Chapter 206

STORMWATER MANAGEMENT

[HISTORY: Adopted by the Board of Commissioners of the Township of Upper Dublin 9-14-2004 by Ord. No. 1141.[1] Amendments noted where applicable.]

1. Editor's Note: This ordinance also repealed former Ch. 206, Stormwater Management, adopted 7-14-1998 by Ord. No. 973.

GENERAL REFERENCES

Planning Agency — See Ch. 39.
Building construction - uniform construction code — See Ch. 73.
Excavations — See Ch. 99.
Fees — See Ch. 110.
Flood damage prevention — See Ch. 122.
Subdivision and land development — See Ch. 212.
Watercourses — See Ch. 240.
Wells — See Ch. 244.
Zoning — See Ch. 255.

ARTICLE I
General Provisions

§ 206-1. Short title.

This chapter shall be known and may be cited as the "Upper Dublin Township Stormwater Management Ordinance."

§ 206-2. Statement of findings.

The Board of Commissioners of the Township of Upper Dublin finds that:

A. Stormwater runoff from lands modified by human activities threatens public health and safety by causing decreased infiltration of precipitation, increased runoff flow volume and increased runoff flow velocity, which overtax the carrying capacity of streams and storm sewers resulting in flooding, and greatly increases the cost to the public to manage stormwater.

B. Inadequate planning and management of stormwater runoff resulting from land development and redevelopment throughout a watershed harms surface water resources by changing the natural hydrologic patterns, accelerating stream flows (which increase scour and erosion of streambeds and streambanks thereby elevating sedimentation), destroying aquatic habitat and elevating aquatic pollutant concentrations and loadings such as sediments, nutrients, heavy metals and pathogens. Groundwater resources are also impacted through loss of recharge.

C. A program of stormwater management, including reasonable regulation of land development and redevelopment that causes loss of natural infiltration, is fundamental to the public health, safety, welfare and the protection of the people of the Township and all the people of the commonwealth, their resources and the environment.

D. Stormwater is an important water resource that provides 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 the Township to implement a program of stormwater controls. The Township is required to obtain a permit for stormwater discharges for its municipal separate storm sewer system (MS4) under the National Pollutant Discharge Elimination System (NPDES).

G. Nonstormwater discharges to MS4s contribute to pollution of waters of the commonwealth.

§ 206-3. Purpose.

The purpose of this chapter is to promote public health, safety and welfare within the Township and its watersheds by minimizing the harms and maximizing the benefits described in § 206-2 of this chapter, through provisions designed to:

A. Manage stormwater runoff impacts at their source by regulating activities that cause the problems.

B. Provide review procedures and performance standards for stormwater planning and management.

C. Properly use and preserve existing drainage systems and watercourses.

D. Manage stormwater impacts close to the runoff source through reliance on natural processes and a minimum of structures.

E. Maximize infiltration of stormwater to maintain groundwater recharge, to prevent degradation of surface and groundwater quality, to otherwise protect water resources, and to promote the natural hydrologic regime.

F. Maintain and improve existing flows and quality of streams and watercourses.

G. Meet legal water quality requirements under Pennsylvania law, to protect and maintain existing uses and maintain the level of water quality to support those uses in all streams, and to protect and maintain water quality in special protection streams.

H. Prevent scour and erosion of streambanks and streambeds.

I. Provide for proper operations and maintenance of all stormwater management facilities within the Township.

J. Provide a mechanism to identify controls necessary to meet NPDBS requirements.

K. Implement an illicit discharge detection and elimination program to address nonstormwater discharges into the Township's MS4 and watercourses within the Township.

§ 206-4. Statutory authority.

The Township is empowered to regulate land use activities that affect stormwater and water quality by the authority of the First Class Township Code and the Municipalities Planning Code.

§ 206-5. Applicability.

A. This chapter applies to all activities within the Township and all stormwater runoff entering into the Township's MS4.

B. Regulated activities include, but are not limited to, the following:

(1) Land development or redevelopment.

(2) Land subdivision.

(3) Development, construction or reconstruction of impervious, semipervious or pervious surfaces.

(4) Construction of new buildings or structures and additions to existing buildings or structures.

(5) Stormwater discharges to the Township's MS4 or watercourses.

(6) Installation or construction of stormwater management structures, facilities, and appurtenances thereto.

(7) Property maintenance, grading and landscaping.

(8) Alteration of existing vegetation or land cover.

C. Earth disturbance activities and associated stormwater management controls are also regulated under existing federal and state law and implementing regulations. This chapter shall operate in coordination with those parallel requirements; the requirements of this chapter shall be no less restrictive than federal or state law.

§ 206-6. Compatibility with other requirements.

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

B. To the extent that this chapter is inconsistent with or imposes more rigorous or stringent requirements than any other ordinance or regulation of the Township, the specific requirements contained in this chapter shall be followed.

C. Nothing in this chapter shall be construed to affect any of the Township's requirements regarding stormwater matters which do not conflict with the provisions of this chapter, 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 chapter addressing state water quality requirements.

§ 206-7. Severability.

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

§ 206-8. (Reserved)

§ 206-9. (Reserved)

§ 206-10. (Reserved)

§ 206-11. (Reserved)

§ 206-12. (Reserved)

§ 206-13. (Reserved)

§ 206-14. (Reserved)

§ 206-15. (Reserved)

§ 206-16. (Reserved)

§ 206-17. (Reserved)

§ 206-18. (Reserved)

§ 206-19. (Reserved)

§ 206-20. (Reserved)

ARTICLE II
Definitions

§ 206-21. Word usage.

Unless otherwise expressly stated, the following terms, for the purpose of this chapter, shall be interpreted as follows:

A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include the feminine gender, and words of feminine gender include the masculine gender.

B. The words "includes" or "including" shall not limit a term to the specific example but are intended to extend its meaning to all other instances of like kind and character.

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

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

§ 206-22. Terms defined.

As used in this chapter, the following terms shall have the meanings indicated:

ACCELERATED EROSION — The removal of the surf ace of the land through the combination of human activity and natural processes at a rate greater than would occur due to natural processes alone.

AGRICULTURAL ACTIVITIES — The work of producing crops and raising livestock, including tillage, plowing, discing, harrowing, pasturing and installation of conservation measures. Construction of new buildings or impervious areas in support of agricultural activities is not considered agricultural activities.

APPLICANT — A landowner, as herein defined, or agent of the landowner, who has filed an application for a stormwater management permit or other approval under this chapter.

BASE FLOW — Stream flow originating from groundwater seepage into a streambed and any releases from impoundment structures.

BEST MANAGEMENT PRACTICE (BMP) — Structural and nonstructural measures, including activities, facilities, designs, measures or procedures, used to manage stormwater runoff to meet water quality requirements and to reduce flooding, to promote groundwater recharge and to otherwise meet the purposes of this chapter and federal and state stormwater regulations. BMPs include but are not limited to infiltration, filter strips, low-impact design, bioretention, wet ponds, permeable paving, grassed swales, forested buffers, sand filters and detention basins.

BIORETENTION AREA — Stormwater management measure which involves the shallow, temporary ponding of stormwater runoff in areas with well-drained soils and native vegetation.

BUILDING — Any structure, either temporary or permanent, having enclosed walls and a roof, located on the land, designed or used for the shelter of any person, animal or property, and occupying more than 100 square feet of area.

CHANNEL EROSION — The widening, deepening and headward cutting of small channels and waterways due to erosion caused by water flows.

CISTERN — An underground reservoir or tank for storing rainwater.

CONSERVATION DISTRICT — The Montgomery County Conservation District.

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

DAM — A refuse bank, fill, structure or artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or other fluid.

DEDICATION — The deliberate donation of property by its owner for public use.

DEP — The Pennsylvania Department of Environmental Protection or its predecessor or successor agencies.

DESIGN STORM — The magnitude of precipitation from a storm event measured in probability of occurrence (e.g., fifty-year storm) and duration (e.g., twenty-four-hour), and used in computing stormwater management control systems.

DETENTION BASIN — A stormwater management structure with a controlled release rate which is essentially dry while not receiving stormwater.

DEVELOPER — Any landowner, agent of such landowner or tenant who, with the permission of such landowner, makes or causes to be made a subdivision of land or a land development or who undertakes a regulated activity as defined herein.

DEVELOPMENT — Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, the placement of mobile homes, streets and other paving, utilities, filling, grading, excavation, mining, dredging or drilling operations and the subdivision of land. This term includes redevelopment.

DEVELOPMENT SITE — The specific tract of land for which a development is proposed, conducted or maintained.

DOWNSLOPE PROPERTY LINE — That portion of the property line of a lot, tract or parcel of land being developed which is located such that all overland or pipe (low of stormwater from the site would be directed towards it.

DRAINAGE EASEMENT — A right granted by a landowner to a grantee, including an association or the Township, allowing the use of private land for stormwater management purposes.

DRAINAGE FACILITY — Any ditch, pipe, culvert, storm sewer, stream, channel, swale, conduit or other structure or feature designed, intended or constructed for the purpose of

diverting surface water from or carrying surface waters off streets, public rights-of-way, parks, recreational areas or any part of any subdivision or land development.

DRAINAGE PERMIT — A permit issued by the Township after a stormwater management plan has been approved. Said permit is issued prior to or with a final land development approval.

DRY WELL — Below-grade stormwater retention structure that is open at the base, allowing water to percolate to the underlying soil.

EARTH DISTIJRBANCE — Any activity, including, but not limited to, grading, construction, mining, timber harvesting, clearing and grubbing, and stockpiling or storage which alters, disturbs and exposes the surface of the land greater than 5,000 square feet. See also "land disturbance."

EROSION — The removal or wearing away of the surface of the land by the action of natural processes, including the action of water, wind and ice, and chemicals.

EROSION AND SEDIMENT POLLUTION CONTROL PLAN — A plan, which designates measures to be employed to minimize accelerated erosion and sedimentation.

EXISTING CONDITIONS — The initial condition of a project site prior to the proposed construction, earth disturbance, clearing, grubbing or filling. If the initial condition of the site is undeveloped land, the land use shall be considered as meadow unless the natural land cover is proven to generate a lower curve number or Rational Ç value, such as forested lands.

FEMA — Federal Emergency Management Agency.

FILL —

A. (Verb) Any action by which earth, sand, gravel, rock or any other acceptable material is deposited, placed, pushed, dumped, pulled, transported or moved to a new location.

B. (Noun) Earth, sand, gravel, earth or other material permitted and acceptable by law to be placed or deposited to form an embankment or raise the elevation of the land surface. The term includes material used to replace an area of aquatic life with dry land or to change the bottom elevation of a regulated water of the commonwealth.

FLOOD — A temporary condition of partial or complete inundation of normally dry land areas from excessive surface water or the overflow of streams, rivers and other waters of the commonwealth and waters of the United States. The action by which a flood occurs.

FLOODPLAIN — The area along a watercourse which is periodically flooded by water therefrom, as defined by the Township Code, Chapter 255, Zoning, Article XXII, Floodplain Conservation District.

FLOODWAY — The channel of a watercourse and those portions of the adjoining floodplains which are reasonably required to carry and discharge the one-hundred-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 one-hundred-year frequency floodway, it is assumed (absent evidence to the contrary) that the floodway extends from the watercourse to 50 feet

from the top of the bank of the watercourse or as determined by § 255-161A(4), whichever distance from the top of bank is greater.

FREEBOARD — A vertical distance between the elevation of the design high water and the top of the berm or embankment of a stormwater management structure. The space is required as a safety margin in a pond or a basin to prevent overtopping.

GRADE —

A. (Noun) A slope of a street, pipe, culvert, channel or natural ground, specified as a percentage or ratio and shown on plans as specified herein.

B. (Verb) To finish or work the surface of the land, a roadbed, top of embankment or bottom of excavation.

C. GRADE, EXISTING — The vertical elevation of the ground surface prior to earthmoving, filling or other land disturbance.

D. GRADE, FINAL — The final vertical elevation of the ground after earthmoving, filling or other land disturbance.

GRASSED WATERWAY — A natural or constructed waterway, usually broad and shallow, used to convey surface water.

GROUNDWATER — The water beneath the surface of the ground, the source of water in springs and wells and base flow in streams.

GROUNDWATER RECHARGE — Replenishment of the water beneath the surface of the ground, the source of water in springs and wells. Infiltration of precipitation and its movement to the water table is one form of natural recharge.

GROUNDWATER RECHARGE DESIGN STORM — Benchmark rainfall event used as a basis for establishing compliance with the groundwater recharge requirement of this chapter: seventy-five-hundredths-inch, twenty-four-hour rainfall.

IMPERVIOUS SURFACE — A surface which prevents the infiltration of water into the ground. Impervious surfaces shall include the horizontal surface area of stormwater management structures.

IMPOUNDMENT — A retention or detention basin designed to manage stormwater runoff by retaining it or releasing it at a controlled rate.

INFILTRATION STRUCTURE — A structure designed to direct runoff into the ground, (e.g., seepage pits, infiltration trench).

LAND DEVELOPMENT — Any of the following activities:

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

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

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

B. A subdivision of land.

C. Any activity regulated as development in accordance the Municipalities Planning Code and any amendments thereto.

LAND DISTURBANCE — Any activity involving grading, tilling, digging, filling of ground, clearing, grubbing, stripping of vegetation or any other activity that causes an alteration to the natural condition of the land. See also "earth disturbance."

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

MANNING'S EQUATION — A method for calculation of flow velocity (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.

MUNICIPALITIES PLANNING CODE — Pennsylvania Municipalities Planning Code, Act of July 31, 1968, P.L. 805, No. 247, as reenacted and amended December 31, 1988, P.L. 1329, No. 170, as amended, 53 P.S. § 10101 et seq., and any further amendments thereto.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) — A means of conveyance or system of conveyances (including roads with drainage systems, public streets, catch basins, curbs, gutters, ditches, channels or storm drains) owned or operated by the state, a municipality or other public body and designed or used for collecting or conveying storm water, and which is not a combined sewer and which is not part of a publicly owned treatment works.

NONPOINT SOURCE POLLUTION — Pollution that enters a waterway or body from diffuse origins in the watershed and does not result from a discernible, confined or discrete conveyance.

NPDES — National Pollutant Discharge Elimination System, the federal government's system for issuance of permits under the Clean Water Act, which is delegated to DEP, and to the Conservation District to a limited extent.

NRCS — Natural Resource Conservation Service, previously known as the Soil Conservation Service ("SCS").

OPEN CHANNEL — A drainage conveyance 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 flowing partly full.

OUTFALL — Point where water discharges from a conduit, pipe, or other drainage conveyance. "Point source," as described in 40 CFR § 122.2, at the point where the MS4 discharges to surface waters of the commonwealth.

OUTLET — Point of water discharge from a watercourse, stream, river, lake or artificial drain.

PEAK DISCHARGE — The maximum rate of flow of stormwater runoff at a given point and time resulting from a specified storm event, expressed as volume per unit of time (cubic feet per second).

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

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

POINT SOURCE — Any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel or conduit from which stormwater is or may be discharged, as defined in state regulations at 25 Pa. Code § 92.1.

PROJECT SITE — The specific area of land where any regulated activity in the Township is planned, conducted or maintained.

RAPARIAN CORRIDOR — A vegetated or natural area directly adjacent to (or surrounding) a water body, including watercourses, ponds, lakes and wetlands, that serves a variety of functions important to the health and welfare of humans and the environment. A riparian corridor is determined by boundaries set by a horizontal measurement extending from the top of bank or high water mark of a water body to one foot above the one-hundred-year base flood elevation, or, alternatively, a horizontal measurement extending 50 feet from the top of bank or high water mark of the water body, whichever distance is greater.

RATIONAL METHOD (FORMULA) — A precipitation-runoff relation used to estimate peak discharge.

REDEVELOPMENT — Earth disturbance activity on land which has previously been disturbed or developed.

REGULATED ACTIVITIES —

A. Actions or proposed actions which affect stormwater runoff and which are governed by this chapter.

B. Earth disturbance activity one acre or more in area with a point source discharge to surface waters or the Township's MS4, 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. This only includes road maintenance activities involving 25 acres or more of earth disturbance.

RETENTION BASIN — A stormwater management structure with a controlled release rate which maintains a constant water level while not receiving stormwater.

RETENTION VOLUME — The combined storage volume provided by BMPs on a site for the retention and eventual infiltration or evaporation of precipitation.

RETURN PERIOD — The average interval, in years, within which a storm event of a given magnitude can be expected to recur. A storm with a probability of occurrence of four percent in any year. See "storm frequency."

RISER — A vertical pipe extending from the bottom of a pond or basin that is used to control the discharge rate from the pond or basin for a specified design storm.

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

ROOFTOP DETENTION — Temporary capture and gradual release of precipitation falling directly onto a roof surface by incorporating controlled flow roof drains into building designs.

RUNOFF — The surface water discharge of a given watershed after precipitation that does not enter the soil but runs off the surface of the land.

SEDIMENT — Solid material, both mineral and organic, that is in suspension, is being transported or has been moved from its site of origin or has been deposited by water.

SEDIMENT BASIN — A barrier, dam, retention or detention structure designed to capture sediment.

SEDIMENT POLLUTION — The placement, discharge or any other introduction of sediment into the waters of the commonwealth occurring from the failure to design, construct, implement or maintain control measures and control facilities in accordance with the requirements of this chapter.

SEDIMENTATION — The process by which mineral or organic matter is accumulated or deposited by wind, water or gravity. Once this matter is deposited (or remains suspended in water), it is usually referred to as "sediment."

SEEPAGE PIT OR SEEPAGE TRENCH — An area of excavated earth filled with loose stone or similar material and lined with filter fabric into which surface water is directed for infiltration into the ground. Also known as an "infiltration pit" or "infiltration trench."

SEMIPERVIOUS SURFACE — A surface, such as turf, stone, porous paving or other material, which allows some percolation or infiltration of water into the ground.

SHEET FLOW — Runoff which flows over the ground surface as a thin, even layer not concentrated in a channel.

SINGLE ENTITY — An association, public or private corporation. partnership, firm, trust, estate or any other legal entity empowered to own real estate exclusive of an individual lot owner.

SOIL COVER COMPLEX METHOD — A method of runoff volume computation developed by the Natural Resource Conservation Service. Soil type, land use/cover, rainfall amounts and moisture conditions are related to the predicted runoff volume for a single rainfall event.

SOIL GROUP, HYDROLOGIC — A classification of soils by the Natural Resource Conservation Service into four runoff potential groups. The groups are distinguished by letters A through D. The soils represent a range of drainage capabilities from A soils that are very permeable and produce little runoff to D soils, which are not very permeable and produce much more runoff.

SPILLWAY — A depression in or a stormwater system through the embankment of a stormwater management structure which is used to pass peak discharge greater than the maximum design storm controlled by the structure.

STATE WATER QUALITY REQUIREMENTS — As defined under state regulations, protection of "designated" and "existing uses" (see 25 Pa. Code chapters 93 and 96).

A. Each stream segment in Pennsylvania has a "designated use," such as "cold water fishery" or "potable water supply," which are listed in 25 Pa. Code chapter 93. These uses must be protected and maintained, under state regulations.

B. "Existing uses" are those attained as of November 1975, regardless whether they have been designated in 25 Pa. Code chapter 93. 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 is a function of the chemical, biological and physical characteristics of surface water bodies. After regulated earth disturbance activities are complete, these characteristics can be impacted by addition of pollutants, such as sediment, and changes in habitat through increased flow volumes and/or rates as a result of changes in land surface area from those activities. Therefore, permanent discharges to surface waters must be managed to protect the streambank, streambed and structural integrity of the waterway to prevent these impacts.

STORM FREQUENCY — The number of times that a given storm event occurs or is equaled or exceeded on the average in a given year. See "return period."

STORM SEWER — 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. Excludes domestic sewage and industrial waste systems.

STORMWATER — The total amount of precipitation reaching the ground surface.

STORMWATER DETENTION FACILITY — Stormwater detention facilities include all structural measures whose principle purpose is the attenuation of incoming runoff peak discharge rates, All stormwater detention facilities incorporate a method of restricting outflow and a storage volume for the temporary detention of incoming runoff. Stormwater detention facilities include both above-grade and below-grade devices. See also "detention basin."

STORMWATER MANAGEMENT FACILITY OR STRUCTURE — Any structure, natural or man-made, that, due to its condition, design or construction, conveys, stores or otherwise controls stormwater runoff. Typical stormwater management facilities include, hut are not

limited to, detention and retention basins, open channels, storm sewers, pipes and infiltration structures, Referred to as a "storm water management structure" when man-made.

STORMWATER MANAGEMENT PLAN — The depiction, to scale, of the stormwater management facilities, BMPs, design and techniques, if any, to be used for a given development site, including drainage areas, pipes, inlets, culverts, basins and appurtenances.

STREAM — A watercourse.

STREAM ENCLOSURE — A bridge, culvert, pipe or other structure which encloses a watercourse. A permit to construct such an enclosure is required for an enclosure greater than 100 feet in length.

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 ten acres, not involving any new street or easement of access or any residential dwelling, shall be exempt.

SWALE — A low-lying stretch of land which intercepts, collects or carries surface water runoff.

TIME OF CONCENTRATION (TC) — The time for surface runoff to travel from the hydraulically most distant point in 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 — The Township of Upper Dublin, Montgomery County, Pennsylvania.

TOWNSHIP CODE — The Code of the Township of Upper Dublin.

WATER QUALITY DESIGN STORM — Benchmark rainfall event used as a basis for establishing compliance with the water quality requirement of this chapter: one-year, twenty-four-hour rainfall.

WATERCOURSE — A channel or conveyance of surface water, such as a stream or creek, having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

WATERSHED — The area contained within a drainage divide above a specified point on a stream. In water-supply engineering it is termed a watershed, and in river-control engineering it is termed a drainage area, drainage basin or catchment area.

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

WETLAND — Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, ferns and similar areas, as defined by the U.S. Army Corps of Engineers.

§ 206-23. (Reserved)

§ 206-24. (Reserved)

§ 206-25. (Reserved)

§ 206-26. (Reserved)

§ 206-27. (Reserved)

§ 206-28. (Reserved)

§ 206-29. (Reserved)

§ 206-30. (Reserved)

ARTICLE III
Stormwater Management for Water Quality

§ 206-31. General requirements for stormwater management.

A. All regulated activities within the Township shall be designed, implemented, operated and maintained to meet the purposes of this chapter, through these two elements:

(1) Erosion and sediment control during earth disturbance and construction activities (e.g., during construction).

(2) Water quality protection measures after completion of earth disturbance and construction activities, including operations and maintenance. These measures are also known as "postconstruction stormwater management."

B. No regulated activities within the Township shall commence until the requirements of this chapter are met.

C. Erosion and sediment control during regulated activities shall be addressed as required by § 206-33.

D. Postconstruction water quality protection shall be addressed as required by § 206-34. Operations and maintenance of permanent stormwater BMPs shall be addressed as required by Article IV and Article V of this chapter.

E. All BMPs used to meet the requirements of this chapter shall conform to the state water quality requirements, and any more stringent requirements as determined by the Township.

F. Techniques for low-impact development practices described in Article XI of this chapter are encouraged because they reduce the impacts on development and promulgate compliance with the requirements of this chapter and the state water quality requirements.

G. The standards referred to in this article shall apply as minimum design standards; however, federal and state regulations may impose additional standards subject to their jurisdiction.

H. Chapter 240 and the following requirements apply to existing watercourses and natural drainage features:

(1) Whenever a watercourse is located within a development site, it shall remain open in a natural state to maintain pre-development conditions. This requirement may be waived on a case-by-case basis by the Board to limit enclosure and disturbance in furtherance of public health, safety and welfare.

(2) The existing points of natural drainage discharge onto adjacent property shall not be altered without the written approval of the affected landowners and the grant of a permanent drainage easement by the landowners.

(3) No stormwater runoff or natural drainage shall be so diverted as to overload existing drainage systems (including existing stormwater management facilities) or create flooding.

(4) The Township may require a developer to grant to the Township a permanent drainage easement along any watercourse located within or along the boundary of any property being subdivided or developed. The purpose of any such easement shall be for the maintenance of the channel of any watercourse. The terms of the easement shall prohibit the placing of fill or structures and any alterations which may adversely affect the watercourse. The required width of any such easement shall be determined by the Township Engineer, and in no case shall such easement be less than 50 feet in width. The developer will retain maintenance responsibility for the easement until such time as the following are accomplished:

(a) The easement is offered for dedication by the developer and accepted by the Township; and

(b) If an easement acceptable to the Township is established and officially entered upon the deeds of those properties affected by the easement by the Montgomery County Office for the Recording of Deeds, the maintenance shall then be the responsibility of the individual lot owners over whose property the easement passes. For land developments, the maintenance shall

then be the responsibility of the lot owner upon which the watercourse traverses; or

(c) A homeowners' association or other approved legal entity, approved by the Township, assumes responsibility for the maintenance of the development, including the watercourse easement.

I. Developers shall construct and/or install stormwater management facilities, on and offsite, as necessary to:

(1) Prevent erosion damage and to satisfactorily carry off, detain or retain and control the rate and volume of stormwatcr discharge.

(2) Manage the anticipated peak discharge from property being developed and existing runoff being contributed from all land at a higher elevation in the same watershed.

(3) Manage volume of runoff. Postdevelopment conditions shall not exceed predevelopment conditions.

(4) Convey stormwater along or through the property to an outfall.

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

(b) An outfall shall have sufficient capacity to receive stormwater without deterioration of the facility and without adversely affecting property in the Township. This outfall may be a stream or other drainage facility so designated by the township.

(c) Roof runoff.

[1] Roof runoff shall be conveyed into watercourses on the property or to a storm drainage system of the Township. However, a direct connection of roof drains to watercourses and storm drainage systems is prohibited unless approved by the Township Engineer. Discharge from roof drains over a sidewalk, into a driveway, over a parking area or into gutters will not be permitted.

[2] Compliance with groundwater recharge requirements requires that roof runoff generated by the groundwater recharge design storm be infiltrated on-site. Infiltration can be achieved locally (e.g., dry wells, french drain) or in conjunction with other on site BMP's (e.g., infiltration trench, bioretention area, porous pavement sand filter).

[3] Where conditions are not suitable for groundwater recharge, roof drains are required to discharge onto a vegetated surface (e.g., lawn, filter strip, swale, grassed waterway). The minimum length of the flow path

between the drain outlet and the point of discharge to a watercourse or storm sewer inlet shall be 20 feet.

[4] Unsuitable groundwater recharge conditions must be documented to the satisfaction of the Township Engineer.

[5] Roof runoff discharge points shall be no closer than 20 feet to an adjoining property.

(d) Water originating from other than natural sources, such as air-conditioning units, sump pumps or other dry weather flow, wherever practicable, shall be discharged to infiltration areas or negative BMPs at the direction of the Township Engineer. Discharge from sump pumps shall be no closer than 20 feet to an adjoining property.

(e) Water from swimming pools or similar uses containing chlorine shall be pretreated to remove chlorine to acceptable limits prior to discharge.

J. A horizontal riparian corridor buffer area shall be established between the top of bank or high water mark of a water body and a line one foot above the one-hundred-year base flood elevation or from the top of bank or high water mark of a water body and a line 50 feet from the top of bank or high water mark of the water body, whichever distance is greater. The riparian corridor may be part of any lot to meet minimum lot area and minimum yard requirements. No building or structure of any kind or any work, such as earth disturbance or excavation, shall be permitted within the riparian corridor except as permitted within the Floodplain Conservation District under chapter 255, Article XXII, Floodplain Conservation District.

K. Where applicable, construction of stormwater management facilities shall comply with the requirements of chapter 102 (Erosion Control), chapter 105 (Dam Safety and Waterway Management) and chapter 106 (Flood Plain Management) of Title 25, Pa Code, Rules and Regulations of DEP. Inquiries regarding dam safety permit requirements or other concerns shall be addressed to DEP. Copies of any correspondence to and from DEP must be provided to the Township.

L. Stormwater management facilities which are located in, adjacent to or that will discharge to a state highway right-of-way shall be subject to the approval of the Pennsylvania Department of Transportation (PennDOT). Copies of any correspondence to and from PennDOT must be provided to the Township.

M. Stormwater management facilities located within or affecting any floodplain shall be subject to the requirements of applicable DEP codes and the Township Code which regulates construction and development within areas which are subject to flooding. See Chapter 255, Zoning, Article XXII, Floodplain Conservation District.

N. A permanent access easement to stormwater management facilities for maintenance purposes shall be granted to the Township for maintenance and operation of the facilities. Accessways shall be cleared and stabilized to a minimum of 20 feet wide, with an all-weather surface suitable for access for maintenance equipment and personnel. Proximity of facilities to public rights-of-way shall be encouraged in order to minimize

the length of accessways. Multiple accessways shall be encouraged for major or regional facilities. The owner of the servient property shall be responsible for maintenance of the easement. A deed restriction to the satisfaction of the Township Solicitor shall be submitted to provide for maintenance, to authorize the Township to take corrective maintenance measures if necessary and to lien the cost of the work against the property should corrective measures not be performed by the homeowner, association or entity owning the property.

O. Additional studies and higher levels of control than the minimum provided in the requirements and criteria of this chapter may be required by the Board of Commissioners to ensure adequate protection of life and property and preservation of water quality.

P. A drainage release or easement, in a form approved by the Township Solicitor, may be required by the Township for discharges to adjoining properties and watercourses.

Q. Landowners shall comply with any future requirements promulgated by the Township in order to conform with any local, county, state or federal watershed management plans adopted in the future.

§ 206-32. Permit requirements by other government entities.

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

A. All earth disturbance activities subject to permit requirements by DEP under regulations at 25 Pa. Code Chapter 102.

B. Work within natural drainageways subject to permit by DEP under 25 Pa. Code Chapter 105.

C. Any stormwater management facility that would be located in or adjacent to surface waters of the commonwealth, including wetlands, subject to permit by DEP under 25 Pa. Code Chapter 105.

D. Any stormwater management facility that would be located on a state highway right-of-way, or that would require access from a state highway, shall be subject to approval by PennDOT.

E. Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area and any facility which may constitute a dam subject to permit by DEP under 25 Pa. Code Chapter 105.

§ 206-33. Erosion and sediment control during regulated activities.

A. No regulated activities within the Township shall commence until the Township approves an erosion and sediment control plan for construction activities and a permit is issued.

B. DEP has regulations that require an erosion and sediment control plan for any earth disturbance activity of 5,000 square feet or more, under 25 Pa. Code § 102.4(b).

C. In addition, under 25 Pa. Code chapter 92, a DEP NPDES construction activities permit is required for regulated earth disturbance activities on sites one acre or greater in area.

D. Evidence of any and all necessary permit(s) for regulated earth disturbance activities from DEP or the County Conservation District must be provided to the Township prior to final approval or commencement of earthmoving activities.

E. A copy of the approved erosion and sediment control plan and narrative, and any required permit, as required by DEP regulations, shall be available at the project site at all times.

§ 206-34. Water quality requirements after regulated activities are complete.

A. No regulated activities within the Township shall commence until the Township approves a plan which demonstrates compliance with state water quality requirements after construction is complete.

B. BMPs must be designed, implemented and maintained to meet state water quality requirements and any other more stringent requirements as published by the Township.

C. To control postconstruction stormwater impacts from regulated activities, state water quality requirements can be met by BMPs, including site design, which provide for replication of preconstruction stormwater infiltration and runoff conditions, so that postconstruction stormwater discharges do not degrade the physical, chemical or biological characteristics of the receiving waters. As described in the DEP Comprehensive Stormwater Management Policy (No. 392-0300-002, September 28, 2002), this shall be achieved by the following:

(1) Infiltration: replication of preconstruction stormwater infiltration quantities.

(2) Treatment: use of water quality treatment BMPs to ensure filtering out of the chemical and physical pollutants from the stormwater runoff.

(3) Streambank and streambed protection: management of volume and rate of postconstruction stormwater discharges to prevent physical degradation of receiving waters (e.g., from scouring).

D. DEP has regulations that require municipalities to ensure design, implementation and maintenance of BMPs that control runoff from new development and redevelopment after regulated earth disturbance activities are complete. These requirements include the need to implement postconstruction stormwater BMPs with assurance of long-term operations and maintenance of those BMPs.

E. Evidence of any necessary permit(s) for earth disturbance activities must be provided to the Township.

F. BMP operations and maintenance requirements are described in Article IV of this chapter.

§ 206-35. Water quality requirement.

A. One of the major objectives of this chapter is to maintain and, if possible, improve existing water quality by preventing discharge of stormwater runoff pollutants. In considering issues such as ease of implementation and cost-effectiveness, the following minimum water quality criteria are established to meet the objective of this chapter.

B. Stormwater detention facilities shall include provisions to detain, for extended periods of time, runoff from the water quality design storm (one-year, twenty-four-hour rainfall event), using methodology appropriate for the drainage area under consideration and approved by the Township Engineer.

C. Release of detained stormwater can begin at the start of the storm (i.e., the stormwater detention facility will not permanently retain a portion of the runoff). The design of the facility shall consider and minimize the chances of clogging and sedimentation potential.

D. When detention basins are used to satisfy the water quality requirement, the invert of the water quality orifice may be placed at the invert of the basin. Because the standard for water quality may result in a fairly small outlet orifice in detention basins, the Township Engineer will determine the minimum standard diameter orifice as part of the stormwater management plan review. In soils nonconducive to infiltration, the addition of an underdrain is required, although this requirement can be waived upon determination by the Township Engineer that conditions warrant such a waiver.

E. All stormwater management facilities must implement the water quality requirement of this section. The water quality objective can be obtained through a variety of approved BMP's or combinations thereof, including retention basins, detention basins and bioretention areas.

F. Below-grade detention facilities may not be used to satisfy the water quality requirement. Examples include below-grade infiltration beds or galleries and below-grade detention chambers. In these instances, approved water quality BMP's which supplement the below-grade stormwater detention facilities shall be installed. Examples include water quality inlets (including oil/water separators), filter strips and sand filters. All such water quality BMP's must be designed to treat runoff derived from the water quality design storm (one-year, twenty-four-hour rainfall event).

G. Unless derived from roofs associated with known or suspected contamination, roof runoff is exempt from the water quality requirement. However, this exemption applies only to roof runoff before it is combined with runoff from other sources.

H. Commercial and industrial properties and establishments must demonstrate compliance with the NPDES (40 CFR, Chapter 1, Part 122), as administered by DEP. Copies of stormwater pollution prevention plans (SWPPP) and monitoring reports shall be provided to the Township.

§ 206-36. Groundwater recharge requirement

A. BMP's shall be provided to retain all runoff generated by the groundwater recharge design storm (seventy-five-hundredths-inch, twenty-four-hour rainfall event) for infiltration.

B. BMP's shall be designed to infiltrate retained runoff within a forty-eight-hour period. Infiltration rates shall be based on field measurements using a method approved by the Township Engineer. Tests shall be conducted at the proposed depth of the bottom of the infiltration device. A factor of safety of 3, or greater. shall be used when computing infiltration potential of a BNP from field measurements of infiltration rate.

C. Compliance by lot owners; exceptions.

(1) Lot owners must comply, individually, with the groundwater recharge requirement. However, groundwater recharge BMP's will not be required on properties where:

(a) Average slopes for the property exceed 10%.

(b) Seasonal high water table is shallower than four feet below final grade.

(c) Soil or bedrock conditions will not permit efficient percolation (nominal infiltration rate of less than 0.2 inches/hour).

(d) Site configuration will require that runoff must be infiltrated within:

[1] One hundred feet of a known or suspected sinkhole.

[2] Fifty feet of a water supply well.

[3] Fifty feet of a perennial stream.

[4] Twenty feet of a basement wall.

[5] Fifty feet of a septic system.

(2) The groundwater recharge objective can be obtained through a variety of approved BMP's or combinations thereof, including bioretention areas, dry wells, french drains, infiltration trenches, porous pavement and some types of sand filters. Community (multilot) groundwater recharge BMP's may be approved by the Township Engineer. However, the total upgradient drainage areas served by any groundwater recharge BMP may not exceed five acres.

D. The storage volume of detention basins or retention basins may not be used to satisfy the required retention volume for groundwater recharge.

E. Potentially contaminated runoff may not be infiltrated without appropriate pretreatment. The Township Engineer will determine whether contaminated runoff can be satisfactorily treated to permit infiltration. Sites which generate contaminated runoff must segregate uncontaminated runoff (e.g., roof runoff). Measures shall be introduced to infiltrate uncontaminated runoff generated by a property during the groundwater recharge design storm (e.g., roof runoff).

F. Above-grade groundwater recharge BMP's which incorporate biofiltration are required for the infiltration of untreated runoff from public, commercial or industrial parking lots. Runoff from private or institutional parking lots may utilize below-grade devices (e.g., infiltration trenches, porous pavement).

G. Direct runoff from public roads is exempt from the groundwater recharge requirement. However, privately owned and maintained roads must comply with this requirement.

H. Procedures used to predict runoff must use standard and accepted calculation methodology and be satisfactory to the Township Engineer.

I. Groundwater recharge BMP's shall be designed to provide storage equal to 100% of the required retention volume.

§ 206-37. Stormwater design standards and criteria.

A. The design and construction requirements for stormwater management and stormwater conveyance systems, described in Article VI of this chapter, are hereby established as indicated in said article.

B. Runoff control measures or BMPs.

(1) Any selected BMP must meet the required water quality and runoff peak rate requirements of this chapter.

(2) Developers shall consider the use of innovative BMP's (e.g., infiltration techniques, wet ponds, riparian buffers, bioretention areas, underground detention, seepage beds, artificial wetlands), if appropriate, to provide for water quality improvement and groundwater recharge. Guidelines for the selection and design of a wide variety of BMP's are available in the Pennsylvania Handbook of Best Management Practices for Developing Areas (Pennsylvania Association of Conservation Districts, 1998) and its successor document or documents when available. Other design guides, approved by the Township, may also be used in preparing stormwater management plans. In selecting the appropriate BMP's or combinations thereof, the following must be considered:

(a) Contributing drainage area served by the BMP.

(b) Hydraulic conductivity of soils and bedrock.

(c) Depth to seasonal high water table and bedrock.

(d) Erodibility of soils.

(e) Land availability and topographic constraints.

(f) Existing natural resources which require conservation or enhancement.

(g) Other factors as may be identified by the Township Engineer, MCCD, DEP, EPA or other state and federal agencies.

(3) Exemptions.

(a) Any regulated activity specified in Article IV which meets the stormwater management plan exemption criteria is exempt from meeting the water quality requirements of § 206-35. This exemption shall apply to the total proposed development even if development is to take place in stages. Exemption shall not relieve the applicant from providing adequate stormwater management to meet the purpose of this chapter. Nevertheless, the following control techniques are encouraged where appropriate:

[1] Small on-site bioretention areas, providing detention storage, with grassed overflow.

[2] Oversized storm sewers with flow constrictions (reduced orifice) at discharge.

[3] Stream channel preservation and protection of vegetation; energy reduction spillways.

[4] Reduction of maintained landscaped areas.

[5] Preservation of existing vegetation, especially native plantings and woodland.

[6] Planting of wetland species along drainage swales and depressions.

[7] Fertilization practices minimized/eliminated.

[8] Site design criteria which prevent significant alteration of existing topography.

[9] Sites that have suitable soils are encouraged to incorporate on-site infiltration methods, such as grassed waterways, shrub filter strips, and french drains and trenches, into the design of the development.

(b) All sites with suitable conditions must comply with the groundwater recharge requirement. The groundwater recharge requirement may be satisfied using a variety of BMP's.

(4) Subregional (combined site) storage.

(a) Traditionally, the approach to stormwater management has been to control the runoff on an individual site basis. However, there is a growing commitment to finding cost-effective comprehensive control techniques which both preserve and protect the natural drainage system. In other words, two developers developing sites adjacent to each other could pool their capital resources to provide for a community stormwater management facility in the most hydrologically advantageous location or locations,

(b) The goal is the development and use of the most cost effective and environmentally sensitive stormwater runoff controls which significantly improve the capability and flexibility of land developers and communities to control runoff.

(c) An advantage to combining efforts is to increase the opportunity to utilize stormwater management facilities to meet other community needs and safety considerations. For example, certain stormwater management facilities could be designed so that recreational facilities, such as ball fields, open space, sand volleyball courts, etc., could be incorporated. Natural or artificial ponds and lakes could serve both recreational and stormwater management objectives.

(d) To take this concept a step further, there is also the possibility that the stormwater could be managed off site; that is, in a location off the property(s) in question. There could be a regional detention, retention, lake, pond or other physical facilities to serve multiple developments. Any such facility shall have a construction, ownership and maintenance program, in a recordable form.

(5) All stormwater management facility designs shall conform to the applicable standards and specifications of the following governmental and institutional agencies:

(a) American Society of Testing and Materials (ASTM).

(b) Asphalt Institute (AI).

(c) Montgomery County Conservation District. (MCCD).

(d) Federal Highway Administration (FHWA).

(e) National Crushed Stone Association (NCSA).

(f) National Sand and Gravel Association (NSGA).

(g) Pennsylvania Department of Environmental Protection (DEP).

(h) Pennsylvania Department of Transportation (PennDOT).

(i) United States Department of Agriculture, Natural Resources Conservation Service, Pennsylvania (USDA, NRCS, PA)

(j) Montgomery County Planning Commission. (MCPC).

(k) Environmental Protection Agency. (EPA).

(l) Federal Emergency Management Agency. (FEMA).

(m) U.S. Army Corps of Engineers (ACOE).

(6) If special geological hazards or soil conditions, such as carbonate derived soils, are identified on the site, the developer's engineer and geologist shall consider the affect of proposed stormwater management measures on these conditions. In such cases, the Township may require an in-depth report by a competent registered professional engineer and/or geologist.

§ 206-38. (Reserved)

§ 206-39. (Reserved)

§ 206-40. (Reserved)

ARTICLE IV
Stormwater Management Plan Requirements

§ 206-41. General requirements for stormwater management plans.

All subdivision or land development plans prepared for any site within the Township in accordance with the Municipalities Planning Code requirements or Township Code requirements shall submit a stormwater management plan for the site in accordance with the requirements found in § 206-43 of this chapter, unless exempt by § 206-42 below.

§ 206-42. Exemptions.

A. The following activities are exempt from submitting a full stormwater management plan in accordance with the requirements of this chapter, but instead shall submit a stormwater management plan in accordance with Subsection B below. This criterion shall apply to the total development even if development is to take place in phases. Exemption shall not relieve the applicant from providing adequate stormwater management to meet the purpose of this chapter.

(1) Land disturbance associated with existing or proposed one- and two-family dwellings is exempt.

(2) Any land disturbance associated with agricultural activities, including growing crops, rotating crops, tilling of soil and grazing animals, and activities operated in accordance with a conservation plan or erosion and sedimentation control plan approved by the Conservation District or the NRCS.

(3) Any land disturbance associated with forest management operations which is following DEP's management practices, including those contained in its publication "Soil Erosion and Sedimentation Control Guidelines for Forestry," and which is operating under an erosion and sedimentation control plan approved by the Conservation District is exempt.

(4) Any land disturbance associated with mining operations approved and operated in accordance with all applicable rules and regulations of the DEP and operating under an erosion and sedimentation control plan approved by the applicable agency is exempt.

(5) Use of land for gardening for home consumption is exempt.

(6) Any land disturbance which would increase the peak runoff by less than 0.5 or 1/2 cubic foot per second (CFS) from the existing conditions in a one-hundred-year storm.

B. An applicant for an exempt activity as listed in § 206-42A above shall do the following:

(1) Select appropriate stormwater management techniques.

(2) Prepare a stormwater management plan showing general features and locations of proposed stormwater management techniques. The design of the proposed stormwater management plan shall be provided by a licensed professional engineer trained and experienced in stormwater management and erosion and sedimentation control. The design, construction, integrity and installation of the control measures are the responsibility of the landowner/developer and the developer's professional.

(3) Submit two copies of the stormwater management plan to the Township Engineer and one copy to the township for review and approval.

C. For exempt activities, the stormwater management plan must be approved by the Township Engineer before issuance of any building or zoning permits.

D. No exemption from the plan requirements shall be provided for regulated activities.

§ 206-43. Stormwater management plan contents.

The stormwater management plan shall be prepared by a licensed professional engineer experienced in stormwater management and erosion and sedimentation control. The following items shall be included in the stormwater management plan:

A. Written report, including the following information:

(1) Narrative description of project.

(2) Narrative description of proposed stormwater management controls and facilities, both during and after development, including construction specifications.

(3) Narrative description of erosion and sedimentation controls, including those contained in any required erosion and sedimentation control plan, including construction specifications and all necessary calculations.

(4) Complete hydrologic, hydraulic and structural computations for all stormwater management facilities accompanied by a narrative description of the computations, including an explanation of all assumptions, estimations and design criteria.

(5) Expected project time schedule, including anticipated start and completion dates.

(6) Written maintenance plan for postconstruction time frame,

B. Maps, including or prepared in accordance with the following:

(1) Drafting standards. The drafting standards, including requirements for scale, dimensions, sheet numbering and plan size, shall be the same standards as those listed in the Township Code, Chapter 212, Subdivision and Land Development.

(2) General information.

(a) Name or identifying title of project and tax parcel number.

(b) Name and address of the record owner, applicant and developer.

(c) Name and address of the individual who prepared the plan.

(d) A location map for the purpose of locating the site, at a scale not less than 800 feet to the inch, showing the relation of the tract to adjoining property and to all streets, roads and municipal boundaries existing within 1,000 feet of any part of the tract.

(e) Plan date and date of latest revision to plan, North point, graphic scale and written scale.

(f) Note on plan indicating any area that is to be offered for dedication.

(g) Certificate, signed and sealed by an individual registered in the Commonwealth of Pennsylvania and qualified to perform such duties, indicating compliance with the stormwater management plan application.

(h) Total acreage of tract.

(i) Existing and proposed impervious area.

(3) Existing features.

(a) Complete outline survey of the property to be subdivided or developed shall be provided showing all courses, distances and area and tie-ins to all adjacent intersections.

(b) The location, names and widths of streets; the location of property lines and names of owners; the location of sanitary sewers, storm drains and similar features within 400 feet of any part of the land to be subdivided or developed; the location of streams, lakes, ponds or other watercourses outside the project area which will be affected by runoff from the project.

(c) The location, size and ownership of all underground and aboveground utilities and services (e.g., wells, on-site sewage disposal systems) and any rights-of-way or easements within the property. Include the PA One-Call serial number.

(d) The location of existing buildings, streets and other significant features within the property; the location and area of all floodplains, riparian corridors, woods, forests, lakes, ponds, watercourses (including drainage swales), wetlands, slopes 10% to 15%, steep slopes 15% to 25%, steep slopes 25% or steeper.

(e) Contours at vertical intervals of two feet. One-foot intervals shall be shown on lands with any slope of 5% or less. Contouring shall be in compliance with the National Map Accuracy Standards.

(f) An overlay showing soil types, boundaries, limitations for proposed uses and a statement as to how the soils data was obtained. Include soil data from Montgomery County Soil Survey.

(g) Watershed boundaries applicable to the site.

(h) All trees eight inches in diameter or larger.

(i) Tree masses.

(j) Boundary monumentation.

(k) Easements and restrictions of record.

(4) Proposed features.

(a) Proposed land use, total number of lots and dwelling units and extent of commercial, industrial or other nonresidential uses.

(b) Locations and dimensions of all proposed streets, sidewalks, lot lines, setbacks, building locations, parking compounds, impervious and semiimpervious surfaces (total area), sanitary sewer facilities, water facilities and areas proposed for public dedication.

(c) Proposed changes to land surface and vegetative cover, including areas to be cut or filled as shown on a plan for surface drainage.

(d) Final contours at vertical intervals of two feet. One-foot intervals shall be shown on lands with any slope of 5% or less.

(e) Plans and profiles of proposed stormwater management facilities, including horizontal and vertical location, size and type of material. This information shall be of the quality required for the construction of all facilities and include all calculations, assumptions and criteria used in the design of the facilities; a schedule for installation of such facilities; and a proposed schedule of inspections which will be performed by the applicant's engineer or designee in company with the Township Engineer.

(f) The locations of septic tank infiltration areas and wells when infiltration methods, such as cisterns, seepage beds or trenches, infiltration basins or porous pavement are used. Also soil percolation tests and submission of the percolation data and test locations to substantiate percolation rates used in the drainage calculations.

(g) Plans and profiles of all erosion and sedimentation control measures, temporary as well as permanent, including all calculations, assumptions and criteria used in designing the controls and a schedule for their implementation.

(h) An encroachment map which illustrates all natural features and a preliminary regrading plan which illustrates all disturbance of the identified natural feature areas; the amount of each natural feature disturbed indicated and illustrated on the encroachment map.

(i) Rights-of-way and/or easements proposed to be created for all drainage purposes, utilities or other reasons.

(j) Construction sequence.

(k) Street and parking lot grades.

(l) Landscaping.

(m) Features to be demolished.

C. Description of an ownership and maintenance program, in a recordable form, that clearly sets forth the ownership and maintenance responsibility for all temporary and permanent stormwater management facilities to the satisfaction of the Township Solicitor, including the following:

(1) Description of the method and extent of the maintenance requirements.

(2) When maintained by a private entity, identification of a responsible individual, corporation, association or other entity for ownership and maintenance. Deed covenants and restrictions must be submitted to provide for maintenance by this entity, and the legally handing document must provide that the Township shall have the right to:

(a) Enter the property and inspect the facilities at any time.

(b) Require the private entity to take corrective measures and assign the private entity reasonable time periods for any necessary action.

(c) Authorize maintenance to be done by the Township and lien the cost of the work against the properties of the private entity responsible for maintenance.

(d) Be provided with a yearly maintenance report by a qualified professional. Two copies to be forwarded to the township and one copy to the Township Engineer.

(3) Where the stormwater management plan proposes that the Township own or maintain the facilities, a description of the methods, procedures and the extent to which any facilities shall be turned over to the Township.

(4) Stormwater management easement area shown and recorded in the Office of the Recorder of Deeds.

D. Financial security for the completion of stormwater management facilities.

E. Maintenance guaranty.

F. When a stormwater management plan is submitted in sections, a generalized stormwater management plan for the entire project site shall be submitted in addition to the detailed stormwater management plan for the proposed section. This generalized plan shall demonstrate how the stormwater of the proposed section will relate to the entire development. If temporary facilities are required for construction of a section, such facilities shall be included in the submitted stormwater management plan.

§ 206-44. Plan submission.

A. For subdivision and land development:

(1) The stormwater management plan shall be submitted by the developer to the Office of Code Enforcement as part of the preliminary plan submission for a subdivision or land development.

(2) Eighteen copies of the stormwater management plan and any reports shall be submitted.

(3) Distribution of the stormwater management plan shall be as follows:

Distribution	Number of Copies
Township	1
Commissioners Planning Committee	7
Township Engineer	2
Township Manager	1
Township Solicitor	1
Code Enforcement Office	1
Planning Advisory Board	1
Environmental Protection Advisory Board	1
Public Works Department	1
Parks and Recreation Department	1
Montgomery County Planning Commission	1

(4) Developer is responsible for submitting plans and reports to Montgomery County Conservation District, Pennsylvania Department of Environmental Protection, Army Corps of Engineers, Montgomery County Planning Commission and other agencies as required for permitting.

B. For new or additional construction of impervious or semi-pervious surfaces, buildings or structures that do not require action by the Board of Commissioners under § 206-44A, six copies of the stormwater management plan shall be submitted by the developer to the Office of Code Enforcement as part of the building permit application. Distribution of the stormwater management plan and any reports shall be as follows:

Distribution	Number of Copies
Code Enforcement Office	1
Public Works Department	1
Township Engineer	2

C. For diversion or piping of stream channel and installation of stormwater systems:

(1) The stormwater management plan shall be submitted by the developer to the Office of Code Enforcement, the Montgomery County Planning Commission and the Montgomery County Conservation District for coordination with the DEP permit application process under chapter 105 (Dam Safety and Waterway management) or chapter 106 (Flood Plain Management) of DEP's rules and regulations.

(2) Six copies of the stormwater management plan shall be submitted to the Office of Code Enforcement for distribution as follows:

Distribution	Number of Copies
Code Enforcement Office	1
Public Works Department	1
Township Engineer	2

D. The stormwater management plan shall be accompanied by the permit application and requisite permit fee, in accordance with the fee schedule adopted by the Board of Commissioners and found in chapter 110, Fees, of the Township Code.

§ 206-45. Plan review and approval.

A. Following receipt of the Township Engineer's review of the stormwater management plan, the Board of Commissioners shall review and approve or disapprove a stormwater management plan submitted pursuant to § 206-44A.

B. The Township Engineer shall review and approve or disapprove a stormwater management plan submitted pursuant to § 206-44B and C.

C. The Township Engineer shall review all stormwater management plans for consistency with this chapter and any additional stormwater management provisions contained in the Township Code, as applicable, as well as accepted engineering practices.

D. No stormwater management plan for a regulated activity shall be approved if the stormwater management plan has been found to be inconsistent with this chapter as determined by the Township Engineer.

E. The developer shall be responsible for completing a certified as-built survey prepared by a professional land surveyor of all stormwater management facilities included in the approved stormwater management plan. Criteria for the as-built plan will be provided at the preconstruction meeting. The certified as-built survey and explanation of any

discrepancies with the design plans shall be submitted to the Township Engineer for review and approval. In no case shall the Township Engineer approve the as-built survey until the Township Engineer receives a copy of an approved declaration of adequacy, highway occupancy permit from PennDOT and any applicable permits from DEP.

F. Modification of plans.

(1) A modification to a submitted stormwater management plan for a proposed development site which involves a change in control methods or techniques or which involves the relocation or redesign of control measures or which is necessary because soil or other conditions are not as stated on the stormwater management plan as determined by the Township Engineer shall require the resubmission of a modified stormwater management plan consistent with § 206-43 and subject to review per this chapter.

(2) Minor design changes may be permitted as authorized by the Board of Commissioners and as recommended by the Township Engineer without resubmission consistent with the requirements of this chapter.

(3) A modification to an approved stormwater management plan shall require a new stormwater management permit. The permit shall be issued following approval of the revised plan.

G. Resubmission of disapproved stormwater management plan. A disapproved stormwater management plan may be resubmitted, with the revisions addressing the Township Engineer's concerns documented in writing, to the Township Engineer in accordance with the plan submittal requirements of this chapter and subject to the plan review requirements of this chapter. The applicable Township Engineer's review security must accompany a resubmission of a disapproved stormwater management plan.

§ 206-46. Permit requirements and procedures.

A. A regulated activity as defined in this chapter shall not be initiated nor any disturbance, clearing or cutting of trees until a Township stormwater management permit has been issued, regardless of the receipt of permits of other regulatory agencies.

B. Application requirements.

(1) The landowner shall obtain the required stormwater management permit for regulated activities related to land development and subdivision after obtaining the required subdivision or land development plan approval and stormwater management plan approval as specified in Article IV of this chapter. The stormwater management permit will be issued by the Township Engineer.

(2) The landowner shall obtain the required stormwater management permit for regulated activities specified in § 206-5B(3) and (4) after obtaining the required building permit approval and stormwater management plan approval as specified in Article IV of this chapter. The stormwater management permit will be issued by the Township Engineer concurrently with the issuance of the building permit.

(3) The landowner shall obtain the required stormwater management permit for regulated activities specified in § 206-5B(5) and (6) from the Office of Code Enforcement after obtaining any necessary county, state and/or federal permits, copies of which shall be provided to the Office of Code Enforcement.

C. Application for permit.

(1) Applications for stormwater management permits required by this chapter shall be made by the landowner on forms supplied by the Township Engineer. Such applications shall provide a brief description of the stormwater management controls and regulated activities. This application shall become part of the stormwater management plan submission required by Article IV of this chapter.

(2) Any incomplete application submission shall be rejected by the Township Engineer without any further processing or review.

D. Modification of plans. A modification to an approved stormwater management plan shall require a new stormwater management permit. The permit shall be issued following approval of the revised plan.

E. Expiration and renewal.

(1) All stormwater management permits shall expire 24 months from the date of issuance unless construction is commenced prior to this date, an extension of time is approved or if more than 12 months is required for completion of site work, as incorporated into the construction escrow documentation.

(2) All extension requests must be submitted in writing to the Township Engineer at least 60 days prior to permit expiration.

(3) A stormwater management permit shall not expire while a request for an extension is pending.

(4) An extension of an expired stormwater management permit may be issued by the Board of Commissioners following the submission of a written request if, in the opinion of the Township Engineer, the subject property or affected surrounding area has not been altered in a manner which requires alteration to the stormwater management plan.

(5) A renewal of an expired stormwater management permit may be issued by the Board of Commissioners following a resubmittal of the permit application form and review by the Township Engineer to determine if any changes have occurred in project site conditions or stormwater management plan requirements since the original permit was issued. If such changes have occurred, the Board of Commissioners may require the applicant to resubmit the stormwater management plan for a new review pursuant to Article IV of this chapter.

(6) The refusal of the Board of Commissioners to reissue an expired stormwater management permit shall be in writing and contain the reasons for such refusal.

F. Suspension and revocation.

(1) Any stormwater management permit issued under this chapter may be suspended or revoked by the Board of Commissioners or Township Engineer for:

(a) Noncompliance with or failure to implement any provision of the permit.

(b) A violation of any provision of this chapter or any other applicable law, ordinance, rule or regulation relating to the project.

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

(2) Suspension of a stormwater management permit requires owner/contractor to stabilize all disturbed areas, restore all erosion and sedimentation controls, stop all site activity and perform all needed maintenance operations to the satisfaction of the Township Engineer.

(3) A suspended stormwater management permit shall be reinstated by the Township Engineer when:

(a) The Township Engineer has inspected and approved the corrections to the stormwater management control measures(s) or the elimination of the hazard or nuisance; and/or

(b) The Township Engineer is satisfied that the violation of the ordinance, law or rule and regulation has been corrected.

(4) A stormwater management permit which has been revoked by the Township cannot be reinstated. The applicant may apply for a new permit under the procedures outlined in this chapter.

(5) All construction activities must cease when a stormwater management permit has been suspended or revoked.

§ 206-47. (Reserved)

§ 206-48. (Reserved)

§ 206-49. (Reserved)

§ 206-50. (Reserved)

ARTICLE V
Stormwater Management Operations and Maintenance Plan Requirements

§ 206-51. General requirements.

A. No regulated activities within the Township shall commence until the Township Engineer approves a stormwater management operations and maintenance plan which describes how the permanent (e.g., postconstruction) stormwater management facilities will be properly operated and maintained.

B. The following items shall be included in the stormwater management operations and maintenance plan:

(1) Plan(s) of the project area, in a form that can be recorded at the Offices of the Recorder of Deeds of Montgomery County, submitted on twenty-four-inch-by-thirty-six-inch sheets. The contents of the maps(s) shall include, but not be limited to:

(a) Clear identification of the location and nature of all permanent stormwater management facilities.

(b) The location of the project site relative to watercourses, roads, municipal boundaries or other identifiable landmarks.

(c) Existing and final contours at intervals of two feet, or others as appropriate.

(d) Existing wetlands, floodplains, streams, lakes, ponds or other watercourses within the project site area.

(e) Other physical features, including flood hazard boundaries, sinkholes, existing drainage courses and areas of natural vegetation to be preserved.

(f) The locations of all existing utilities, sanitary sewers, and water lines within 100 feet of property lines of the project site.

(g) Proposed final changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added, and the type, amount and depth of fill material to be placed.

(h) Proposed structures, roads, paved areas and buildings.

(i) A twenty-foot wide access easement to all stormwater management facilities for ingress to and egress from a public right-of-way.

(2) A description of how each permanent stormwater facility will be operated and maintained and the identity of the person(s) responsible for operations and maintenance,

(3) The name of the project site, the name and address of the owner of the property and the name of the individual or firm preparing the plan.

(4) A statement, signed by the landowner, acknowledging that the stormwater management facilities are fixtures that can be altered or removed only after approval by the Township.

(5) Legal document to be recorded that subjects the alteration or removal of stormwater management facilities to the approval of the Township.

§ 206-52. Responsibilities for stormwater management operations and maintenance.

A. The stormwater management operations and maintenance plan for the project site shall establish landowner responsibilities for the continuing operation and maintenance of all permanent stormwater management facilities as follows:

(1) If a plan includes structures or lots which are to be separately owned and in which streets, sewers and other public improvements are to be dedicated to the Township, stormwater management facilities may also, at the option of the township, be dedicated to and maintained by the Township.

(2) If a plan includes operations and maintenance by a single ownership, or if sewers and other public improvements are to be privately owned and maintained, then the operation and maintenance of stormwater management facilities shall be the responsibility of the owner or private management entity.

B. The Township shall make the final determination on the continuing operations and maintenance responsibilities. The Township reserves the right to accept or reject the operations and maintenance responsibility for any or all stormwater management facilities.

§ 206-53. Review of stormwater management operations and maintenance plan.

A. The Township Engineer and Solicitor shall review the Stormwater Management Operations and Maintenance Plan for consistency with the purposes and requirements of this chapter and any permits issued by DEP.

B. The Township Engineer shall notify the applicant in writing whether the stormwater management operations and maintenance plan is approved.

C. The Township will require an as-built survey of all stormwater management facilities and an explanation of any discrepancies with the Operations and Maintenance Plan.

D. Stormwater management plans shall be reviewed every three years after initial issuance of plan approval.

§ 206-54. Adherence to stormwater management operations and maintenance plan.

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

Board of Commissioners. Failure to maintain SWM structures will result in no future U & Oof any kind to be issued by the Zoning Officer until all maintenance items have been completed.

§ 206-55. Operations and maintenance agreement for privately owned stormwater management facilities.

A. The property owner shall sign an operations and maintenance agreement with the Township covering all stormwater management facilities that are to be privately owned. The Township Solicitor shall determine the form of the agreement.

B. Other items may be included in the agreement where determined necessary to guarantee the satisfactory operation and maintenance of all permanent stormwater management facilities. The agreement shall be subject to the review and approval of the Township Engineer and Township Solicitor.

§ 206-56. Stormwater management easements.

A. Stormwater management easements are required for all areas used for off-site stormwater discharge and management unless a waiver is granted by the Township Engineer.

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

§ 206-57. Recording of approved stormwater management operations and maintenance plan and related agreements.

A. When permanent stormwater management facilities are placed, constructed or implemented, as described in the stormwater management operations and maintenance plan, the Township shall record the following documents in the Office of the Recorder of Deeds for Montgomery County within 15 days of approval of the stormwater management operations plan by the Township:

(1) The operations and maintenance plan, or a summary thereof. If a summary is recorded, the summary document shall identify a location where the complete plan may be viewed.

(2) Operations and maintenance agreements under § 206-55.

(3) Easements under § 206-56.

(4) Declaration of covenants and restrictions or other similar documents under § 206-51.

(5) Deeds of dedication or other similar documents under § 206-52.

B. The Township may suspend or revoke any approvals granted for the project site upon discovery of the failure of the owner to comply with this section.

§ 206-58. Township Stormwater Management Operation and Maintenance Fund.

A. If stormwater management facilities are accepted by the Township for dedication, the Township may require persons installing stormwater management facilities to pay a specified amount to the Township Stormwater Management Operation and Maintenance Fund to help defray costs of operations and maintenance activities. The amount may be determined as follows:

(1) If the stormwater management facility is to be owned and maintained by the Township, the amount shall cover the estimated annual costs for operations and maintenance for 10 years, as determined by the Township.

(2) The estimated annual costs shall be converted to present value to determine the payment.

B. If a stormwater management facility also serves as a recreation facility (e.g., ball field), the Township may adjust the amount due accordingly.

§ 206-59. (Reserved)

§ 206-60. (Reserved)

ARTICLE VI
Inspections and Right of Entry

§ 206-61. Inspections.

A. DEP or its designee (e.g., Montgomery County Conservation District), as well as the Township, monitors compliance with any permits issued, including those for stormwater management. In addition to DEP compliance programs, the Township will inspect all phases of the construction, operations, maintenance and any other implementation of stormwater management facilities.

B. During any stage of regulated activities, if the Township determines that any stormwater management facilities are not being installed, operated or maintained in accordance with this chapter, the Township may suspend or revoke any existing permits or other approvals until the deficiencies are corrected.

§ 206-62. Right of entry.

A. Upon presentation of proper credentials, duly authorized representatives of the Township may enter at reasonable times upon any property within the Township to inspect the

implementation, condition or operation and maintenance of the stormwater management facilities in regard to any aspect governed by this chapter.

B. Stormwater management facility 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 chapter.

C. Persons working on behalf of the Township shall have the right to temporarily locate on any stormwater management facility in the Township such devices as are necessary to conduct monitoring and/or sampling of the discharges from such stormwater management facility.

D. Unreasonable delays in allowing the Township access to a stormwater management facility is a violation of this chapter.

§ 206-63. Schedule of inspections.

A. Prior to approval of the stormwater management plan, the owner, applicant or the developer must coordinate a schedule of inspections, including a final inspection schedule, with the Township Engineer. These inspection provisions pertain only to construction activities regulated by the plan preparation provisions of Article IV. Any activities granted exemption from plan preparation provisions are not exempt from the inspection provisions and must nonetheless manage stormwater in a manner specified in the other provisions of this chapter.

B. Required inspections,

(1) The Township Engineer shall inspect all phases of development of the site, including, but not limited to:

(a) Completion of preliminary site preparation, which includes clearing and grubbing, stockpiling of topsoil and construction of temporary stormwater management and erosion control facilities.

(b) Completion of rough grading, but prior to placing topsoil, permanent drainage or other site development improvements and ground covers.

(c) Construction of the permanent stormwater management facilities at such times as specified by the Township Engineer.

(d) Completion of permanent stormwater management facilities, including established ground covers and plantings.

(e) Completion of any final grading, vegetative control measures or other site restoration work done in accordance with the approved stormwater management plan and permit.

(2) There shall be pre-topsoil and a post-topsoil volume checks with surface basins.

C. No work shall begin on a subsequent stage until the preceding stage has been inspected and approved by the Township Engineer.

D. It is the responsibility of the landowner to notify the Township Engineer at least 48 hours in advance of the completion of each identified phase of development.

E. Any portion of the work that does not comply with the approved stormwater management plan must be corrected by the landowner within 15 days of notice. No work may proceed on any subsequent phase of the stormwater management plan, the subdivision or land development or building construction until the required corrections have been made.

F. If, at any stage of the work, the Township Engineer determines that the soil or other conditions are not as stated or shown in the approved application, the same may refuse to approve further work, and the Township may revoke existing permits until a modified stormwater management plan is submitted and approved, as required by of this chapter. If the modified stormwater management plan cannot remedy the situation, then the Township reserves the right to cancel its approval and halt all work except for that work required to eliminate the activity and return the site to pre-activity conditions as much as is reasonably possible.

G. If the Township Engineer discovers that the facilities or measures installed may be in violation of chapter 102 (Erosion Control) of the Clean Streams Law, the Township Engineer will refer these violations to the Montgomery County Conservation District.

H. When the landowner has completed his inspection of all the required facilities, he shall notify the Township, in writing, by certified or registered mail, and shall send a copy of such notice to the Township Engineer. Within 15 days after receipt of such notice, the Township Engineer shall inspect the required facilities. Following this final inspection, the Township Engineer shall promptly file a report, in writing, with the Township and shall deliver a copy of the report to the developer by actual delivery, certified mail, registered mail or first class mall. The report shall be made and delivered within five days after final inspection by the Township Engineer.

I. Following final inspection, the landowners shall submit reproducible drawings bearing the seal and certification of a Pennsylvania registered professional surveyor indicating the as-built improvements called for in the approved plan.

§ 206-64. (Reserved)

§ 206-65. (Reserved)

§ 206-66. (Reserved)

§ 206-67. (Reserved)

§ 206-68. (Reserved)

§ 206-69. (Reserved)

§ 206-70. (Reserved)

ARTICLE VII
Fees and Expenses

§ 206-71. General.

The Township may charge a reasonable fee for review of a stormwater management plan and stormwater management operations and maintenance plan to defray review costs incurred by the Township. The applicant shall pay all such fees.

§ 206-72. Expenses covered by fees.

The fees required by this chapter may cover:

A. Administrative/clerical costs.

B. The review of the stormwater management plan and the stormwater management operations and maintenance plan by the Township Engineer.

C. Site inspections, including, but not limited to, pre-construction meetings, inspections during construction of stormwater management facilities and final inspection upon completion of the stormwater management facilities.

D. Any additional work required to monitor and enforce any provisions of this chapter, correct violations and assure proper completion of stipulated remedial actions.

E. Video or photographic recording of conditions at preconstruction, during construction and after construction.

§ 206-73. Financial and maintenance guaranties.

A. Performance guaranties. Financial security shall be provided by the landowner as a performance guaranty for stormwater management facilities in accordance with improvement guaranty provisions outlined in § 509 of the Municipalities Planning Code or any amendment thereto.

B. Maintenance responsibility and guaranties.

(1) The maintenance responsibilities for permanent stormwater management facilities shall be determined based upon the type of ownership of the property that is occupied by the facilities.

(a) Single entity ownership. Where the permanent stormwater management facilities designed to manage runoff from property in a single entity ownership, the maintenance responsibility for the stormwater management facilities shall be with the single entity owner. The stated responsibilities of the entity related to owning and maintaining the facilities shall be submitted with the stormwater management operations and maintenance plan for determination of their adequacy. Approval of the stormwater management plan shall depend upon the approval of these terms. These terms shall be in writing, shall be in recordable form and shall, in addition to any other terms deemed necessary by the Board of Commissioners, contain a provision permitting inspection at any reasonable time by the Township Engineer or other Township officials of all such facilities deemed critical to the public welfare consistent with current Township practices.

(b) Municipal ownership. Where the Board of Commissioners has accepted an offer of dedication of the permanent stormwater management facilities, the Township shall be responsible for maintenance. Upon approval of the stormwater management facilities by the Board of Commissioners, the developer shall provide a financial security, in a form approved by the Township Solicitor for maintenance guaranties, as follows:

[1] Construction maintenance bond. The Board of Commissioners may require the posting of a maintenance bond to secure the structural integrity and functioning of said facilities, in accordance with the design and specifications as depicted on the approved stormwater management plan for a term not to exceed 18 months from the date of acceptance of dedication. Said financial security shall be the same type as required in accordance with the improvement guaranty provisions in the Municipalities Planning Code or any amendment thereto, and the amount of the financial security shall not exceed 10% of the actual cost of installation of said facilities. A cash contribution can be used as the financial security in lieu of a maintenance bond, although the contribution must be equivalent to the amount that would be estimated for the maintenance bond.

[2] Operation and Maintenance Fund. Long-term maintenance shall be secured through a payment to the Township stormwater management operation and maintenance fund in an amount equal to the present worth of maintenance of the facilities for a ten-year period. This amount shall be determined by the Township Engineer.

[3] Documentation.

[a] The terms of the maintenance guaranties shall be documented as part of the stormwater management plan.

[b] For certain types of facilities, the Board of Commissioners may benefit by transferring the maintenance responsibility to an individual or group of individuals residing within the controlled

area. These individuals may have the permanent stormwater management facilities adjacent to their lots or otherwise have an interest in the proper maintenance of the facilities. In these instances, the Board of Commissioners and the individual(s) may enter into a formal agreement for the maintenance of the facilities whereby the Township shall maintain ownership of the facilities and be responsible for periodic inspections.

[c] Individual lot ownership. Where any stormwater management facility is located on an individual lot, and maintenance thereof is the responsibility of that landowner, a description of the facility or systems and the terms of the required maintenance shall be noted on the record plan and incorporated as a part of the deed to the property. The deed shall be recorded with the Montgomery County Office for the Recording of Deeds within 90 days following the Board of Commissioners approval. In addition, the Board of Commissioners may require as a condition of approval that a deed conveying any interest in such lot contain language indicating that the conveyance is subject to an express covenant by the grantee that the grantee will maintain the stormwater management facility.

[d] Multientity ownership. In cases where property is in multiple ownership (i.e., many individual interests in various portions of the property on which stormwater facilities are located), the developer(s) shall enter into an agreement with the Township to determine the maintenance of the permanent stormwater facilities. If maintenance is prescribed for each individual lot owner, the requirements above for single-entity ownership shall apply.

(2) The failure of any person, individual lot owner or private entity to properly maintain any stormwater management facility shall be construed to be a violation of this chapter and is declared to be a public nuisance, subject to penalties as set forth in this chapter.

C. Liability insurance. If, in the opinion of the Board of Commissioners based upon a recommendation from the Township Engineer, the nature of the work is such that it may create a hazard to human life or endanger adjoining property or streets, the Board of Commissioners shall, before issuing the stormwater management permit, require that the applicant file a certificate of insurance showing that there exists insurance against claims for damages for personal injury, bodily injury and property damage, including damage to the Township by surface water flow which has been altered on the site. The liability insurance shall be to the amount prescribed by the Board of Commissioners in accordance with the nature of risks involved and include the Township of Upper Dublin as an additional insured. Such insurance shall be written by a company licensed to do business in the commonwealth. Neither issuance of the stormwater management permit nor compliance with the provisions hereto or any conditions imposed by the Township shall relieve any person from any responsibility for damage otherwise imposed by law nor impose any liability upon the Township or its officers and employees for damages to persons or property.

§ 206-74. (Reserved)

§ 206-75. (Reserved)

§ 206-76. (Reserved)

§ 206-77. (Reserved)

§ 206-78. (Reserved)

§ 206-79. (Reserved)

§ 206-80. (Reserved)

ARTICLE VIII
Prohibitions

§ 206-81. Prohibited discharges.

A. No person in the Township shall allow, or cause to allow, discharges into the Township's MS4 that are not composed entirely of stormwater except as provided in Subsection B below and discharges allowed under a state or federal permit.

B. Permissible discharges which the Township finds do not significantly contribute to pollution to surface waters of the commonwealth, are:

(1) Discharges from fire-fighting activities.

(2) Potable water sources, including dechlorinated water line and fire hydrant flushings.

(3) Irrigation drainage.

(4) Routine external building washdown (that does not use detergents or other compounds).

(5) Air-conditioning condensate.

(6) Water from individual residential car, boat or other vehicle washing (that does not use detergents or other compounds.

(7) Springs.

(8) Water from crawl space pumps.

(9) Uncontaminated water from foundation or from footing drains.

(10) Flows from riparian habitats and wetlands.

(11) Lawn watering.

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

(13) Dechlorinated swimming pool discharges.

(14) Uncontaminated groundwater.

C. In the event that the Township determines that any of the discharges identified in Subsection B significantly contribute to pollution of waters of the commonwealth, or is so notified by DEP, the Township will notify the responsible person to cease the discharge.

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

E. Nothing in this section shall affect a discharger's responsibilities under federal or state law.

F. Permitee must notify Township at least 7 days prior to any discharges. Township reserves the right to sample any discharges.

§ 206-82. Prohibited connections.

The following connections are prohibited except as provided in § 206-SUB. above:

A. Any drain or conveyance, whether on the surface or subsurface, which allows any nonstormwater discharge, including sewage, process wastewater and wash water, to enter the MS4, and any connections to the storm drain system from indoor drains, washers, slop tubs and sinks.

(1) Any drain or conveyance connected from a nonresidential land use to the municipal separate storm sewer system which has not been documented in plans, maps or equivalent records and approved by the Township.

§ 206-83. Roof drains, sumps, french drains and underground drains.

A. Roof drains, sumps, french drains and underground drains shall not directly discharge to watercourses or be connected to streets, sanitary or storm sewers or roadside ditches except as provided in § 206-83B.

B. Connections of roof drains, sumps, french drains and underground drains to streets or roadside ditches may be permitted by the Township if the Township finds the connection does not significantly contribute to pollution to surface waters of the commonwealth.

C. Roof drains, sumps, french drains and underground drains shall discharge to infiltration areas or vegetative BMPs to the maximum extent practicable.

§ 206-84. Alteration of stormwater management facilities.

A. No person shall modify, remove, fill, landscape or alter any existing stormwater management facility or easement, unless it is part of an approved maintenance program, without the written approval of the Township Engineer.

B. No person shall place any structure, fill, landscaping or vegetation into a stormwater management facility or within a drainage easement which would interfere with the access and maintenance or limit or alter the functioning of the facility without the written approval of the Township Engineer.

C. Landowners shall properly maintain existing stormwater management facilities located on their property.

§ 206-85. (Reserved)

§ 206-86. (Reserved)

§ 206-87. (Reserved)

§ 206-88. (Reserved)

§ 206-89. (Reserved)

§ 206-90. (Reserved)

ARTICLE IX
Enforcement and Penalties

§ 206-91. Public nuisance.

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

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

§ 206-92. Notification of failure to comply.

In the event that an owner, subdivider, developer or his agent fails to comply with the requirements of this chapter or fails to conform to the requirements of any permit issued hereunder, the Township shall provide written notification of violation. Such notification shall

set forth the nature of the violation(s) and establish a time limit for correction of the violation(s). Upon failure to comply within the time specified, the owner, subdivider, developer or his agent shall be subject to the penalty provisions of this chapter or other penalty provisions where applicable.

§ 206-93. Enforcement generally

A. Whenever the Township finds that a person has violated a prohibition or failed to meet a requirement of this chapter. the Township may order compliance by written notice to the responsible person. Such notice may require without limitation:

(1) The performance of monitoring, analyses and reporting.

(2) The elimination of prohibited connections or discharges.

(3) Cessation of any violating discharges, practices or operations.

(4) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property.

(5) Payment of a fine to cover administrative and remediation costs.

(6) The implementation of stormwater management measures.

(7) Operation and maintenance of stormwater management facilities.

B. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violations(s). Said notice may further advise that, if applicable, should the violator fail to take the required action within the established deadline, the work will be done by the Township and the expense thereof shall be charged to the violator.

C. Failure to comply within the time specified shall also subject such person to the penalty provisions of this chapter. All such penalties shall be deemed cumulative and shall not prevent the Township from pursuing any and all other remedies available in law or equity.

§ 206-94. Suspension and revocation of permits and approvals.

A. Any building, land development, grading or other permit or approval issued by the Township may be suspended or revoked by the Township for:

(1) Noncompliance with or failure to implement any provision of the permit;

(2) A violation of any provision of this chapter; or

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

B. A suspended permit or approval shall be reinstated by the Township when:

(1) The Township Engineer or designee has inspected and approved the corrections to the stormwater management facilities, or the elimination of the hazard or nuisance; and/or

(2) The Township is satisfied that the violation of the chapter, law or rule and regulation has been corrected.

C. A permit or approval which has been revoked by the Township cannot be reinstated. The applicant may apply for a new permit under the procedures outlined in this chapter.

§ 206-95. Violations and penalties.

A. Any person violating the provisions of this chapter or who fails to comply with any written notice from the Township that describes a condition of noncompliance shall, upon being found liable therefor in a civil enforcement proceeding commenced by the Township, pay a judgment of not more than $600 for each violation, plus all court costs, including reasonable attorney fees incurred by the Township as a result thereof.

B. If the defendant neither pays nor appeals the judgment in a timely manner, the Board of Commissioners may enforce the judgment pursuant to the applicable rules of civil procedure.

C. Each day that a violation continues shall constitute a separate violation, unless the District Justice determining that there has been a violation further determines that there was a good faith basis for the person, partnership or corporation violating this chapter to have believed that there was no such violation, in which event there shall be deemed to have been only one such violation until the fifth day following the date of the determination of a violation by the District Justice, and thereafter each day that a violation continues shall constitute a separate violation.

D. No judgment shall commence or be imposed, levied or payable until the date of the determination of a violation by the District Justice.

E. The Township, though the Township Solicitor, may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this chapter. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

F. All judgments, costs and reasonable attorney fees collected for the violation of this chapter shall be paid over to the Board of Commissioners.

G. The Montgomery County Court of Common Pleas, upon petition, may grant an order of stay, upon cause shown, tolling the per diem fine pending a final adjudication of the violation and judgment.

H. Nothing contained in this section shall be construed or interpreted to grant to any person or entity other than the township the right to commence any action for enforcement pursuant to this section.

§ 206-96. Appeals.

Any person aggrieved by any action of the Township or its designee, relevant to the provisions of this chapter, may appeal to the relevant judicial or administrative body within the time period allowed.

§ 206-97. (Reserved)

§ 206-98. (Reserved)

§ 206-99. (Reserved)

§ 206-100. (Reserved)

ARTICLE X
Design Schedules

§ 206-101. Schedule I: General Performance Standards.

All erosion and sedimentation controls are to be in place prior to the start of construction. Measures used to collect and convey stormwater on any site shall be designed to meet the following minimum performance standards:

A. Prevent erosion damage and satisfactorily convey and control the rate and volume of discharge of stormwater to waters of the commonwealth.

B. When soil conditions are suitable, require runoff control measures to infiltrate the stormwater into the ground to aid in the recharge of groundwaters and the preservation of baseflow.

C. Control/accommodate not only the anticipated peak discharge from the on-site disturbed area, but also the existing runoff being contributed from all land at a higher elevation in the same watershed.

D. Maintain the adequacy of the natural stream channels. Accelerated bank erosion shall be prevented by controlling the rate and velocity of runoff discharged to these watercourses so as to avoid increasing the occurrence of streambank overflow.

E. Preserve the adequacy of existing culverts and bridges by suppressing the new flood peaks created by the new earth disturbances and new increased imperiousness.

F. If, in the course of preparing or reviewing the stormwater management plan, the Township Engineer determines that off-site improvements are necessary to satisfactorily control the stormwater from the site, the applicant shall be responsible for such off-site improvements.

G. All stormwater detention and retention facilities shall be in place and functioning prior to the creation of any impervious surface.

H. Whenever a watercourse, stream or intermittent stream is located within a grading site, it shall remain open in its natural state and location and shall not be piped unless permitted by DEW and the Township Board of Commissioners. See Upper Dublin chapter 240 for activity in and near a watercourse,

I. The existing points of natural drainage discharge from and onto adjacent properties shall not be altered without the written approval of and a drainage easement from the affected upstream and downstream landowners.

J. No stormwater runoff or natural drainage shall be so diverted as to overload existing drainage systems or create flooding or the need for additional drainage structures on other private properties or public lands.

§ 206-102. Schedule II: Detention Facility Design.

A. Stormwater detention facilities. Stormwater detention facilities include all structural measures which can reliably and predictably achieve the peak discharge requirements of this chapter. Stormwater detention facilities include, but are not necessarily limited to, detention basins, retention basins, bioretention areas, open (at-grade) sand filters, closed (below-grade) sand filters, water quality inlets, dry wells, below-grade detention chambers and rooftop detention.

B. Peak discharge design storms. The design storm criteria to be used in calculations for the watershed is to limit the post-development runoff for the one-, two-, ten-, fifty- and one-hundred-year storms to the corresponding predevelopment rates. Any stormwater detention facilities required by this chapter and subject to the water quality requirements and stormwater runoff peak rate requirements herein shall meet the applicable water quality and peak rate requirement for the one-, two-, ten-, fifty- and one-hundred-year return period runoff events (design storms) consistent with the standard and accepted calculation methodology and engineering standards and be satisfactory to the Township Engineer.

C. Runoff calculation methodology.

(1) Any stormwater runoff calculation involving drainage areas greater than 20 acres, including on- and off-site areas, shall use a generally accepted calculation technique that is based on the NRCS soil cover complex method. It is assumed that all methods will be selected by the design professional based on the individual limitations and suitability of each method for a particular site.

(2) All calculations consistent with this chapter using the soil cover complex method shall use the appropriate design rainfall depths for the various return periods cited.

(3) For purposes of predevelopment flow rate determination, undeveloped land shall be considered as meadow, in good condition, unless the natural ground cover generates a lower curve number or Rational C value. Landowner is to use the lower runoff coefficient value.

(4) All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration for overland flow and return periods from NCRS Methodology. Time of concentration for sheet flow (maximum 150 feet) and concentrated flow shall both be calculated using NRCS methodology. Times of concentration for channel and pipe flow shall be computed using Manning's Equation or NCRS Methodology.

(5) The design of any stormwater detention facilities intended to meet the performance standards of this chapter shall be verified by routing the design storm hydrograph through these facilities using accepted methods of practice. The Township Engineer may approve the use of any generally accepted reservoir routing technique which shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph. The computer routing program used must take into account the tailwater effect of the discharge pipe on the outlet design as well as the submergence of the discharge pipe outlet.

(6) Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this chapter using any generally accepted hydraulic analysis technique or method approved by the Township Engineer.

D. Stormwater detention and retention facilities, Stormwater detention and retention facilities shall meet the following minimum design/construction standards:

(1) Detention basins shall be designed to allow regular maintenance, mowing and periodic silt removal and reseeding. Shallow broad basins are preferred to steep sided basins.

(2) The maximum slope of the basin embankment shall be 3 to 1. Whenever possible, the side slope and basin shape shall conform to the natural topography.

(3) Unless approved as a conditional use, detention basins shall not be located within riparian corridors, floodplains nor within areas of floodplain or alluvial soils.

(4) Detention basins shall be designed so they return to normal conditions within approximately 24 hours after termination of the storm, unless the Township Engineer finds that downstream conditions may warrant other design criteria for stormwater release.

(5) If retention basins are used, the applicant shall demonstrate that such ponds are designed to protect public health, safety and welfare.

(6) Fences may be required for any detention or retention basins where there is a permanent water surface or conditions warrant.

(7) The minimum top width of a basin berm shall be 10 feet. A cut-off trench (keyway) of relative impervious material shall be provided beneath all embankments requiring fill material. The keyway shall be a minimum 8 feet wide, minimum three feet deep and have 1 to 1 side slopes.

(8) Unless designed to be a naturalized basin, in order to ensure proper drainage on a basin bottom, a minimum grade of 2% shall be maintained for sheet flow. If

deemed necessary by the Township Engineer, an underdrain shall be placed in the basin floor to help dry the basin.

(9) All basin embankments shall be placed in eight-inch maximum lifts to a minimum dry density of 95%. Prior to proceeding to the next lift, compaction shall be checked by the Township Engineer or an approved soils engineer who shall provide the Township Engineer with a written report. Compaction tests shall be performed using the modified proctor method in accordance with ASTM D-1557. Compaction tests shall be run on the leading and trailing edge as well as the top of the berm.

(10) Emergency overflow facilities shall be provided for facilities to accommodate runoff in excess of design flows. Emergency spillways for basins shall be constructed on undisturbed ground. If the emergency spillway is constructed on filled ground, the emergency spillways shall be constructed of concrete payers, gabions or other similar materials approved by the Township Engineer. All emergency spillways shall be constructed so that the detention basin berm is protected against downstream embankment erosion if the basin berm is overtopped. The minimum capacity of the emergency spillways shall be the peak flow rate of the one-hundred-year design storm after development. The construction material of the emergency spillway shall extend along the upstream and downstream berm embankment slopes. The upstream edge of the emergency spillway shall be a minimum of three feet below the spillway crest elevation. The downstream slope of the spillway shall, as a minimum, extend to the toe of the berm embankment. The emergency spillway shall not discharge over earthen fill or easily erodible material.

(11) The minimum freeboard shall be one foot as measured from the top of the post-development one-hundred-year flood elevation over the spillway and the top of the berm.

(12) Antiseep collars shall be installed around the pipe barrel within the normal saturation zone of the detention basin berms. The antiseep collars and their connections to the pipe bands shall be watertight. The antiseep collars shall extend a minimum of two feet beyond the outside of the principle pipe barrel. The maximum spacing between collars shall be 14 times the minimum projection of the collar measured perpendicular to the pipe. A minimum of two antiseep collars shall be installed on each outlet pipe.

(13) All outlet pipes through a basin berm shall be reinforced concrete pipe, designed to withstand the loading caused by a fully saturated berm and shall have watertight joints using 0-ring joint pipe. Outlet pipes shall be backfilled with material similar to the core material (semi-impervious).

(14) The invert of the inlet pipe(s) into a basin shall be above the basin floor or lining so that it can adequately drain after rainstorms. Inlet pipe(s) shall discharge to areas of the basin that slope toward the outlet structure, having the minimum slope as prescribed in Subsection D(8) above.

(15) Energy dissipaters and/or level spreaders shall be installed at points where pipes or drainageways drain to or from the basin. Energy dissipaters shall comply with criteria in Hydraulic Engineering Circular No. 15 - Design of Stable Channels with Flexible Linings, published by the Federal Highway Administration of the United States Department of Transportation or the Engineering Field Manual for Conservation Practices, NCRS energy dissipating device calculations shall be submitted for township review and approval.

(16) Inlet and outlet structures shall be located at a maximum distance from one another in order to promote water quality benefits. The Township Engineer may require a rock filter or rock-filled gabion for entrapping sediments carried in stormwater if sufficient separation of inlet and outlet structures cannot be achieved. The use of forebays as a sediment removal feature is encouraged for all basins.

(17) A perforated riser or similar sediment control device shall be provided at each outlet of all detention basins during construction for sediment control. The riser shall be constructed of metal or concrete. The riser shall extend to a maximum elevation of two feet below the crest elevation of the emergency spillway. The perforated riser shall be designed so that the rate of outflow is controlled by the pipe barrel through the basin berm when the depth of water within the basin exceeds the height of the riser. Circular perforations with a maximum diameter of one inch shall be spaced 12 inches vertically. The horizontal spacing shall be in accordance to DEP Soil Erosion and Sedimentation Control Manual Specifications. The perforations shall be cleanly cut and shall not be susceptible to enlargement. All metal risers shall be suitably coated to prevent corrosion. A trash rack or similar appurtenance shall be provided to prevent debris from entering the pipe. All risers shall have a concrete base attached with a watertight connection. The base shall be of sufficient weight to prevent flotation of the riser. An antivortex device consisting of a thin vertical plate normal to the base and berm shall be provided at the top of the riser. Unless this structure is part of the permanent outlet control, it shall be removed from the site when it has been adequately stabilized as determined by the Township Engineer.

(18) All drainage channels shall be designed to prevent erosion of the bed and banks. The maximum permissible flow velocity shall not exceed the design requirements outlined in the current Soil Erosion and Sedimentation Control Manual, published by the Pennsylvania Department of Environmental Protection. Suitable stabilization shall be provided where required to prevent erosion of the drainage channels. The design procedure used shall be that contained in the current Soil Erosion and Sedimentation Control Program Manual, published by the Pennsylvania Department of Environmental Protection.

(19) Any vegetated drainage channel requiring mowing of the vegetation shall have a maximum grade of three horizontal to one vertical on those areas to be mowed.

(20) Because of the critical nature of vegetated drainage channels, the design of all vegetated channels shall, as a minimum, conform to the design requirements outlined in the current Soil Erosion and Sedimentation Control Program Manual, published by the Pennsylvania Department of Environmental Protection.

§ 206-103. Schedule 111: Stormwater Conveyance System.

A. General.

(1) Storm sewers, culverts, bridges and related installations shall be provided to:

(a) Permit unimpeded flow of natural watercourses and in such a manner as to protect the natural character of the watercourses and to provide regulated discharge.

(b) Ensure adequate drainage of all low points along the line of streets.

(c) Intercept stormwater runoff along streets at intervals reasonably related to the extent and grade of the area drained and to prevent substantial flow of water across intersections.

(2) All storm sewer system components shall conform to current Upper Dublin Township Engineering and Construction Standards and PennDOT standards for materials, manufacture and construction.

(3) Drainage structures, which drain watershed areas in excess of one-half square mile (320 acres) or which have a span of eight feet or more, shall be designed for a maximum expected runoff as calculated using the Soil Conservation Service Technical Release 55, Urban Hydrology for Small Watersheds (Less Than 2000 Acres).

(4) The design storm of all cross roadway culverts shall be one-, two-, five-, ten-, twenty-five, fifty- and one-hundred-year storm. A water obstruction permit shall be obtained from DEP for the waterway opening before final design is undertaken.

(5) The cartway over a culvert or bridge shall be as wide as the ultimate width of the roadway approaches. Additional width may be required to provide sidewalks on one or both sides of the cartway.

B. Storm sewer design and construction requirements.

(1) Minimum pipe size is 18 inches.

(2) Minimum pipe slope shall be 0.005 foot per foot.

(3) Minimum drop across junctions shall be two inches. At changes in pipe diameter, pipe crowns shall be matched at junctions (manhole, inlet or junction box).

(4) Maximum distance between junctions shall be 300 feet.

(5) Runoff to proposed storm sewers and inlets shall be calculated using the Rational Method.

(6) The time of concentration shall be assumed five minutes for pipes under 30 inches. For pipes 30 inches or greater, the calculated time of concentration can be utilized.

(7) The time of concentration to inlets for grate capacity calculations shall be five minutes.

(8) All storm sewer pipes shall be designed at a minimum to accommodate a ten-year storm. Twenty-five-year storms shall be used if required by the Township Engineer.

(9) All storm sewer pipes downstream of inlets in sump condition shall be designed to accommodate the fifty-year storm.

(10) All storm sewer pipes and inlets intended to drain to detention facilities shall be designed to accommodate the one-hundred-year storm if any of the stormwater runoff bypass or overflow will not reach the basin by overland flow. In cases where the bypass or overflow will flow over land, a stable swale shall be constructed to accommodate the excess floods in a non-erosive manner.

(11) All inlets in sump condition shall be six-foot inlets or dual four-foot inlets, as needed.

(12) All storm sewer systems shall be analyzed for both inlet and outlet control (including tailwater effects) by using the equations and nomographs as shown in the FHA's Hydraulic Design Services No. 5. In lieu of this, computer programs that calculate the actual hydraulic grade line for the storm sewer system can be used, provided that all losses (friction, bend, junction, etc.) are taken into account. Documentation for the program must be submitted for approval.

(13) Minimum cover over pipes is two feet from finished grade to outside of pipe bell.

(14) Inlet capacities shall be calculated using PennDOT or manufacturer's nomographs. Documentation for manufacturer's nomograph must be provided to the Township Engineer.

C. Shoulders in cut areas (without swales).

(1) Water flowing in the shoulder shall not encroach more than two-thirds the shoulder width during a twenty-five-year frequency storm of five-minute duration.

(2) The maximum velocity as determined by Manning's Equation shall not exceed the allowable velocities for the specific type of shoulder material.

(3) Inlets shall be provided to control the shoulder encroachment and water velocity.

D. Swales adjacent to shoulders.

(1) Swales in cut areas shall be designed to prevent the passage of water on the cartway during a twenty-five-year frequency storm of five-minute duration.

(2) The maximum velocity as determined by Manning's Equation shall not exceed the allowable velocities for the specific type of shoulder material.

E. Curbed sections.

(1) Inlets shall be provided to control the encroachment of water on the pavement.

F. Inlets, general.

(1) At street intersections, inlets shall be placed in the tangent portion, rather than the curved portion, of the curbing.

(2) If the capacity of the shoulder, swale, curb section or depressed median section exceeds the assumed inlet capacities, the inlet capacities shall govern the spacing of inlets.

(3) If the capacity of the shoulder, swale, curb section or depressed median section is less than the inlet capacities, then the shoulder, swale, curb section or depressed section capacity shall govern the spacing of inlets.

§ 206-104. Schedule IV: Water Quality and Groundwater Recharge Stormwater Management Facilities.

A. Development, which increases runoff, poses a significant threat to the environmental resources of Pennsylvania's groundwater, streams and wetlands. Therefore, attention is being turned to methods of increasing infiltration and groundwater recharge to offset the loss of infiltration and increased runoff due to development.

B. All stormwater management facilities shall be designed to satisfy the following requirements.

(1) All facilities shall be provided with the capability to withstand the discharge associated with the one-hundred-year return rainfall event, without failing or resulting in damage to downstream areas. Some nondetention facilities may be designed to bypass stormwater discharges which are in excess of the appropriate design storm. In this case, conveyance must be provided to transport the one-hundred-year surcharge flow to a downstream facility, natural watercourse or storm drainage system inlet.

(2) All groundwater recharge devices shall be protected from sedimentation. Areas designated for recharge shall not receive runoff until the contributory drainage areas have achieved final stabilization.

(3) Groundwater recharge requirement. The recommended criterion for addressing groundwater recharge is to maintain the annual volume of total runoff at predevelopment levels. This approach is implemented by requiring that a minimum retention volume be completely infiltrated on the site during every storm. The retention volume for Upper Dublin Township is 0.75 inches. Therefore, all rainfall events of less than 0.75 inches of rainfall should be completely retained on the site and infiltrated. If an analysis shows that runoff from the site will be negligible during this event, then the groundwater recharge requirement is satisfied. Controlling runoff from the groundwater recharge design storm is the only requirement for preserving the overall water budget for the watershed.

C. For design of BMPs, refer to the Pennsylvania Handbook of Best Management Practices for Developing Areas, or its successor document.

§ 206-105. (Reserved)

§ 206-106. (Reserved)

§ 206-107. (Reserved)

§ 206-108. (Reserved)

§ 206-109. (Reserved)

§ 206-110. (Reserved)

ARTICLE XI

Low-Impact Development Practices For Managing Stormwater Runoff

§ 206-111. General guidelines for low-impact development.

A. Natural hydrologic conditions may be altered unnecessarily 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 approach has been to remove runoff from a site as quickly as possible and capture it in a detention basin. This 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.

B. Developers shall use design practices that minimize postdevelopment runoff rates and volumes, which minimize artificial conveyance and storage facilities and which simulate predevelopment hydrologic conditions. Forced infiltration is often necessary to offset the loss of infiltration by creation of impervious surfaces.

C. Preserving natural hydrologic conditions requires careful alternative site design practices that include preserving natural drainage features, minimizing impervious surface area, reducing the hydraulic connectivity of impervious surfaces, and protecting natural depression storage.

D. A careful consideration of the existing topography and implementation of a combination of the above-mentioned techniques mentioned in this section may avoid construction of costly stormwater management facilities. Other benefits include reduced potential of downstream flooding, water quality degradation of receiving streams/water bodies and 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.

§ 206-112. Protecting natural drainage features and depression storage areas.

A. Natural drainage features, particularly vegetated drainage swales and channels, shall be protected because of their ability to infiltrate and attenuate flows and to filter pollutants.

Runoff and pollutants generated from impervious surfaces shall not flow directly into storm sewers with no opportunity for attenuation, infiltration or filtration. Developments shall be designed to fit site topography and minimize the amount of grading on site.

B. 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. The volume and release-rate characteristics of depressions should be protected in the design of the development site. The depressions shall be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.

§ 206-113. Avoiding introduction of impervious areas.

Site planning shall consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways and other features producing impervious surfaces shall be evaluated to minimize impacts on runoff. Porous pavement and open graded pavers are two alternate methods.

§ 206-114. Reducing the hydraulic connectivity of impervious surfaces.

Impervious surfaces shall not be directly connected to an impervious conveyance system (such as storm sewer). Roof runoff shall be directed over lawns and infiltrated where appropriate, and the use of storm sewers shall be minimized. Site grading shall promote increasing travel time of stormwater runoff and shall reduce concentration of runoff to a single point in the development.

§ 206-115. Routing roof runoff over lawns.

Roof runoff shall be routed over lawns. Direct connections of downspouts to storm sewers or parking lots is discouraged. The practice also discourages sloping driveways, and parking lots shall be minimized. Driveways shall be crowned direct to run off to lawn areas.

§ 206-116. Reducing the use of storm sewers.

The use of storm sewers for draining streets, parking lots and backyards shall be minimized to reduce the potential for accelerating runoff from the development.

§ 206-117. Reducing street widths.

Street widths may be reduced by either eliminating on-street parking or by reducing roadway or cartway widths. Developers who desire to reduce street widths should consult with the Township Engineer prior to application for subdivision/land development approval regarding any waivers or deviations from the requirements of chapter 212 that may be needed for reduced street widths.

§ 206-118. Limiting sidewalks to one side of the street.

A sidewalk on one side of the street may be considered in low-traffic neighborhoods. The deleted sidewalk may be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials. Developers who desire to reduce sidewalks should consult with the Township Engineer prior to application for subdivision/land development approval regarding any waivers or deviations from the requirements of chapter 212 that the Board of Commissioners may need to grant for limited sidewalks.

§ 206-119. 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.

§ 206-120. (Reserved)