, open top, storage facilities shall completely drain the rate control storage over a period of time less than or equal to 24 hours from the peak 100-year water surface design elevation.

D. A variety of BMPs should be employed and tailored to suit the development site. The following is a partial listing of BMPs which can be utilized in SWM systems for rate control where appropriate:

- (1) Decreased impervious surface coverage.
- (2) Routed flow over grass.
- (3) Grassed channels and vegetated strips.
- (4) Bio-retention areas (rain gardens).
- (5) Concrete lattice block or permeable surfaces.
- (6) Seepage pits, seepage trenches or other infiltration structures.
- (7) Rooftop detention.
- (8) Parking lot detention.
- (9) Cisterns and underground reservoirs.
- (10) Amended soils.
- (11) Retention basins.
- (12) Detention basins.
- (13) Other methods as may be found in the BMP Manual.

E. Small projects are not required to provide for rate control.

(Ord. 00075, 4/14/2014, §17-303)

§17-304. Stormwater Management Performance Standards.

1. Runoff from impervious areas shall be drained to pervious areas within the development site, unless the site has 85 percent or more impervious cover and is a redevelopment,¹⁰ in which case the portion of the site that discharges to pervious areas shall be maximized.

2. Stormwater runoff from a development site to an adjacent property shall flow directly into a natural drainageway, watercourse, or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow.

3. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification of the adjacent

property owner(s) by the developer. Such stormwater flows shall be subject to the requirements of this Borough, including the establishment of a drainage easement. Copies of all such notifications shall be included in SWM site plan submissions.

4. Existing on-site natural and man-made SWM facilities shall be used to the maximum extent practicable.

5. Stormwater runoff shall not be transferred from one sub-watershed to another unless they are sub-watersheds of a common watershed that join together within the perimeter of the development site and the effect of the transfer does not alter the peak discharge onto adjacent lands.

6. Minimum floor elevations for all structures that would be affected by a basin, other temporary impoundments, or open conveyance systems where ponding may occur shall be 2 feet above the 100-year water surface elevation. If basement or underground facilities are proposed, detailed calculations addressing the effects of stormwater ponding on the structure and water-proofing and/or flood-proofing design information shall be submitted for approval.

7. All stormwater conveyance facilities (excluding detention, retention, and wetland basin outfall structures) shall be designed to convey a 25-year storm event.* All stormwater conveyance facilities (excluding detention, retention, and wetland basin outfall structures) conveying water originating from offsite shall be designed to convey a 50-year storm event.* Safe conveyance of the 100-year runoff event* to appropriate peak rate control BMPs must be demonstrated in the design.

* A 24-hour SCS Type II storm or an IDF curve rational method storm.

8. Erosion protection shall be provided along all open channels, and at all points of discharge. Flow velocities from any storm sewer may not result in erosion of the receiving channel.

(Ord. 00075, 4/14/2014, §17-304)

§17-305. Calculation Methodology.

1. Any stormwater runoff calculations involving drainage areas greater than 200 acres and time of concentration (T_c) greater than 60 minutes, including on- and off-site areas, shall use generally accepted calculation techniques based on the NRCS soil-cover complex method.

2. Stormwater runoff from all development sites shall be calculated using either the modified rational method, a soil-cover-complex methodology, or other method acceptable to the Borough. Table 17-3-1 summarizes acceptable computation methods. It is assumed that all methods will be selected by the design professional based on the individual limitations and suitability of each method for a particular development site.

Table 17-3-1 Acceptable Computation Methodologies for Stormwater Management Plans		
Method	Method Developed by	Applicability
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.

Method	Method Developed by	Applicability
WinTR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1/ HEC-HMS	U.S. Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.
Rational method (or commercial computer package based on rational method)	Emil Kuichling (1889)	For development sites less than 200 acres, $T_c < 60$ min. or as approved by the Borough.
EFH2	USDA NRCS	Applicable in rural and undeveloped areas subject to the program limits.
Other Methods	Varies	Other methodologies approved by the Borough.

3. If the SCS method is used, Antecedent Moisture Condition 1 is to be used in areas of carbonate geology, and Antecedent Moisture Condition 2 is to be used in all other areas. A type II distribution shall be used in all areas.

4. If the rational method is used, the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 data (see subsection .2 above) or PennDOT Publication 584 “PennDOT Drainage Manual,” 2008 Edition, or latest, shall be used to determine the rainfall intensity in inches per hour based on the information for the 5 through 60 minute duration storm events.

5. Hydrographs may be obtained from NRCS methods such as TR-55, TR-20, or from use of the “modified” or “unit hydrograph” rational methods. If “modified” or “unit hydrograph” rational methods are used, the ascending leg of the hydrograph shall have a length equal to three times the time of concentration ($3xT_c$) and the descending leg shall have a length equal to 7 times the time of concentration ($7xT_c$) to approximate an SCS Type II hydrograph.¹¹

6. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediment basins, retention and detention structures and sufficient design information to construct such facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of stormwater runoff from all discharge points.

7. For the purpose of calculating pre-development peak discharges, all runoff coefficients, both on-site and off-site, shall be based on actual land use assuming summer or good land conditions. Post-development runoff coefficients for off-site discharges used to design conveyance facilities shall be based on actual land use assuming winter or poor land conditions.

8. Criteria and assumptions to be used in the determination of stormwater runoff and design of management facilities are as follows:

A. Runoff coefficients shall be based on the information contained in Appendix 17-B-1 and 17-B-2 if the actual land use is listed in those appendices. If

the actual land use is not listed in these appendices, runoff coefficients shall be chosen from other published documentation, and a copy of said documentation shall be submitted with the SWM site plan.

B. A sample worksheet for calculating T_c is provided in Appendix 17-B-4. Times of concentration (T_c) shall be based on the following design parameters:

(1) *Sheet Flow*. The maximum length for each reach of sheet or overland flow before shallow concentrated or open channel flow develops is 150 feet. Flow lengths greater than 100 feet shall be justified based on the actual conditions at each development site. Sheet flow may be determined using the nomograph in Appendix 17-B-3, or the Manning's kinematic solution shown in the sheet flow section of Worksheet No. 1 in Appendix 17-B-4.

(2) *Shallow Concentrated Flow*. Travel time for shallow concentrated flow shall be determined using Figure 3-1 from TR-55, Urban Hydrology for small watersheds, as shown in Appendix 17-B-5.

(3) *Open Channel Flows*. At points where sheet and shallow concentrated flows concentrate in field depressions, swales, gutters, curbs, or pipe collection systems, the travel times to downstream end of the development site between these design points shall be based upon Manning's equation and/or acceptable engineering design standards as determined by the Municipal Engineer.

C. The developer may use stormwater credits for nonstructural BMPs in accordance with the BMP Manual. The allowable reduction will be determined by the Borough.

D. Peak rate control is not required for off-site runoff. Off-site runoff may be by-passed around the site provided all other discharge requirements are met. If off-site runoff is routed through rate control facilities, runoff coefficients for off-site discharges used to design those rate control facilities shall be based on actual land use assuming winter or poor land conditions.

9. Times of concentration shall be calculated based on the methodology recommended in the respective model used. Times of concentration for channel and pipe flow shall be computed using Manning's equation. Supporting documentation and calculations must be submitted for review and approval.

(Ord. 00075, 4/14/2014, §17-305)

§17-306. Riparian Corridors.

1. In order to protect and improve water quality, a riparian corridor easement shall be created and recorded as part of any subdivision or land development that encompasses a riparian corridor.

2. Except as otherwise required by Chapter 102, the riparian corridor easement shall be measured to be the greater of the limit of the 100-year floodplain or 35 feet from the top of streambank (on each side).

3. *Minimum Management Requirements for Riparian Corridors.*

A. Existing native vegetation shall be protected and maintained within the riparian corridor easement.

B. Whenever practicable invasive vegetation shall be actively removed and the riparian corridor easement shall be planted with native trees, shrubs and other

vegetation to create a diverse native plant community appropriate to the intended ecological context of the site.

4. The riparian corridor easement shall be enforceable by the Borough and shall be recorded in the Lancaster County Recorder of Deeds Office, so that it shall run with the land and shall limit the use of the property located therein. The recorded easement shall be superior to all liens of record and the easement shall be on such form as the Borough Council may adopt, from time to time, by resolution. The easement shall allow for the continued private ownership and shall count toward the minimum lot area as required by zoning, unless otherwise specified in Chapter 27 of the Borough of Akron Code of Ordinances.

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

6. The following conditions shall apply when public and/or private recreation trails are permitted within riparian corridors:

A. Trails shall be for non-motorized use only.

B. Trails shall be designed to have the least impact on native plant species and other sensitive environmental features.

7. Septic drainfields and sewage disposal systems shall not be permitted within the riparian corridor easement and shall comply with setback requirements established under 25 Pa Code, Chapter 73.

(*Ord. 00075, 4/14/2014, §17-306*)

§17-307. Technical Standards.

Attached hereto as Appendix 17-D is a certain “design templates” for purposes of administering the technical provisions of this Chapter. Council of the Borough of Akron reserves the right, from time to time by resolution, to amend the design templates. The use of the design templates shall not in any way reduce the requirements of this Chapter as it relates to the matter of design, the use of BMPs and the standards of maximum extent practical as contained in this Chapter. This design templates provides specifications for design professionals and municipalities to use in administering the provisions of the ordinance.

The use of the design templates are mandatory, unless a waiver is granted by Council (however, no waiver shall be given that effects the BMPs). The standard for modification of a design template shall be the same as the standard for a waiver of a standard in a subdivision and land development plan under the Pennsylvania Municipalities Planning Act.

(*Ord. 00075, 4/14/2014, §17-307*)

§17-308. New Residential Construction.

In the case of the construction of one or more new residential dwelling units, the stormwater management plan shall include calculations and facilities to insure that, as to each dwelling, the standards of this Part 3 allow an additional 250 square feet of impervious surface above that calculated and designed for the proposed dwelling and

its appurtenances, so that each subsequent property owner may have the ability to erect a utility shed not in excess of 250 square feet without additional planning.

(Ord. 00075, 4/14/2014, §17-308)

Part 4**Information to Be Included on or with
Stormwater Management Site Plans****§17-401. General Plan Requirements.**

1. The SWM site plan shall consist of a narrative and all applicable calculations, maps, plans and supplemental information necessary to demonstrate compliance with this Chapter.

2. All landowners of land included in the SWM site plan shall be required to execute all applications and final documents.

3. All SWM site plans shall be prepared by a qualified person.

4. Where the regulated activity constitutes subdivision or land development as hereinabove defined, the SWM site plan shall be submitted with and form an integral part of the plans required under Chapter 22 of the Borough of Akron Code of Ordinances.

(Ord. 00075, 4/14/2014, §17-401)

§17-402. Drafting Standards.

1. The plan should be clearly and legibly drawn.

2. If the plan is prepared in two or more drawing sheets, a key map showing the location of the sheets and a match line shall be placed on each sheet.

3. Each sheet shall be numbered to show the relationship to the total number of sheets in the plan (e.g., sheet 1 of 5).

4. Drawings or maps of the project area shall be drawn at 1" = 50' or larger scale (i.e., 1" = 40', 1" = 30', etc.) and shall be submitted on 24-inch x 36-inch sheets.

5. SWM site plans shall be prepared in a form that meets the requirements for recording for the Office of the Recorder of Deeds of Lancaster County.

6. The total development site boundary and size with distances marked to the nearest foot and bearings to the nearest degree.

(Ord. 00075, 4/14/2014, §17-402)

§17-403. SWM Site Plan Information.

The following items shall be included in the SWM site plan:

A. The date of the SWM site plan and latest revision, graphic scale, written scale and North arrow.

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

C. The file or project number assigned by the firm that prepared the plan.

D. A statement, signed by the landowner, acknowledging the SWM facilities to be permanent fixtures that cannot be altered or removed unless a revised plan is approved by the Borough.

E. The following signature block for the Borough:

_____ Borough of Akron SWM
site plan Approval Certification

At a meeting on _____, 20____, the
_____ (Municipal Governing
Body) approved this project. This approval includes the complete
set of plans and information that are filed with the Borough in
File No. _____, based upon its conformity with the
standards of the _____ Chapter 17 of the
Borough of Akron Code of Ordinances.

_____ Governing Body Signature

_____ Governing Body Signature

F. For SWM facilities located off-site:

(1) A note on the plan referencing a recorded stormwater operation and maintenance (O&M) agreement that indicates the location and responsibility for maintenance of the off-site facilities.

(2) All off-site SWM facilities shall meet the performance standards specified in this Chapter.

G. A note informing the owner that the Borough shall have the right of entry for the purposes of inspecting all stormwater conveyance, treatment, or storage facilities.

H. A location map, drawn to a scale of a minimum of 1 inch equals 2,000 feet (1" = 2,000'), relating the plan to municipal boundaries, at least two intersections of road centerline or other identifiable landmarks.

I. *Existing Features.*

(1) In areas of disturbance, contours at intervals of 1 or 2 feet. In areas of steep slopes (greater than 15 percent) and areas undisturbed, 5-foot contour intervals may be used.

(2) The locations of all existing utilities (including on lot disposal systems and wells), sanitary sewers, and water lines and associated easements.

(3) Physical features including flood hazard boundaries, wetlands, sinkholes, streams, lakes, ponds and other waterbodies, existing drainage courses, karst features, areas of native vegetation including trees greater than 6-inch diameter at breast height, woodlands, other environmentally sensitive areas and the total extent of the upstream area draining through the development site.

(4) An overlay showing soil names and boundaries.

(5) All existing man-made features within 200 feet of the development site boundary.

J. *Proposed Features.*

(1) Changes to the land surface and vegetative cover, (including overland drainage paths), including final proposed contours at intervals of 1 or 2 feet in

areas of disturbance. In areas of steep slopes (greater than 15 percent) and areas undisturbed, 5-foot contour intervals may be used.

(2) Proposed structures, roads, paved areas, buildings and other impervious and semi-impervious areas.

(3) The location of any proposed on-lot disposal systems, replacement drainfield easements, and water supply wells.

(4) A note indicating existing and proposed land use(s).

(5) Plan and profile drawings of all proposed SWM facilities, including BMPs, drainage structures, pipes, open channels, and swales.

(6) Where pervious pavement is to be installed, pavement material and construction specifications shall be included.

(7) The location of all existing and proposed easements, including drainage easements, access easements and riparian corridor easements.

(8) A planting plan shall be provided for all vegetated BMPs in accordance with §17-301.14.

(9) The construction specifications of the materials to be used for stormwater management facilities.

K. The location of all E&S control facilities.

(Ord. 00075, 4/14/2014, §17-403)

§17-404. Additional Information.

1. General description of the development site, including a description of existing natural and hydrologic features and any environmentally sensitive areas.

2. General description of the overall SWM concept for the project, including a description of permanent SWM techniques, nonstructural BMPs to be employed and construction specifications of the materials to be used for structural SWM facilities. The narrative shall include a description of any treatment trains and how the facilities are meant to function with each other to manage stormwater runoff.

3. The effect of the project (in terms of runoff volumes, water quality and peak flows) on adjacent properties and on any existing municipal stormwater management facilities that may receive runoff from the development site.

4. Complete hydrologic, hydraulic, and structural computations for all SWM facilities.

5. Expected project time schedule.

(Ord. 00075, 4/14/2014, §17-404)

§17-405. Supplemental Information.

1. In areas of carbonate geology, a detailed geologic evaluation prepared by a registered Professional Geologist (PG) must be submitted as part of the SWM site plan. The report shall include, but not limited to the following:

A. The location of the following karst features.

(1) Sinkholes.

- (2) Closed depressions.
- (3) Lineaments in carbonate areas.
- (4) Fracture traces.
- (5) Caverns.
- (6) Intermittent lakes.
- (7) Ephemeral disappearing streams.
- (8) Bedrock pinnacles (surface or subsurface).

B. A plan for remediation of any identified karst features.

C. Impacts of stormwater management facilities on adjacent karst features, and impacts of karst features on adjacent stormwater management facilities.

2. An E&S plan, including all approvals, as required by 25 Pa.Code, Chapter 102, shall be provided to the Borough prior to unconditional final plan approval.

3. For any activities that require a DEP Joint Permit Application and are regulated under Chapter 105 or Chapter 106, require a Penn DOT Highway Occupancy Permit, or require any other permit under applicable State or Federal regulations, the permit(s) shall be part of the SWM site plan and must be obtained prior to unconditional final plan approval.

4. An operation and maintenance (O&M) plan that addresses the requirements of §17-603.

5. Where applicable, a recorded stormwater management agreement for off-site facilities.

6. Applicant shall identify the number of square feet of impervious surface coverage for which the stormwater management facilities have been designed. This number shall be placed in the stormwater management agreement and declaration of easement referenced elsewhere herein, and shall also note the actual number of square feet of impervious surface coverage that is intended to exist following the completion of construction. To the extent that the designed and implemented facilities exceed the required stormwater management (in excess of that needed for the proposed impervious coverage), the property owner (as part of the property owner's application) shall be given credit in the future against any additional coverage that the property owner may apply.

(Ord. 00075, 4/14/2014, §17-405)

Part 5**Plan Processing Procedures****§17-501. Small Projects.**

1. Anyone proposing a small project, shall submit three copies of the small project application to the Borough Zoning Officer.

2. A complete small project application shall include:

A. Small project application form (Appendix 17-A), which Council may revise, from time to time by resolution of Council.

B. Small project sketch plan including the following:

(1) Name and address of landowner/developer, if applicable.

(2) Date of small project application submission.

(3) Name of individual and/or firm that prepared the sketch if different than the landowner and/or developer.

(4) Location and square footage of proposed impervious area or land disturbance, which shall not be within 10 feet of any structures with basements.

(5) Approximate footprint and location of all structures on adjacent properties if located within 50 feet of the proposed impervious area or land disturbance.

(6) Approximate location of existing stormwater management facilities if present.

(7) Location and description of proposed stormwater management facilities.

(8) Direction of proposed stormwater discharge (e.g., with arrows).

(9) Scale and north arrow.

(10) A copy of the property owner's deed, together with a copy of the agreement described in §17-509 hereof.

C. Filing fee (in accordance with the Borough's current fee schedule).

3. The small project application shall be submitted in a format that is clear, concise, legible, neat and well organized.

(Ord. 00075, 4/14/2014, §17-501)

§17-502. Exemption from Plan Submission Requirements.

1. The following regulated activities are specifically exempt from the SWM site plan preparation and submission requirements articulated in §17-301.1 and Parts 4 and 5 of this Chapter:

A. Agricultural activity (see definitions) provided the activities are performed according to the requirements of 25 Pa.Code, Chapter 102.

B. Forest management and timber operations (see definitions) provided the

activities are performed according to the requirements of 25 Pa.Code, Chapter 102.

C. Conservation practices being installed as part of the implementation of a conservation plan written by an NRCS certified planner.

D. The installation of 1,000 or fewer square feet of impervious surface coverage proposed after the effective date of this Chapter, provided that the activities meet the criteria at subsection .3 below and are conducted in accordance with all requirements of this Chapter.

2. The Borough may deny or revoke any exemption pursuant to this Section at any time for any project that the municipality believes may pose a threat to public health, safety, property or the environment.

3. An applicant proposing the cumulative installation of 1,000 square feet or less of impervious surface coverage may be exempt from the design, plan submittal, and processing requirements of Parts 3, 4 and 5 of this Chapter if the proposal meets the criteria in this subsection .3. No person or activity is exempted from compliance with Parts 6, 7, 8, and 9 of this Chapter.

A. Any applicant desiring exemption from design, plan submission, and plan processing requirements shall complete an application for exemption in the form set forth in Appendix 17-E and pay any applicable filing fee.

B. The applicant for exemption under this Section shall provide the Borough with all information necessary for the Borough to determine that:

(1) There shall be no disturbance of land within floodplains, wetlands, environmentally sensitive areas, riparian forest buffers, or slopes greater than 15 percent.

(2) No impervious surface coverage shall be installed and no grading or excavation shall be conducted within any existing drainage or stormwater easement, whether or not created by or shown on any recorded plan.

(3) The applicant shall minimize soil disturbance, take steps to minimize erosion during construction activity, and promptly reclaim all disturbed areas with topsoil and vegetation.

(4) The applicant shall take steps that runoff be directed to pervious areas on the subject property. No runoff shall be directed onto an abutting street or neighboring property.

(5) The proposed impervious surface shall not adversely impact any existing known problem areas or downstream property owners or the quality of runoff entering any municipal separate storm sewer system.

(6) The proposed impervious surface shall not create accelerated erosion.

C. If the proposed activity does not meet all of the criteria set forth in subsection .3.B above, the applicant may follow the small project processing procedure in §17-501.

D. No applicant and no activity is exempt from complying with any State or Federal requirements applicable if the subject property is located in a high quality (HQ) or exceptional value (EV) watershed.

E. No applicant and no activity shall violate or cause to be violated: the Federal Clean Water Act or any regulation issues thereunder, an NPDES permit,

any recorded stormwater management or operations and maintenance agreement, or any requirement applicable to a municipal separate storm sewer system.

(*Ord. 00075, 4/14/2014, §17-502*)

§17-503. Pre-Application Meeting.

Where an NPDES permit is required, applicants are encouraged to schedule a pre-application meeting to review the overall stormwater management concept with Municipal staff/Engineer. The pre-application meeting is not mandatory and shall not constitute formal filing of a plan with the Borough. Topics discussed may include the following:

- A. Available geological maps, plans and other available data.
- B. Findings of the site analysis including identification of any environmentally sensitive areas, wellhead protection areas, riparian corridors, hydrologic soil groups, existing natural drainageways, karst features, areas conducive to infiltration to be utilized for volume control, etc.
- C. Results of infiltration tests.
- D. Applicable Borough other ordinances, resolutions and regulations.
- E. The conceptual project layout, including proposed structural and nonstructural BMPs.

(*Ord. 00075, 4/14/2014, §17-503*)

§17-504. Stormwater Management Site Plan Submission.

1. When a stormwater management site plan is required, the applicant shall submit the following to the Borough:

- A. Five copies to the SWM site plan prepared in accordance with the requirements of Part 4 of this Chapter.
- B. Two copies of all supplemental data.
- C. A filing fee (in accordance with the Borough's current fee schedule).

2. The SWM site plan shall be submitted in a format that is clear, concise, legible, neat and well organized.

3. The applicant is responsible for submitting plans to any other agencies such as the Lancaster County Conservation District, PennDOT, DEP, etc., when permits from these agencies are required. Final approval shall be conditioned upon the applicant obtaining all necessary permits.

4. Incomplete submissions as determined by the governing body or its designee, shall be returned to the applicant within 7 days, along with a statement that the submission is incomplete, and stating the deficiencies found. Otherwise, the application shall be deemed accepted for filing as of the date of submission. Acceptance of the application shall not, however, constitute an approval of the plan or a waiver of any deficiencies or irregularities. The applicant may appeal the Borough's decision not to accept a particular application in accordance with §17-805 of this Chapter.

5. At its sole discretion and in accordance with this Part, when a SWM site plan is found to be deficient, Borough may either disapprove the submission and require a resubmission, or in the case of minor deficiencies, Borough may accept submission of

revisions.

(*Ord. 00075, 4/14/2014, §17-504*)

§17-505. Municipal Review.

1. When the regulated activity constitutes a subdivision or land development as defined in Chapter 22 of the Borough of Akron Code of Ordinances, the SWM site plan and subdivision/land development plan shall be processed concurrently according to the plan processing procedure outlined in Chapter 22.

2. When the regulated activity constitutes a small project the Borough shall review and take action on the small project application within 10 days of filing.

3. When the regulated activity does not constitute a subdivision or land development or small project the Municipal Engineer shall review the SWM site plan for conformance with the provisions of this Chapter.

4. Following receipt of the Municipal Engineer's report and within 90 days following the date of the first regular meeting of the Governing Body after the date the application is filed, the Governing Body will schedule the SWM site plan application for action at a regularly scheduled public meeting.

5. Within 15 days of the meeting at which the SWM site plan application is acted upon by the Governing Body, written notice of the Governing Body's action shall be sent to the following individuals:

- A. Landowner or his agent.
- B. Applicant.
- C. Firm that prepared the plan.
- D. Lancaster County Planning Commission.
- E. Lancaster County Conservation District.

6. If the Borough disapproves the SWM site plan, the Borough will state the reasons for the disapproval in writing. The Borough also may approve the SWM site plan with conditions and, if so, shall provide the acceptable conditions for approval in writing. Such conditional approval shall be contingent upon the applicant's written acceptance of the conditions.

(*Ord. 00075, 4/14/2014, §17-505*)

§17-506. Revision of Plans.

1. Revisions to a SWM site plan after submission but before municipal action shall require a re-submission of the modified SWM site plan consistent with §17-504 of this Chapter and be subject to review as specified in §17-505 of this Chapter.

2. For the purposes of review deadlines, each resubmission required under subsection .1 (after submission but before approval) shall constitute a new submission for the purposes of time limits as set forth in the MPC and this Chapter.

3. Any substantial revisions to a SWM site plan after approval shall be submitted as a new plan to the Borough, accompanied by the applicable review fee.

(*Ord. 00075, 4/14/2014, §17-506*)

§17-507. Authorization to Construct and Term of Validity.

Approval of a SWM site plan shall be valid for a period not to exceed 5 years. This time period shall commence on the date that the Borough approves the SWM site plan. If a certificate of completion as required by §17-508 of this Chapter has not been submitted within the specified time period, then the Borough may consider the SWM site plan disapproved and may revoke any and all permits issued by the Borough SWM site plans that are considered disapproved by the Borough may be resubmitted in accordance with §17-504 of this Chapter.

(Ord. 00075, 4/14/2014, §17-507)

§17-508. Certificate of Completion.

1. Except in the use of small projects, at the completion of the project, and as prerequisite for the release of the financial security, the applicant shall provide certification of completion from an engineer, landscape architect, surveyor or other qualified person verifying that all permanent SWM facilities have been constructed according to the plans and specifications and approved revisions thereto.

2. Upon receipt of the certificate of completion, and prior to release of the remaining financial security the Borough shall conduct a final inspection to certify compliance with this Chapter.

(Ord. 00075, 4/14/2014, §17-508)

§17-509. Plan Recordation.

1. Upon completion of the plan improvements (including small projects) the applicant shall submit an as-built plan for recordation in the Office of the Recorder of Deeds. The as-built plan must show the final design specifications for all stormwater management facilities and be sealed by a registered professional engineer. When a digital submission of an as-built plan is required, all coordinates as depicted on the plan shall be based on the PA South Zone State Plane Coordinate System (NAD83 for horizontal and NAVD88 for vertical).

2. Concurrently with the recordation of the as-built plan, the applicant shall submit the SWM site plan for recordation in the Office of the Recorder of Deeds, unless the site plan has already been recorded.

(Ord. 00075, 4/14/2014, §17-509)

Part 6**Operation and Maintenance (O&M)****§17-601. Responsibilities of Developers and Landowners.**

1. The landowner, successor and assigns shall maintain all stormwater management facilities in good working order in accordance with the approved O&M plan.

2. The landowner shall convey to the Borough easements to assure access for inspections and maintenance, if required.

3. Except in the case of small projects, the landowner shall keep on file with the Borough the name, address and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information will be submitted to the Borough within 10 days of the change.

4. Enumerate permanent SWM facilities as permanent real estate appurtenances and record as deed restrictions or easements that run with the land.

5. The record owner of the development site shall sign and record an operation and maintenance (O&M) agreement covering all stormwater management facilities, including riparian buffers and riparian forest buffers, which are to be privately owned. Said agreement, designated as Appendix 17-C, is attached and made part hereto. The O&M plan and agreement shall be recorded as a restrictive covenant agreement that runs with the land.

(Ord. 00075, 4/14/2014, §17-601)

§17-602. Operation and Maintenance Agreements.

1. The operation and maintenance agreement shall be subject to the review and approval of the municipal solicitor and governing body.

2. The Borough is exempt from the requirement to sign and record an O&M agreement.

(Ord. 00075, 4/14/2014, §17-602)

§17-603. Operation and Maintenance (O&M) Plan Contents.

1. The O&M plan shall clearly establish the operation and maintenance necessary to ensure the proper functioning of all temporary and permanent stormwater management facilities and erosion and sedimentation control facilities.

2. The following shall be addressed in the O&M plan:

A. Description of maintenance requirements, including, but not limited to, the following:

(1) Regular inspection of the SWM facilities. To assure proper implementation of BMPs, maintenance and care SWM BMPs should be inspected by a qualified person, which may include the landowner, or the owner's designee (including the Borough for dedicated and owned facilities), according to the following minimum frequencies:

- (a) Annually for the first 5 years.
 - (b) Once every 3 years thereafter.
 - (c) During or immediately after the cessation of a 10-year or greater storm.
 - (d) As specified in the O&M agreement pursuant to §17-602.
 - (2) All pipes, swales and detention facilities shall be kept free of any debris or other obstruction and in original design condition.
 - (3) Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, or BMPs, and thus reducing their capacity to convey or store water.
 - (4) Re-establishment of vegetation of scoured areas or areas where vegetation has not been successfully established. Selection of seed mixtures shall be subject to approval by the Borough.
 - B. Riparian forest buffer management plan prepared in accordance with 25 Pa.Code, Chapter 102 §14(b)(4) if required.
 - C. Identification of a responsible individual, corporation, association or other entity for ownership and maintenance of both temporary and permanent stormwater management and erosion and sedimentation control facilities.
 - D. Establishment of suitable easements for access to all facilities.
3. All reports prepared shall be submitted to the Borough within 60 days of completion.
- (Ord. 00075, 4/14/2014, §17-603)

§17-604. Maintenance of Facilities Accepted by the Borough.

1. The Borough reserves the right to accept or reject any proposal to dedicate ownership and operating responsibility of any SWM facilities to the Borough.
2. If SWM facilities are accepted by the Borough for dedication, the land-owner/developer shall be required to pay a specified amount to the municipal stormwater maintenance fund to defray costs of periodic inspections and maintenance expenses. This fee shall be provided to the Borough prior to unconditional plan approval. The amount of the deposit shall be determined as follows subject to the approval of the municipal governing body:
 - A. The deposit shall cover the estimated costs for maintenance and inspections for 25 years. The Borough will establish the estimated costs according to the O&M requirements outlined in the approved O&M plan.
 - B. The amount of the deposit to the fund shall be converted to present worth of the annual series values.
 - C. If a storage facility is proposed that also serves as a recreation facility (e.g., ballfield, lake), the Borough may reduce or waive the amount of the maintenance fund deposit based upon the value of the land for public recreation purpose.
3. If at any time a dedicated storage facility is eliminated due to the installation of storm sewers or other storage facility such as a regional detention facility, the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the

facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

4. All dedicated facilities shall be inspected by the Borough according to the following minimum frequencies:

- A. Annually for the first 5 years.
- B. Once every 3 years thereafter.
- C. During or immediately after the cessation of a 10-year or greater storm.
- D. As specified in the O&M agreement pursuant to §17-602.

5. Maintenance shall be conducted as necessary to provide for the continued functioning of the facility. Costs of inspections, maintenance and repairs are recoverable from the municipal stormwater maintenance fund.

(*Ord. 00075, 4/14/2014, §17-604*)

§17-605. Maintenance of Existing Facilities/BMPs.

SWM facilities existing on the effective date of this Chapter, which have not been accepted by the Borough or for which maintenance responsibility has not been assumed by a private entity such as a homeowners' association shall be maintained by the individual landowners. Such maintenance shall include at a minimum those items set forth in subsection .2.A above. If the Borough determines at any time that any permanent SWM facility has been eliminated, altered, blocked through the erection of structures or the deposit of materials, or improperly maintained, the condition constitutes a nuisance and the Borough shall notify the landowner of corrective measures that are required, and provide for a reasonable period of time, not to exceed 30 days, within which the property owner shall take such corrective action. If the landowner does not take the required corrective action, the Borough may either perform the work or contract for the performance of the work and bill the landowner for the cost of the work plus a penalty of 10 percent of the cost of the work. If such bill is not paid by the property owner within 30 days, the Borough may file a municipal claim against the property upon which the work was performed in accordance with the applicable laws. The Borough shall have the right to choose among the remedies and may use one or more remedies concurrently.

(*Ord. 00075, 4/14/2014, §17-605*)

§17-606. Akron Borough Stormwater Maintenance Fund.

1. Persons (other than the Borough) installing stormwater storage facilities shall be required to pay a specified amount to the Akron Borough Stormwater Maintenance Fund to help defray costs of periodic inspections and administrative expenses.

2. The amount of the deposit shall be determined as follows:

A. If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by the Borough, for a period of 10 years.

B. If the storage facility is to be owned and maintained by the Borough, the deposit shall cover the cost of periodic inspections performed by the Borough and

for maintenance costs, for a period of 10 years.

C. Borough Engineer's initial estimate shall be based upon a reasonable estimate to inspect the stormwater facilities on each property four times. Those four times include the completion of work, 3 years later, 6 years later, and 9 years after completion. The calculation includes a 3 percent increase each year to address salary costs increases. The formula is as follows:

$$\text{Contribution} = X + X(1.03)^3 + X(1.03)^6 + X(1.03)^9$$

D. The Borough's Engineer will establish the estimated costs utilizing information submitted by the applicant. If the applicant is not satisfied with costs prepared by the Borough Engineer, applicant may appeal the same pursuant to the Local Agency Law.

3. If at some future time a storage facility (whether publicly or privately owned) is eliminated due to the installation of storm sewers or other storage facility the unused portion of the maintenance fund deposit will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the depositor.

4. No interest shall be earned on any deposits by any person and all interest shall become the property of the Borough to be further used for inspection, maintenance and correction of privately and publicly owned stormwater storage facilities.

5. Nothing contained herein shall constitute a waiver of any duty of any private owner to maintain its stormwater storage facilities at its sole expense.

6. The use of these funds by the Borough shall not be limited to the respective deposit of each property owner. In the event the Borough uses any of said sums, the property owner shall be fully obligated to reimburse the Borough for its expenditures and for all costs to collect thereof, including the Borough's reasonable legal fees.

(*Ord. 00075, 4/14/2014, §17-606*)

Part 7**Fees and Expenses****§17-701. General.**

The Borough may, by resolution from time to time, establish review, filing fees, and escrows associated with the same, consistent with law.

(*Ord. 00075, 4/14/2014, §17-701*)

§17-702. Expenses Covered by Fees.

1. The Borough shall be entitled to set a filing fee, from time to time by resolution of Council, which shall cover the initial administrative costs of receiving and processing the paperwork from the applicant. No application shall be deemed complete without payment of such filing fee.

2. The Borough shall also be entitled to set review fees, from time to time by resolution of Council. The review fee shall be established by the Borough by separate resolution (meeting all requirements of the PMPC and administered consistent with the PMPC) to defray review costs incurred directly or indirectly by the Borough and the Borough designee.

3. All review and filing fees shall be paid by the applicant prior to the issuance of any building permits or any site improvements. No application shall be deemed complete without payment of such fees.

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

A. The review of the stormwater management plan by the Borough and its designees.

B. The development site inspection.

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

D. The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the stormwater management plan, and review of the as-built plans and calculations for compliance.

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

F. Defray administration and clerical costs.

5. A. The Borough may set, from time to time by resolution, an escrow deposit schedule based upon the estimated cost of fees described in subsections .2 and .4 above. Such escrow deposit shall be deposited with the Borough in advance of review of any filing. No application shall be deemed complete without payment of such escrow deposit.

B. The Borough designee, from time to time, may require replenishment of the escrow to insure that it is not exhausted by reasonably estimated current and future costs and fees as described herein.

(*Ord. 00075, 4/14/2014, §17-702*)

Part 8**Prohibitions****§17-801. Prohibited Discharges and Connections.**

1. The following connections are prohibited, except as provided in subsection .4 below.

A. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter a municipal separate storm sewer (if applicable), or waters of this Commonwealth, and any connections to the storm sewer from indoor drains and sinks.

B. Any drain or conveyance connected from a commercial or industrial land use to the municipal separate storm sewer (if applicable) which has not been documented in plans, maps, or equivalent records, and approved by the Borough.

2. No person shall allow, or cause to allow, discharges into surface waters of this Commonwealth which are not composed entirely of stormwater, except (A) as provided in subsection .4 below and (B) discharges allowed under a State or Federal permit.

3. No person shall place any structure, fill, landscaping or vegetation into a SWM facility or within a drainage easement that will limit or diminish the functioning of the facility in any manner.

4. The following discharges are authorized unless they are determined to be significant contributors to pollution to the waters of this Commonwealth:

A. Discharges from firefighting activities.

B. Potable water sources including water line flushing.

C. Irrigation drainage.

D. Air conditioning condensate.

E. Springs.

F. Water from crawl space pumps.

G. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used.

H. Flows from riparian habitats and wetlands.

I. Uncontaminated water from foundations or from footing drains.

J. Lawn watering.

K. De-chlorinated swimming pool discharges.

L. Uncontaminated groundwater.

M. Water from individual residential car washing.

N. Routine external building wash down (which does not use detergents or other compounds).

O. Diverted stream flows.

P. Rising ground waters.

5. In the event that the Borough or DEP determines that any of the discharges identified in subsection .4 above significantly contribute to pollution of the waters of this Commonwealth, the Borough or DEP will notify the responsible person(s) to cease the discharge.

(Ord. 00075, 4/14/2014, §17-801)

§17-802. Alteration of SWM BMPs.

No person shall modify, remove, fill, landscape, or alter any SWM BMPs, facilities, areas, or structures without the written approval of the Borough.

(Ord. 00075, 4/14/2014, §17-802)

Part 9**Enforcement and Penalties****§17-901. Right-of-Entry.**

Upon presentation of proper credentials, duly authorized representatives of the Borough may enter at reasonable times upon any property within the Borough to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Chapter.

(Ord. 00075, 4/14/2014, §17-901)

§17-902. Enforcement.

The Borough Council or its Designee is hereby authorized to enforce all of the provisions of this Chapter.

A. Any permit or approval issued by the Borough pursuant to this Chapter may be suspended by the Borough for:

(1) Noncompliance with or failure to implement any provision of the approved SWM site plan or O&M agreement.

(2) A violation of any provisions of this Chapter or any other applicable law, Chapter rule, or regulation relating to the regulated activity.

(3) The creation of any condition or the commission of any act during construction or development that constitutes or creates a hazard, nuisance, pollution or endangers the life or property of others.

B. A suspended permit may be reinstated by the Borough when:

(1) The Borough has inspected and approved the corrections to the violation that caused the suspension.

(2) The Borough is satisfied that the violation has been corrected.

C. It shall be unlawful for any person, firm, or corporation to undertake any activity under this Chapter on any property except as provided for in the approved stormwater management plan and pursuant to the requirements of this Chapter. It shall be unlawful to alter or remove any control structure required by the stormwater management plan pursuant to this Chapter or to allow the property to remain in a condition which does not conform to the approved stormwater management plan.

D. An occupancy permit shall not be issued unless satisfactory inspection has been secured. The occupancy permit shall be required for each lot owner and/or developer for all subdivisions and land development in the Borough.

E. It shall also be a violation of this Chapter to commit any of the following acts.

(1) To commence and disturbance activities for which an approved stormwater management plan is required prior to approval of said plan.

(2) To install, repair, modify or alter stormwater management facilities prior to obtaining an approved stormwater management plan.

(3) To misuse or fail to maintain any stormwater management facility installed upon a property.

(4) To construct any improvements upon, grade, fill, or take any other action which will impair the proper functioning of any stormwater management facility.

(5) To place false information on or omit relevant information from a stormwater management plan or application.

(6) To fail to comply with any other provisions of this Chapter.

(Ord. 00075, 4/14/2014, §17-902)

§17-903. Penalties.

1. Any person who or which has violated any provisions of this Chapter, shall, upon a judicial determination thereof, be subject to civil judgment of not less than \$100, or more than \$600, for each violation, recoverable with costs, Borough expenses, and the Borough's reasonable attorney's fees. Each day (or part thereof) that a violation occurs shall constitute a separate offense. All moneys shall be paid to Akron Borough.

2. In addition, the Borough may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Chapter, and may request any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief, and the Borough may recover its reasonable attorneys fees and costs for such suit in the event it is successful.

(Ord. 00075, 4/14/2014, §17-903)

§17-904. Appeals.

1. Any person aggrieved by any administrative action of the Borough may appeal to Council within 30 days of that action. Any such appeal shall be governed by the procedures of Part V of the Local Agency Law, 2 Pa.C.S.A. 401 *et seq.*

2. Any person aggrieved by any decision of Council may appeal to the Lancaster County Court of Common Pleas, in accordance with Part VII of Local Agency Law, 2 Pa.C.S.A. 701 *et seq.*, the Local Agency Law, within 30 days of that decision.

(Ord. 00075, 4/14/2014, §17-904)

§17-905. Modification of Chapter Provisions.

1. The provisions of this Chapter not relating to water quality are intended as minimum standards for the protection of the public health, safety, and welfare. The Borough reserves the right to modify or to extend them conditionally in individual cases as may be necessary in the public interest; provided, however, that such variation shall not have the effect of nullifying the intent and purpose of this Chapter, and that the applicant shows that to the satisfaction of the Borough that the applicable regulation is unreasonable, or will cause undue hardship, or that an alternative proposal will allow for equal or better results. The list of such modifications, along with an explanation of and justification for each modification, shall be included on the plan. This Section does not apply during an enforcement action.

2. In granting waivers/modifications for provisions of this Chapter not relating

to water quality, the Borough may impose such conditions as will, in its judgment, secure substantially the objectives of the standards and requirements of this Chapter.

3. The Borough Council may delegate any initial determination of Chapter violations, service of notice of violation and enforcement thereof, to such Designee as Borough Council shall deem, from time to time, qualified for that purpose.

4. All appendices to this Chapter are for reference only and may be changed, from time to time, by resolution of the Board of Supervisors as may be fitting for changed circumstances, evolution of legal principals, evolution of engineering principals and concepts, ease of use, or for any other reasonable purposes, as the Board of Supervisors shall, by Resolution, find to be in the best interests of the Township.

(Ord. 00075, 4/14/2014, §17-905)

Part 10**References****§17-1001. References.**

1. 25 Pa.Code, Chapter 102 Erosion and Sediment Control.
2. Minnesota Pollution Control Agency.
3. Code of Federal Regulations—Title 44: Emergency Management and Assistance, §9.4 Definitions.
4. 25 Pa.Code, Chapter 105.
5. Based on definition in Wisconsin Department of Natural Resources Administrative Rule NR 151.006.
6. Pennsylvania Department of Environmental Protection. No. 363-0300-002 (December 2006), as amended and updated. *Pennsylvania Stormwater Best Management Practices Manual*. Harrisburg, PA.
7. City of Jacksonville website,
<http://www3.coj.net/Departments/CityFees/Glossary.aspx>.
8. Lancaster County Model Subdivision and Land Development Ordinance.
9. Pennsylvania Department of Environmental Protection. No. 363-2134-008 (March 2012), as amended and updated. *Erosion and Sediment Pollution Control Program Manual*. Harrisburg, PA.
10. CSN Technical Bulletin No. 5, Stormwater Design for High Intensity Redevelopment Projects in the Chesapeake Bay Watershed, version 2.0. Chesapeake Stormwater Network, January 5, 2011—page 43.
11. “Penn State Urban Hydrology Model User Manual” by Thomas A. Seybert, PE, David F. Kibler, PE, and Elizabeth I. White, PE, August 1993 page 70 and VT/PSUHM help screen.
12. 25 Pa.Code, Chapter 71 Administration of Sewage Facilities Planning Program, §71.1.
(*Ord. 00075, 4/14/2014, Part 10*)

APPENDIX 17-A

**AKRON BOROUGH
SAMPLE SMALL PROJECT APPLICATION**

File Number _____

Date Received _____

Submitted Fees \$ _____

Approval of Application Date _____

Project Street Address: _____

Project Name: _____

Owner's Name and Address: _____

Phone# / Fax# / Email: _____

Please list the date of any previous Small Project Applications for the subject property:

Proposed Activity:

Removal of ground cover, grading, filling or excavation of an area less than 5,000 square feet

Total area of land disturbance: _____ sq. ft.

Type of Regulated Activity (check all that apply):

- Removal of ground cover
- Grading
- Filling
- Excavation
- Other earth disturbance activity (please describe)

Addition of Impervious Surface (5,000 SF or less)

Type of new impervious surface: driveway, shed, garage, deck, walkway,

other (describe) _____

Total new impervious surface proposed for construction: _____ sq. ft.

Are you removing existing impervious as part of this project?

No

Yes – Total area of existing Impervious to be removed _____ sq. ft.

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

- _____ Mature trees
- _____ Sinkholes
- _____ Water wells
- _____ Septic drainfields
- _____ Alternate septic drainfields
- _____ Creeks, streams, wetlands, or ponds
- _____ Existing stormwater management facility (basin, swale, etc.)
- _____ Easements

Small Project Application Pg. 2

Total runoff volume to be permanently removed/managed on site from attached calculation worksheet: _____ gallons or _____ cubic feet

Proposed Stormwater Management Controls (Best Management Practice):

- _____ Rain Garden
- _____ Infiltration Trench
- _____ Cistern
- _____ Rain Barrel
- _____ Other (describe) _____

Sketch

Provide a sketch of the proposed additional impervious area or land disturbance. Include the following on the sketch:

- Property boundary
- Location and approximate footprint of existing structures (buildings, patios, driveways, etc.)
- Approximate location of any of the following features which will be impacted by the project:
 - Mature trees
 - Sinkholes
 - Water wells
 - Septic drainfields
 - Alternate septic drainfields
 - Creeks, streams, wetlands, ponds
 - Existing stormwater management facilities (basins, swales, etc.)
- Location and approximate footprint of proposed impervious area or land disturbance.
- Approximate footprint and location of all structures on adjacent properties if located within fifty feet (50') of the proposed impervious area or land disturbance
- Location and description of proposed stormwater management facilities (e.g. rain gardens, swales, rain barrels, etc.)
- Direction of flow of proposed stormwater discharge (e.g. with arrows)
- Scale and north arrow

Person/Firm to be completing work: _____

Phone# / Fax# / Email: _____

Name of Person Submitting this Application: _____

Signature: _____

Date: _____

Small Project Application Calculation Worksheet

The applicant may use the following to calculate the amount of runoff which must be managed in accordance with §17-302.B of this Chapter.

Project Name: _____

Owner Name: _____

Proposed Additional Impervious Area: _____ square feet

Volume Control for Small Projects

At least the first one inch (1") of runoff from new impervious surfaces or an equivalent volume shall be permanently removed from the runoff flow – i.e. it shall not be released into the surface Waters of this Commonwealth. Removal options include reuse, evaporation, transpiration and infiltration.

Impervious Area Calculations

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

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

1,200 square feet of additional impervious ÷ 12 = 100 cubic feet PRV

100 cubic feet x 7.48 gallons per cubic feet = 748 gallons PRV

1. storage via a surface depression
 - a. Length 20 feet x Width 10 feet x Depth .05 feet = Required PRV in cf. 100 cf
 - i. It is recommended that the surface area of the depression (Length x Width) be maximized to limit the depression depth.
 - ii. Ex. If the surface depression measures 20 feet long by 10 feet wide the surface area equals 200 sq ft. Depressing this area 6 inches or 0.5 feet will create a surface depression of (200 sq ft x 0.5 feet) = 100 meets the Wrequired storage volume.

2. storage via a subsurface retention trench backfilled with clean 2B stone
 - a. [Length 25 feet x Width 5 feet x Depth 2 feet of trench] x 40% = 100 Required PRV in cf.
 - i. Ex. If the trench is 25 feet long by 5 feet wide by 2 feet deep and

back

filled with stone, the available storage space is = 25 feet x 4 feet x 2 feet = 200 cf x 0.40 = 80 cf. Required storage volume has been exceeded.

TO BE ADJUSTED BY ENGINEER

EXAMPLE

Small Project Application Calculation Worksheet

Landowner Name: Jane Doe (30' x 40' garage)

Owner Name: Jane Doe

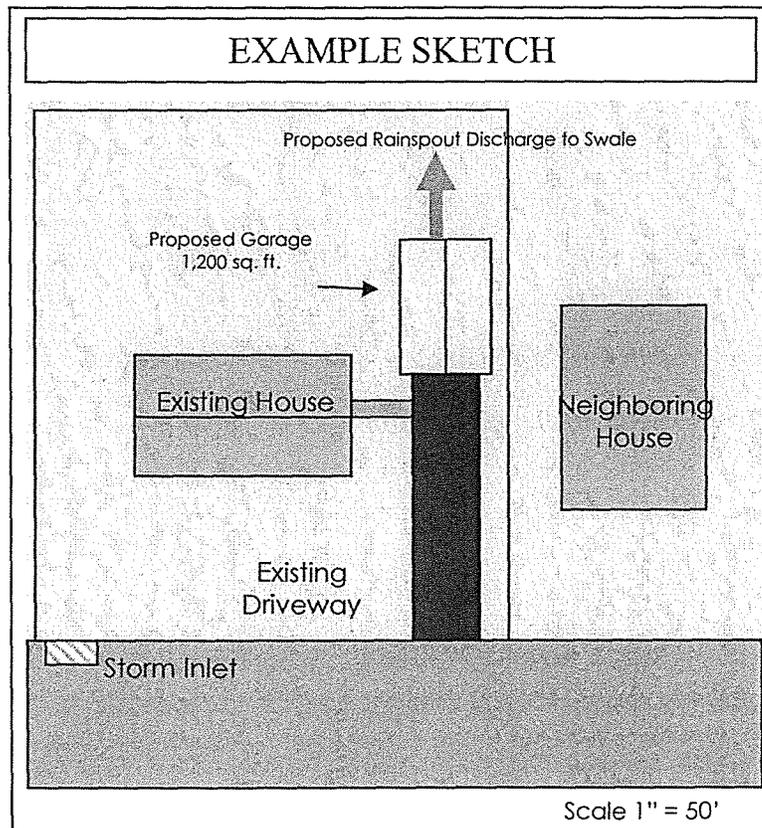
Proposed Additional Impervious Area: 1,200 square feet

Impervious Area Calculations

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

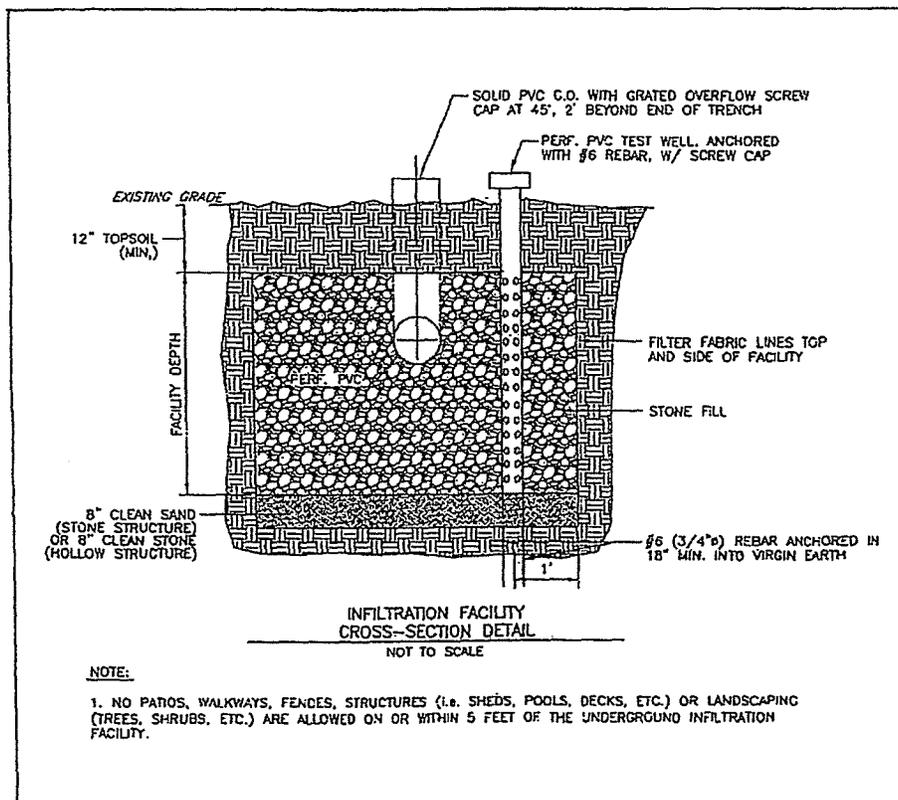
$$\text{Additional impervious area} \div 12 = \text{Permanently Removed Runoff Volume (PRV)}$$

$$\begin{aligned} & \frac{1,200 \text{ square feet of additional impervious}}{12} = 100 \text{ cubic feet PRV} \\ & 100 \text{ cubic feet} \times 7.48 \text{ gallons per cubic foot} = 748 \text{ gallons PRV} \end{aligned}$$



EXAMPLE 1

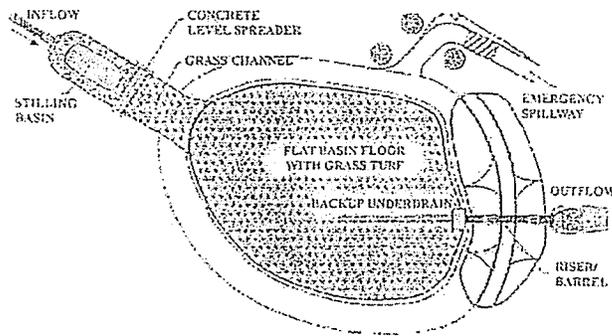
BMP Subsurface Infiltration Bed



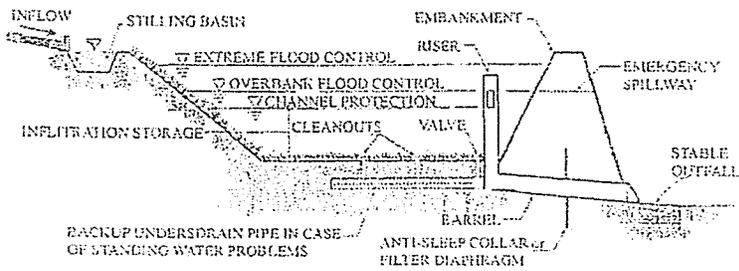
EXAMPLE 2

BMP Infiltration Basin

Draft Pennsylvania Stormwater Management Manual



Schematic design of constructed infiltration basin with concrete level spreader (Schueler)



Cross section schematic of infiltration basin (Schueler)

APPENDIX NO. 17-B-1

**RUNOFF COEFFICIENTS "C" FOR
RATIONAL FORMULA**

Soil Groups Slope	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land												
winter conditions	.14	.23	.34	.21	.32	.41	.27	.37	.48	.34	.45	.56
summer conditions	.10	.16	.22	.14	.20	.28	.19	.26	.33	.23	.29	.38
Fallow Fields												
poor conditions	.12	.19	.28	.17	.25	.34	.23	.33	.40	.27	.35	.45
good conditions	.08	.13	.16	.11	.15	.21	.14	.19	.26	.18	.23	.31
Forest/Woodland	.08	.11	.14	.10	.14	.18	.12	.16	.20	.15	.20	.25
Grass Areas												
good conditions	.10	.16	.20	.14	.19	.26	.18	.22	.30	.21	.25	.35
average conditions	.12	.18	.22	.16	.21	.28	.20	.25	.34	.24	.29	.41
poor conditions	.14	.21	.30	.18	.28	.37	.25	.35	.44	.30	.40	.50
Impervious Areas	.90	.91	.92	.91	.92	.93	.92	.93	.94	.93	.94	.95
Weighted Residential												
Lot size 1/8 acre	.29	.33	.36	.31	.35	.40	.34	.38	.44	.36	.41	.48
Lot size 1/4 acre	.26	.30	.34	.29	.33	.38	.32	.36	.42	.34	.38	.46
Lot size 1/3 acre	.24	.28	.31	.26	.32	.35	.29	.35	.40	.32	.36	.45
Lot size 1/2 acre	.21	.25	.28	.24	.27	.32	.27	.31	.37	.30	.34	.43
Lot size 1 acre	.18	.23	.26	.21	.24	.30	.24	.29	.36	.28	.32	.41

APPENDIX NO. 17-B-2

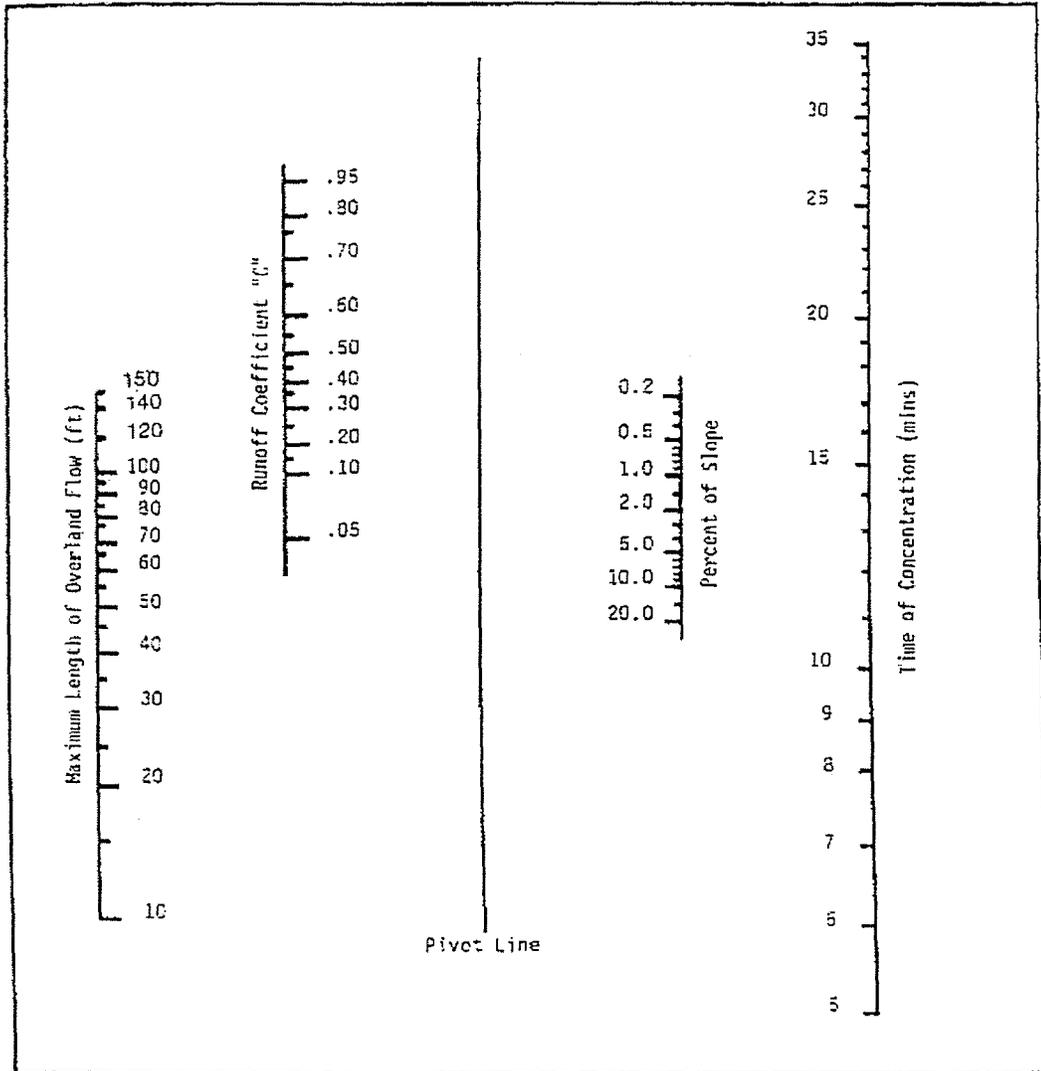
RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD

Soil Groups Slope	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Land Use												
Cultivated Land												
winter conditions	48	60	65	62	73	73	68	78	79	77	81	88
summer conditions	35	51	61	48	55	70	57	65	77	64	69	80
Fallow Fields												
poor conditions	45	54	76	56	63	85	64	74	90	69	77	93
good conditions	30	44	74	43	48	83	48	54	88	56	60	90
Forest/Woodland	30	30	40	42	46	55	45	50	70	50	56	77
Grass Areas												
good conditions	35	39	51	48	54	61	56	59	74	62	63	80
average conditions	45	49	53	52	55	69	60	63	79	65	69	84
poor conditions	48	53	68	56	67	79	66	74	86	73	81	89
Impervious Areas	96	97	98	96	97	98	96	97	98	96	97	98
Weighted Residential												
Lot size 1/8 acre	71	75	77	74	76	85	78	80	90	81	83	92
Lot size 1/4 acre	61	62	67	66	69	75	67	69	83	75	78	87
Lot size 1/3 acre	57	59	65	64	66	72	65	66	81	74	77	86
Lot size 1/2 acre	54	57	63	62	64	70	63	65	80	72	76	85
Lot size 1 acre	51	55	62	61	63	68	61	64	79	71	75	84

APPENDIX NO. 17-B-3

NOMOGRAPH FOR DETERMINING SHEET FLOW

(for use with the Rational Method)



APPENDIX NO. 17-B-4

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

Project _____ By _____ Date _____

Location: _____ Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T _c only)	Segment ID			
1. Surface description (table 3-1)				
2. Manning's roughness coeff., n (table 3-1)				
3. Flow length, L (total L ≤ **150 ft)				
4. Two-yr 24-hr rainfall, P ₂				
5. Land slope, s				
6. $T_t = \frac{0.007 (P_2)^{0.5} L^{0.8}}{s^{0.4}}$ Compute T _t		+		=

Shallow concentrated flow	Segment ID			
7. Surface description (paved or unpaved)				
8. Flow length, L				
9. Watercourse slope, s				
10. Average velocity, V (figure 3-1)				
11. $T_t = \frac{L}{3600 V}$ Compute T _t		+		=

Channel flow	Segment ID			
12. Cross sectional flow area, a				
13. Wetted perimeter, P _w				
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r				
15. Channel slope, s				
16. Manning's roughness coeff., n				
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V				
18. Flow length, L				
19. $T_t = \frac{L}{3600 V}$ Compute T _t		+		=
20. Watershed or subarea T _c or T _t (add T _t in steps 6, 11, and 19)				=

*Table 3-1 per latest TR-55, Urban Hydrology for Small Watershed
 **150' sheet flow length per latest TR-55 revision

APPENDIX NO. 17-B-5

AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR SHALLOW CONCENTRATED FLOW

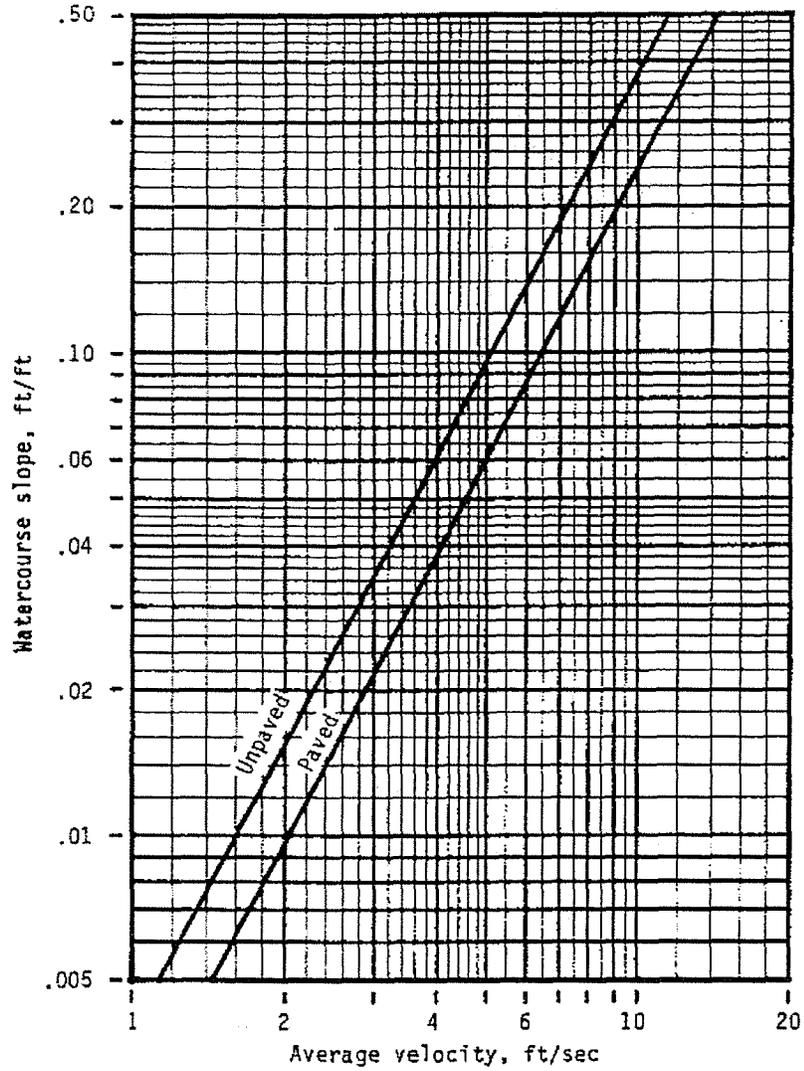


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

(210-VI-TR-55, Second Ed., June 1986)

APPENDIX 17-C

**Prepared By and
Return To:**
Shirk & Mejia, LLP
115 South State Street
Ephrata, PA 17522
717-733-7997

**STORM WATER MANAGEMENT AGREEMENT
AND DECLARATION OF EASEMENT**

THIS AGREEMENT AND DECLARATION OF EASEMENT made as of this _____ day of _____, 20____, by and between _____, with offices or residence located at _____ (hereinafter referred to as the "**Grantor**"); and the **BOROUGH OF AKRON**, Lancaster County, Pennsylvania, a Borough duly organized under the laws of the Commonwealth of Pennsylvania, with its municipal offices located at 117 South Seventh Street, P.O. Box 130, Akron, Pennsylvania 17501 (hereinafter referred to as the "**Borough**").

BACKGROUND.

Grantor is the legal and/or beneficial owner of premises located at _____, in the Borough of Akron, Lancaster County, Pennsylvania, known as _____, as more specifically described in a deed recorded at Document No. _____ in the Office of the Recorder of Deeds in and for Lancaster County, Pennsylvania, and as shown in the _____,

prepared by _____, Project No. _____ dated _____,
200_, last revised _____, 200_, (hereinafter referred to as the "Premises").

Prior to the commencement of any development, Grantor is required under Chapter 17 of the Akron Borough Code of Ordinances, known as the Akron Borough Stormwater Ordinance (the "**Ordinance**"), to submit a storm water management plan to the Borough for approval. Chapter 17 requires that the Grantor make provision for the ownership of, and the method of administering and maintaining, all permanent storm water management facilities, drainage courses, swales, grassed waterways, storm water inlets, pipes, conduits, detention basins, retention basins, infiltration structures, and other storm water management facilities, including Best Management Practices facilities ("**BMPs**"), which shall be included under the term "storm water management facilities" in this Agreement And Declaration of Easement.

The purpose of this Agreement And Declaration of Easement is to describe the ownership and maintenance responsibilities for the storm water management facilities which will be installed on the Premises and to impose the ownership and maintenance responsibilities upon Grantor, its successors and assigns, and upon successor owners of the Premises.

NOW, THEREFORE, intending to be legally bound hereby and in consideration of receiving approval of its Storm Water Management Plan (hereinafter referred to as the "**Plan**") from Akron Borough Council, and/or in consideration of receiving permits from the Borough to develop the Premises, Grantor, for Grantor and the heirs, executors, assigns and successors of Grantor, covenants and declares as follows:

1. The storm water facilities will be owned by Grantor, its successors and assigns.

2. All drainage courses, swales, storm water inlets, pipes, conduits, manholes, detention basins, BMPs, and other storm water management facilities shall be installed, constructed and maintained by Grantor, its successors and assigns, in a first-class condition in conformance with the Plan, as approved, and in a manner sufficient to meet or exceed the design standards and specifications set forth on the Plan. These responsibilities shall include, but not be limited to, the following:

(A) Liming, fertilizing, seeding and mulching of vegetated channels and all other unstabilized soils or areas according to the specifications in the “Erosion and Sedimentation Control Program Manual” (Pennsylvania Code Title 25, Chapter 102), latest revision.

(B) Reestablishment of vegetation by seeding, mulching and use of erosion matting or sodding of scoured areas or areas where vegetation has not been successfully established.

(C) Mowing as necessary to maintain adequate stands of grass and to control weeds. Chemical weed control may be used if federal, state and local laws and regulations are met. Selection of seed mixtures shall be subject to approval by the Borough.

(D) Removal of silt from all permanent structures which trap silt or sediment in order to keep the material from building up in grass waterways, pipes, detention or retention basins, infiltration structures, BMPs, and/or other facilities and thus reducing their capacity.

(E) Regular inspection of the areas in question to assure proper maintenance and care, including but not limited to proper implementation of BMPs.

(F) All pipes, swales and detention facilities shall be kept free of any debris or other obstruction.

3. Grantor shall be responsible for performing the foregoing maintenance and for implementing and maintaining BMP facilities as required by the Ordinance and to submit all applications and pay all fees and expenses required by Chapter 17 of the Akron Borough Code of Ordinances, as amended.

4. Grantor agrees that the failure to maintain all drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs, and other storm water management facilities in a first-class condition in conformance with this Agreement, the Plan, and Chapter 17, as amended, shall constitute a nuisance and shall be abatable by the Borough as such.

5. Grantor authorizes the Borough, at any time and from time to time, by its authorized representatives, to enter upon the Premises to inspect the storm water management facilities.

6. The Borough may require that Grantor, or any future owner or occupier of the Premises, or any part thereof, take such corrective measures as the Borough may deem reasonably necessary to bring the Premises into compliance with this Agreement, the Plan, and Chapter 17, as amended.

7. Upon the failure of the owner or occupier of the Premises to comply with the terms of this Storm Water Management Agreement or to take corrective measures, following thirty (30) days' notice from the Borough, the Borough, through its authorized representatives, may take such corrective measures as it deems reasonably necessary to bring the Premises into

compliance with this Agreement, the Plan, and Chapter 17, as amended, including, but not limited to, the removal of any blockage or obstruction from drainage pipes, swales, detention basins and BMPs, and may charge the cost thereof to Grantor or any owner of the Premises and, in default of such payment, may cause a municipal lien to be imposed upon the Premises or any part thereof or to sue in Court for the recovery thereof, together with reasonable attorneys fees and costs.

8. [OPTIONAL] If ownership or maintenance responsibility of the storm water management facilities is assigned to a homeowners' association, condominium unit owners' association, or similar entity, the Borough shall be notified. In the event such an association or entity has already been formed, the association or entity shall consent to and join in this Agreement. If such association or entity fails to properly maintain the storm water management facilities, the Borough shall have the same rights granted to municipalities with reference to maintenance of common open space under Section 705 of the Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247, or any future amendment thereof, to maintain the storm water management facilities. Any association or entity hereinafter formed shall enter into an agreement with the Borough recognizing its duties and the Borough's rights under this Agreement.

9. [OPTIONAL] The Borough and Grantor acknowledge that the design of any stormwater management facilities constructed will allow for an additional _____ square feet of impervious coverage above that intended for the current project of the Grantor. Upon subsequent application by Grantor or Grantor's heirs, successors, or assigns, and assuming the

stormwater management facilities have been maintained as designed, and that the standards related to the same have not been changed, Grantor and Grantor's heirs, successors and assigns, shall be granted credit (following application to the Borough as is otherwise required by Ordinances then in effect) for the aforesaid _____ square feet as long as the original impervious coverage is such that the facilities constructed by Grantor are such that it can provide the capture of the additional impervious square feet as is then required by Ordinances and regulations in effect.

10. Grantor hereby imposes upon the Premises for the benefit of all present and future owners of the Premises or any part of the Premises, the Borough and all other property owners affected by the storm water management facilities, the perpetual nonexclusive right, privilege and easement for the draining of storm water in and through the drainage courses, swales, storm water inlets, pipes, conduits, detention basins, BMPs, and other storm water management facilities depicted on the plan or plans submitted to the Borough or hereafter made of record and now or hereafter installed on or constructed upon the Premises and, in addition, easements of access to the storm water management facilities.

11. Grantor shall include a specific reference to this Storm Water Management Agreement and Declaration of Easement and the obligations thereunder in any deed of conveyance for the Premises or any part thereof.

12. Grantor agrees to indemnify the Borough and all of its elected and appointed officials, agents and employees (hereinafter collectively referred to as the "Indemnitees") against and hold Indemnitees harmless from any and all liability, loss or damage, including attorneys'

fees and costs of investigation and defense, as a result of claims, demands, costs or judgments against Indemnitees which arise as a result of the design, installation, construction or maintenance of the storm water management facilities.

13. The Borough may, in addition to the remedies prescribed herein, proceed with any action at law or in equity to bring about compliance with the Chapter 17 and this Agreement.

14. (A) Grantor's personal liability under this Agreement shall cease at such time as (a) all storm water management facilities have been constructed in accordance with the specifications of Chapter 17, the Akron Borough Subdivision and Land Development Ordinance and the approved plans; (b) the storm water management facilities have been inspected and approved by the Borough; (c) all financial security, including any maintenance security, posted by Grantor has been released by the Borough; and (d) Grantor has transferred all lots to be created from the Premises to third parties.

(B) Notwithstanding the foregoing, Grantor's personal liability shall continue for any violations of this Agreement and Declaration of Easement which occurred during the time that Grantor owned the Premises or any lot created from the Premises or in the event the storm water management facilities were not completed, inspected or approved as set forth herein.

15. It is the intent of the parties to this Agreement that personal liability and maintenance obligations shall pass to subsequent title owners upon change in ownership of the Premises or any lot created from the Premises, and such subsequent owners shall assume all personal liability and maintenance obligations for the time period during which they hold title.

Personal liability shall remain for any violations of this Agreement and Declaration of Easement or Chapter 17 which occurred during the period in which an owner held title.

16. This Agreement and Declaration of Easement shall be binding upon Grantor, the heirs, executors, successors and assigns of Grantor, and all present and future owners of the Premises, or any part thereof, and is intended to be recorded in order to give notice to future owners of the Premises, or any part thereof, of their duties and responsibilities with respect to the storm water management facilities.

17. This Agreement and Declaration of Easement may be amended only by written instrument signed on behalf of all owners of the Premises and the Borough.

IN WITNESS WHEREOF, the undersigned have caused this Agreement and Declaration to be executed on the day and year first above written.

BOROUGH OF AKRON

Attest: _____
(Assistant) Secretary

By: _____
Borough Council President

[BOROUGH SEAL]

GRANTOR

Witness:

By: _____ (SEAL)

JOINDER BY MORTGAGEE

_____ ("Mortgagee")

as holder of a certain mortgage on the within-described Premises, which mortgage, in the amount of \$ _____, is dated _____, 20__, and is recorded or is about to be recorded in the Recorder of Deeds Office in and for Lancaster County, Pennsylvania, as well as any other mortgages which Mortgagee may now or hereafter hold on the Premises (all such mortgages hereinafter collectively referred to as the "Mortgages"), joins in, consents to, and expressly approves the grant of easements and other rights and privileges described in the attached Storm Water Management Agreement and Declaration of Easement (the "Agreement").

The Mortgagee, for itself, its successors and assigns (which shall include any assignee of the Mortgages and any purchaser of the Premises at a sale in foreclosure of the Mortgages or otherwise), hereby covenants and agrees that the rights and privileges herein granted with respect to the Premises shall not be terminated or disturbed by reason of any foreclosure or other action which may be instituted by the Mortgagee, its successors and assigns, as a result of any default under the Mortgages or the debt instruments that such Mortgages secure. Mortgagee by consenting to the Agreement shall not by virtue of its interest as Mortgagee be deemed to have undertaken any of the obligations of the Grantor under the Agreement, including but not limited to construction, maintenance, inspection or indemnification.

IN WITNESS WHEREOF, Mortgagee hereby joins in the execution of the Agreement as of this ____ day of _____, 20__.

(Name of Mortgagee)

ATTEST: _____ By: _____

[SEAL]

(MORTGAGEE ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF LANCASTER)

On this, the ____ day of _____, 20 __, before me, a notary public,
the undersigned officer, personally appeared

_____, who acknowledged ____ self to be the
_____ of _____, a

corporation, and that as such officer being authorized to do so, acknowledged the foregoing
instrument for the purpose therein contained by signing the name of the Bank by _____ self
as _____.

IN WITNESS WHEREOF, I have hereunto set my hand and notarial seal.

Notary Public

APPENDIX 17-D

Design Templates

Introduction

A stormwater engineers group, organized through the Lancaster County Clean Water Consortium and LCATS, developed the following stormwater facility Design Template to supplement the Lancaster County Act 167 Stormwater Management Model Ordinance prepared by the Lancaster County Planning Commission (LCPC). The engineers group consists of municipal engineers, design engineers and design professionals representing numerous municipalities and design firms throughout the County. The group formed to develop the Design Template based on the following ideas:

- 1 The Design Template should permit frequently used Best Management Practices (BMPs) as well as allow for updates and revisions to BMP design and construction specifications. Additionally, the Template should permit flexibility in facility design instead of a one-size-fits-all approach.
- 2 Standardized Design Template should exist throughout the County for stormwater management facilities based on generally accepted practice.
- 3 Assist municipalities by developing standardized stormwater facility design guidelines that they can incorporate into the LCPC Act 167 Model Ordinance. Currently, each municipality adopting the Act 167 Model Ordinance will need to either use their existing design guidelines which may not support BMPs or write new guidelines.
- 4 Address the void created by PADEP's direction to the LCPC that the previous stormwater facility Design Template be removed from the LCPC Act 167 Model Ordinance. The Design Template document provides specifications for design professionals and municipalities to use during development of their Stormwater Management Ordinance. The Template primarily address three categories of stormwater management facilities -"Above Ground Storage Facility Design", "Subsurface Storage Facility Design", and "Conveyance Facility Design". The intent is for municipalities to use the document as a template for development of their stormwater ordinance with the understanding that certain specific sections of the Design Template may be modified due to unique circumstances and characteristics (borough/township, rural/suburban) within the municipality.

The group's hope is that the stormwater facility design guidelines aid municipalities in their development of a Stormwater Management Ordinance and that the resulting ordinances promote use of BMPs and provide more consistency across the County.

Section 307. Stormwater Management Facility Design Standards

A. Above ground storage facilities.

(1) Design criteria. Above ground storage facilities shall comply with the design criteria in the following table:

N/A = Not applicable SLHDPE = Smooth lined high density polyethylene pipe; PVC = Polyvinyl

Above-ground storage facility design criteria			
	Facility Depth		
	Less than 2 feet	2 feet to 8 feet	Greater than 8 feet
(a) Embankment Geometry			
[1] Top width (minimum)	2 feet	5 feet	8 feet
[2] Interior side slope (maximum)	2 : 1	3 : 1	5 : 1
[3] Exterior side slope (maximum)	2 : 1	3 : 1	3 : 1
(b) Embankment construction			
[1] Key trench	Not required	Required	Required
[2] Pipe collar	Not required	Required	Required
[3] Compaction density	Not required	Required	Required
(c) Internal Construction			
[1] Dewatering feature	N/A	Required	Required
[2] Pretreatment elements	Not required	Required	Required
(d) Outlet Structure			
[1] Pipe size (minimum)	6 inches	12 inches	15 inches
[2] Pipe material	SLHDPE, PVC, RCP	SLHDPE, RCP	RCP
[3] Anticlogging devices	Required	Required	Required
[4] Antivortex design	Not required	Required	Required
[5] Watertight joints in piping?	No	Yes	Yes
(e) Spillway Requirements			
[1] Spillway freeboard (minimum)	Not required	3 inches	6 inches
[2] Width (minimum)	Not required	10 feet	20 feet
[3] Width (maximum)	Not required	50 feet	50 feet
[4] Spillway channel design	Not required	Required	Required
[5] Routing of 100 year storm	Permitted	Permitted	Permitted

chloride; RCP = Reinforced concrete pipe

(2) Facility depth.

(a) For the purposes of the design criteria, the facility depth is defined to be the depth between the bottom invert of the lowest orifice and the invert of the spillway. If there is no spillway, the top of the berm shall be used. For basins with no orifices or outlet structure, the bottom elevation of the basin shall be used.

(b) Facilities with a facility depth greater than eight feet (8 feet) shall not be permitted in residential areas.

(c) Facilities with a facility depth greater than 15 feet require a dam permit from DEP.

(3) Embankment construction.

(a) Impervious core/key trench. An impervious core/key trench, when required, shall consist of a cutoff trench (below existing grade) and a core trench (above existing grade). A key trench may not be required wherever it can be shown that another design feature, such as the use of an impermeable liner, accomplishes the same purpose.

[1] Materials. Materials used for the core shall conform to the Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the No. 200 sieve.

[2] Dimensions.

[a] The dimensions of the core shall provide a minimum trench depth of two (2) feet below existing grade, minimum width of four (4) feet and side slope of 1H:1V or flatter.

[b] The core should extend up both abutments to the 10 year water surface elevation or six (6) inches below the emergency spillway elevation, whichever is lower.

[c] The core shall extend four (4) feet below any pipe penetrations through the impervious core. The core shall be installed along or parallel to the centerline of the embankment.

[3] Compaction.

[a] Compaction requirements shall be the same as those for the embankment to assure maximum density and minimum permeability.

[b] The core shall be constructed concurrently with the outer shell of the embankment.

[c] The trench shall be dewatered during backfilling and compaction operations.

(b) Pipe collars. All pipe collars, when required, shall be designed in accordance with Chapter 7 of the DEP E&S Manual. The material shall consist of concrete or otherwise non-degradable material around the outfall barrel and shall be watertight.

(c) Embankment fill material. The embankment fill material shall be taken from an appropriate borrow area which shall be free of roots, stumps, wood, rubbish, stones greater than 6 inches, frozen or other objectionable materials.

(d) Embankment compaction. When required, embankments shall be compacted by sheepsfoot or pad roller. The loose lift thickness shall be nine (9) inches or less, depending on roller size, and the maximum particle size is six (6) inches or less (two-thirds of the lift thickness). Five passes of the compaction equipment over the entire surface of each lift is required. Embankment compaction to visible non-movement is also required.

(4) Internal construction.

(a) Bottom slope. The minimum bottom slope of facilities not designed for infiltration shall be one percent (1%). A flatter slope may be used if an equivalent dewatering mechanism is provided.

(b) Dewatering features. When required, dewatering shall be provided through the use of underdrain, surface device, or alternate approved by the Municipal Engineer. If the facility is to be used for infiltration, the dewatering device should be capable of being disconnected and only be made operational if the basin is not dewatering within the required timeframe.

(c) Pretreatment elements. When required, pretreatment elements shall consist of forebays, or alternate approved by the Municipal Engineer, to keep silt to a smaller portion of the facility for ease of maintenance.

(d) Infiltration basins. Within basins designed for infiltration, existing vegetation shall be preserved, if possible. For existing unvegetated areas or for infiltration basins that require excavation, the SWM Site Plan shall identify the proposed planting to establish appropriate vegetation to promote infiltration. The planting plan should follow the guidelines established in the BMP Manual for infiltration basins.

(5) Outlet configuration.

(a) For facilities with a depth of two (2) feet or greater, a type D-W endwall or riser box outlet structure shall be provided.

(b) For facilities with a depth less than two (2) feet, no outlet structure is required.

(c) All discharge control devices with appurtenances shall be made of reinforced concrete and stainless steel. Bolts/fasteners shall be stainless steel.

(6) Spillway.

(a) Material. The spillway shall be designed to provide a non-erosive, stable condition when the project is completed.

(b) Non-emergency use. Use of the spillway to convey flows greater than the 50-year design storm is permitted.

(c) Emergency use. The spillway shall be designed to convey the 100-year peak inflow.

(d) When required, freeboard shall be measured from the top of the water surface elevation for emergency use.

(7) Breach analysis. The municipality may require a breach analysis based on site-specific conditions and concern of threat for downstream property. When required, the breach analysis shall be conducted in accordance with the NRCS methodology, the US Army Corps of Engineers methodology (HEC-1) or other methodologies as approved by the municipality.

Subsurface storage facilities.

(1) Design criteria. Subsurface storage facilities shall comply with the design criteria in the following table:

Subsurface storage facility design criteria		
	Facility Type	
	Infiltration and Storage	Storage without Infiltration
(a) Facility Geometry		
[1] Depth from surface (maximum)	2 feet less than limiting zone	N/A
[2] Loading ratio (maximum)	Per BMP Manual*	N/A
(b) Distribution System Requirements		
[1] Pipe size (minimum)	4 inches	4 inches
[2] Pretreatment	Required	Required
[3] Loading/balancing	Required	Not required
[4] Observation/access ports	Required	Required

*Unless otherwise determined by professional geologic evaluation.

(2) Distribution system requirements.

(a) Pretreatment requirements. The facility shall be designed to provide a method to eliminate solids, sediment, and other debris from entering the subsurface facility.

(b) Loading/balancing. The facility shall be designed to provide a means of evenly balancing the flow across the surface of the facility to be used for infiltration.

(c) Observation/access ports.

[1] For facilities with the bottom less than five (5) feet below the average grade of the ground surface, a clean-out shall be an acceptable observation port.

[2] For facilities with the bottom five (5) feet or more below the average grade of the ground surface, a manhole or other means acceptable to the municipality shall be provided for access to and monitoring of the facility.

[3] The number of access points shall be sufficient to flush or otherwise clean out the system.

(3) Materials.

(a) Pipe material. Distribution system piping may be PVC, SLHDPE, or RCP.

(b) Stone for infiltration beds. The stone used for infiltration beds shall be clean washed, uniformly graded coarse aggregate (AASHTO No. 3 or equivalent approved by the municipality). The void ratio for design shall be assumed to be 0.4.

(c) Backfill material. Material consistency and placement depths for backfill shall be (at a minimum) per all applicable pipe manufacturer's recommendations, further providing it should be free of large (not exceeding 6 inches in any dimension) objectionable or detritus material. Select non-aggregate material should be indigenous to the surrounding soil material for non-vehicular areas. Backfill within vehicular areas shall comply with this section unless otherwise specified in governing municipal road/street or subdivision and land development ordinances. Furthermore, if the design concept includes the migration of runoff through the

backfill to reach the infiltration facility, the material shall be well drained, free of excess clay or clay like materials and generally uniform in gradation.

(d) Lining material. Non-woven geotextiles shall be placed on the sides and top of subsurface infiltration facilities. No geotextiles shall be placed on the bottom of subsurface infiltration facilities.

(4) Cover.

(a) When located under pavement, the top of the subsurface facility shall be a minimum of three (3) inches below the bottom of pavement subbase.

(b) Where located under vegetative cover, the top of the subsurface facility shall be a minimum of 12 inches below the surface elevation or as required to establish vegetation.

(5) Subsurface facilities shall be designed to safely convey and/or bypass flows from storms exceeding the design storm.

C. Conveyance Facilities.

(1) Design criteria. Conveyance facilities shall comply with the design criteria in the following table:

Conveyance facility design criteria			
Location	Within public street right-of-way	Outside public street right-of-way	
Loading	All	Vehicular loading	Non-vehicular loading
(a) Pipe design			
[1] Material	SLHDPE, RCP	PVC, SLHDPE, RCP	PVC, SLHDPE, RCP
[2] Slope (minimum)	0.5%	0.5%	0.5%
[3] Cover	1 foot to stone subgrade	1 foot to stone subgrade	1 foot to surface
[4] Diameter (minimum)	15 inches	15 inches	8 inches
[5] Street crossing angle	75° to 90°	N/A	N/A
[6] Access/maintenance port frequency (maximum)	400 feet	400 feet	600 feet
(b) Inlet design			
[1] Material	Concrete	Concrete	N/A
[2] Grate depression	2 inches	2 inches	1 inch minimum
(c) Manhole design			
[1] Material	Concrete	Concrete	Concrete
(d) Swale design			
[1] Freeboard (minimum)	6 inches	N/A	6 inches
[2] Velocity (maximum)	Stability check	N/A	Stability check
[3] Slope (minimum)	1%	N/A	1%
[4] Side slopes (residential area)	4 : 1 max	N/A	4 : 1 max
[5] Side slopes (non-residential area)	4 : 1 max	N/A	3 : 1 max
[6] Bottom width to flow depth ratio	12 : 1	N/A	12 : 1
(e) Outlet design			
[1] End treatment	Headwall/endwall	N/A	Headwall/ endwall or flared end section
[2] Energy dissipater	Required	N/A	Required

N/A = Not applicable or no criteria specified SLHDPE = Smooth lined high density polyethylene pipe; PVC = Polyvinyl chloride; RCP = Reinforced concrete pipe

(2) Conveyance pipes, culverts, manholes, inlets and endwalls within the public street right-of-way or proposed for dedication shall conform to the requirements of PennDOT Standards for Roadway Construction, Publication No. 72M. Conveyance pipes, culverts, manholes, inlets and endwalls which are otherwise subject to vehicular loading shall be designed for the HS-25 loading condition.

(3) Conveyance pipes.

(a) Backfill requirements. Backfill material. Material consistency and placement depths for backfill shall be (at a minimum) per all applicable pipe manufacturer's recommendations, further providing it should be free of large (not exceeding 6 inches in any dimension) objectionable or detritus material. Select non-aggregate material should be indigenous to the surrounding soil material for non-vehicular areas. Backfill within vehicular areas shall comply with this section unless otherwise specified in governing municipal road/street or subdivision and land development ordinances.

(b) Inlets or manholes shall be placed at all points of changes in the horizontal or vertical directions of conveyance pipes. Curved pipe sections are prohibited.

(c) Access/maintenance ports. An access/maintenance port is required may either be an inlet or manhole.

(d) Watertight joints shall be provided where pipe sections are joined, except for perforated pipe installed as pavement base drain.

(e) The street crossing angle shall be measured between the pipe centerline and the street centerline.

(f) Elliptical pipe of an equivalent cross-sectional area may be substituted in lieu of circular pipe where cover or utility conflict conditions exist.

(g) The roughness coefficient (Manning "n" values) used for conveyance pipe capacity calculations should be determined in accordance with PennDOT Publication 584, *PennDOT Drainage Manual*, or per the manufacturer's specifications.

(4) Inlets.

(a) All pipes must enter inlets completely through one of the sides. No corner entry of pipes is permitted.

(b) Within the public street right-of-way, the gutter spread based on the 25-year storm shall be no greater than one half of the travel lane and have a maximum depth of three inches (3 inches) at the curb line. A parking lane shall not be considered as part of the travel lane. In the absence of pavement markings separating a travel lane from the parking lane, the parking lane shall be assumed to be eight feet (8 feet) wide if parking is permitted on the street.

(c) Flow depth within intersections. Within intersections of streets, the maximum depth of flow shall be one and one-half inches (1 ½ inches) based on the 25-year storm.

(d) Curbed streets.

[1] Inlets in streets shall be located along the curb line.

[2] Top units shall be PennDOT Type "C". The hood shall be aligned with the adjacent curb height.

(e) All inlets placed in paved areas shall have heavy duty bicycle-safe grating consistent with PennDOT Publication 72M, latest edition. A note to this effect shall be added to the SWM Site Plan or inlet details therein.

(f) Inlets, junction boxes, or manholes greater than five feet (5 feet) in depth shall be equipped with ladder rungs and shall be detailed on the SWM Site Plan.

(5) Swales.

(a) A swale shall be considered as any man-made ditch designed to convey stormwater directly to another stormwater management facility or surface waters.

(b) Inlets within swales shall have PennDOT Type "M" top units or equivalent approved by the municipal engineer.

(c) Swale capacities and velocities shall be computed using the Manning equation using the following design parameters:

[1] Vegetated swales.

[a] The first condition shall consider swale stability based upon a low degree of retardance ("n" = 0.03);

[b] The second condition shall consider swale capacity based upon a higher degree of retardance ("n" = 0.05); and

[c] All vegetated swales shall have a minimum slope of 1% unless otherwise approved by the Municipal Engineer.

[2] The "n" factors to be used for paved or riprap swales or gutters shall be based upon accepted engineering design practices, as approved by the Municipal Engineer.

(d) All swales shall be designed to maximize infiltration and concentrate low flows to minimize siltation and meandering, unless geotechnical conditions do not permit infiltration.

(6) Culverts. In addition to the material requirements in this section, culverts designed to convey Waters of the Commonwealth may be constructed with either a corrugated metal arch or a precast concrete culvert.

(7) Level spreaders.

(a) Shall discharge at existing grade onto undisturbed vegetation.

(b) Discharge at a depth not exceeding 3.0 inches for a 50-year, 24-hour design storm.

(8) Energy dissipaters. Energy dissipaters shall be designed in accordance with the requirements in the DEP E&S Manual.

(9) End treatments.

(a) Where the connecting pipe has a diameter 18 inches or greater, headwalls and endwalls shall be provided with a protective barrier device to prevent entry of the storm sewer pipe by unauthorized persons. Such protection devices shall be designed to be removable for cleaning.

(b) Headwalls and endwalls shall be constructed of concrete.

(c) Flared end sections shall be of the same material as the connecting pipe and be designed for the size of the connecting pipe.

D. SWM Facilities which qualify as a dam per DEP regulations or facilities deemed a potential threat to the life, safety or welfare of the general public shall be subject to the following requirements:

(1) Facilities which qualify as a dam per DEP regulation shall obtain the required permit through DEP and design the facility in accordance with DEP standards.

(2) Additional requirements and analysis may be required by the township to prove that the proposed facility has been designed to limit the potential risk to the life, safety or welfare of the general public.

APPENDIX 17-E

AKRON BOROUGH EXEMPTION APPLICATION

Date Received _____ File Number _____ Property Act # _____

Submitted Fee \$ _____

Project Street Address _____

Owners' Name _____

Signatures (all owners must sign) _____

Phone # / Fax # / Email: _____

Person / Firm to be completing work: _____

Phone # / Fax # / Email: _____

Proposed Activity:

- After _____, have you previously added impervious surface on this property?
 - No
 - Yes, Total area of previous impervious surface _____ sq. ft.

- Are you removing existing impervious surface as part of this project?
 - No
 - Yes, Impervious surface to be removed _____ sq. ft.

- Addition of impervious surface (5,000 square feet or less)
 - Total new impervious surface proposed _____ sq. ft.
 - Type of new impervious surface: driveway, shed, garage, deck,
 walkway, other (please describe)

- Removal of ground cover, grading, filling, or excavating of an area
 - Total area of land disturbance: _____ sq. ft.
 - Type of regulated removal activity (check all that apply): Ground Cover,
 Grading, Filling, Excavation, Other earth disturbance activity
 (please describe)
-
-

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

- Floodplain
- Wetlands
- Slopes greater than 15%
- Known bedrock within 6 feet of the ground surface
- Riparian Forest Buffer
- Natural water flow paths (creeks, streams, ponds, swales, etc.)
- Existing known stormwater problem areas
- Downstream property owners

Sketch:

Provide a sketch of the proposed additional impervious area and/or land disturbance.