

**TOWNSHIP OF FAIRVIEW
ERIE COUNTY, PENNSYLVANIA
ORDINANCE NO. 2014-__**

Style Definition: Ordinance Article Heading:
Centered, Tab stops: Not at 3" + 6"

**AN ORDINANCE ESTABLISHED TO ASSURE SAFE MANAGEMENT OF STORMWATER RUNOFF
RESULTING FROM LAND ALTERATION AND DISTURBANCE ACTIVITIES IN ACCORDANCE WITH
WATERSHED STORMWATER MANAGEMENT PLANS ADOPTED PURSUANT TO THE PENNSYLVANIA
STORM WATER MANAGEMENT ACT (ACT 167 OF 1978, AS AMENDED).**

BE IT ENACTED AND ORDAINED by the Board of Supervisors of Fairview Township, Erie County, Pennsylvania, and it is hereby enacted and ordained by authority of the same.

**ARTICLE I
GENERAL PROVISIONS**

Section 101 – Statement of Findings

The Board of Supervisors of Fairview Township finds that:

- A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flood flows and velocities; contributes to erosion and sedimentation; overtaxes the carrying capacity of streams and storm sewers; greatly increases the cost of public facilities to carry and control stormwater; undermines flood plain management and flood control efforts in downstream communities; reduces groundwater recharge; and threatens public health and safety; and
- B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety and welfare and the protection of the people of Fairview Township and all the people of the Commonwealth, their resources and the environment.
- C. A program of stormwater management, including reasonable regulation of land development and redevelopment causing loss of natural infiltration, is fundamental to the public health, safety, welfare, and the protection of the people of Fairview Township and all the people of the Commonwealth, their resources, and the environment.
- D. Stormwater can be an important resource by providing groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.
- E. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.
- F. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES).

Section 102 – Purpose

These regulations have the following general purposes and objectives:

- A. To promote the health, safety and welfare within the community.
- B. To assure proper management of stormwater runoff resulting from land alteration and disturbance activities in accordance with watershed stormwater management plans adopted pursuant to the Pennsylvania Storm Water Management Act (Act 167 of 1978, as amended).
- C. To utilize and preserve the existing natural drainage systems and to maintain existing flows and quality of streams and water courses.
- D. To encourage natural infiltration of rainfall to preserve groundwater supplies and stream flows.
- E. To provide for adequate maintenance of all permanent stormwater management structures in Fairview Township.

Section 103 – Statutory Authority

Fairview Township is empowered to regulate land use activities that affect runoff by the authority of the Act of October 4, 1978, P.L. 864 (Act 167), “The Storm Water Management Act” as amended, and the Stormwater Management Plans and Facilities Amendments to the Second Class Township Code, as set forth in 53 P.S. 67701, et. seq., the Second Class Township Code, the Act of May 1, 1933, P.L. 103, as amended, and the Pennsylvania Municipalities Planning Code, the Act of July 31, 1968, P.L. 805, as reenacted and amended.

Section 104 – Applicability

The following activities involving alteration or development of land are deemed to have possible effects upon storm water runoff characteristics and are included within the scope of this Ordinance:

- A. Subdivision
- B. Land Development
- C. Construction of new or additional impervious or semi-pervious surfaces (driveways, parking lots, etc.)
- D. Diversion or piping of any natural or man-made stream channel
- E. Installation, replacement or substantial repair of storm water systems or appurtenances.
- F. Earth moving involving one acre or more
- G. Construction of new buildings or additions to existing buildings

Section 105 – Repealer

This Ordinance shall repeal all other ordinances, or parts thereof, which are contrary to or conflict with the provisions of this Ordinance to the extent necessary to give this Ordinance full force and effect.

Section 106 – Severability

Should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of this Ordinance as a whole or any other part hereof; the parts or sections remaining shall remain in effect as if the part of the section declared unconstitutional had never been a part of this Ordinance.

Section 107 – Liability Disclaimer

- A. Neither the granting nor the denial of any approval nor the compliance with the provisions of this ordinance or with any condition imposed by the Commonwealth of Pennsylvania (Department of Environmental Protection), the Erie County Conservation Office, the Township, its officials, employees or designated representatives hereunder, shall relieve any person from any responsibility for damage to persons or property resulting therefrom, or as otherwise imposed by law, nor impose any liability upon the municipal officials, employees or its designated representatives to the maximum extent permitted by law.
- B. Neither the granting nor the denial of any permit which includes any stormwater management requirements shall not constitute a representation, guarantee or warranty of any kind by the Commonwealth of Pennsylvania, Erie County Conservation office, by Fairview Township, the municipal officials, employees or designated representatives thereof of the practicability or safety of any stormwater structure or facility, use or other plan proposed, and shall create no liability or cause of action upon any municipal official, employee, or designated representative thereof for any damage that may result pursuant thereto to the maximum extent permitted by law.

Section 108 – Compatibility with other permit and ordinance requirements

- A. Permits and approvals issued pursuant to this ordinance do not relieve the applicant of the rule, act or ordinance. If more stringent requirements concerning regulation of stormwater or erosion and sedimentation control are contained in another code, rule act or ordinance, the more stringent regulation shall apply.
- B. Nothing in this Ordinance shall be construed to affect any of Fairview Township's requirements regarding stormwater matters which do not conflict with the provisions of this Ordinance, such as local stormwater management design criteria (e.g., inlet spacing, inlet type, collection system design and details, outlet structure design, etc.). Conflicting provisions in other municipal ordinances or regulations shall be construed to retain the requirements of this ordinance addressing State Water Quality Requirements.

ARTICLE II DEFINITIONS

Accelerated Erosion: The removal of the surface of the land through the combined action of man's activities and natural processes at a rate greater than would occur because of the natural processes alone.

Act: The Storm Water Management Act (Act of October 4, 1978, P.L. 864 No. 167; 32 P.S. Sections 680.1-680.17, as amended by Act of May 24, 1984, No. 63).

Agriculture: The science and art of farming including cultivating the soil, producing crops and raising livestock and poultry. Agriculture activities include normal farming operations, as well as orchards and vineyards, dairy farms, greenhouses, horticulture operations, nurseries, and agricultural storage and/or processing activities.

Agricultural Activities - Activities associated with agriculture such as agricultural cultivation, agricultural operation, and animal heavy use areas. This includes the work of producing crops, tillage, land clearing, plowing, disking, harrowing, planting, harvesting crops, or pasturing and rearing of livestock and installation of conservation measures. Construction of new buildings or impervious area is not an Agricultural Activity and thus not exempted from the storm water regulations.

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; changing of surface conditions by causing the surface to be more or less impervious; land disturbance.

Applicant: A landowner or developer who has filed an application for development including his/her heirs, successors and assigns.

Best Management Practices (BMPs) - Activities, facilities, designs, measures or procedures used to manage stormwater impacts from Regulated Activities, to meet State Water Quality Requirements, to promote groundwater recharge and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: "non-structural" or "structural". "Non-structural" BMPs are measures referred to as operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff whereas "structural" BMPs are measures that consist of a physical device or practice that is installed to capture and treat stormwater runoff. "Structural" BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales (meadow grass is not an acceptable ground covering), riparian or forested buffers, sand filters, detention basins (meadow grass is not an acceptable ground covering), and manufactured devices. "Structural" stormwater BMPs are permanent appurtenances to the project site.

Bluff: The edge or crest of the elevated segment of the shoreline above the beach terrace, subject to ground and surface water erosion.

Bluff Recession: The loss of material along the bluff caused by the direct or indirect action by one or a combination of ground water seepage, wind and/or currents or high water levels.

Channel: A perceptible natural or artificial waterway which periodically or continuously contains moving water or which forms a connecting link between two bodies of water. It has a definite bed and banks which confine the water.

Channel Erosion - The widening, deepening, and head ward cutting of channels and waterways, due to erosion caused by moderate to large floods.

Cistern - An underground reservoir or tank used for storing rainwater.

Coastal Plain: The portion of Fairview Township as identified by the Department of Environmental Protection, division of Coastal Zone Management and shall be considered as from PA Route 5 (West Lake Road) northward to the shore of Lake Erie. This area is where ground water and other elements may impact the stability of the lake bluff.

County: Erie County, Pennsylvania

County Conservation District: The Erie County Conservation District.

Culvert: A closed conduit for the free passage of surface drainage under a highway, railroad, canal or other embankment.

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

Design Criteria: (1) Engineering guidelines specifying construction details and materials. (2) Objectives, results, or limits which must be met by a facility, structure, or process in performance of its intended functions.

Design Storm: (see storm frequency)

Designee - The agent of this municipality and/or agent of the governing body involved with the administration, review or enforcement of any provisions of this Ordinance by contract or memorandum of understanding.

Detention: The slowing, dampening or attenuating of runoff flows entering the natural drainage pattern or storm drainage system by temporarily holding water on a surface area in a detention basin or within the drainage system.

Detention Pond or Basin: A basin or reservoir constructed to impound or retard surface runoff temporarily so that it can be released at a controlled rate and maintained by multiple seasonal mowing a minimum of three (3) to deter animal habitation, unwanted vegetation growth and proper functioning of the designed drainage system.

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

Developer: The person, persons, or any corporation, partnership, association, or other entity or any responsible person therein or agent therefor that undertakes the activities associated with changes in land use. The term "developer" is intended to include but not necessarily be limited to the term "subdivider", "owner", and "builder" even though the individuals involved in successive stages of a project may vary.

Development: Any activity, construction, alteration, change in land use or practice that affects stormwater runoff characteristics.

Discharge: The flow or rate of flow from a canal, conduit, channel or other hydraulic structure.

Disturbed Area - An unstabilized land area where an Earth Disturbance Activity is occurring or has occurred.

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

Drainage: In general, the removal of surface water from a given area. Commonly applied to surface water and ground water.

Drainage Area: (1) The area of a drainage basin or watershed, expressed in acres, square miles, or other unit of area. Also called catchment area, watershed, river basin. (2) The area served by a sewer system receiving storm and surface water, or by a watercourse.

Drainage Conveyance Facility - A stormwater management facility designed to convey stormwater runoff and shall include streams, channels, swales, pipes, conduits, culverts, storm sewers, etc.

Drainage Easement: A right granted by a land owner to a grantee, allowing the use of private land for storm water management purposes.

Drainageway - Any natural or artificial watercourse, trench, ditch, pipe, swale, channel, or similar depression into which surface water flows.

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, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth materials.

Encroachment: Any structure or activity which in any manner changes, expands or diminishes, the course, current or cross section of any watercourse, floodway or body of water.

Erosion: Wearing away of the lands by running water, glaciers, winds and waves.

Erosion Control: The application of measures to reduce erosion of land surfaces to be shown on a plan and/or a permit that may be required to be issued by The Erie County Conservation District.

Existing Conditions - The initial condition of a project site prior to the proposed construction. If the initial condition of the site is undeveloped land and not forested, the land use shall be considered as "meadow" unless the natural land cover is documented to generate lower Curve Numbers or Rational "C" Coefficient.

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 the Commonwealth.

Flood Fringe - The remaining portions of the 100-year floodplain outside of the floodway boundary.

Floodplain - A relatively flat or low land area which is subject to partial or complete inundation from an adjoining or nearby stream, river or watercourse; and/or any area subject to the unusual and rapid accumulation of surface waters from any source. As delineated by the Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary - mapping from studies as being a special flood hazard area. Included are lands adjoining a river or stream that have been or may be inundated by a 100-year flood. Also included are areas that comprise Group 13 Soils, as listed in Appendix A of the Pennsylvania Department of Environmental Protection (PADEP) Technical Manual for Sewage Enforcement Officers (as amended or replaced from time to time by PADEP).

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

Forest Management Operations: All activities connected with growing and harvesting of forest products including the site preparation, cultivation and logging of trees, and the construction and maintenance of roads.

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

Grade - A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein.

(To) Grade - To finish the surface of a roadbed, top of embankment or bottom of excavation.

HEC-HMS Model Calibrated - (Hydrologic Engineering Center Hydrologic Modeling System) A computer-based hydrologic modeling technique adapted to the watershed(s) in Erie County for the Act 167 Plan. The model has been calibrated by adjusting key model input parameters.

High Quality Waters - Surface water having quality, which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying PA Code Title 25 Environmental Protection, Chapter 93 Water Quality Standards 93.4b(a).

Hydrologic Soil Group (HSG) - Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into one of four HSG (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. The Natural Resource Conservation Service (NRCS) of the US Department of Agriculture defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of interest may be identified from a soil survey report from the local NRCS office or the County Conservation District.

Ground Cover: Materials covering the ground surface.

Ground Water: Subsurface water occupying the saturation zone, from which wells and springs are fed.

Ground Water Recharge: Replenishment of ground water naturally by precipitation or runoff or artificially by spreading or injection.

Impervious: Not allowing or allowing only with great difficulty the movement of water; impermeable.

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

Impervious Surface: A surface that prevents the infiltration of water into the ground. Impervious surface includes, but is not limited to, any roof, parking or driveway areas, and any new streets and sidewalks. Any surface areas designed to initially be gravel or crushed stone may be assumed to be impervious surfaces as determined by the Township engineer if necessary.

Infiltration: (1) The flow or movement of water through the interstices or pores of a soil or other porous medium. (2) The absorption of liquid by the soil.

Infiltration Structure: A structure designed to direct runoff into the ground, e.g., French drains, seepage pits, seepage trench.

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

Land Development: Any of the following activities:

1. the improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving: (a) a group of two or more residential or non-residential buildings, whether proposed initially or cumulatively, or a single non-residential building on a lot or lots regardless of the number of occupants or tenure; or (b) the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features;
2. a subdivision of land;
3. development in accordance with Section 503 (1.1) of the Pennsylvania Municipalities Planning Code.

Land Disturbance: Any activity involving the changing, grading, transportation, fill and any other activity which causes land to be exposed to the danger of erosion.

Low Impact Development (LID) - an approach to land development that uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.

Main Stem (Main Channel) - Any stream segment or other runoff conveyance facility used as a reach in the Erie County Act 167 watershed hydrologic model(s).

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

Maintenance: The upkeep necessary for efficient operation of physical properties.

Municipality: Fairview Township, Erie County

Municipal Engineer: A professional engineer licensed in the Commonwealth of Pennsylvania, duly appointed by the Fairview Township Board of Supervisors.

Natural Stormwater Runoff Regime: A watershed where natural surface configurations, runoff characteristics and defined drainage conveyances have attained the conditions of equilibrium.

National Pollutant Discharge Elimination System (NPDES) - The federal government's system for issuance of permits under the Clean Water Act, which is delegated to PADEP in Pennsylvania.

NOAA Atlas 14: - Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, US Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland (2004). NOAA's Atlas 14 can be accessed at Internet address <http://hdsc.nws.noaa.gov/hdsc/pfds/>.

Non-point Source Pollution - Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

NRCS - Natural Resource Conservation Service (previously Soil Conservation Service (SCS)).

Nursery: A tract of land on which trees and plants are raised or stored for transplanting and sale.

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 drainageways, swales, streams, ditches, canals, and pipes not under pressure.

Outfall/outlet: (1) The point, location or structure where drainage discharges from a sewer, drain or other conduit. (2) The conduit leading to the ultimate discharge point.

Outlet Control Structure: The means of controlling the relationship between the headwater elevation and the discharge, placed at the outlet or downstream end of any structure through which water may flow.

PADEP - The Pennsylvania Department of Environmental Protection.

Parking Lot Storage - Involves the use of impervious parking areas as temporary impoundments with controlled release rates during rainstorms.

Performance Standard: A standard which establishes an end result or outcome which is to be achieved but does not prescribe specific means for achieving it.

Peak Discharge: The maximum rate of flow of water at a given point and time resulting from a specified storm event.

Peak Flow: Maximum flow.

PA DEP: Pennsylvania Department of Environmental Protection.

Person: An individual, partnership, public or private association or corporation, or a government unit, public utility or any other legal entity whatsoever that is recognized by law as the subject of rights and duties.

Pervious Area - Any area not defined as impervious.

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

Planning Commission - The Planning Commission of Fairview Township.

Point Source: Any discernable, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel or conduit from which stormwater is or may be discharged, as defined in State regulations at 25 Pa Code § 92.1.

Probable Maximum Flood (PMF) - The flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in any area. The PMF is derived from the probable maximum precipitation (PMP) as determined on the basis of data obtained from the National Oceanographic and Atmospheric Administration (NOAA).

Project Site - The specific area of land where any Regulated Activities in the Municipality are planned, conducted, or maintained.

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

Rational Formula - A rainfall-runoff relation used to estimate peak flow.

Redevelopment - Earth disturbance activities on land, which has previously been developed.

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

Regulated Earth Disturbance Activity - Activity involving Earth Disturbance subject to regulation under 25 PA Code Chapter 92, Chapter 102, or the Clean Streams Law.

Release Rate District - Those subwatershed areas in which post-development flows must be reduced to a certain percentage of pre-development flows as required to meet the plan requirements and the goals of Act 167.

Release Rate Percentage: The watershed factor determined by comparing the maximum rate of runoff from a sub-basin to the contributing rate of runoff to the watershed peak rate at specific points of interest.

Retention Pond: A basin, usually enclosed by artificial dikes, that is used to decrease stormwater runoff by storing the runoff without release.

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

Return Period: The average interval in years over which an event of a given magnitude can be expected to recur.

Riparian Buffer - A vegetated area bordering perennial and intermittent streams and wetlands, that serves as a protective filter to help protect streams and wetlands from the impacts of adjacent land uses.

Riser - A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

Road Maintenance - Earth disturbance activities within the existing road right-of-way, such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches, and other similar activities. Road maintenance activities (such as milling and overlays) that do not disturb the subbase of a paved road are not considered earth disturbance activities.

Rooftop Detention - Temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff: That part of precipitation which flows over the land.

Runoff Capture Volume - The volume of runoff that is captured (retained) and not released into surface Waters of the Commonwealth during or after a storm event.

Runoff Characteristics: The surface components of any watershed which affect the rate, amount, and direction of stormwater runoff. These may include but are not limited to: vegetation, soils, slopes and man-made landscape alterations.

SCS: U.S. Department of Agriculture Soil Conservation Services.

Sediment: Mineral or organic solid material that is being transported or has been moved from its site of origin by air, water or ice and has come to rest.

Sedimentation: The process by which mineral or organic matter is accumulated or deposited by moving water, wind or gravity.

Sediment Basin: A barrier, dam, retention or detention basin designed to retain sediment.

Sediment Pollution - The placement, discharge, or any other introduction of sediment into Waters of the Commonwealth occurring from the failure to properly design, construct, implement or maintain control measures and control facilities in accordance with the requirements of this Ordinance.

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- Pervious Surface: A surface such as stone, rock, concrete or other materials which permits some vertical transmission of water.

Separate Storm Sewer System: A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) primarily used for collecting and conveying stormwater runoff.

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

Soil-Cover Complex Method: A method of runoff computation developed by SCS and found in its publication "Urban Hydrology for Small Watersheds," Technical Release No. 55, SCS, January,1975.

Storage Facility: (see Detention Pond and Retention Pond).

State Water Quality Requirements: As defined under State regulations – protection of designated and existing uses (see 25 Pa. Code Chapter 93 and 96) – including:

- A) Each stream section in Pennsylvania has a "designated use," such as "cold water fishery" or "potable water supply," which are listed in C, Chapter 93. These uses must be protected and maintained under state regulations.
- B) "Existing uses are those attained as of November 1975, regardless of whether they have been designated in Chapter 93. Regulated Earth Disturbance activities must be designed to protect and maintain existing uses and maintain the level of water quality necessary to protect those uses in all streams and to protect and maintain water quality in special protection streams.
- C) Water quality involves the chemical, biological and physical characteristics of surface water bodies. After Regulated Earth Disturbance activities are complete, these characteristics can be impacted by addition of pollutants such as sediment and change in habitat through increased flow volumes and/or rates as a result of changes in land surface area from those activities. Therefore, permanent discharges to surface waters must be managed to protect the stream bank and structural integrity of the waterway to prevent these impacts.

Spillway (Emergency) - A depression in the embankment of a pond or basin, or other overflow structure, that is used to pass peak discharges greater than the maximum design storm controlled by the pond or basin.

Storage Facility: (see Detention and Retention Pond).

Storm Frequency: The average interval in years over which a storm event of a given precipitation volume can be expected to occur.

Storage Indication Method - A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage) with outflow defined as a function of storage volume and depth.

Storm Sewer: A sewer that carries intercepted surface runoff, street water and other drainage but excludes domestic sewage and industrial waste.

Stormwater: That portion of precipitation which runs over the land.

Stormwater Collection System: Natural or man-made structures that collect and transport stormwater through or from a drainage area to the point of final outlet including, but not limited to, any of the following: conduits and appurtenant features, canals, channels, ditches, streams, culverts, streets, and pumping stations.

Stormwater Hotspot - A land use or activity that generates higher concentrations of hydrocarbons, trace metals, or toxicants than are found in typical stormwater runoff.

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

Stormwater Management Plan: The plan for managing stormwater runoff adopted by Erie County as required by the Storm Water Management Act.

Stormwater Management Site Plan (SWM Site Plan) - The plan prepared by the Applicant or his representative indicating how stormwater runoff will be managed at the project site in accordance with this Ordinance.

Stream Enclosure - A bridge, culvert, or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated Waters of the Commonwealth.

Subwatershed Area - The smallest drainage unit of a watershed for which stormwater management criteria has been established in the Stormwater Management Plan.

Subdivision: The division or redivision of a lot, tract or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building or lot development; provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than 10 acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

Swale: A low-lying stretch of land which gathers or carries surface water runoff.

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.

Township – Fairview Township, Erie County.

USDA - The United States Department of Agriculture.

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

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

Watershed: The entire region or area drained by a river or other body of water whether natural or artificial. A “designated watershed” is an area delineated by the Pennsylvania DEP and approved by the Environmental Quality Board for which counties are required to develop watershed stormwater management plans.

Wetland - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs and similar areas. The term includes but is not limited to wetland areas listed in the State Water Plan, the United States Forest Service Wetlands Inventory of Pennsylvania, the Pennsylvania Coastal Zone Management Plan and a wetland area designated by a river basin commission. This definition is used by the United States Environmental Protection Agency and the United States Army Corps of Engineers.

ARTICLE III

STORMWATER MANAGEMENT REQUIREMENTS

Section 301 – Stormwater Management Districts

- A. For purposes of stormwater management, Fairview Township is divided into the following stormwater management districts:
1. Lake Erie/Elk Creek Watershed
 2. This district may be further subdivided into subareas which have similar hydrological characteristics and drain to a common point.
 3. The location and boundaries of the watershed(s) and subareas may be shown on the “Municipal Stormwater Management District Map” which may be adopted at a future date).
- B. When a project or land disturbance activity is located in more than one watershed management district, stormwater may not be transferred from a district with stricter storm water management criteria to a district with less strict criteria, unless the need for such a transfer is identified in the county stormwater management plan, the regional water quality management plan or the state water plan.

Section 302 – General Standards

- A. For all Regulated Activities, unless specifically exempted:
- a. Preparation and implementation of an approved SWM Site Plan is required.
 - b. No Regulated Activities shall commence until the authorized Township official issues written approval of a SWM Site Plan, which demonstrates compliance with the requirements of this Ordinance.
 - c. The SWM Site Plan shall demonstrate that adequate capacity will be provided to meet the Volume and Rate Control Requirements, as described under Sections 305 and 306 of this Ordinance.
 - d. The SWM Site Plan approved by the Township, shall be on-site throughout the duration of the Regulated Activities.
- B. For all Regulated Earth Disturbance Activities, erosion and sediment control BMPs shall be designed, implemented, operated, and maintained during the Regulated Earth Disturbance Activities (e.g., during construction) to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code (including, but not limited to Chapter 102 Erosion and Sediment Control) 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), No. 363-2134-008 (April 15, 2000), as amended and updated.
- C. For all Regulated Activities, stormwater BMPs shall be designed, installed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law, conform to the State Water Quality Requirements, meet all requirements under the Storm Water Management Act and any more stringent requirements as determined by the Township.
- D. The Township may, after consultation with PADEP and the County Conservation District, approve measures for meeting the State Water Quality Requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with state law, including, but not limited to, the Clean Streams Law.
- E. All Regulated Activities shall include, to the maximum extent practicable, measures to:
- a. Protect health, safety, and property.

- b. Meet the water quality goals of this Ordinance by implementing measures to:
 - i. Minimize disturbance to floodplains, wetlands, natural slopes, existing native vegetation and woodlands.
 - ii. Create, maintain, or extend riparian buffers and protect existing forested buffers.
 - iii. Provide trees and woodlands adjacent to impervious areas whenever feasible.
 - iv. Minimize the creation of impervious surfaces and the degradation of Waters of the Commonwealth and promote groundwater recharge.
 - v. Protect natural systems and processes (drainageways, vegetation, soils, and sensitive areas) and maintain, as much as possible, the natural hydrologic regime.
 - vi. Incorporate natural site elements (wetlands, stream corridors, mature forests) as design elements.
 - vii. Avoid erosive flow conditions in natural flow pathways.
 - viii. Minimize soil disturbance and soil compaction.
 - ix. Minimize thermal impacts to Waters of the Commonwealth.
 - x. Disconnect impervious surfaces by directing runoff to pervious areas, wherever possible and decentralize and manage storm water at its source.
 - xi. Protect the Coastal Bluff from recession due to the introduction of storm water infiltration in the Coastal Plan through a detention basin.

F. Impervious Areas:

- a. The measurement of impervious areas shall include all of the impervious areas in the total proposed development, even if development is to take place in stages.
- b. For developments taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.

G. If diffused flow is proposed to be concentrated and discharged onto adjacent property, the Applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding, or other harm will result from the concentrated discharge.

- a. Applicant must provide an easement for proposed concentrated flow across adjacent properties to a drainage way or public right-of-way.
- b. Such stormwater flows shall be subject to the requirements of this ordinance.

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

I. Where watercourses traverse a development site, drainage easements (with a minimum width of 20 feet and include the 100-year water surface) shall be provided conforming to the line of such watercourses. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations that may adversely affect the flow of stormwater within any portion of the easement. Also, maintenance, including mowing of vegetation within the easement may be required, except as approved by the appropriate governing authority.

J. When it can be shown that, due to topographic conditions, natural drainageways on the site cannot adequately provide for drainage, open channels may be constructed conforming substantially to the line and grade of such natural drainageways.

K. Design storm volumes and precipitation intensities to be used in the analysis of discharge or runoff shall be obtained from either of the following sources:

- a. The Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland. NOAA's Atlas 145 can be accessed at: <http://hdsc.nws.noaa.gov/hdsc/pfds/>.
- b. The Pennsylvania Department of Transportation Drainage Manual, Publication 584, Chapter 7, Appendix A.

L. Minimization of impervious surfaces and infiltration of runoff through seepage beds, infiltration trenches, etc., are encouraged, where soil conditions and geology permit, to reduce the size or eliminate the need for detention facilities.

- M. Infiltration BMPs should be dispersed throughout the site, made as shallow as practicable, and located to maximize use of natural on-site infiltration features while still meeting the other requirements of this Ordinance.
- N. The design of facilities over karst shall include an evaluation and implementation of measures to minimize adverse effects.
- O. Roof drains should not be connected to streets, sanitary or storm sewers, or roadside ditches.
- P. Applicants are encouraged to use Low Impact Development Practices to reduce the costs of complying with the requirements of this Ordinance and the State Water Quality Requirements.
- Q. When stormwater management facilities are proposed within 1,000 feet of a downstream municipality, the Developer shall notify the downstream municipality and provide a copy of the SWM Plan, if requested, for review and comment.
- R. No person in Fairview Township shall allow, or cause to allow, stormwater discharges into Fairview Township's separate storm sewer system which are not composed entirely of stormwater, except:
 1. Discharges allowed under a state or federal permit
 2. As provided in subsection 303 A.

Section 303 – Exemptions / Modifications

- A. Subject to paragraph B. below, discharges which may be allowed, based on a finding by Fairview Township that the discharge(s) do not significantly contribute to pollution to surface waters of the Commonwealth, are:

• Discharges from fire fighting activities	• Uncontaminated water from foundations or from footing drains
• Potable water sources including dechlorinated water line and fire hydrant flushings	• Flows from riparian habitats and wetlands
• Irrigation drainage	• Lawn watering
• Routine external building washdown (which does not use detergents or other compounds)	• Pavement washwaters 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
• Air conditioning condensate	• Dechlorinated swimming pool discharge
• Water from individual residential car washing	• Springs and uncontaminated groundwater
• Water from crawl space pumps	

- B. In the event that Fairview Township determines that any of the discharges identified in subsection A significantly contribute to pollution of waters of the Commonwealth, or is so notified by DEP, Fairview Township will notify the responsible person to cease the discharge.
- C. Upon notice provided by Fairview Township under subsection B, the discharger shall cease the discharge. Any person deemed in violation of this Ordinance shall be subject to penalties as provided under Sections 1203 and 1204 of this Ordinance
- D. The following connections to Fairview Township's storm sewer system are prohibited, except as provided in section A above:
 1. Any drain or conveyance, whether on the surface or subsurface, which allows any non-stormwater discharge including sewage, process wastewater, and wash water to enter the system.

2. Any connections from indoor drains and sinks.
 3. Any drain or conveyance connected from a commercial or industrial land use which has not been documented in plans, maps, or equivalent records, and approved by Fairview Township.
- E. Nothing in this section shall affect a discharger's responsibilities under state law.
- F. Under no circumstance shall the Applicant be exempt from implementing such measures as necessary to:
1. Meet State Water Quality Standards and Requirements.
 2. Protect health, safety, and property.
 3. Meet special requirements for High Quality (HQ) and Exceptional Value (EV) watersheds.
- G. The Applicant must utilize the following BMPs to the maximum extent practicable to receive consideration for the exemptions:
1. Design around and limit disturbance of Floodplains, Wetlands, Natural Slopes over 15%, existing native vegetation, and other sensitive and special value features.
 2. Maintain riparian and forested buffers.
 3. Limit grading and maintain non-erosive flow conditions in natural flow paths.
 4. Maintain existing tree canopies near impervious areas.
 5. Minimize soil disturbance and reclaim disturbed areas with topsoil and vegetation.
 6. Direct runoff to pervious areas.
- H. The Applicant's proposed development/additional impervious area may not adversely impact the following:
1. Capacities of existing drainageways and storm sewer systems.
 2. Velocities and erosion.
 3. Quality of runoff if direct discharge is proposed.
 4. Existing known problem areas.
 5. Safe conveyance of the additional runoff.
 6. Downstream property owners.
 7. Bluff recession
- I. An Applicant proposing Regulated Activities, after demonstrating compliance with Sections 303.F, 303.G, and 303.H, may be exempted from various requirements of this Ordinance according to the following table:

New Impervious Area ^{1,2} (square footage)	Applicant Must Provide
0 -1,000	---
1,000-2,500	Documentation of impervious area ³
2,500-5,000	Volume Controls & Small Project SWM Application ³
> 5,000	Rate Controls, Volume Controls & SWM Site Plan

NOTES:

¹ New Impervious Area since the date of Adoption of this Ordinance.

² Gravel in existing condition shall be considered pervious and gravel in proposed condition may be considered impervious.

³ The Small Project Stormwater Management Application included in Appendix D may be used for projects under 5,000 sf of new impervious surface and single family home construction. The Small Project SWM Application allows documentation of new impervious surface, credits through disconnection of impervious surfaces and tree planting, and sizing of Volume Control BMP's that may be required.

- J. Single Family Residential activities are exempt from these requirements provided the construction:
1. Comply with Sections 302.G, , and 303.F, 303.G, and 303.H
 2. Have building setback 75 feet from downstream property lines, and
 3. Driveways:
 - a. Runoff must discharge onto pervious surface with a gravel strip or other spreading device.
 - b. No more than 1,000 square feet of paved surface may discharge to any one point.

- c. The length of flow on the pervious must exceed the length of the paved surface flow.
 - d. The diagonal surface grading or pitching of 2% or greater into the property directing runoff into swales dispersing storm water within the parcel.
 - 4. The municipality can require more information or require mitigation of certain impacts through installation of stormwater management BMP's if there is a threat to property, health, or safety.
- K. An Applicant proposing Regulated Activities, after demonstrating compliance with Sections 303.F, 303.G, and 303.H, may be exempted from various requirements of this Ordinance if documentation can be provided that a downstream man-made water body (i.e., reservoir, lake, man-made wetlands, or other BMP) has been designed or modified to address the potential stormwater flooding and volume impacts of the proposed development.
- L. The purpose of this section is to ensure consistency of stormwater management planning between local ordinances and NPDES permitting (when required) and to ensure that the Applicant has a single and clear set of stormwater management standards to which the Applicant is subject. The Township may accept alternative stormwater management controls under this section provided that:
- 1. The Township, in consultation with the PADEP (or Delegated Authority), determines that meeting the Volume Control requirements (See Section 304) is not possible or places an undue hardship on the Applicant.
 - 2. The alternative controls are documented to be acceptable to PADEP (or Delegated Authority), for NPDES requirements pertaining to post construction stormwater management requirements.
 - 3. The alternative controls are in compliance with all other sections of this ordinance, including but not limited to Sections 302.D and 303.F, 303.G, and 303.H.
- M. Agricultural activity is exempt from the rate control and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 PA Code Chapter 102.
- N. Forest management and timber operations are exempt from the Rate and Volume Control requirement and SWM Site Plan preparation requirement of this Ordinance provided the activities are performed according to the requirements of 25 PA Code Chapter 102. It should be noted that temporary roadways are not exempt.
- O. The Township may deny or revoke any exemption pursuant to this Section at any time for any project that the Township believes may pose a threat to public health, safety, property or the environment.

Section 304. Waivers

- A. All waiver requests must meet the provisions of Section 304.G. Waivers shall not be issued from implementing such measures as necessary to:
- 1. Meet State Water Quality Standards and Requirements.
 - 2. Protect health, safety, and property.
 - 3. Meet special requirements for High Quality (HQ) and Exceptional Value (EV) watersheds.

The Township will then consider waivers in accordance with Section 302.D; except that waiver requests for relief from the design requirements of Article IV will be processed by the Township at its sole discretion.

- B. When Applicant demonstrates to the satisfaction of the Township that a requirement of this Ordinance causes undue hardship as it applies to a proposed Project, and that an alternate design produces equal or better results in meeting the purpose and requirements of this Ordinance, the governing body of the Township, after completing a thorough technical review consistent with Paragraph A above, may grant a waiver request.
- C. Applicants shall submit requests for waivers in writing and these requests shall be included as part of a permit application submission. In the request for waiver, the Applicant shall state in full the facts of undue hardship on which the request is based, identify the provision or provisions of the Ordinance that are causing such undue hardship, and state the minimum waiver or relief that is necessary. The Applicant shall state how the proposal in

the Applicant's waiver request provides equal or better results in meeting the purpose and requirements of this Ordinance.

- D. The Township shall keep a written record of all actions on waiver requests in the project file.
- E. The Township may charge Applicants fees for waiver requests sufficient to cover all costs incurred by the Township to process the requests.
- F. In processing waiver requests, the Township may impose reasonable conditions that will, in its sole judgment, resolve the undue hardship while meeting the purpose and requirements of this Ordinance.
- G. The Township may grant requests for waivers when the following findings are made by the Township, when each is determined solely by the Township to be applicable and relevant:
 - 1. That the waiver shall result in an equal or better means of complying with the purpose and requirements of this Ordinance.
 - 2. That the waiver is the minimum necessary to provide relief from undue hardship.
 - 3. That the applicant is not requesting a waiver based solely on cost considerations.
 - 4. That existing down gradient stormwater problems will not be exacerbated by the proposed waiver request.
 - 5. That runoff is not being diverted to a different drainage area in a manner that may cause hardship to others.
 - 6. That increased flooding or ponding on off-site properties or roadways will not be caused by the waiver request.
 - 7. That potential icing conditions will not be caused by the waiver request.
 - 8. That increased or unusual municipal maintenance expenses will not result from the waiver request.
 - 9. That operation and maintenance requirements are not reduced by the waiver request.

Section 305. Volume Controls

- A. The Low Impact Development Practices provided in the BMP Manual and in Appendix B of this Ordinance shall be utilized for all Regulated Activities to the maximum extent practicable.
- B. Stormwater runoff Volume Controls shall be implemented using the *Design Storm Method* or the *Simplified Method* as defined below. For Regulated Activity areas equal or less than one (1) acre that do not require hydrologic routing to design the stormwater facilities, this Ordinance establishes no preference for either method; therefore, the Applicant may select either method on the basis of economic considerations, the intrinsic limitations on applicability of the analytical procedures associated with each methodology, and other factors.
 - 1. The *Design Storm Method* (CG-1 in the BMP Manual) is applicable to any sized Regulated Activity. This method requires detailed modeling based on site conditions.
 - a. Do not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour storm.
 - 2. The *Simplified Method* (CG-2 in the BMP Manual) is independent of site conditions and should be used if the *Design Storm Method* is not followed. This method is not applicable to Regulated Activities greater than 1 acre or for projects that require detailed design of stormwater storage facilities. For new impervious surfaces:
 - a. Stormwater facilities shall capture at least the first 2 inches of runoff from all new impervious surfaces.
 - b. At least the first 1 inch of runoff from new impervious surfaces shall be permanently removed from the runoff flow, i.e. it shall not be released into surface Waters of the Commonwealth.

Removal options include reuse, evaporation, transpiration, and infiltration not increase bluff recession.

- c. Wherever possible, infiltration facilities should be designed to accommodate infiltration of the entire permanently removed runoff; however, in all cases at least the first 0.5 inch of the permanently removed runoff should be infiltrated.
 - d. Actual field infiltration tests at the location of the proposed elevation of the stormwater BMPs are required. Infiltration test shall be conducted in accordance with the BMP Manual. A minimum 48-hour notification of the Township shall be provided to allow witnessing of the testing.
3. In cases where it is not possible or desirable to use infiltration-based best management practices to partially fulfill the requirements in either Section 305.B.1 or 305.B.2, the following procedure shall be provided to allow witnessing of the testing:
- a. At a minimum, the following documentation shall be provided to justify the decision to reduce the use of infiltration BMPs:
 - i. Description of and justification for field infiltration/permeability testing with respect to the type of test and test locations).
 - b. The following water quality pollutant load reductions will be required for all disturbed areas within the proposed development:

Pollutant Load	Units	Required reduction (%)
Total Suspended Solids (TSS)	Pounds	85
Total Phosphorous (TP)	Pounds	85
Total Nitrate (NO ₃)	Pounds	50

- c. The performance criteria for water quality best management practices shall be determined from the Pennsylvania Stormwater Best Management Practices Manual, most current version.

C. The applicable Worksheets from the BMP Manual must be used in calculations to establish Volume Control.

Section 306. Rate Controls

- A. Lands contained within the Township that have not had release rates established under an approved Act 167 Stormwater Management Plan:
 - 1. Post-development discharge rates shall not exceed the pre-development discharge rates for the 1-year, 2-year, 10-year, 25-year, 50-year, and 100-year storms.
- B. Lands contained within the Township that have had release rates established under an approved Act 167 Stormwater Management Plan:
 - 1. The post-development peak discharge rates shall be in accordance with the approved release rate map for the following watersheds (see Appendices for Release Rate Map):
 - a. Lake Erie Watersheds

Section 307 – Watershed Standards: Designated Lake Erie/Elk Creek Stormwater Management Watershed

- A. The stormwater performance standards contained in this section are intended to implement the standards and criteria contained in the Lake Erie Area Watershed Stormwater Management Plan, adopted and approved in accordance with the Pennsylvania Storm Water Management Act. If there is any discrepancy between the provisions of this section and the standards and criteria of the plan, or if the watershed plan is subsequently amended, then the standards/criteria of the amended watershed plan shall govern.
- B. Storm Frequencies: Stormwater management facilities on all development sites shall control the peak stormwater discharge for the 1-, 2-, 10-, 25-, 50- and 100- year storm frequencies. The Soil Conservation Service (SCS) 24-hour, Type II Rainfall Distribution shall be used for analyzing stormwater runoff for both pre- and post- development conditions. The 24-hour total rainfall for these storm frequencies in the watershed are:

NRCS Rainfall-Runoff Method – The Natural Resource Conservation Service Type II, 24-hour rainfall distribution shall be used in conjunction with rainfall depths from NOAA Atlas 14 or be consistent with the following table:

Return Interval (Year)	24-hour Rainfall Total (inches)
1	2.13
2	2.56
10	3.71
25	4.46
50	5.09
100	5.76

C. Calculation Methods

- 1. Development Sites: For the purpose of computing peak flow rates and runoff hydrographs from development sites, calculations shall be performed using one of the following: NRCS Rainfall Runoff Method, HEC I or Penn State Runoff Model (PSRM) or Rational Method. Under special circumstances other computation methods may be used subject to the approval of Fairview Township. Combining curve numbers for land areas proposed for development with Curve Numbers for areas unaffected by the proposed development into a single weighted curve number is NOT acceptable.
- 2. Stormwater Collection/Conveyance Facilities: For the purposes of designing storm sewers, open swales and other stormwater runoff collection and conveyance facilities, the Rational Method or other method as approved by Fairview Township may be applied. Rainfall intensities for design should be obtained from the Pennsylvania Department of Transportation rainfall charts. The Rational Method shall not be used to calculate runoff volumes.
- 3. Routing of hydrographs through detention/retention facilities for the purpose of designing those facilities shall be accomplished using the Modified-Pulse Method (storage indication method) or other recognized reservoir routing method subject to the approval of Fairview Township.
- 4. Predevelopment Conditions: Predevelopment conditions shall be assumed to be those which exist on any site at the time prior to the commencement of development activities. SCS runoff curve numbers selected for use in the calculations shall accurately reflect existing conditions subject to the approval of Fairview Township. At its discretion, Fairview Township may direct that hydrologic conditions for all areas with previous cover (i.e., fields, woods, lawn areas, pastures, cropland, etc.) shall be assumed to be in “good” condition, and the lowest recommended SCS runoff survey number (CN) shall be applied for all pervious land uses within the respective range for each land use and hydrologic soil group.

D. Release Rate Percentage

1. Definition: The release rate percentage defines the percentage of the predevelopment peak rate of runoff that can be discharged from an outfall on the site after development under the 1, 2, 10, 25, and 50 year storm conditions. Under all circumstances, a 100% release rate percentage shall be applied to the 100 year frequency storm whether or not lower reduced release rate percentages are specified for the 1, 2, 10, 25, and 50 year return frequency storms. The assigned release rate percentage for each subarea applies uniformly to all land development or alterations within the subarea. A listing of the release rate percentage by subareas is delineated on the Release Rate Percentage Maps.

2. Procedure for Use

- (a) Identify the specific subarea in which the development site is located from the watershed map and obtain the subarea release rate percentage from Appendix E and the appropriate Release Rate Percentage Map.
- (b) Compute the pre- and post-development runoff hydrographs for each stormwater outfall on the development site using an acceptable calculation method for the 1, 2-, 10-, 25, 50, and 100- year storms. Apply no on-site detention for stormwater management but include any techniques to minimize impervious surfaces and/or increase the time of concentration for stormwater runoff flowing from the development site. If the post-development peak runoff rate and the runoff volume are less than or equal to the predevelopment peak runoff rate and volume, then additional stormwater control shall not be required at that outfall.
- (c) If the post-development peak runoff rate and volume are greater than the predevelopment peak runoff rate and volume, then stormwater detention shall be required. The capacity of the detention facility shall be calculated by multiplying the predevelopment rate of runoff from the 1, 2, 10, 25 and 50 year frequency storm by the subarea release rate percentage and the predevelopment runoff rate from the 100 year storm event by 100% to determine the maximum allowable releases from any detention facility.

E. Time of Concentration:

1. The Time of Concentration is to represent the average condition that best reflects the hydrologic response of the area. The following Time of Concentration (T_c) computational methodologies shall be used unless another method is pre-approved by the MunicipalityMunicipality:

i. Pre-development – NRCS’s Lag Equation:

$$\text{Time of Concentration} = T_c = [(T_{lag}/.6) * 60] \text{ (minutes)}$$

$$T_{lag} = L^{0.8} \frac{(S + 1)^{0.7}}{1900\sqrt{Y}}$$

Where:

T_{lag} = Lag time (hours)

L = Hydraulic length of watershed (feet)

Y = Average overland slope of watershed (percent)

S = Maximum retention in watershed as defined by: $S = [(1000/CN) - 10]$

CN = NRCS Curve Number for watershed

- ii. Post-development; commercial, industrial, or other areas with large impervious areas (>20% impervious area) – NRCS Segmental Method. The length of sheet flow shall be limited to 100 feet. T_c for channel and pipe flow shall be computed using Manning’s equation.
- iii. Post-development; residential, cluster, or other low impact designs less than or equal to 20% impervious area – NRCS Lag Equation or NRCS Segmental Method.

2. Additionally, the following provisions shall apply to calculations for Time of Concentration:

- i. The post-development T_c shall never be greater than the pre-development T_c for any watershed or sub-watershed. This includes when the designer has specifically used swales to reduce flow

velocities. In the event that the designer believes that the post-development T_c is greater, it will still be set by default equal to the pre-development T_c for modeling purposes.

- ii. The minimum T_c for any watershed shall be 5 minutes.
- iii. The designer must provide computations for all pre-development T_c paths. A 5 minute T_c can not be assumed for pre-development.

F. Exception Areas

1. Exceptions to the peak discharge standards will be considered only in the following instances:
 - (a) In the Lake Erie Area Watershed: only in instances where the discharge from the development site occurs directly to Lake Erie, an adequately sized storm or combined sewer which discharges directly into Lake Erie, or through a properly sized and designed stormwater detention pond, basin or facility..
2. The analyses of storm or combined sewers and/or detention pond, basin or facilities as are necessary to demonstrate their adequacy for the proposed discharges shall be completed by the applicant using methods and procedures as directed by Fairview Township.

ARTICLE IV
DESIGN CRITERIA FOR STORMWATER MANAGEMENT CONTROLS

Section 401 – General Criteria

- A. Applicants may select runoff control techniques, or a combination of techniques, which are most suitable to control stormwater runoff from the development site. All controls shall be subject to approval of the municipal engineer. The municipal engineer may request specific information on design and/or operating features of the proposed stormwater controls in order to determine their suitability and adequacy in terms of the standards of this Ordinance.
- B. The applicant should consider the effect of the proposed stormwater management techniques on any special soil conditions or geological hazards which may exist on the development site. In the event such conditions are identified on the site, the municipal engineer may require in-depth studies by a competent geotechnical engineer. Not all stormwater control methods may be advisable or allowable at a particular development site.
- C. Best Management Practices must be designed to protect and maintain existing uses (e.g., drinking water use; cold water fishery use) and maintain the level of water quality necessary to protect those uses in all streams, and to protect and maintain water quality in “Special Protection” streams, as required by statewide regulations at 25 Pa. Code Chapter 93.
- D. To control post-construction stormwater impacts from Regulated Earth Disturbance activities, State Water Quality Requirements can be met by BMPs, including site design, which provide for replication of pre-construction stormwater infiltration and runoff conditions, so that post-construction stormwater discharges do not degrade the physical, chemical or biological characteristics of the receiving waters. As described in the DEP Comprehensive Management Policy (# 392-0300-002, September 28, 2002), this may be achieved by the following:
 - 1. minimization of impervious surfaces with semi-pervious or pervious surfaces during site design
 - 2. flow attenuation by use of open vegetated swales and natural depressions
 - 3. use of infiltration structures
 - 4. stormwater detention/retention structures
 - 5. use of water quality treatment BMPs to ensure filtering out of chemical and physical pollutants
 - 6. streambank and streambed protective measures
- E. Infiltration practices shall be used to the extent practicable to reduce volume increases and promote groundwater recharge. A combination of successive practices may be used to achieve the applicable minimum control requirements. Justification shall be provided by the applicant for rejecting each of the preferred practices based on actual site conditions.
- F. DEP has regulations that require municipalities to ensure design, implementation and maintenance of Best Management Practices (“BMPs”) that control runoff from new developments and redevelopment after Regulated Earth Disturbance activities are complete. These requirements include the need to implement post-construction BMPs with assurance of long-term operations and maintenance of those BMPs.

Section 402 – Criteria for Infiltration Systems

- A. Infiltration systems shall be sized and designed based upon local soil and ground water conditions.
- B. Infiltration systems greater than three (3) feet deep shall be located at least ten (10) feet from basement walls.

- C. Infiltration systems shall not be used to handle runoff from commercial or industrial working or parking areas. This prohibition does not extend to roof areas which are demonstrated to be suitably protected from the effects of the commercial/industrial activities.
- D. Infiltration systems may not receive runoff until the entire drainage area to the system has received final stabilization.
- E. The stormwater infiltration facility design shall provide an overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall.

Section 403 – Criteria for Flow Attenuation Facilities

- A. If flow attenuation facilities are employed to assist in the control of peak rates of discharge, their effects must be quantified using the methodologies referenced in Section 307. The effects of the flow attenuation facilities on travel time should be reflected in the calculations.
- B. Flow attenuation facilities such as swales and natural depressions should be properly graded to ensure positive drainage and avoid prolonged ponding of water.
- C. Swales shall be properly vegetatively stabilized or otherwise lined to prevent erosion.
- D. Swales shall be designed according to the recommendations contained in the Commonwealth of Pennsylvania Erosion and Sediment Pollution Control Program Manual.

Section 404 – Criteria for Stormwater Detention Facilities

- A. If detention or retention facilities are utilized for the development site, the facility(ies) shall be designed such that post-development peak runoff rates from the developed site are controlled to those rates defined by the subarea release rate percentage for the 1-, 2-, 10-, 25-, 50-, and 100-year storm frequencies.
- B. All detention facilities shall be equipped with outlet structures to provide discharge control for the designated storm frequencies. Provisions shall also be made to safely pass the post-development 100-year storm runoff without damaging or impairing the continued function of the facilities. Emergency spillways shall be designed to accommodate one foot of freeboard above the 100 year level in the basin. Should any stormwater management facilities be regulated by PA DEP Chapter 105 regulations, the facility shall be designed in accordance with those regulations and meet the regulations concerning dam safety.
- C. Shared-storage facilities which provide detention of runoff for more than one development site within a single subarea are encouraged wherever feasible and provided such facilities meet the criteria contained in this section. In addition, runoff from the development sites involved shall be conveyed to the facility in a manner that avoids adverse impacts (such as flooding or erosion) to channels and properties located between the development site and the shared-storage facilities.
- D. Where detention or retention facilities will be utilized, multiple use facilities, such as wetlands, lakes, ballfields or similar recreational/open space uses are encouraged wherever feasible, subject to the approval of Fairview Township and compliance with the Pennsylvania Department of Environmental Protection's Chapter 105 regulations.
- E. Other considerations which should be incorporated into the design of the detention facilities include:
 - 1. Inflow and outflow structures shall be designed and installed to prevent erosion and bottoms of impoundment type structures should be protected from soil erosion.
 - 2. Control and removal of debris both in the storage structure and in all inlet or outlet devices shall be a design consideration.

3. Inflow and outflow structures, pumping stations, and other structures shall be designed and protected to minimize safety hazards.
4. The water depth at the perimeter of a storage pond should be limited to that which is safe for children. Restriction of access (fence, walls, etc.) may be necessary depending on the location of the facility and the maximum depths of water.
5. Side slope of storage ponds shall not exceed a ratio of three to one (3:1) horizontal to vertical dimension.
6. Landscaping shall be provided for the facility which harmonizes with the surrounding area.
7. Facilities shall be located to facilitate maintenance, considering the frequency and type of equipment that will be required.
8. Bottoms of detention basins should be graded with sufficient slope to provide positive surface drainage. A subdrainage system may be required depending on the location of the pond bottom relative to groundwater levels.
9. The minimum dimension of an outlet orifice shall be three inches
10. Fencing shall be provided if required by Fairview Township.

Section 405 – Criteria for Collection/Conveyance Facilities

- a. All stormwater runoff collection or conveyance facilities, whether storm sewers or other open or closed channels, shall be designed in accordance with the following basic standards:
 1. All sites shall be graded to provide drainage away from and around the structure in order to prevent any potential flooding damage.
 2. Lots located on the high side of streets shall extend roof and French drains to the curb line storm sewer (if applicable). Low side lots shall extend roof and french drains to a stormwater collection/conveyance/control system or natural watercourse in accordance with the approved stormwater management plan for the development site.
 3. Collection/conveyance facilities should not be installed parallel and close to the top or bottom of a major embankment to avoid the possibility of failing or causing the embankment to fail.
 4. All collection/conveyance facilities shall be designed to convey the 25-year storm peak flow rate from the contributing drainage area and to carry it to the nearest suitable outlet such as a stormwater control facility, curbed street, storm sewer or natural watercourse.
 5. Convey stormwater along or through the property to a natural outfall. If the developer concentrates dispersed stormwater flow or redirects stormwater flow to exit the property at a location other than a natural outfall, the developer is responsible for constructing an adequate channel on the adjacent property and on all properties until a natural outfall is reached.
 6. Where drainage swales or open channels are used, they shall be suitably lined to prevent erosion and designed to avoid excessive velocities.
- b. In Lake Erie coastal bluff areas (as defined by the Pennsylvania Bluff Recession and Setback Act of 1980) and the Coastal Plain, special care should be taken to properly direct, collect, and discharge stormwater runoff so as to protect against bluff recession and erosion. The developer's activities shall be coordinated with Fairview Township to effect such protections. The Pennsylvania Department of Environmental Protection Division of Coastal Programs may be able to provide guidance in the form of technical assistance.

1. Storm water detention ponds or basins used to control stormwater shall be designed to have a discharge occurring no longer than 72 hours from the end of the design storm in order to
 - a. Provide a reasonable time to minimize increased groundwater from added increase of bluff recession and/or erosion.
 - b. Provide a controlled discharge to protect existing waterways from storm discharge impact. Wherever storm sewers are proposed to be utilized, they shall comply with the following criteria:
 1. Where practical, designed to traverse under seeded and planted areas. If constructed within ten (10) feet of road paving, walks or other surfaced areas, drains shall have a narrow trench and maximum compaction of backfill to prevent settlement of the superimposed surface or development.
 2. Installation shall be after excavating and filling in the area to be traversed is completed, unless the drain is installed in the original ground with a minimum of three (3) feet cover and/or adequate protection during the fill construction.
 3. Designed: (1) with cradle when traversing fill areas of indeterminate stability, (2) with anchors when gradient exceeds twenty (20) percent, and (3) with encasement or special backfill requirements when traversing under a paved area.
 4. Designed to adequately handle the anticipated stormwater flow and be economical to construct and maintain. The minimum pipe size shall be twelve (12) inches in diameter.
 5. Drain pipe, trenching, bedding and backfilling requirements shall conform to the requirements of Fairview Township and/or applicable PennDOT Specifications, Form 408.
 6. The minimum slope for storm sewer pipe shall be 0.5%.
 7. All pipe material shall be: High Density Polyethylene; PVC; RCP, or as approved by the Board of Supervisors.
 8. Storm inlets and structures shall be designed to be adequate, safe, self-cleaning and unobtrusive and consistent with municipal standards.
 9. Approved grates shall be designed for all catch basins, stormwater inlets and other entrance appurtenances.
 10. Manholes shall be designed so that the top shall be at finished grade and sloped to conform to the slope of the finished grade. Top castings of structures located in roads or parking areas shall be machined or installed to preclude "rattling."
 11. Where a proposed storm sewer connects with an existing storm sewer system, the applicant shall demonstrate that sufficient capacity exists in the downstream system to handle the additional flow.
 12. Storm sewer outfalls shall be equipped with energy dissipation devices to prevent erosion and conform with applicable requirements of the Pennsylvania DEP for stream encroachments (Chapter 105 of Pennsylvania DEP Rules and Regulations).
 13. The Developer shall install all catch basins such that they are flush with the pavement. Where the wearing course will not be placed immediately following the BCBC (Bituminous Concrete Base Course), the contractor shall leave the top of the grate flush with the top of the BCBC, and raise the grate and frame when the wearing course is applied. The contractor shall saw cut any pavement needed to be removed in order to raise the frame and grate. All exposed saw cut edges shall be tack coated in accordance with the latest PennDOT specifications.

14. Storm sewers shall be constructed in accordance with the Fairview Township Subdivision and Land Development Ordinance.

c. Parallel Drain System

1. The discharge of sumps, footer drains, roof drains and the like through the development of lots or parcels onto any roadways, (cartway or right-of-way area) shall not be permitted.
2. Access to the Storm Sewer shall be provided for all discharges from sumps, footer drains, roof drains. This access may be provided to the street catch basin provided the catch basin is on the same side of the street. A 6" pipe with 12 gauge tracer wire running parallel to the street may be provided within the right-of-way that drains to a street catch basin, provided that the 6" pipe does not cross the street. The pipe shall be PVC schedule 40 pipe or an approved equal. A saddle "T" and cleanout shall be provided at property line for all pipes carrying sumps, footer drain, roof drains. The parallel storm system is not to be used for street, or yard runoff, or runoff from other developed or undeveloped areas.

ARTICLE V

EROSION AND SEDIMENTATION CONTROLS

Section 501 – Erosion and Sedimentation Control Requirements

- A. All land disturbance activities shall be conducted in such a way as to minimize accelerated erosion and resulting sedimentation and shall comply with the requirements of the DEP, 25 Pa. Code, Chapter 102.
- B. No regulated earth disturbance activities within Fairview Township shall commence until approval of the “Erosion and Sedimentation Control Plan” is obtained from the Erie County Conservation District and a copy of such approval and plan and any other permit as required by DEP regulations is received by Fairview Township.
- C. The proposed erosion/sedimentation plan shall be submitted to the Township with the stormwater management plan.
- D. The DEP has regulations that requires an Erosion and Sedimentation Control Plan for any earth disturbance activity of 5000 square feet or more, under 25 Pa. Code § 102.4(b).
- E. In addition, under 25 Pa. Code Chapter 92, a DEP “NPDES Construction Activities” permit is required for any earth disturbance one acre or more with a point source discharge to surface waters or Fairview Township’s storm sewer system, or five acres or more regardless of the planned runoff . This includes earth disturbance on any portion of, part of, or during any stage of, a larger common plan of development.
- F. Evidence of any necessary permit(s) for Regulated Earth Disturbance Activities from the appropriate DEP regional office or County Conservation District must be provided to Fairview Township prior to approval by the Township of the stormwater management plan.
- G. A copy of the approved Erosion and Sedimentation Control Plan and any required permit, as required by the DEP regulations, shall be available at the project at all times.

ARTICLE VI

MAINTENANCE OF STORMWATER MANAGEMENT CONTROLS

Section 601. Financial Guarantee

- A. The Applicant shall provide a Financial Guarantee to the Township for the timely installation and proper construction of all stormwater management controls as required by the approved SWM Site Plan and this Ordinance, equal to 110% of the full construction cost of the required controls in accordance with the Municipalities Planning Code.
- B. At the completion of the project and as a prerequisite for the release of the Financial Guarantee, the Applicant shall:
 1. Provide a certification of completion from an engineer, architect, surveyor or other qualified person, verifying that all permanent facilities have been constructed according to the SWM Site Plan & Report and approved revisions thereto.
 2. Provide a set of Record Drawings.
 3. Request a final inspection from the Township to certify compliance with this Ordinance, after receipt of the certification of completion and Record Drawings by the Township.

Section 602. Maintenance Responsibilities

- A. The SWM Site Plan & Report for the project site shall describe the future operation and maintenance responsibilities. The operation and maintenance description shall outline required routine maintenance actions and schedules necessary to ensure proper operation of the stormwater control facilities.
- B. The SWM Site Plan & Report for the project site shall establish responsibilities for the continuing operation and maintenance of all proposed stormwater control facilities, consistent with the following principals or a combination thereof:
 1. If a development consists of structures or lots that are to be separately owned and in which streets, sewers, and other public improvements are to be dedicated to the Township, stormwater control facilities/BMPs may also be dedicated to and maintained by the Township.
 2. If a development site is to be maintained in a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities/BMPs shall be the responsibility of the owner or private management entity.
 3. Facilities, areas, or structures used as stormwater BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or easements that run with the land.
 4. The SWM Site Plan & Maintenance Agreement shall be recorded as a restrictive deed covenant that runs with the land.
 5. The Township may take enforcement actions against an Applicant or private management entity for failure to satisfy any provision of this Ordinance.
- C. The Township, upon recommendation of the Township Engineer, shall make the final determination on the continuing maintenance responsibilities and an inspection cost estimation for escrow prior to final approval of the SWM Site Plan & Report. The Township may require a dedication of such facilities as part of the requirements for approval of the SWM Site Plan. Such a requirement is not an indication that the Township will accept the

facilities. The Township reserves the right to accept or reject the ownership and operating responsibility for any portion of the stormwater management controls.

- D. If the Township accepts ownership of stormwater BMPs, the Township may, at its discretion, require a fee from the Applicant to the Township to offset the future cost of inspections, operations, and maintenance based on a recommendation by the Township Engineer.
- E. It shall be unlawful to alter or remove any permanent stormwater BMP required by an approved SWM Site Plan, or to allow the property to remain in a condition, which does not conform to an approved SWM Site Plan, unless the Township grants an exception in writing.

Section 603. Maintenance Agreement for Privately Owned Stormwater Facilities

- A. Prior to final approval of the SWM Site Plan & Report, the Applicant shall sign the Operation and Maintenance (O&M) Agreement (Appendix A) covering all stormwater control facilities that are to be privately owned. The Operation and Maintenance (O&M) Agreement shall be recorded with the SWM Site Plan and made a part hereto.
- B. Other items may be included in the Operation and Maintenance (O&M) Agreement where determined necessary to guarantee the satisfactory operation and maintenance of all BMP facilities. The Operation and Maintenance (O&M) Agreement shall be subject to the review and recommended approval of the Township Solicitor and Township Engineer to the Township.
- C. The owner is responsible for operation and maintenance of the stormwater BMPs. If the owner fails to adhere to the Operation and Maintenance (O&M) Agreement, the Township may perform the services required and charge the owner appropriate fees. Non-payment of fees may result in a lien against the property.

Section 604 – Municipal Stormwater Maintenance Fund

- A. Persons installing stormwater storage facilities shall be required to pay a specified amount to the Fairview Township Stormwater Maintenance Fund to help defray costs of periodic inspections and maintenance expenses. The amount of the deposit shall be determined as follows:
 - 1. If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by Fairview Township for a period of ten (10) years, as estimated by the municipal engineer. After that period of time a revised estimate based on the costs of inspection will be performed and the expense and the new ten (10) year account amount will be determined and paid by the other party
 - 2. If the storage facility is to be owned and maintained by Fairview Township, the deposit shall cover the estimated costs for maintenance and inspections for ten (10) years. The municipal engineer will establish the estimated costs utilizing information submitted by the applicant or other appropriate sources.
 - 3. The amount of the deposit to the fund shall be converted to present worth of the annual series values. The municipal engineer shall determine the present worth equivalents which shall be subject to the approval of the governing body.
- B. If in the future 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.

**ARTICLE VII
STORMWATER PLAN REQUIREMENTS**

Section 701. General Requirements

For any of the activities regulated by this Ordinance and not eligible for the exemptions provided in Section 303, the final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any land disturbance activity, may not proceed until the Applicant has received written approval of a SWM Site Plan from the Township upon recommendation from the Township Engineer.

Section 702. SWM Site Plan & Report Contents

The SWM Site Plan & SWM Site Report shall consist of all applicable calculations, maps, and plans. All SWM Site Plan materials shall be submitted to the Township in a format that is clear, concise, legible, neat and well organized; otherwise, the SWM Site Plan shall be rejected.

Appropriate sections from the Fairview Township Subdivision and Land Development Ordinance, and other applicable local ordinances, shall be followed in preparing the SWM Site Plan.

A. SWM Site Plan shall include, but not be limited to:

1. Plans shall be of one size and in a form that meets the requirements for recording in the Office of the Recorder of Deeds of Erie County.
 - a. Plans for tracts of less than 20 acres shall be drawn at a scale of one inch equals no more than 50 ft.;
 - b. Plans for tracts of 20 acres or more, plans shall be drawn at a scale of one inch equals no more than 100 ft.;
 - c. All lettering shall be drawn to a size to be legible if the plans are reduced to half size.
2. The name of the development, name and location address of the property site, name, address, and telephone number of the Applicant/Owner of the property, and name, address, telephone number, email address, and engineering seal of the individual preparing the SWM Site Plan.
3. The date of submission and dates of all revisions.
4. A graphical and written scale on all drawings and maps.
5. A north arrow on all drawings and maps.
6. A location map at a minimum scale of one (1) inch equals one-thousand (1,000) feet and illustrates the project relative to highways, municipalities or other identifiable landmarks.
7. Existing and final contours at intervals:
 - a. Slopes less than 5%: no greater than one (1) foot;
 - b. Slopes between 5 and 15%: no greater than two (2) feet;
 - c. Steep slopes (greater than 15%), 5-foot contour intervals may be used.
8. Perimeters of existing waterbodies within the project area including stream banks, lakes, ponds, springs, field delineated wetlands or other bodies of water, sinkholes, flood hazard boundaries (FEMA delineated floodplains and floodways), areas of natural vegetation to be preserved, the total extent of the upstream area draining through the site, and overland drainage paths. In addition, any areas necessary to determine downstream impacts, where required for proposed stormwater management facilities must be shown.

9. The location of all existing and proposed utilities, on-lot wastewater facilities, water supply wells, sanitary sewers, and water lines on and within fifty (50) feet of property lines including inlets, manholes, valves, meters, poles, chambers, junction boxes, and other utility system components.
10. A key map showing all existing man-made features beyond the property boundary that may be affected by the project.
11. Soil names and boundaries with identification of the Hydraulic Soil Group classification including rock outcroppings.
12. Proposed impervious surfaces (structures, roads, paved areas, and buildings), including plans of roads and paved areas and floor elevations of buildings. Road profiles shall be provided at the request of the Township.
13. Existing and proposed land use(s).
14. Horizontal alignment, and cross sections of all open channels, pipes, swales and other BMPs. Profiles shall be provided at the request of the Township.
15. The location and clear identification of the nature of permanent stormwater BMPs.
16. The location of all erosion and sedimentation control facilities, shown separately from the SWM Site Plan (typically an E&S Plan).
17. A minimum twenty (20) foot wide access easement around all stormwater management facilities that would provide ingress to and egress from a public right-of-way. In lieu of providing an easement to the public right-of-way, a note may be added to the Plan granting the Township or their designees access to all easements via the nearest public right-of-way.
18. Construction details for all drainage and stormwater BMPs.
19. Identification of short-term and long-term ownership, operations, and maintenance responsibilities.
20. Notes and Statements:
 - a. A statement, signed by the landowner, acknowledging that the stormwater BMPs are fixtures that cannot be altered or removed without prior approval by the Township.
 - b. A statement referencing the Operation and Maintenance (O&M) Agreement and stating that the O&M Agreement is part of the SWM Site Plan.
 - c. A note indicating that Record Drawings will be provided for all stormwater facilities prior to occupancy, or the release of the surety bond.
 - d. The following signature block for the registered professional preparing the Stormwater Management Plan:

"I, _____, hereby certify that the Stormwater Management Plan meets the design standards and criteria of the Fairview Township Stormwater Management Ordinance."
 - e. The following signature block for the Township official reviewing the Stormwater Management Plan:

"I, _____, have reviewed this Stormwater Management Plan in accordance with the Design Standards and Criteria of Fairview Township

Stormwater Management Ordinance and if required upon receipt of a recommendation by the Township Engineer regarding technical information submitted."

B. SWM Site Report shall include (but not limited to):

1. General data including:
 - a. Project Name
 - b. Project location - address of the property site
 - c. Name, address, and telephone number of the Applicant/Owner of the property;
 - d. Name, address, telephone number, email address, and engineering seal of the individual preparing the SWM Site Report;
 - e. Date of submission and revisions.
2. Project description narrative that clearly discusses the project and provides the following information, where applicable:
 - a. Narrative
 - Statement of the regulated activity describing what is being proposed. Overall stormwater management concept with description of permanent stormwater management techniques, including construction specifications and materials to be used for stormwater management facilities.
 - Expected project schedule
 - Location map showing the project site and its location relative to release rate districts.
 - Detailed description of the existing site conditions including a site evaluation completed for projects proposed in areas of carbonate geology or karst topography, and other environmentally sensitive areas such as brownfields.
 - Total site area – pre and post, which must be equal or have an explanation as to why it is not
 - Total site impervious area
 - Total off-site areas
 - Number and description of stormwater management facilities
 - Type of development
 - Pre-development land use
 - Whether site is a water quality sensitive (WQS) development
 - Whether site is in a defined sensitive area
 - Types of water quality and recharge systems used, if applicable
 - Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.
 - A written maintenance plan for all stormwater features including detention facilities and other stormwater management elements.
 - Identification of ownership and maintenance responsibility for all permanent stormwater management facilities.
 - Other pertinent information, as required
 - b. Summary Tables
 - Pre-development Hydrologic soil group (HSG) assumptions, curve numbers (CN), Computation of average slope, hydraulic length, computed time of concentration
 - Existing conditions runoff volume & peak rate of runoff
 - Post-development runoff volume & peak rate of runoff
 - Undetained areas, areas to ponds
 - Land use for each subarea
 - Hydrologic soil group (HSG) assumptions, curve numbers (CN)
 - Time of concentration computed for each subarea
 - Post-development peak rate of runoff routed to ponds and out
 - Pond maximum return period design data including: maximum water surface elevation, berm elevation, and emergency spillway elevation
 - Water quality depth and volume requirements

- c. Calculations
 - Complete hydrologic, hydraulic and structural computations, calculations, assumptions, and criteria for the design of all stormwater BMPs.
 - Details of the berm embankment and outlet structure indicating the embankment top elevation, embankment side slopes, top width of embankment, emergency spillway elevation, perforated riser dimensions, pipe barrel dimensions and dimensions and spacing of antiseep collars.
 - Design computations for the control structures (pipe barrel and riser, etc).
 - A plot or table of the stage-storage (volume vs. elevation) and all supporting computations.
 - Routing computations.

- d. Drawings
 - Drainage area maps for all watersheds and inlets depicting the time of concentration path for both existing conditions and post developed condition.
 - All stormwater management facilities must be located on a plan and described in detail including easements and buffers boundaries.

3. Reports that do not clearly indicate the above information may be deemed incomplete for review by the Township and will be returned to the applicant.
4. Description of, justification, and actual field results for infiltration testing with respect to the type of test and test location for the design of infiltration BMPs.
5. The effect of the project (in terms of runoff volumes, water quality, and peak flows) on surrounding properties and aquatic features and on any existing municipal stormwater collection system that may receive runoff from the project site.
6. Description of the proposed changes to the land surface and vegetative cover including the type and amount of impervious area to be added.
7. Identification of short-term and long-term ownership, operation, and maintenance responsibilities as well as schedules and costs for inspection and maintenance activities for each permanent stormwater or drainage BMP, including provisions for permanent access or maintenance easements.

C. Supplemental information to be provided prior to recording of the SWM Site Plan, as applicable:

1. Signed and executed Operations and Maintenance Agreement (Appendix A).
2. Signed and executed easements, as required for all on-site and off-site work.
3. An Erosion and Sedimentation Control Plan & approval letter from the Erie County Conservation District.
4. A NPDES Permit.
5. Permits from PADEP and ACOE.
6. Geologic Assessment.
7. Soils investigation report, including boring logs, compaction requirements, and recommendations for construction of detention basins.
8. A Highway Occupancy Permit from PENNDOT when utilization of a PENNDOT storm drainage system is proposed or when proposed facilities would encroach onto a PENNDOT right-of-way.

Section 703. SWM Site Plan & Report Submission

- A. The Applicant shall submit the SWM Site Plan & Report for the Regulated Activity.
- B. Three (3) copies of the SWM Site Plan & Report shall be submitted and be distributed as follows:
 1. Three (3) copies to the Township accompanied by the requisite executed Review Fee Reimbursement Agreement, as specified in this Ordinance

- C. Additional copies shall be submitted as requested by the Township or PADEP.

Section 704. SWM Site Plan & Report Review

- A. The Township shall require receipt of a complete SWM Site Plan & Report as specified in this Ordinance. The Township shall review the SWM Site Plan & Report for consistency with the purposes, requirements, and intent of this Ordinance.
- B. The Township shall not approve any SWM Site Plan & Report that is deficient in meeting the requirements of this Ordinance. At its sole discretion and in accordance with this Article, when a SWM Site Plan & Report is found to be deficient, the Township may disapprove the submission and require a resubmission, or in the case of minor deficiencies, the Township may accept submission of modifications.
- C. The Township shall notify the Applicant in writing within forty-five (45) calendar days whether the SWM Site Plan & Report is approved or disapproved if the SWM Site Plan & Report is not part of a Subdivision or Land Development Plan. If the SWM Site Plan & Report involves a Subdivision or Land Development Plan, the timing shall follow the Subdivision and Land Development process according to the Municipalities Planning Code.
- D. The Township Building Permit Office shall not issue a building permit for any Regulated Activity if the SWM Site Plan & Report has been found to be inconsistent with this Ordinance, as determined by the Township. All required permits from PADEP must be obtained prior to issuance of a building permit.

Section 705. Modification of Plans

- A. A modification to a submitted SWM Site Plan & Report for a development site that involves a change in stormwater management facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the Township, shall require a resubmission of the modified SWM Site Plan in accordance with this Ordinance.

Section 706. Resubmission of Disapproved SWM Site Plan & Report

- A. A disapproved SWM Site Plan & Report may be resubmitted with the revisions addressing the Township's concerns documented in writing, to the Township in accordance with this Ordinance. The applicable Township Review deposit to be held in escrow must accompany a resubmission of a disapproved SWM Site Plan & Report.

Section 707. Authorization to Construct and Term of Validity

- A. The Township's approval of a SWM Site Plan & Report authorizes the Regulated Activities contained in the SWM Site Plan for a maximum term of validity of five (5) years following the date of recording by the applicant. The applicant shall file an approved plan within 90 days after the approval. The applicant shall record the required documents in the Erie County Recorder of Deeds Office and shall file with the Township Office a copy showing the Recorder's signature and seal and Instrument number of the recording. The Township may specify a term of validity shorter than five (5) years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Township signs the approval for a SWM Site Plan. If stormwater management facilities included in the approved SWM Site Plan have not been constructed, or if a Record Drawing of these facilities has not been approved within this time, then the Township may consider the SWM Site Plan disapproved and may revoke any and all permits or approvals.

Section 708. Record Drawings, Completion Certificate and Final Inspection

- A. The Applicant shall be responsible for providing Record Drawings of all stormwater BMPs included in the approved SWM Site Plan. The Record Drawing and an explanation of any discrepancies with the approved SWM

Site Plan shall be submitted to the Township as a prerequisite for the release of the guarantee or issuance of an occupancy permit.

- B. The Record Drawing shall include a certification of completion signed by a Qualified Professional verifying that all permanent stormwater BMPs have been constructed according to the approved SWM Site Plan & Report.
 - 1. Drawings shall show all approved revisions and elevations and inverts to all manholes, inlets, pipes, and stormwater control facilities.
 - 2. Submission shall include a comparison of the constructed stage-storage (volume vs. elevation) of all above ground and below ground stormwater storage facilities to the approved design.
- C. After receipt of the Record Drawing and certification of completion by the Township, the Township may conduct a final inspection.

**ARTICLE IX
INSPECTIONS OF STORMWATER MANAGEMENT CONTROLS**

Section 901 – Inspections

Unless waived by the Township, prior to the start of construction, a pre-construction meeting shall be held with the developer, the developer's engineer and contractor, Township Official(s) and the Township Engineer.

- A. The municipal engineer or a designated representative of Fairview Township shall inspect the construction of the temporary and permanent stormwater management system for the development site. The permittee shall notify the municipal engineer 48 hours in advance of the following key development phases:
 - 1. At the completion of preliminary site preparation including stripping of vegetation, stockpiling of topsoil and construction of temporary stormwater management and erosion control facilities.
 - 2. At the completion of rough grading but prior to placing topsoil, permanent drainage or other site development improvements and ground covers.
 - 3. During construction of the permanent stormwater facilities at such times as specified by the municipal engineer.
 - 4. At the completion of permanent stormwater management facilities.
 - 5. At the completion of final grading, vegetative control measures and any other site restoration work done in accordance with the approved plan and permit.
- B. No work shall commence on any subsequent phase until the preceding one has been inspected and approved. If there are deficiencies in any phase, the municipal engineer shall issue a written description of the required corrections and stipulate the time by which they must be made.
- C. If during construction, the contractor or permittee identifies any site condition, such as subsurface soil conditions, alterations in surface or subsurface drainage which could affect the feasibility of the approved stormwater facilities, he/she shall notify the municipal engineer within 24 hours of the discovery of such condition and request a field inspection. The municipal engineer shall determine if the condition requires a stormwater plan modification.
- D. In cases where stormwater facilities are to be installed in areas of landslide-prone soils or other special site conditions exist, Fairview Township may require special precautions such as soil tests and core borings, full-time inspectors and/or similar measures. All costs of any such measures shall be borne by the permittee.

Section 902. Right-of-Entry

- A. Upon presentation of proper credentials, duly authorized representatives of the Township may enter at reasonable times, upon any property over the recorded Plan areas as designated on the recorded Plan within the Township, to inspect the implementation, condition, or operations and maintenance of the stormwater BMPs in regard to any aspect governed by this Ordinance.
- B. Stormwater BMP owners and operators shall allow persons working on behalf of the Township ready access to all parts of the premises for the purposes of determining compliance with this Ordinance.
- C. Persons working on behalf of the Township shall have the right to temporarily locate on any stormwater BMP in the Township such devices, as are necessary, to conduct monitoring and/or sampling of the discharges from such stormwater BMP.
- D. Refusal of access to the areas subject to this Ordinance shall constitute a violation of this Ordinance.

ARTICLE X
FINANCIAL GUARANTEES AND DEDICATION OF PUBLIC IMPROVEMENTS

Section 1001 – Financial Guarantee

- A. The Applicant shall provide a Financial Guarantee to the Township for the timely installation and proper construction of all stormwater management controls as required by the approved SWM Site Plan and this Ordinance, equal to 110% of the full construction cost of the required controls in accordance with the Municipalities Planning Code.
- B. At the completion of the project and as a prerequisite for the release of the Financial Guarantee, the Applicant shall:
1. Provide a certification of completion from an engineer, architect, surveyor or other qualified person, verifying that all permanent facilities have been constructed according to the SWM Site Plan & Report and approved revisions thereto.
 2. Provide a set of Record Drawings.
 3. Request a final inspection from the Township to certify compliance with this Ordinance, after receipt of the certification of completion and Record Drawings by the Township.

Section 1002 – Dedication of Public Improvements

- A. When stormwater management facilities or other required improvements in the development have been completed in accordance with the final approved plan, such improvements shall be deemed private until such time as they have been offered for dedication to Fairview Township and accepted by separate ordinance or resolution or until they have been condemned for use as a public facility.
- B. Prior to acceptance of any improvements or facilities, the municipal engineer shall inspect them to ensure that they are constructed in accordance with the approved plan and are functioning properly. In the case of any stormwater control facility, it must be free of sediment and debris.
- C. The owner and/or developer shall submit as-built plans for all facilities proposed for dedication.
- D. Prior to acceptance of any improvements or facilities, the applicant shall provide a financial security to secure the structural integrity and functioning of the improvements. The security shall: (1) be in the form of a bond, cash, certified check or other negotiable securities acceptable to Fairview Township, (2) be for a term of 36 months, and (3) be in an amount equal to 10 percent of the actual cost of the improvements actual cost of installation and facilities so dedicated.

ARTICLE XI

FEES

Section 1101 – Fee Schedule

Fairview Township may adopt by resolution from time to time a reasonable schedule of a deposit to be held in escrow to cover the cost of plan reviews, inspections and other activities necessary to administer the provisions of this Ordinance. All assurance of completion of the improvements by financial security shall be made by one of the following methods, or other such method as shall be satisfactory to the Township: A bond, irrevocable letter of credit, restrictive or escrow account, certified check, cashier's check, or other satisfaction to the Township in accordance with the applicable provisions of the Pennsylvania Municipalities Planning Code, which shall be made payable to the Township. Any dispute over the fee amount shall be resolved in the manner prescribed by the Pennsylvania Municipalities Planning Code.

1. In the case of a bond, it shall also:
 - a. Be with surety satisfactory to the Township.
 - b. Be in a form, sufficiency, and execution acceptable to the Township.

ARTICLE XII

ENFORCEMENT PROCEDURES AND REMEDIES

Section 1201 – Public Nuisance

The violation of any provision of this Ordinance is hereby deemed a public nuisance.

Each day that a violation continues shall constitute a separate violation.

Section 1202 – Prevention Remedies

- A. In addition to any other remedies, Fairview Township may institute and maintain appropriate actions at law or in equity to restrain, correct or abate a violation, to prevent unlawful construction, to recover damages and to prevent illegal occupancy of a building or premises.
- B. In accordance with the Pennsylvania Municipalities Planning Code (Sec. 515.1, or any amendment thereto), Fairview Township may refuse to issue any permit or grant approval to further improve or develop any property that has been developed in violation of this Ordinance.

Section 1203 – Enforcement Remedies

- A. Any building, land development, or other permit or approval issued by Fairview Township may be suspended or revoked by Fairview Township for:
 - 1. Non-compliance with or failure to implement any provision of the permit or approval;
 - 2. A violation of any provision of this Ordinance; or
 - 3. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or nuisance, pollution, or that endangers the life or property of others.
- B. A suspended permit or approval shall be reinstated by Fairview Township when:
 - 1. the municipal engineer or designee has inspected and approved the corrections to the stormwater BMPs or the elimination of the hazard or nuisance, and/or;
 - 2. Fairview Township is satisfied that the violation of the Ordinance law or rule and regulation has been corrected.
- C. A permit or approval that has been revoked by Fairview Township cannot be reinstated. The applicant may apply for a permit under the procedures outlined in this Ordinance
- D. Any person, partnership or corporation who or which has violated or permitted the violation of the provisions of this Ordinance shall be subject to the provisions of Section 515.3 of the Pennsylvania Municipalities Planning Code.
- E. In addition to the remedy set forth in Section 1204A, this Ordinance may be enforced through an action in equity in the Court of Common Pleas of Erie County, Pennsylvania.

Section 1204 -Additional Remedies

In addition to the above remedies, Fairview Township may also seek remedies and penalties under applicable Pennsylvania statutes, or regulations adopted pursuant thereto, including but not limited to the Storm Water Management Act (32 P.S.

Section 680.1-680.17), Clean Streams Law and the Erosion and Sedimentation Regulations (25 Pennsylvania Code, Chapter 102). Any activity conducted in violation of this Ordinance or any Pennsylvania approved watershed stormwater management plan is hereby declared a public nuisance and is abatable as such.

Section 1205 – Effective Date

This Ordinance shall be in full force and effect from and after the ____ day of _____, 2014.

ENACTED AND ORDAINED into an Ordinance this _____ day of _____, 2014.

ATTEST:

BOARD OF SUPERVISORS OF FAIRVIEW
TOWNSHIP

Pamela Rhoades, Secretary

Peter D. Kraus, Supervisor

Ralph Heidler, Supervisor

Mark Gennuso, , Supervisor

(SEAL)

APPENDIX A - OPERATION AND MAINTENANCE AGREEMENT

OPERATION AND MAINTENANCE (O&M) AGREEMENT

STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (SWM BMPs)

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between _____, (hereinafter the "Landowner"), and the Township of Fairview, Erie County, Pennsylvania, (hereinafter "Township");

WITNESSETH

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

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

WHEREAS, the SWM Site Plan approved by the Township (hereinafter referred to as the "Plan") for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the Township, provides for management of stormwater within the confines of the Property through the use of BMPs; and

WHEREAS, the Township, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of the Township and the protection and maintenance of water quality require that on-site SWM BMPs be constructed and maintained on the Property; and

WHEREAS, the Township requires, through the implementation of the SWM Site Plan, that stormwater BMPs as required by said Plan and the Municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, its successors and assigns.

NOW, THEREFORE, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The Landowner shall construct the BMPs in accordance with the plans and specifications identified in the SWM Site Plan.
2. The Landowner shall operate and maintain the BMPs as shown on the Plan in good working order in accordance with the specific maintenance requirements noted on the approved SWM Site Plan.
3. The Landowner hereby grants permission to the Township, its authorized agents, and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the BMPs whenever necessary. Whenever possible, the Township shall notify the Landowner prior to entering the property.
4. In the event the Landowner fails to operate and maintain the BMPs per paragraph 2, the Township or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMPs. It is expressly understood and agreed that the Township is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Township.
5. In the event the Township, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Township for all expenses (direct and indirect) incurred within ten (10) days of receipt of invoice from the Township.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the onsite BMPs by the Landowner; provided, however, that this Agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner shall pay such fees as determined by the Township and to escrow same with the Township.

8. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the Township from all damages, accidents, casualties, occurrences or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMPs by the Landowner or Township.
9. The Township may inspect the BMPs at a minimum of once every three years to ensure their continued functioning.

This Agreement shall be recorded at the Office of the Recorder of Deeds of Erie County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For Fairview Township:

For the Landowner:

ATTEST:

_____ (City, Borough, Township)

County of Erie, Pennsylvania

I, _____, a Notary Public in and for the County and State aforesaid, whose commission expires on the _____ day of _____, 20____, do hereby certify that _____ whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20____, has acknowledged the same before me in my said County and State.

GIVEN UNDER MY HAND THIS _____ day of _____, 20_____.

NOTARY PUBLIC

(SEAL)

APPENDIX B – LOW IMPACT DEVELOPMENT PRACTICES

LOW IMPACT DEVELOPMENT PRACTICES ALTERNATIVE APPROACHES FOR MANAGING STORMWATER RUNOFF

Natural hydrologic conditions may be altered radically by poorly planned development practices, such as introducing unneeded impervious surfaces, destroying existing drainage swales, constructing unnecessary storm sewers, and changing local topography. A traditional drainage approach of development has been to remove runoff from a site as quickly as possible and capture it in a detention basin. This approach leads ultimately to the degradation of water quality, as well as expenditure of additional resources for detaining and managing concentrated runoff at some downstream location.

The recommended alternative approach is to promote practices that will minimize post-development runoff rates and volumes, which will minimize needs for artificial conveyance and storage facilities. To simulate pre-development hydrologic conditions, forced infiltration is often necessary to offset the loss of infiltration by creation of impervious surfaces. The ability of the ground to infiltrate runoff depends upon the soil types and its conditions.

Preserving natural hydrologic conditions requires careful alternative site design considerations. Site design practices include preserving natural drainage features, minimizing impervious surface area, reducing the hydraulic connectivity of impervious surfaces, and protecting natural depression storage. A well-designed site will contain a mix of all those features. The following describes various techniques to achieve the alternative approaches:

- ◆ **Preserving Natural Drainage Features.** Protecting natural drainage features, particularly vegetated drainage swales and channels, is desirable because of their ability to infiltrate and attenuate flows and to filter pollutants. However, this objective is often not accomplished in land development. In fact, commonly held drainage philosophy encourages just the opposite pattern - streets and adjacent storm sewers typically are located in the natural headwater valleys and swales, thereby replacing natural drainage functions with a completely impervious system. As a result, runoff and pollutants generated from impervious surfaces flow directly into storm sewers with no opportunity for attenuation, infiltration, or filtration. Developments designed to fit site topography also minimize the amount of grading on site.
- ◆ **Protecting Natural Depression Storage Areas.** Depressional storage areas have no surface outlet, or drain very slowly following a storm event. They can be commonly seen as ponded areas in farm fields during the wet season or after large runoff events. Traditional development practices eliminate these depressions by filling or draining, thereby obliterating their ability to reduce surface runoff volumes and trap pollutants. The volume and release-rate characteristics of depressions should be protected in the design of the development site. The depressions can be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.
- ◆ **Avoiding Introduction of Impervious Areas.** Careful site planning should consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways, and other features producing impervious surfaces should be evaluated to minimize impacts on runoff.
- ◆ **Reducing the Hydraulic Connectivity of Impervious Surfaces.** Impervious surfaces are significantly less of a problem if they are not directly connected to an impervious conveyance system (such as storm sewer). Two basic ways to reduce hydraulic connectivity are: routing of roof runoff over lawns; and reducing the use of storm sewers. Site grading should promote increasing travel time of stormwater runoff and should help reduce concentration of runoff to a single point in the development.
- ◆ **Routing Roof Runoff Over Lawns.** Roof runoff can be easily routed over lawns in most site designs. The practice discourages direct connections of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. The routing of roof drains and crowning the driveway to allow runoff to discharge to pervious areas is desirable as the pervious area essentially acts as a filter strip.
- ◆ **Reducing the Use of Storm Sewers.** By reducing the use of storm sewers for draining streets, parking lots, and back yards, the potential for accelerating runoff from the development can be greatly reduced. The practice requires greater use of swales and may not be practical for some development sites, especially if there

are concerns for areas that do not drain in a “reasonable” time. The practice requires educating local citizens and public works officials, who expect runoff to disappear shortly after a rainfall event.

- ◆ **Reducing Street Widths.** Street widths can be reduced by either eliminating on-street parking or by reducing carway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets, which ultimately could lower maintenance and maintenance related costs.
- ◆ **Limiting Sidewalks to One Side of the Street.** A sidewalk on one side of the street may suffice in low-traffic neighborhoods. The lost sidewalk could be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials.
- ◆ **Using Permeable Paving Materials.** These materials include permeable interlocking concrete paving blocks or porous bituminous concrete. Such materials should be considered as alternatives to conventional pavement surfaces, especially for low use surfaces such as driveways, overflow parking lots, and emergency access roads.
- ◆ **Reducing Building Setbacks.** Reducing building setbacks reduces driveway and entry walks and is most readily accomplished along low-traffic streets where traffic noise is not a problem.
- ◆ **Constructing Cluster Developments.** Cluster developments can also reduce the amount of impervious area for a given number of lots. The biggest savings is in street length, which also will reduce costs of the development. Cluster development “clusters” the construction activity onto less-sensitive areas without substantially affecting the gross density of development.

In summary, careful consideration of the existing topography and implementation of a combination of the above mentioned techniques may avoid construction of costly stormwater control measures. Other benefits include: reduced potential of downstream flooding, reduced water quality degradation of receiving streams and water bodies, enhancement of aesthetics, and reduction of development costs. Beneficial results include: more stable baseflows in receiving streams, improved groundwater recharge, reduced flood flows, reduced pollutant loads, and reduced costs for conveyance and storage.

APPENDIX C - STORMWATER MANAGEMENT DESIGN CRITERIA

TABLE C-1 - RATIONAL METHOD RUNOFF COEFFICIENTS

Hydraulic Soil Group	Storm	A			B			C			D		
		0-2%	2-6%	+6%	0-2%	2-6%	+6%	0-2%	2-6%	+6%	0-2%	2-6%	+6%
Cultivated	<25yr	0.08	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
Land	≥25yr	0.14	0.08	0.22	0.16	0.21	0.28	0.2	0.25	0.34	0.24	0.29	0.41
Pasture	<25yr	0.12	0.2	0.3	0.18	0.28	0.37	0.24	0.34	0.44	0.3	0.4	0.5
	≥25yr	0.15	0.25	0.37	0.23	0.34	0.45	0.3	0.42	0.52	0.37	0.5	0.62
Meadow	<25yr	0.10	0.16	0.25	0.14	0.22	0.3	0.2	0.28	0.36	0.24	0.3	0.4
	≥25yr	0.14	0.22	0.3	0.2	0.28	0.37	0.26	0.35	0.44	0.3	0.4	0.5
Forest	<25yr	0.05	0.08	0.11	0.08	0.11	0.14	0.1	0.13	0.16	0.12	0.16	0.2
	≥25yr	0.08	0.11	0.14	0.1	0.14	0.18	0.12	0.16	0.2	0.15	0.2	0.25
Residential													
1/8 Acre	<25yr	0.25	0.28	0.31	0.27	0.3	0.35	0.3	0.33	0.38	0.33	0.36	0.42
	≥25yr	0.33	0.37	0.4	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
1/4 Acre	<25yr	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.3	0.34	0.4
	≥25yr	0.3	0.34	0.37	0.33	0.37	0.42	0.36	0.4	0.47	0.38	0.42	0.52
1/3 Acre	<25yr	0.19	0.23	0.26	0.22	0.26	0.3	0.25	0.29	0.34	0.28	0.32	0.39
	≥25yr	0.28	0.32	0.35	0.3	0.35	0.39	0.33	0.38	0.45	0.36	0.4	0.5
1/2 Acre	<25yr	0.16	0.2	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.3	0.37
	≥25yr	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34	0.38	0.48
1 Acre	<25yr	0.14	0.19	0.22	0.17	0.21	0.26	0.2	0.25	0.31	0.24	0.29	0.35
	≥25yr	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.4	0.31	0.35	0.46
Industrial	<25yr	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.69	0.69	0.69	0.69	0.7
	≥25yr	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial	<25yr	0.71	0.71	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	≥25yr	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.9	0.89	0.89	0.9
Streets	<25yr	0.7	0.71	0.72	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
	≥25yr	0.76	0.77	0.79	0.8	0.82	0.84	0.84	0.85	0.89	0.89	0.91	0.95
Open Space	<25yr	0.05	0.1	0.14	0.08	0.13	0.19	0.12	0.17	0.24	0.16	0.21	0.28
	≥25yr	0.11	0.16	0.2	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Parking or	<25yr	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
Impervious	≥25yr	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

Source: Rawls, W.J., S.L. Long, and R.H. McCuen, 1981. Comparison of Urban Flood Frequency Procedures. Preliminary Draft Report prepared for the Soil Conservation Service, Beltsville, Maryland.

For simplification, a designer may use 0.3 for all pervious areas and 0.95 for all impervious areas.

TABLE C-2 - RUNOFF CURVE NUMBERS (FROM NRCS (SCS) TR-55)

Runoff Curve Numbers for Urban Areas					
Cover Description		Curve Numbers for Hydrologic Soil Groups			
Cover Type and Hydrologic Condition	Average Percent Impervious Area	A	B	C	D
<i>Fully Developed Urban Areas (Vegetation Established)</i>					
Open Space (lawns, parks, golf courses, etc):					
	Poor Condition (grass cover < 50%)	68	79	86	89
	Fair Condition (grass cover 50% to 75%)	49	69	79	84
	Good Condition (grass cover > 75%)	39	61	74	80
Impervious Areas:					
	Paved Parking Lots, Roofs, Driveways, etc.	98	98	98	98
Streets and Roads:					
	Paved: Curbed and Storm Sewers	98	98	98	98
	Paved: Open Ditches	83	89	92	93
	Gravel	76	85	89	91
	Dirt	72	82	87	89
Urban Districts:					
	Commercial and Business	85%	89	92	94
	Industrial	72%	81	88	91
Residential Districts by Average Lot Size:					
	1/8 Acres or less	65%	77	85	90
	1/4 Acre	38%	61	75	83
	1/3 Acre	30%	57	72	81
	1/2 Acre	25%	54	70	80
	1 Acre	20%	51	68	79
	2 Acres	12%	46	65	77

Runoff Curve Numbers for Cultivated Agricultural Lands						
Cover Description			Curve Numbers			
Cover Type	Treatment	Hydrologic Condition	A	B	C	D
Fallow	Bare Soil	--	77	86	91	94
	Crop Residue Cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row Crops	Straight Row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & Terraced (C & T)	Poor	66	74	80	82
		Good	62	71	78	81
	C & T + CR	Poor	65	73	79	81
		Good	61	70	77	80
Small Grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C & T	Poor	61	72	79	82
		Good	59	70	78	81
	C & T + CR	Poor	60	71	78	81
		Good	58	69	77	80
Close Seeded or Broadcast Legumes Or Rotation Meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C & T	Poor	63	73	80	83
		Good	51	67	76	80
Runoff Curve Numbers for Other Agricultural Lands						
Pasture, Grassland, or Range – Continuous Forage for Grazing	Poor	68	79	86	89	
	Fair	49	69	79	84	
	Good	39	61	74	80	
Meadow – Continuous Grass, Protected from Grazing and Generally Mowed for Hay	--	30	58	71	78	
Woods – Grass Combination (orchard or tree farm)	Poor	57	73	82	86	
	Fair	43	65	76	82	
	Good	32	58	72	79	
Woods	Poor	45	66	77	83	
	Fair	36	60	73	79	
	Good	30	55	70	77	
Farmsteads – Buildings, Lanes, Driveways and Surrounding Lots.	--	59	74	82	86	

APPENDIX D — SMALL PROJECTS SWM APPLICATION

FAIRVIEW TOWNSHIP
Small Project Stormwater Management Application

Per Fairview Township's Act 167 Stormwater Management Ordinance, a stormwater management plan is required whenever more than 2,500 square feet of impervious surface are proposed. Impervious surfaces are areas that prevent the infiltration of water into the ground and shall include, but not be limited to, roofs, patios, garages, storage sheds and similar structures, and any new streets or sidewalks.

<i>To Calculate Impervious Surfaces Please Complete This Table</i>					
Surface Type	Length (feet)	X	Width (feet)	=	Proposed Impervious Area
Building (area per downspout)		x		=	
		x		=	
		x		=	
		x		=	
Driveway		x		=	
		x		=	
		x		=	
Parking Areas		x		=	
		x		=	
		x		=	
Patios/Walks		x		=	
		x		=	
		x		=	
		x		=	
Other		x		=	
		x		=	
		x		=	
Total Impervious Surface Area to be managed (sum of all areas)					

If the Total Impervious Surface Area is LESS THAN 2,500 Square Feet, please read, acknowledge and sign below.

If the Total Impervious Surface Area EXCEEDS 2,500 Square Feet, complete the remainder of the Application.

Based Upon the information you have provided a **Stormwater Management Plan IS NOT required** for this regulated activity. Fairview Township may request additional information and/or SWM for any reason.

Property Owner Acknowledges that submission of inaccurate information may result in a stop work order or permit revocation. Acknowledgement of such is by signature below. I declare that I am the owner or owner's legal representative. I further acknowledge that the information provided is accurate and employees of Fairview Township are granted access to the above described property for review and inspection as may be required.

Owner
Date:

CREDITS

Credit 1: DISCONNECTION OF IMPERVIOUS AREA

When runoff from impervious areas is directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, all or parts of the impervious areas may qualify as Disconnected Impervious Area (DIA). Using the criteria below, determine the portion of the impervious area that can be excluded from the calculation of total impervious area.

Criteria: An impervious area is considered to be completely or partially disconnected if it meets the requirements listed below

- rooftop area draining to a downspout is ≤500 sf
- paved area draining to a discharge is ≤1,000 sf
- flow path of paved impervious area is not more than 75'
- soil at discharge is not designated as hydrologic soil group "D"
- flow path at discharge area has a positive slope of ≤5%
- gravel strip or other spreading device is required at paved discharges.

Length of Pervious Flow Path from discharge point * (ft)	DIA Credit Factor
0 – 14	1.0
15 – 29	0.8
30 – 44	0.6
45 – 59	0.4
60 – 74	0.2
75 or more	0

* Flow path cannot include impervious surfaces and must be at least 15 feet from any impervious surfaces.

Calculate DIA Credit & Required Capture Volume									
Surface Type	Proposed Impervious Area (from previous sheet)	X	DIA Credit Factor	=	Impervious Area to be managed	÷	6	=	Required Capture Volume (ft ³)
Building (area per downspout)		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Driveway		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Parking Areas		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Patios/Walks		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Other		X		=		÷	6	=	
		X		=		÷	6	=	
		X		=		÷	6	=	
Total Req'd Capture Volume									

Credit 2: TREE PLANTING

Perhaps the best BMP is a tree as they intercept rainfall, increase evapotranspiration and increase time of concentration. A portion of the required capture volume can be reduced provided the criteria are met.

CREDITS

Deciduous Trees	Evergreen Trees
6 ff ³ per tree planted	10 ff ³ per tree planted

Criteria

To receive credit for planting trees, the following must be met:

- Trees must be native species (see below), minimum 1" caliper tree and 3 feet tall shrub (min).
- Trees shall be adequately protected during construction.
- Trees shall be maintained until redevelopment occurs.
- No more than 25% of the required capture volume can be mitigated through the use of trees.
- Dead trees shall be replaced within 12 months.
- Non-native species are not applicable.

	Req'd Capture Volume (ff³)
-	
	Tree Planting Credit (ff³)
	Capture Volume to be managed (ff³)

Sizing of BMP

	How much of the Volume will you manage with a Rain Garden?
+	
	How much of the Volume will you manage with a Sump or Trench?
	Capture Volume to be managed (ff³)

Enter the volumes into the **Small Project SWM Plan Worksheet** on the next sheet.

Native Species Trees (Common Name)

- | | |
|--------------------------------------|---|
| - Blackgum | - Oak, (white, swamp white, scarlet, pin, red, black) |
| - Cucumber magnolia | - Dogwood (silky or red osier) |
| - Hophornbeam | - Tuliptree |
| - Maple, (sugar, red or silver) | - Willow, black |
| - Pine, (pitch or eastern white) | - Chokeberry (red or black) |
| - Ironwood | - Basswood, American |
| - Hickory, sweet pignut or shag-bark | - Serviceberry, (downy or shadbush) |
| - Sycamore, American | - Elderberry |
| - Cotton-wood, eastern | - Witch hazel |
| - Aspen, big-tooth or quaking | - Mountain laurel |
| - Cherry, black | |

Small Project SWM Plan Worksheet

Based upon the information you have provided a Stormwater Plan IS Required for this development activity. The Stormwater Management Ordinance developed through the Erie County Act 167 Stormwater Management Plan regulates compliance requirements for Stormwater Management in this jurisdiction. A complete copy of the Plan can be found on the Erie County Planning Department website (<http://www.eriecountyplanning.org>) which contains the Model Ordinance.

Regulated activities shall be conducted only after [municipality] approves a stormwater management plan. The Erie County Act 167 Stormwater Management Plan will assist you in preparing the necessary information and plans for [municipality] to review and approve. This document will constitute an approved plan if all of the relevant details are to be installed in their entirety AND no part of the stormwater system adversely affects any other property, nor adversely affect any septic systems or drinking water wells on this, or any other, parcel. Alternative system proposed require a plan will need to be submitted to [municipality] for approval. A design by a qualified professional may be required for more complex sites.

PLEASE INITIAL BELOW TO INDICATE THE STORMWATER MANAGEMENT PLAN FOR THIS SITE

- Minimum Control #1 Erosion & Sediment Pollution Control
- Minimum Control #2: Source Control of Pollution
- Minimum Control #3: Preservation of Natural Drainage Systems and Outfalls

The relevant details from *Erie County Act 167 Stormwater Management Plan* will be installed in their entirety AND the system will be located as not to adversely affect other property, nor any septic systems or drinking water wells on this, or any other, parcel.

To meet this requirement, the following will be installed and maintained:

Capture Volume to be managed (ft ³)			Conversion	Surface Area of BMPs (ft ²)
	By Rain Garden 6" ponding; 2' soil depth	x	1.20	
	Dry Well or Infiltration Trench 2½' aggregate depth	x	1.25	
	Total		Total	

In lieu of meeting the above, an alternative and/or professional design is attached for approval AND the system will be located as not to adversely affect other property, any septic systems or drinking water wells on this, or any other, parcel.

Site Sketch Plan showing:

- Property lines with dimensions
- Proposed buildings with dimensions
- Proposed impervious surfaces with dimensions
- Proposed septic system, if applicable
- Proposed well site, if applicable
- Proposed stormwater management system(s)

Operation and Maintenance Agreement

Condition on approval - The stormwater management plan must be fully implemented prior to a request for final inspection of the building or zoning permit.

Acknowledgement - By executing below, the Owner acknowledges the following:

- I declare that I am the owner of the property.
- The information provided is accurate.
- I further acknowledge that municipal representatives are granted access to the above described property for review and inspection as may be required.

Owner

Date:

APPENDIX F – RELEASE RATE MAP