

AN ORDINANCE

NO. 913

AN ORDINANCE TO AMEND THE CODE OF THE TOWNSHIP OF UPPER DUBLIN BY ADDING A NEW CHAPTER 206, "STORMWATER MANAGEMENT", TO INCLUDE ARTICLE I, "GENERAL PROVISIONS"; ARTICLE II "DEFINITIONS"; ARTICLE III "STORMWATER MANAGEMENT REQUIREMENTS"; ARTICLE IV "STORMWATER MANAGEMENT PLAN REQUIREMENTS"; ARTICLE V "ADMINISTRATION"; AND ARTICLE VI "SCHEDULES FOR DESIGN AND CONSTRUCTION STANDARDS".

The Board of Commissioners of the Township of Upper Dublin does hereby ENACT and ORDAIN as follows:

Section 1. The Code of the Township of Upper Dublin shall be amended to add Chapter 206 "Stormwater Management" which Chapter shall provide as follows:

STORMWATER MANAGEMENT

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**ARTICLE I
General Provisions**

§206-1. Title.

This Chapter shall be known as the "Upper Dublin Township Stormwater Management Ordinance".

§206-2. Statement of findings.

The Board of Commissioners of Upper Dublin Township finds that:

- A. Inadequate management of stormwater runoff from development in a watershed increases flood flows and velocities, erodes and/or silts stream channels, pollutes water, overloads existing drainage facilities, undermines floodplain management in downstream communities, reduces groundwater recharge, and threatens public health and safety.

- B. A comprehensive and reasonable program of stormwater management regulations is fundamental to the public health, safety, and welfare and to the protection of the citizenry and environment.

§206-3. Purpose.

The purpose of this Chapter is to promote public health, safety and welfare within the Township of Upper Dublin by minimizing the damages described in Section 206-2(A), of this Chapter by provisions designed to:

- A. Manage stormwater runoff created by development activities.
- B. Maintain and/or improve existing water quality of streams, watercourses and impoundment's by preventing the additional loading of various stormwater runoff pollutants into the stream system and enhancing base flow as much as possible.
- C. Maximize potential groundwater recharge throughout the watershed in an attempt to maintain the existing hydrologic regime.
- D. Preserve existing natural drainage ways and watercourses.
- E. Provide for proper maintenance of all stormwater management facilities.

§206-4. Statutory authority.

The township is empowered to regulate land use and development activities that affect stormwater runoff by the authority of The Stormwater Management Act of October 4, 1978, P.L. 864 (Act 167), as amended 32 P. S. Section 680.1 et seq., and the First Class Township Code, P.L. 1206, Act of June 24, 1931, as amended, 53 P.S. Section 55101, et seq.

§206-5. Applicability.

The following activities are defined as "Regulated Activities" and shall be regulated by this Chapter:

- A. Land development
- B. Subdivision
- C. Any development involving the construction of new or additional impervious or semi-pervious surfaces (driveways, parking lots, etc.)
- D. Construction of new buildings or additions to existing buildings or structures
- E. Diversion or piping of any natural or man-made stream channel
- F. Installation of stormwater systems or appurtenances thereto

Any public works activity conducted by the township, its employees or agents is exempt from the definition of a "Regulated Activity". The township's policy, however, is to comply with this Chapter to the extent that such compliance would not conflict with other township interests in the health, safety and welfare of the township residents.

§206-6. Repealer.

Any part of the Township Code inconsistent with any of the provisions of this Chapter is hereby repealed to the extent of the inconsistency only.

§206-7. Severability.

Should any section or provision of this Chapter be 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. Compatibility with other code requirements.

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

**ARTICLE II
Definitions**

§206-9. General.

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 masculine gender.
- B. The words "includes" or "including" shall not limit the term to the specific example but is intended to extend its meaning to all other instances of like kind and character.
- C. The words "shall" and "must" are mandatory; the words "may" and "should" are permissive.
- D. The words "used or occupied" include the words "intended, designed, maintained, or arranged to be used or occupied".

§206-10. Terms.

ACCELERATED EROSION - The removal of the surface of the land through the combined action of man's activity and the natural processes of a rate greater than would occur because of the natural process 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 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.

BEST MANAGEMENT PRACTICE (BMP) - Structural and non-structural measures that temporarily store or treat stormwater runoff to reduce flooding, remove pollutants, provide for infiltration, or offer environmental amenities.

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

BUILDING - Any structure, either temporary or permanent, having walls and a roof, 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 moderate to large floods.

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

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

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

DESIGN STORM - The magnitude of precipitation from a storm event measured in probability of occurrence (e.g., 50-year storm) and duration (e.g., 24-hour), and used in computing stormwater management control systems.

DETENTION BASIN - A stormwater storage area with a controlled release rate which is essentially dry while not in use for flood control purposes.

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.

DEVELOPMENT SITE - The specific tract of land for which a Regulated Activity is proposed.

DOWNSLOPE PROPERTY LINE - That portion of the property line of the lot, tract, or parcels of land being developed which is located such that all overland or pipe flow from the site would be directed towards it.

DRAINAGE EASEMENT - A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.

DRAINAGE FACILITY - any ditch, pipe, culvert, storm sewer, stream, channel, swale, conduit or structure 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 the stormwater management plan has been approved. Said permit is issued prior to or with the final township approval.

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

EARTH DISTURBANCE - Any activity including, but not limited to, construction, mining, timber harvesting, and grubbing which alters, disturbs, and exposes the existing land surface.

EROSION - The removal or wearing away of surface materials by the action of natural elements including water, winds and ice.

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, 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 lower curve numbers or Rational "C" value, such as forested lands.

FEMA - Federal Emergency Management Agency.

FILL - (Verb) Any act by which earth, sand, gravel, rock or any other material is deposited, placed, pushed, dumped, pulled, transported or moved to a new location, and shall include the conditions resulting therefrom.

(Noun) Sand, gravel, earth or other material placed or deposited to form an embankment or raise the elevation of the land surface. The term includes material used to replace an area with aquatic life with dry land or to change the bottom elevation of a regulated water of this Commonwealth.

FLOOD - A general but temporary condition of partial or complete inundation of normally dry land areas from the overflow of streams, rivers, and other waters of this commonwealth.

FLOODPLAIN - The area along a natural watercourse which is periodically overflowed by water therefrom, as defined in 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 100-year frequency, flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed (absent evidence to the contrary) that the floodway extends from the watercourse to 50 feet from the top of the bank of the watercourse.

FREEBOARD - A vertical distance between the elevation of the design high water and the top of the spillway. The space is required as a safety margin in a pond or a basin.

GRADE -

- A. (Noun) A slope of a street, pipe, culvert, channel, or natural ground, specified in percent (%) and shown on plans as specified herein.
- B. (Verb) To finish the surface of a roadbed, top of embankment, or bottom of excavation.

- C. GRADE, EXISTING - The vertical elevation of the ground surface prior to earthmoving or filing.
- D. GRADE, FINAL - The final vertical elevation of the ground after development.

GRASSED WATERWAY - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water.

GROUNDWATER - The water beneath the surface of the ground, consisting largely of surface water that has seeped down; the source of water in springs and wells.

GROUNDWATER RECHARGE - Replenishment of the water beneath the surface of the ground, consisting largely of surface water that has seeped down; the source of water in springs and wells.

GROUNDWATER RECHARGE DESIGN STORM - Benchmark rainfall event used as a basis for establishing compliance with the groundwater recharge requirement of the ordinance: 0.75-inch, 24-hour rainfall

IMPERVIOUS SURFACE - A surface which prevents the percolation of water into the ground.

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

INFILTRATION STRUCTURES - A structure designed to direct runoff into the ground, (e.g., seepage pits, seepage 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 or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features.
- B. 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, or filling of ground or stripping of vegetation or any other activity that causes an alteration to the natural condition of the land.

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 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.

MUNICIPALITY - The Township of Upper Dublin, Montgomery County, Pennsylvania.

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

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

OPEN CHANNEL - A drainage element in which stormwater flows with an open surface. Open channels include, but shall not be limited to, natural and man-made drainageways, swales, streams, ditches, canals and pipes flowing partly full.

OUTFALL - point where water flows from a conduit, stream, or drain.

OUTLET - Points of water disposal from a stream, river, lake, tidewater or artificial drain.

PEAK DISCHARGE - The maximum rate of flow of storm runoff at a given point and time resulting from a specified storm event.

PERSON - An individual, firm, association, organization, partnership, trust, company, corporation, or any other similar entity.

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

RATIONAL METHOD (FORMULA) - A rainfall-runoff relation used to estimate peak flow.

REGULATED ACTIVITIES - Actions or proposed actions which impact upon proper management of stormwater runoff and which are governed by this Chapter as specified in Section 206-5.

RETENTION BASIN - A stormwater storage area with a controlled release rate and which maintains a constant water level while not in use for flood storage.

RETENTION VOLUME - The combined storage volume provided by BMPs on a site for the retention and eventual infiltration of rainfall.

RETURN PERIOD - The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the 25-year return period rainfall would be expected to recur on the average once every 25 years. 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.

ROOFTOP DETENTION - Temporary ponding and gradual release of stormwater falling directly onto a flat roof surface by incorporating controlled flow roof drains into building designs.

RUNOFF - The surface water discharge of a given watershed after a fall of rain or snow 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 by water.

SEDIMENT BASIN - A barrier, dam, retention or detention basin designed to retain sediment.

SEDIMENT POLLUTION - The placement, discharge, or any other introduction of sediment into the waters of the Commonwealth occurring from the failure to design, construct, implement or maintain control measure 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 moving wind, water or gravity. Once this matter is deposited (or remains suspended in water), it is usually referred to as "sediment."

SEEPAGE PIT/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.

SEMI-PERVIOUS SURFACE - A surface such as turf, stone, porous paving, or other material which allows some percolation 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 computation developed by the Natural Resource Conservation Service which is based upon relating soil type and land use/cover to a runoff parameter called a Curve Number.

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 the embankment of a pond or basin which is used to pass peak discharge greater than the maximum design storm controlled by the pond or basin.

STORM FREQUENCY - The number of times that a given storm event occurs or is exceeded on the average in a stated period of years. See "Return Period".

STORM SEWER - A system of pipes or other conduits which carries intercepted surface runoff, street water and other waters, or drainage, but excludes domestic sewage and industrial wastes.

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 1) a method of restricting outflow and 2) a storage volume for the temporary detention of incoming runoff. Stormwater detention facilities include both above-grade and below-grade devices.

STORMWATER MANAGEMENT FACILITY - 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, but are not limited to, detention and retention basins, open channels, storm sewers, pipes and infiltration structures.

STORMWATER MANAGEMENT PLAN - The depiction, to scale, of the stormwater management facility 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, or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of this Commonwealth.

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 gathers or carries surface water runoff.

TIME OF CONCENTRATION (T_c) - 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 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 the ordinance: 1-year, 24-hour rainfall.

WATERCOURSE - A permanent stream, intermittent stream, river, brook, creek, channel, culvert or ditch conveying surface water, whether natural or man-made.

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 this Commonwealth.

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.

ARTICLE III

Stormwater Management Plan Requirements

§206-11. General requirements.

- A. 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.
- B. The following requirements apply to the retention of existing watercourses and natural drainage features:
 - (1) Whenever a watercourse, stream, or intermittent stream is located within a development site, it shall remain open in its natural state in as much as possible to maintain these conditions.
 - (2) The existing points of natural drainage discharge onto adjacent property shall not be altered without the written approval of the affected 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 provide 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 25 feet in width. The developer will retain the easement until such time as one of the following is accomplished:
 - (a) The easement is offered for dedication by the developer and accepted by the township.
 - (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 owner.
 - (c) Homeowners' association or other approved legal entity, approved by the

township, assumes responsibility for the maintenance of the development, including the retention of the watercourse easement.

C. Developers shall construct and/or install stormwater management facilities, on and off-site, as necessary to:

- (1) Prevent erosion damage and to satisfactorily carry off, detain, or retain and control the rate of release of stormwater.
- (2) Manage the anticipated peak discharge from property being subdivided or developed and existing runoff being contributed from all land at a higher elevation in the same watershed.
- (3) Convey stormwater along or through the property to a natural 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. A natural outfall shall have sufficient capacity to receive stormwater without deterioration of the facility and without adversely affecting property in the township. This natural outfall may be a river, creek, or other drainage facility so designated by the township for the proposed system.
 - c. Roof runoff shall be conveyed into natural watercourses on the property or to a storm drainage system of the township. However, a direct connection of roof drains to the storm drainage system is prohibited. Likewise, roof drains may not discharge directly to natural watercourses. Discharge from roof drains over a sidewalk, into a driveway, over a parking area, or into gutters will not be permitted.

Compliance with the groundwater recharge requirement (216-13) 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 BMPs (e.g., infiltration trench, bioretention area, porous pavement, sand filter)

Where conditions are not suitable for groundwater recharge (206-13(C)), roof spouts are required to discharge onto a vegetated surface (e.g., lawn, shrub filter strip, swale, grassed waterway). The minimum length of the

flow path between the spout outlet and the point of discharge to a natural watercourse or storm drainage inlet shall be 20 feet.

- d. Water originating from other than natural sources, such as air-conditioning units, sump pumps or other dry weather flow, wherever practicable, shall be connected to the storm drainage system of the township or discharged into natural watercourses on the property, at the direction of the township engineer. These facilities may not be used for pollution matter.
 - e. Water from swimming pools or similar uses containing chlorine shall be pre-treated to remove chlorine to acceptable limits prior to discharge to a township storm sewer system.
- D. A horizontal buffer shall be established at one (1) foot above the 100 year base flood elevation. The buffer may be part of any lot to meet lot area and yard requirements. No building or structure of any nature or any work such as filling or excavation shall be allowed within a horizontal buffer area. The buffer area may be used as part of any required yard area.
- E. Where applicable, construction of stormwater management facilities in wetlands or programs 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, 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.
- F. Stormwater management facilities which are located in or will discharge into a state highway right-of-way shall be subject to the approval of the Pennsylvania Department of Transportation (PennDOT).
- G. Stormwater management facilities located within or affecting the floodplain of any watercourse shall also be subject to the requirements of the Township Code which regulates construction and development within areas which are subject to flooding (See Chapter 255, Zoning, Article XXII, Floodplain Conservation District).
- H. A permanent access easement to the stormwater management facilities shall be provided in favor of the township for maintenance and operation of the facilities. This access shall be a cleared and stabilized access that is a minimum of 20 feet wide, 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 accesses shall be encouraged for major or regional facilities. The owner of the access easement 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 facility,

- I. 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 to life and property.
- J. A drainage release in a form approved by the Township Solicitor, may be required by the township for discharges to adjoining properties and watercourses.
- K. 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.

§206-12. Water quality requirement.

- A. One of the major objectives of the stormwater management ordinance is to maintain and, if possible, improve existing water quality by preventing additional loading of stormwater runoff pollutants. In considering issues such as ease of implementation and cost-effectiveness, the following is the minimum water quality criteria established to meet the objective of the ordinance.
- B. Stormwater detention facilities shall include provisions to detain runoff from the water quality design storm (1-year, 24-hour rainfall event), using methodology appropriate for the drainage area under consideration.
- C. Release of this water 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 non-conducive 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 detention facilities must implement the water quality requirement of this section. The water quality objective can be obtained through a variety of approved BMPs or combinations thereof, including retention basins (i.e., wet detention), detention basins (i.e., extended day detention), open (at-grade) sand filters, 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 BMPs 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 BMPs must be designed to treat runoff derived from the water quality design storm (1-year, 24-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. Industries must demonstrate compliance with the stormwater management provisions of National Pollutant Discharge Elimination System (NPDES: 40CFR, Chapter I, Part 122), as administered by the Commonwealth of Pennsylvania. Copies of Stormwater Pollution Prevention Plans (SWPPP) and monitoring reports shall be provided to the township.

206-13. Groundwater Recharge Requirement

- A. Best management practices (BMPs) shall be provided to retain all runoff generated by the groundwater recharge design storm (0.75-inch, 24-hour rainfall event) for infiltration.
- B. BMP's shall be designed to infiltrate retained runoff within a 48 hour period. Infiltration rates shall be based on field measurements using the double-ring infiltrometer or other approved method. Standard percolation tests are not acceptable. 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 BMP from field measurements of infiltration rate.
- C. Lot owners must comply, individually, with the groundwater recharge requirement. However, Groundwater recharge BMP's will not be required on properties where:
- (1) Average slopes for the property exceed 8 percent
 - (2) Seasonal high water table is shallower than 4 feet below final grade
 - (3) Soil or bedrock conditions will not permit efficient percolation (nominal infiltration rate of less than 0.2 inches/hour)
 - (4) Site configuration will require that runoff must be infiltrated within:
 - 100 feet of a known or suspected sinkhole,
 - 50 feet of a water supply well,
 - 50 feet of a perennial stream, or
 - 20 feet of a basement wall.

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 (multi-lot) 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 5 acres.

- D. The storage volume of detention basins or retention basins may not be used to satisfy the required retention volume.
- E. Potentially contaminated runoff may not be infiltrated without appropriate pre-treatment. 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. Alternatively, it can be demonstrated that the proposed stormwater management plan will result in negligible runoff during the groundwater recharge storm. 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 percent of the required retention volume as determined in 206-13(H).

§206-14. 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. "No Harm" Option.
 - (1) The township, upon recommendation of the Township Engineer, may grant a

developer the option of using a less restrictive runoff control if the developer can prove that "no harm" to the localized downstream areas would be caused by discharging the higher runoff rates than specified for the applicable watershed. However, in no case shall a developer be relieved of the peak discharge requirement for the 2-year return design storm or the groundwater recharge requirement.

- (2) Attempts to prove "no harm" shall also be governed by the following provisions:
 - (a) The peak flow values to be used for downstream areas for various return period storms shall be the values from a method of runoff computation accepted by the Township Engineer.
 - (b) Any available capacity in the downstream conveyance system as documented by a developer may be used by the developer only in proportion to the development site acreage relative to the total upstream undeveloped acreage from the identified capacity (i.e., if the site is 10 percent of the upstream undeveloped acreage, up to 10 percent of the documented downstream available capacity may be used).
 - (c) Developer-proposed runoff controls which would generate increased peak flow rates at documented storm drainage problem areas would, by definition, be precluded from successful attempts to prove "no harm", except in conjunction with proposed capacity improvements for the problem areas.
- (3) Any "no harm" justifications shall be submitted by the developer as part of the stormwater management plan submission per Article IV.

C. Runoff Control Measures or Best Management Practices (BMP's)

- (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 is available in *Pennsylvania Handbook of Best Management Practices for Developing Areas* (Pennsylvania Association of Conservation Districts, 1998). 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:

Contributing drainage area served by the BMP
Hydraulic conductivity of soils and bedrock
Depth to seasonal high water table and bedrock
Erodibility of soils
Land availability and topographic constraints
Existing natural resources which require conservation or enhancement.

- (3) Any Regulated Activity specified in Section 206-5, except for those defined in 206-5(E) and (F), which meets the stormwater management plan exemption criteria in Section 206-16(A) is exempt from meeting the water quality requirements of Section 206-12. 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 the Chapter. Nevertheless, the following control techniques are encouraged where appropriate:
- (a) Small on-site bioretention areas, providing detention storage, with grassed overflow;
 - (b) Oversized storm sewers with flow constrictions (reduced orifice) at discharge;
 - (c) Stream channel preservation and protection of vegetation; energy reduction spillways
 - (d) Reduction of maintained landscaped areas;
 - (e) Preservation of existing vegetation, especially native plantings and woodland;
 - (f) Planting of wetland species along drainage swales and depressions;
 - (g) Fertilization practices minimized/eliminated;
 - (h) Site design criteria which prevent significant alteration of existing topography.
 - (i) Sites that have suitable soils are encouraged to incorporate on-site infiltration methods such grassed waterways, shrub filter strips, French drains, and trenches, into the design of the development.

All sites with suitable conditions must comply with the groundwater recharge requirement. "Exempt" sites (206-16) may use Appendix "A" to determine the required retention volume. The groundwater recharge requirement may be satisfied using a variety of BMP's, including those described in 206-14 (C).

(4) Subregional (Combined Site) Storage

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 storm water storage facility in the most hydrologic advantageous location.

The goal should be 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.

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

To take this concept a step further, there is also the possibility that the storm water could be managed "off-site"; that is, in a location off the property(s) in question. There could be publicly owned detention, retention, lake, pond or other physical facilities to serve multiple developments. Any such facility shall have an ownership and maintenance program, in a recordable form, as required in Section 206-17(C) of this Chapter.

(5) All stormwater control 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
- (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) U.S. Department of Agriculture, Natural Resources Conservation Service, Pennsylvania (USDA, NRCS, PA)
- (6) If special geological hazards or soil conditions, such as carbonate derived soils, are identified on the site, the developer's engineer shall consider the effect of proposed stormwater management measures on these conditions. In such cases, the municipality may require an in-depth report by a competent certified professional soils engineer and/or geologist.

ARTICLE IV
Stormwater Management Plan Requirements

§206-15. General requirements for stormwater management plans.

- A. 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 Section 206-17 of this Chapter, unless exempt by Section 206-16 below.

§206-16. 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 ordinance.
 - (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 Montgomery County Conservation District or the U.S.D.A. Soil Conservation Service is exempt.
 - (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 is operating under an erosion and sedimentation control plan approved by the Montgomery County 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 one-half (0.5) cubic feet per second (CFS) from the existing conditions in a 50 year storm.
- B. An applicant for an exempt activity as listed in Section 206-16(A) above shall do the following:
- (1) Select appropriate stormwater management techniques as identified in Section 206-14(C)(3) of this Chapter.
 - (2) Prepare a schematic stormwater management plan showing general features and locations of proposed stormwater management techniques. The design of the proposed stormwater management techniques can be provided by a licensed professional engineer, licensed land surveyor or a person trained and experienced in stormwater management and erosion and sedimentation control. The design, structure, integrity and installation of the control measure are the responsibility of the developer and the developer's professional.
 - (3) Submit two copies of the schematic stormwater management plan to the Township Engineer for review.
- C. For exempt activities, the schematic 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 as defined in Section 206-5 of this Chapter.

§206-17. Stormwater management plan contents.

The following items shall be included in the stormwater management plan:

- A. Written report, including the following information:
- (1) General description of project;
 - (2) General description of proposed stormwater management controls and facilities

both during and after development, including construction specifications;

- (3) General description of erosion and sedimentation controls including those contained in any required Erosion and Sedimentation Control Plan, including construction specifications;
- (4) Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities;
- (5) Expected project time schedule, including anticipated start and completion dates.

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

(1) Drafting Standards

- (a) 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 (if applicable);
- (b) Name and address of the record owner, applicant, and developer;
- (c) Name and address of 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.

(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 utilities and services (e.g., wells, on-site sewage disposal systems) and any rights-of-way or easements within the property;
- (d) The location of existing buildings, streets, and other significant features within the property; the location and area of all floodplains, forests, lakes, ponds, watercourses (including drainage swales), wetlands, slopes 8-15 percent, steep slopes 15-25 percent, steep slopes 25 percent or steeper;
- (e) Controls at vertical intervals of two feet; vertical intervals of five feet for steep slopes (greater than 15 percent);
- (f) An overlay showing soil types and boundaries and a statement as to where the soils data was obtained;
- (g) Watershed boundaries applicable to the site.

(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, building locations, parking compounds, impervious and semi-impervious 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; vertical intervals of 5 feet for

steep slopes (greater than 15 percent);

- (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 (1) all natural features and (2) 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.

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 binding document must provide that the township shall have the right to:
 - (a) 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 and lien the cost of the work against the properties of the private entity responsible for maintenance.
- (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.
- D. Financial security for the completion of stormwater management facilities as set forth in Section 206-29 of this Chapter.
- E. Maintenance guarantee, as set forth in Section 206-29 of this Chapter.
- 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.

§206-18. Plan submission.

- A. For Regulated Activities specified in Section 206-5(A) and (B) (land development and subdivision):
- (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 the subdivision or land development.
 - (2) Fifteen (15) 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
Board of Commissioners' Planning Committee	3

President, Board of Commissioners	1
Engineer	2
Manager	1
Solicitor	1
Code Enforcement Office	1
Planning Advisory Board	1
Environmental Protection Advisory Board	1
Public Works Department	1
Parks and Recreation Department	1
Licenses and Inspection Department	1
Montgomery County Planning Commission	1

B. For Regulated Activities specified in Section 206-5(C) and (D) (new or additional construction of impervious or semi-pervious surfaces, buildings or structures) Six (6) 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:

- a) Code Enforcement 1 copy
- b) Public Works Department 1 copy
- c) Township Planning Files 2 copies
- d) Township Engineer 2 copies

C. For Regulated Activities specified in Section 206-5(E) and (F) (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 (6) copies of the stormwater management plan shall be submitted to the Office of Code Enforcement for distribution as follows:
 - a) Code Enforcement 1 copy
 - b) Public Works Department 1 copy
 - c) Township Planning Files 2 copies
 - d) Township Engineer 2 copies

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.

§206-19. Plan review and approval.

- A. The Board of Commissioners shall review and approve or disapprove a stormwater management plan submitted pursuant to Section 206-17(A) within a time frame consistent with established procedures under the Municipalities Planning Code and the Township Code.
- B. The Township Engineer shall review, and approve or disapprove a stormwater management plan submitted pursuant to 206-17(B) and (C) within 45 days following formal acceptance of the plan.
- C. The Township Engineer shall review all stormwater management plans for consistency with this Chapter and any additional storm drainage 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" by a professional Land Surveyor of all stormwater management facilities included in the

approved stormwater management plan. 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 the PennDOT District Office, and any applicable permits from DEP.

§206-20. Modification of plans.

- A. 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 Section 206-17 subject to review per Section 206-19 of this Chapter.
- B. Minor design changes may be permitted as authorized by the Board of Commissioners and advised by the Township Engineer without resubmission consistent with the requirements this Chapter.
- C. 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.

§206-21. 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 be subject to the plan review requirements of this Chapter. The applicable Township Engineer's review fee must accompany a resubmission of a disapproved stormwater management plan.

§206-22. Permit requirements and procedures.

A Regulated Activity as defined in this Chapter shall not be initiated until a stormwater management permit has been issued, regardless of the receipt of permits of other regulatory agencies.

§206-23. Application requirements.

- A. The applicant 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 Board of Commissioners concurrently with the final subdivision and land development approval.

- B. The applicant shall obtain the required stormwater management permit for Regulated Activities specified in Sections 206-5(C) and (D) 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 Office of Code Enforcement concurrently with the issuance of the building permit.
- C. The applicant shall obtain the required stormwater management permit for Regulated Activities specified in Sections 206-5(E) and (F) 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.

§206-24. Application for permit.

- A. Applications for stormwater management permits required by this Chapter shall be made on forms supplied by the Office of Code Enforcement. 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.
- B. Any incomplete application submission shall be rejected by the Office of Code Enforcement without any further processing or review.

§206-25. Modification of plans.

A modification to an approved stormwater management plan, when required under Section 206-19 of this Chapter, shall require a new stormwater management permit. The permit shall be issued following approval of the revised plan.

§206-26. Expiration and renewal.

- A. All stormwater management permits shall expire 12 months from the date of issuance unless construction is commenced prior to this date or an extension of time is approved.
- B. All extension requests must be submitted in writing to the Office of Code Enforcement at least sixty (60) days prior to permit expiration.
- C. A stormwater management permit shall not expire while a request for an extension is pending.

- D. 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.
- E. 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.
- F. 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.

§206-27. Suspension and revocation.

- A. Any stormwater management permit issued under this Chapter may be suspended or revoked by the Office of Code Enforcement for:
 - 1. Noncompliance with or failure to implement any provision of the permit;
 - 2. A violation of any provision of this Chapter or any other applicable law, ordinance, rule or regulation relating to the project;
 - 3. 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.
- B. A suspended stormwater management permit shall be reinstated by the Office of Code Enforcement when:
 - 1. 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
 - 2. The Office of Code Enforcement is satisfied that the violation of the ordinance, law, or rule and regulation has been corrected.
- C. 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.

ARTICLE V
Administration

§206-28. Schedule of inspections

- A. Prior to approval of the stormwater management plan, 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 as described in Section 206-15 and therefore exempt from the inspection provisions, must nonetheless manage stormwater in a manner specified in the other provisions of this Chapter.

- B. The Township Engineer shall inspect all phases of development of the site including, but not limited to:
 - 1. Completion of preliminary site preparation includes stripping of vegetation, stockpiling of topsoil and construction of temporary stormwater management and erosion control facilities.
 - 2. Completion of rough grading, but prior to placing top soil, permanent drainage or other site development improvements and ground covers.
 - 3. Construction of the permanent stormwater facilities at such times as specified by the Township Engineer.
 - 4. Completion of permanent stormwater management facilities, including established ground covers and plantings.
 - 5. Completion of any final grading, vegetative control measures or other site restoration work done in accordance with the approved stormwater management plan and permit.
 - 6. 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 proceeding stage has been inspected and approved by the Township Engineer.

- D. It is the responsibility of the developer 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 developer within 15 days. 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 Section 206-19 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 provision, the Township Engineer will refer these violations to the Montgomery County Conservation District.
- H. When the developer 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 mail a copy of the report to the developer by certified or registered mail. The report shall be made and mailed within 5 days after final inspection by the Township Engineer
- I. Following final inspection, the developer 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.

§206-29. Financial and maintenance guarantees.

A. Performance guarantees.

Financial security shall be provided by the developer as a performance guarantee for stormwater management control facilities in accordance with improvement guarantee provisions outlined in section 509 of the Municipalities Planning Code or any amendment thereto.

B. Maintenance Responsibility and Guarantees.

- 1. The maintenance responsibilities for permanent stormwater runoff control facilities shall be determined based upon the type of ownership of the property that is controlled by the facilities.

- (a) **Single-Entity Ownership**-Where the permanent stormwater runoff control facilities are designed to manage runoff from property in a single entity ownership, the maintenance responsibility for the stormwater control 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 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 guarantees, as follows:
- (1) **Construction Maintenance Bond** - The Board of Commissioners may require the posting of a maintenance bond to secure the structural integrity of said facilities as well as the 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 guarantee provisions in the Municipalities Planning Code or any amendment thereto, and the amount of the financial security shall not exceed 10 percent 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) **Long-term Maintenance Bond** - The long-term maintenance bond shall be in an amount equal to the present worth of maintenance of the facilities for a 10-year period. The estimated annual maintenance cost for the facilities shall be based on a fee schedule provided by the Township Engineer and adopted by the Board of Commissioners. The fee schedule must be reasonable. A cash contribution can be used in lieu of the long-term maintenance bond, although the

contribution must be equivalent to the amount that would be estimated for the maintenance bond.

- (3) Documentation - The terms of the maintenance guarantees shall be documented as part of the stormwater management plan as per Section 206-17 of this Chapter.

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 control 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 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) Multi-Entity Ownership - In cases where property is in multiple ownership (i.e., many individual ownership's of 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 report of 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 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 relive 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.

§206-30. Right-of-entry.

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

§206-31. Notification.

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 thereunder, 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 contained in the subdivision and land development Chapter, where applicable.

§206-32. Public nuisance.

- A. Any violation of any provision of this Chapter is deemed a public nuisance.
- B. Each day that a violation of any provision continues constitutes a separate violation.

§206-33. Penalties.

Anyone violating the provisions of this Chapter, or who shall fail to comply with any written notice from the township which 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 Six Hundred Dollars (\$600) plus all court costs, including reasonable attorney fees incurred by the township as a result thereof.

No judgment shall commence or be imposed, levied or payable until the date of the determination of a violation by the district justice.

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.

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.

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

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.

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.

§206-34. Appeals.

All appeals from actions taken relative to Regulated Activities shall be governed by the applicable section of the Municipalities Planning Code.

ARTICLE VI
Schedules for Design and Construction Standards

§206-35. Schedule I: General performance standards.

Measures used to collect and carry stormwater on any site shall be designed to meet the following minimum performance standards.

- A. Prevent erosion damage and satisfactorily carry-off or detain and control the rate of release of surface waters.
- B. When subsurface soil conditions are suitable, require runoff control measures to percolate

the stormwater into the ground to aid in the recharge of ground waters, and the preservation of baseflow.

- C. Carry surface water to the nearest adequate street, storm drain, detention basin, natural watercourse, or drainage facility.
- D. Take surface water from the bottom of vertical grades, to lead water away from springs, and collect water upgrade of all street intersections at the earliest or most efficient point.
- E. 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.
- F. 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 stream bank over-flow.
- G. Preserve the adequacy of existing culverts, and bridges by suppressing the new flood peaks created by the new earth disturbances.
- H. 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.
- I. All stormwater detention and retention facilities shall be in place and functioning prior to the creation of any impervious surface.
- J. When ever a water course, 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 Pennsylvania Department of Environmental Protection (DEP) and the Township Board of Commissioners.
- K. The existing points of natural drainage discharge onto adjacent property shall not be altered without the written approval and a drainage easement from the affected land owners.
- L. No storm water 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.

§206-36. 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. 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 2, 10, 50 and 100 year storms to the 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 1-, 2-, 10-, 50- and 100-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.
- (3) All calculations consistent with this Chapter using the soil cover complex method shall use the appropriate design rainfall depths for the various return period storms.
- (4) 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.
- (5) All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration for overland flow and return periods from NRCS Methodology. Time of concentration for overland flow (maximum 300 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 NRCS Methodology.
- (6) 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 orifice design as well as the submergence of the discharge pipe outlet.

- (7) 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 basin shall be designed to facilitate regular maintenance, mowing and periodic silt removal and reseeded. Shallow broad basins are preferred to steep sided basins.
- (2) The maximum slope of the earth and detention basin embankment shall be three-to-one (3:1) with the exception that any slope to be maintained by the Township shall be four-to-one (4:1). The top or toe of any slope shall be located a minimum of five (5) feet from a property line. Whenever possible the side slope and basin shape shall conform to the natural topography.
- (3) Unless permitted as a Conditional Use by the Zoning Hearing Board, detention basins shall not be located within 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 the detention basin berm shall be 10 ft. 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 3 feet deep, and have 1:1 side slopes.
- (8) In order to insure proper drainage on the basin bottom, a minimum grade of 2%, shall be maintained for sheet flow. Where a 2% slope cannot be maintained, low flow channels at a minimum grade of 1% constructed of concrete or other materials approved by the Township Engineer, shall be constructed between all basin inlets and the basin outlet.
- (9) All detention and retention basin embankments shall be placed in 8 inch maximum lifts to a minimum 95% dry density. 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 detention facilities to accommodate runoff in excess of design flows. Whenever possible, emergency spillway for the detention basins shall be constructed on undisturbed ground. Emergency spillways shall be constructed of concrete pavers, 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 erosion. The minimum capacity of all emergency spillways shall be the peak flow rate of the one-hundred (100) 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 (3) 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 (1) foot.
- (12) Anti-seep collars shall be installed around the pipe barrel within the normal saturation zone of the detention basin berms. The anti-seep collars and their connections to the pipe barrels shall be watertight. The anti-seep collars shall extend a minimum of two feet beyond the outside of the principle pipe barrel. The maximum spacing between collars shall

be fourteen (14) times the minimum projection of the collar measured perpendicular to the pipe. A minimum of two (2) anti-seep collars shall be installed on each outlet pipe.

- (13) All outlet pipes through the basin berm shall be reinforced concrete pipe, designed to withstand the loading caused by a fully saturated berm and shall have watertight joints using O-ring joint pipe. Outlet pipe 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 six (6) inches above the basin floor or lining so that it can adequately drain after rain storms. Inlet pipe(s) shall discharge to areas of the basin that slope toward the outlet structure.
- (15) Energy dissipaters and/or level spreaders shall be installed at points where pipes or drainage ways 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 U.S. Department of Transportation of 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.
- (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 (2) 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 (1) inch shall be spaced twelve (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 suitable coated to prevent corrosion. A trash rack or similar appurtenance shall

be provided to prevent debris from entering the pipe. All risers shall have concrete base attached with a watertight connect. The base shall be of sufficient weight to prevent flotation of the riser. An anti-vortex 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.
- (19) Any vegetated drainage channel requiring mowing of the vegetation shall have a maximum grade of three (3) horizontal to one (1) 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 Manual", published by the Pennsylvania Department of Environmental Protection.

§206-37. Schedule III: Stormwater conveyance system.

A. General

- (1) Storm sewers, culverts, bridges and related installations shall be provided:
 - (a) To 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) To insure adequate drainage of all low points along the line of streets; and
 - (c) To intercept stormwater run-off 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 PennDOT standards.

- (3) Drainage structures, which drain watershed areas in excess of one half square mile (320 acres), or which have a span of eight (8) feet or more, shall be designed for a maximum expected run-off as calculated using the Soil Conservation Service Technical Release 55 "Urban hydrology for Small Watersheds (less than 2000 acres)".
- (4) The design storm shall be a 100 year storm. A Water Obstruction Permit shall be obtained from the Pennsylvania Department of Environmental Protection for the waterway opening before final design is undertaken.
- (5) The cartway over the culvert or bridge shall be as wide as the ultimate width of the roadway approaches. Additional width may be required to provide sidewalk 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 ft./ft.
- (3) Minimum drop across junctions shall be 2 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) Run-off to proposed storm sewers and inlets shall be calculated using the rational method.
- (6) The time of concentration shall be assumed 5 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 assumed 5 minutes.
- (8) All storm sewer pipes shall be designed at a minimum to accommodate a minimum of a 10 year storm. Twenty-five (25) year storms shall be used as required by the township engineer.
- (9) All storm sewer pipes at inlets in sump condition shall be designed to accommodate the 50 year storm.
- (10) All storm sewer pipes and inlets intended to drain to detention facilities shall be

designed to accommodate the 100 year storm if the bypass or overflow run-off will not reach the basin by overland flow. In cases where the bypass or overflow run-off will flow over land, a stable swale shall be constructed to accommodate the excess run-off.

- (11) All inlets in sump condition shall be 6 foot inlets or dual 4 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 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 2 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 (25) 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 (25) year frequency storm of five (5) 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) The maximum encroachment of water on the roadway pavement shall not exceed

4 inches in depth at the curb during a twenty-five (25) year frequency storm of five (5) minute duration.

- (2) 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.

206-38 Schedule IV: Water quality and groundwater recharge BMP's.

In most natural watersheds in Pennsylvania, 50 percent or more of the annual rainfall infiltrates. A part of the infiltrated water volume will be returned to the atmosphere through evaporation or plant transpiration. The remainder will percolate to the water table from where it will replenish the groundwater supply or re-emerge as base flow (i.e., dry-weather discharges) to streams and wetlands. Development, which increases the proportion of runoff, poses a significant threat to the environmental resources of Pennsylvania's groundwater, streams, and wetlands. Therefore, attention is increasingly being turned to methods of increasing infiltration and groundwater recharge in developed areas.

All Storm water Management facilities shall be designed to satisfy the following requirements.

- A. All BMP's shall be provided with the capability to withstand the discharge associated with the 100-year return rainfall event, without failing or resulting in damage to downstream areas. Some non-detention BMP's may be designed to by-pass stormwater discharges which are in excess of the appropriate design storm. In this case, conveyance must be provided to transport the 100-year surcharge flow to a downstream BMP, natural watercourse, or storm drainage system inlet.
- B. 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.

- C. **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. The groundwater recharge design storm has the property that 60 percent of the annual rainfall will occur in storms of equal or smaller magnitude. Therefore, controlling runoff from the groundwater recharge design storm is the only requirement for preserving the overall water budget for the watershed.

For design of BMP's refer to the Pennsylvania Handbook of Best Management Practices for Developing Areas (1998)

Section 2. The Code of the Township of Upper Dublin, Chapter 212 thereof, entitled Subdivision and Land Development, Article II, Terminology, Section 212-5, "Definitions", shall be amended to include the following definition in alphabetical order:

§212-5. Definitions.

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.

Section 3. The Code of the Township of Upper Dublin, Chapter 212 thereof, entitled Subdivision and Land Development, Article VI, Plan Submission Requirements and Processing Procedures, Section 212-41 "Plans required for approval", shall be amended to read as follows:

§212-41. Plans required for approval.

Applicants shall be required to submit the following plans:

- E. A stormwater management plan shall be submitted, if required pursuant to Article IV of Chapter 206, Stormwater Management, in accordance with the provisions outlined therein.

Section 4. The Code of the Township of Upper Dublin, Chapter 255 thereof, entitled Zoning, Article I, General Provisions, Section 255-7 "Definitions", shall be amended by adding new definitions in alphabetical order to read as follows:

§255-7. Definitions.

FEMA - Federal Emergency Management Agency.

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

WATERCOURSE - A permanent stream, intermittent stream, river, brook, creek, channel, culvert or ditch conveying surface water, whether natural or man-made.

Section 5. The Code of the Township of Upper Dublin, Chapter 110 thereof, entitled Fees, shall be amended by adding a new Section 110-21, "Stormwater Management", to read as follows:

**Chapter 110
FEES**

§110-21. Stormwater Management.

In accordance with Chapter 206, Stormwater Management, the following fees shall be charged:

A. Plan review.

- (1) Sketch stormwater management plan for exempt activities pursuant to Section 206-16. (\$ 125.00).
- (2) Stormwater management plan for Regulated Activities pursuant to Section 206-5 (\$ 500.00).
- (3) Modified plan, resubmitted plan, or renewal of expired plan (\$ 150.00).

B. Stormwater management permit issuance (\$ 25.00).

C. Inspection charges.

- (1) Exempt activities. Inspection by the Township Engineer shall only occur if requested by the applicant or the Director of Code Enforcement.
- (2) Regulated activities. Inspection by the Township Engineer will occur as needed in accordance with the plan approval by the Board of Commissioners or the Director of Code Enforcement.

- (3) The inspection fees of the Township Engineer shall be billed to the permit applicant at the approved, standard hourly rate charged to the township by the Township Engineer.
- D. No permit to begin any work on the project shall be issued and no site work shall begin until the requisite plan review and permit fees have been paid. Inspection fees will be billed by the township according to its standard schedule. The township reserves the right to revoke any stormwater management permit for nonpayment of inspection fees.
- E. Modification of plans. If it is determined that an existing stormwater management plan shall be modified, a new stormwater management permit shall not be issued until any additional review or permit fees have been paid by the applicant.
- F. Renewal of expired plan. If an applicant requests the renewal of an expired plan, the application will not be approved nor a permit reissued until any additional review or fees have been paid by the applicant.

Section 6. The Code of the Township of Upper Dublin, Chapter 99 thereof, entitled Excavations, Section 99-12, "Excavations in steep slopes", shall be amended to read as follows:

§99-12. Excavations in steep slopes.

- A. No excavation shall be made with a cut face steeper in slope than one and three (3) horizontal to one (1) vertical.
- B. The Township Engineer may require an excavation to be made with a cut face flatter in slope than three (3) horizontal to one (1) vertical if he finds the material in which the excavation is to be made unusually subject to erosion, or if other conditions exist which make such flatter cut slope necessary for stability and safety.
- C. Excavations shall not extend below the angle of repose or natural slope of the soil under the nearest point of any footing or foundation of any building or structure unless such footing or foundation is first properly underpinned or protected against settlement.
- D. Before commencing any excavation which will in any way affect an adjoining property or structures thereon, the person making or causing the excavation to be made shall notify, in writing, the owners of adjoining buildings not less than thirty (30) days before such excavation is to be made that the excavation is to be made. Adjoining properties and structures shall be protected as in Chapter 73, Building Construction.

Section 7. The Code of the Township of Upper Dublin, Chapter 99 thereof, entitled Excavations, Section 99-13, "Filling standards", shall be amended to read as follows:

§99-13. Filling standards.

- A. No fill shall be made which creates any exposed surface steeper in slope than one and three (3) horizontal to one (1) vertical, except when a written statement from a civil engineer, licensed by the Commonwealth of Pennsylvania and experienced in erosion control, certifying that he has inspected the site and that the proposed deviation from the slope specified above will not endanger any property, or result in property damage, is submitted to and approved by the Township Engineer. In no case shall the slope be steeper than two (2) horizontal to one (1) vertical.
- B. The Township Engineer may require that the fill be constructed with an exposed surface flatter than three (3) horizontal to one (1) vertical if he finds that under the particular condition such flatter surface is necessary for stability and safety.

Section 8. The Code of the Township of Upper Dublin, Chapter 212 thereof, entitled Subdivision and Land Development, Article IV, Design Standards, Section 212-23, "Grading", shall be amended to read as follows:

§212-23. Grading.

- A. Topsoil preservation. No topsoil shall be removed from the site or used as spoil. Topsoil must be removed from the areas of construction and stored separately. Upon completion of the construction, the topsoil must be redistributed on the site uniformly. All areas of the site shall be stabilized by seeding or planting on slopes of less than ten percent (10%) and shall be stabilized by sodding on slopes ten percent (10%) or more and planted in ground cover on slopes of twenty percent (20%), provided that rip-rap shall be utilized for banks exceeding twenty-five percent (25%).
- B. Excavation and fill. No permanent excavation or fill shall be made with a face steeper in slope than three (3) horizontal to one (1) vertical, except under one (1) or more of the following conditions:
 - (1) The submission of a soils report to the Township Engineer stating that the material in which the excavation or fill is made is sufficiently stable to sustain a slope of steeper than three (3) horizontal to one (1) vertical. A qualified engineer, experienced in soil exploration, and licensed in the Commonwealth of Pennsylvania shall make the report.
 - (2) A concrete or stone masonry wall designed by a qualified engineer, licensed in the Commonwealth of Pennsylvania and approved by the Township Engineer is provided to support the face of the excavation.

- C. Fills shall not encroach on natural watercourses or constructed channels.
- D. Fills placed adjacent to natural watercourses or constructed channels shall have suitable protection against erosion during periods of flooding.
- E. Slopes and fences. The top or bottom edge of slopes shall be a minimum of five (5) feet from property or right-of-way lines of streets or alleys in order to permit the normal rounding of the edge without encroaching on the abutting property. All property lines [where walls or slopes are steeper than three (3) horizontal to one (1) vertical and five (5) feet or more in height] shall be protected by a chain link fence four (4) feet in height approved by the township. The fence shall be an integral part of the wall.
- F. Site grading plan. The Township Engineer shall require a grading plan in conjunction with the plan of subdivision or land development in order to ensure compliance with the above standards.

Section 9. The Code of the Township of Upper Dublin, Chapter 212 thereof, entitled Subdivision and Land Development, Article IV, Design Standards, Section 212-24, "Drainage", shall be amended to read as follows:

A. General provisions. All land development and subdivisions must be designed in conformance with the provisions set forth in the Township Code, Chapter 206, Stormwater Management.

B. Requirements.

- (1) When required. Storm drains and appurtenances shall be required to be constructed by the subdivider to take surface water from the bottom of vertical grades, the grades of which slope on both sides toward the bottom; to lead water away from springs; and to avoid excessive use of cross gutters at street intersections and elsewhere.
 - (a) All surface waters shall be enclosed in a storm drain.
 - (b) Open watercourses will be permitted where they exist naturally and where, in the opinion of the Township Engineer, they will not interfere with public convenience or safety but in fact will provide comparable or superior drainage capabilities of piped drainage.
- (2) Drainage. Drainage easements shall be required along natural watercourses to a minimum width of twenty-five (25) feet from the centerline and may be used for

storm and sanitary sewers and as open space. Where conditions warrant, such as in floodplains, additional width shall be required in such cases where runoff treatment requires a wider easement. Runoff studies must prove such requirements beyond the floodplain.

- (3) Dedication. Where stormwater or surface water will be gathered within the subdivision or land development and discharged or drained in volume over lands within or beyond the boundaries of the subdivision or land development in such a way to affect adjoining properties, the subdivider, developer or builder shall reserve or obtain easements over all lands affected. The easements shall be adequate for such discharge of drainage and for carrying off of such water and for the maintenance, repair and reconstruction of the same, including vehicles, machinery and other equipment for such purposes, and which shall be of sufficient width for such passage and work. The subdivider, developer or builder shall convey, at no cost, the easements to the township upon demand.

D. Design.

- (1) Computations and design. All computations and design shall be in accordance with the provisions set forth in the Township Code, Chapter 205, Stormwater Management.

Section 10. Nothing in this Ordinance or in the Code of the Township of Upper Dublin, as hereby amended, shall be construed to affect any suit or proceeding in any Court, any rights acquired or liability incurred, any permit issued, or any cause or causes of action existing under the said Chapter 206 prior to the adoption of this amendment.

Section 11. The provisions of this Ordinance are severable, and if any section, sentence, clause, part, or provision thereof shall be held illegal, invalid, or unconstitutional by any Court of competent jurisdiction, such decision of the court shall not affect or impair the remaining sections, sentences, clauses, parts, or provisions of this Ordinance. It is hereby declared to be the intent of the Board that this Ordinance would have been adopted as if such illegal, invalid, or unconstitutional section, sentence, clause, part, or provision had not been included herein.

Section 12. This Ordinance shall take effect and be in force from and after its approval as required by law.

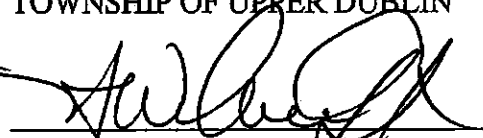
ENACTED AND ORDAINED this 14 day of July, 1998.

BOARD OF COMMISSIONERS OF THE
TOWNSHIP OF UPPER DUBLIN

ATTEST:



PAUL A. LEONARD, SECRETARY
ud/forms\hsrs6



H. WILLIAM GIFT, PRESIDENT

RUN-OFF CAPTURE WORKSHEET

FOR USE ONLY IN MINOR LAND DEVELOPMENTS, SMALL BUILDING ADDITIONS, DRIVEWAYS, PATIOS AND OTHER EXEMPT ACTIVITIES.

1. NEW IMPERVIOUS AREA _____ SQ. FT.

2. RUN-OFF CAPTURE STORAGE REQUIRED:

(a) _____ SQ. FT. \div 24 = (b) _____ CUBIC FEET OF CAPTURE VOLUME

3. SEEPAGE BED DESIGN:

_____ CUBIC FEET OF CAPTURE VOLUME REQUIRED (2b)

x 2.5 (TOTAL VOLUME/VOIDS FOR #4 BALLAST)

= CUBIC FEET OF SEEPAGE BED VOLUME.

4. TYPICAL DETAIL

- SEE ENGINEERING STANDARDS -

- APPENDIX A -

Table Runoff Capture Storage Requirement 24-hour 0.65-inch, Runoff Capture Storm				
Example Cover Type	Average Runoff Curve Number	Saturated Infiltration Rate (in./hr)	Runoff Capture Storage ^{1,2} (inches)	Runoff Capture Storage for D soils ³ (inches)
	< 70	> 0.95	0.00	0.00
Meadow or forest in C soils	70	0.95	0.00	0.00
	75	0.60	0.00	0.00
Grass cover in D soils	80	0.30	0.01	0.00
	85	0.18	0.04	0.03
	90	0.09	0.12	0.11
	95	0.045	0.28	0.27
Conventional pavement	98	<0.045	0.46	0.45
Impervious surfaces		0	0.65	0.64

¹ This volume must be captured and retained for infiltration.
² Computed using an initial abstraction of equal to 0.2 x S.
³ Applies only to surfaces directly underlain by soil of the "D" hydrologic soil group.

Note: Volume requirement, in cubic feet, is determined by multiplying surface area, in square feet, times the runoff capture storage, in inches (see last two columns of table), and dividing by 12. The volume requirement can be satisfied by combining storage provided in multiple or sequential measures.

The storage volumes of these facilities can be subtracted directly from the runoff capture storage computed in this procedure.

Compliance with the runoff capture requirement also can be demonstrated using a stormwater runoff simulation algorithm.