

SPRINGBROOK TOWNSHIP

STORMWATER MANAGEMENT ORDINANCE

JUNE, 1996

with Revisions to January, 2001

SPRINGBROOK TOWNSHIP

STORMWATER MANAGEMENT ORDINANCE

TABLE OF CONTENTS

	<u>PAGE</u>
ARTICLE I.....GENERAL PROVISIONS	
SECTION 101. STATEMENT OF FINDINGS	1
SECTION 102. PURPOSE	1
SECTION 103. STATUTORY AUTHORITY	2
SECTION 104. APPLICABILITY	2
SECTION 105. EXEMPTIONS	3
SECTION 106. REPEALER	3
SECTION 107. SEVERABILITY	4
SECTION 108. COMPATIBILITY WITH OTHER ORDINANCE REQUIREMENTS	4
ARTICLE II.....DEFINITIONS	5-9
ARTICLE III.....STORMWATER MANAGEMENT REQUIREMENTS	
SECTION 301. GENERAL REQUIREMENTS	10-12
SECTION 302. STORMWATER MANAGEMENT STUDY AREAS	12-13
SECTION 303. STORMWATER MANAGEMENT DISTRICT IMPLEMENTATION PROVISIONS	13-16
SECTION 304. CALCULATION METHODOLOGY	16-17
SECTION 305. DESIGN STANDARDS	17-23
ARTICLE IV.....DRAINAGE PLAN REQUIREMENTS	
SECTION 401. GENERAL REQUIREMENTS	24
SECTION 402. DRAINAGE PLAN CONTENTS	24-27
SECTION 403. PLAN SUBMISSION	27-28
SECTION 404. DRAINAGE PLAN REVIEW	28-29
SECTION 405. MODIFICATION OF PLANS	29
SECTION 406. HARDSHIP WAIVER PROCEDURE	29-30

	<u>PAGE</u>
ARTICLE V.....INSPECTIONS	
SECTION 501. SCHEDULE OF INSPECTIONS	31
SECTION 502. ENFORCEMENT	31
SECTION 503. ENFORCEMENT REMEDIES AND PENALTIES	31
ARTICLE VI.....FEES AND EXPENSES	
SECTION 601. GENERAL	32
SECTION 602. EXPENSES COVERED BY FEES	32
ARTICLE VII.....MAINTENANCE RESPONSIBILITIES	
SECTION 701. MAINTENANCE RESPONSIBILITIES	33-34
SECTION 702. RIGHT OF ENTRY	34
ARTICLE VIII.....ADOPTION	
SECTION 801. ADOPTION	35
SECTION 802. PUBLIC HEARING	35
SECTION 803. ADOPTION DATE	35

APPENDIX

- A. APPLICATION FORM
- B. TR-20 MODELING EFFORT - SECTION 4.6 SUPPLEMENT
- C. PRIORITY WATERSHED RUNOFF CURVE NUMBERS BY SUBAREA
- D. PRIORITY WATERSHED PEAK FLOW TABLES
- E. PRIORITY WATERSHED RELEASE RATES BY SUBAREA
- F. RUNOFF COEFFICIENTS TO BE UTILIZED FOR RATIONAL FORMULA
- G. CRITERIA FOR THE SELECTION OF MANNINGS "n" FOR SWALE DESIGN

STORMWATER MANAGEMENT ORDINANCE

ARTICLE I

GENERAL PROVISIONS

SECTION 101. STATEMENT OF FINDINGS

The Board of Supervisors of the Township of Springbrook finds that:

- A. Inadequate management of accelerated runoff of stormwater resulting from development throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to carry and control stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge, and threatens public health and safety.
- B. A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion, is fundamental to the public health, safety and welfare and the protection of the people of Springbrook Township and all the people of the Commonwealth, their resources and the environment.

SECTION 102. PURPOSE

The purpose of this Ordinance is to promote the public health, safety and welfare within the Lackawanna River Watershed by minimizing the damages described in Section 101(A) of this Ordinance by provisions designed to:

- A. Control accelerated runoff and erosion and sedimentation problems at their source by regulating activities which cause such problems.
- B. Utilize and preserve the desirable existing natural drainage systems.
- C. Encourage recharge of groundwater where appropriate.
- D. Maintain the existing flows and quality of streams and water courses in the Township of Springbrook and the Commonwealth.
- E. Preserve and restore the flood carrying capacity of streams.
- F. Provide for proper maintenance of all permanent stormwater management structures which are constructed in Springbrook Township.

SECTION 103. STATUTORY AUTHORITY

The Township of Springbrook is empowered to regulate these activities by the authority of the Act of October 4, 1978, P.L. 864(Act 167), the "Stormwater Management Act" and the Second Class Township Code.

SECTION 104. APPLICABILITY

This Ordinance shall only apply to those areas of the Township which are located within the Lackawanna River drainage basin as delineated on an official map available for inspection at the Township office. A map of the Lackawanna River Watershed is on file in the Township office.

Add the following two (2) sentences (ORD 98-3):

This Ordinance shall also apply to areas within the Township which are located outside the Lackawanna River drainage basin. Release Rate Criteria shall be in accordance with Section 302.B.2.

This Ordinance shall only apply to permanent stormwater management facilities constructed as part of any of the activities listed in this Section. Stormwater management and erosion and sedimentation control measures undertaken during construction which may involve non-permanent facilities are not regulated by this Ordinance but shall continue to be regulated under existing laws and ordinances.

This Ordinance contains only those stormwater runoff control criteria and standards which are necessary or desirable from a total watershed perspective. Additional stormwater management design criteria (i.e. inlet spacing, inlet type, collection system details, etc.) which represent sound engineering practice shall be determined by the Township Engineer.

The following activities are defined as Regulated Activities and shall be regulated by this Ordinance, except those which meet the waiver specifications presented in Section 406 hereof:

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

SECTION 105. EXEMPTIONS

Delete the following (Ord. 98-3)

~~In addition to those activities in Section 406 the following activities will be exempt from meeting the provisions of this Ordinance: private garages and other residentially related outbuildings other than garages; and, single family residential structures on individual lots which are not included in a subdivision or a land development application filed after the effective date of this Ordinance. Other Regulated Activities, except those defined in Section 104.E. and 104.F. hereof, may also be exempted subject to such a determination by the Township Engineer.~~

In addition to these activities in Section 406, the following activities will be exempt from meeting the provisions of this Ordinance:

- A. Private garages and other residentially related outbuildings other than garages;
- B. Single family residential structures on individual lots which are included in a subdivision or a land development filed before the effective date of this Ordinance, provided either of the following criteria are satisfied:
 - 1. Stormwater management controls and facilities provided by a centralized detention system adequately sized to accommodate the runoff generated by full buildout of the subdivision or land development.
 - 2. The absence of stormwater management controls, where upon written justification by the developer and review and concurrence of the Township Engineer, would not create adverse effects to downstream property owners or drainage structures.
- C. Single family residential structures built upon lots of five (5) acres or greater in size, where upon written justification by the Developer, and review and concurrence of the Township Engineer, would not create adverse effects upon downstream property owners or drainage structures.

Other Regulated Activities, except those defined in Section 104.E. and 104.F. hereof, may also be exempted subject to such a determination by the Township Engineer.

SECTION 106. REPEALER

Any ordinance of the Township of Springbrook inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

SECTION 107. SEVERABILITY

Should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

SECTION 108. COMPATIBILITY WITH OTHER ORDINANCE REQUIREMENTS

Approvals issued pursuant to this Ordinance 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

Cistern - An underground reservoir or tank for storing rainwater.

Conservation District - The Lackawanna County Conservation District

Culvert - A pipe, conduit or similar structure including appurtenant works which carries surface water.

DEP - The Pennsylvania Department of Environmental Protection (formerly the Pennsylvania Department of Environmental Resources (DER)).

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.

Detailed Study Area - Study areas outside of the Lackawanna River Boundaries themselves for which plans have been prepared previously by the United States Army Corps of Engineers and/or DER. Modeling for these areas was undertaken with the Penn State Runoff Model.

Detention Basin - A basin designed to retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Developer - A person, partnership, association, corporation or other entity, or any responsible person therein or agent thereof, that undertakes any Regulated Activity of this Ordinance.

Development Site - The specific tract of land for which a Regulated Activity is proposed.

Development Plan - A detailed narrative with related mapping outlining the proposed project along with the stormwater runoff measures proposed to comply with this ordinance.

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

Drainage Plan - The documentation of the proposed stormwater management controls, if any to be used for a given development site, the contents of which are established in Section 402

Erosion - The removal of soil particles by the action of water, wind ice, or other geological

agents.

Freeboard - The incremental depth in a stormwater management structure, provided as a safety factor of design, above that required to convey the design runoff event.

Governing Body - The Board of Supervisors of the Township of Springbrook.

Groundwater Recharge - Replenishment of existing natural underground water supplies.

Delete the following definition (Ord. 98-3)

~~**Impervious Surface**— A surface which prevents the percolation of water into the ground. This shall include any roof, parking or driveway areas and any new streets and sidewalks to be constructed. In addition, any areas which may be designed to initially be semi-pervious (e.g. gravel, crushed stone, etc. shall also be considered as impervious areas).~~

Replace with the following Impervious Surface definition (Ord. 98-3):

Impervious Surface - A surface which prevents the percolation of water into the ground. This shall include any roof, parking or driveway areas and any new streets or sidewalks to be constructed. Gravel or crushed stone shall not be considered impervious unless adequate stormwater control and handling facilities have been designed and approved to account for the conversion of these surfaces to a paved (i.e. impervious) surfaces.

Infiltration Structure - A structure designed to direct runoff into the ground, e.g. french drain, seepage pit or seepage trench.

Land Development - Any of the following activities: (i) the improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving: (a) a group of two or more 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 (b) the division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features; (ii) a subdivision of land.

LCRPC - The Lackawanna County Regional Planning Commission.

Mainstem (main channel) - Any Stream segment or other runoff conveyance facility used as a reach in the Lackawanna River hydrologic model.

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

Municipal Engineer - Person or firm engaged by the municipality to undertake engineering type reviews for projects within the municipal boundaries.

Municipal Planning Commission - That body charged with planning related functions on the municipal level as defined in Act 247, the Pennsylvania Municipalities Planning Code.

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

Penn State Runoff Model (calibrated) - The computer-based hydrologic modeling technique adapted to the Lackawanna River Watershed for the Act 167 Plan. The model has been "calibrated" to reflect actual recorded flow values by adjusting key model input parameters.

Rational Method - A method of peak runoff calculation using a standardized runoff coefficient (rational 'c'), acreage of tract and rainfall intensity determined by return period and by the time necessary for the entire tract to contribute runoff. The rational formula is stated as follows: $Q = ciA$, where "Q" is the calculated peak flow rate in cubic feet per second, "c" is the dimensionless runoff coefficient (see Appendix F), "i" is the rainfall intensity in inches per hour, and "A" is the area of the tract in acres.

Reach - Any of the natural or man-made runoff conveyance channels used for modeling purposes to connect the subareas and transport flows downstream.

Regulated Activities - Actions and proposed actions which impact upon proper management of stormwater runoff and which are governed by this Ordinance, as specified in Section 104.

Release Rate - The percentage of the predevelopment peak rate of runoff for a development site to which the post-development peak rate of runoff must be controlled to protect downstream areas.

Return Period - The average interval in years over which a storm event of a given magnitude can be expected to recur. For example, the twenty-five (25) year return period rainfall or runoff event would be expected to recur on the average once every twenty-five years.

Reviewing Agency - The Planning Commission of the Township of Springbrook is designated as the municipal entity empowered to review stormwater management plans, development site

plans, facilities, and maintenance agreements, and to make recommendations thereon to the Board of Supervisors pursuant to the Township's Subdivision and Land Development Ordinance.

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

SCS - Soil Conservation Service, U.S. Department of Agriculture.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar material and into which surface water is directed for infiltration into the ground.

Soil-Cover-Complex Method - A method of runoff computation developed by SCS which is based upon relating soil type and land use/cover to a runoff parameter called a Curve Number.

Storage Indication Method - A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage for a given time interval) and based on outflow being a unique function of storage volume.

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

Stormwater Management Plan - The plan for managing stormwater runoff adopted by Lackawanna County and the Township of Springbrook for the Lackawanna River Watershed as required by the Act of October 4, 1978, P.L. 864, (Act 167), and known as the "Stormwater Management Act".

Stream - A watercourse.

Subarea - The smallest unit of watershed breakdown for hydrologic modeling purposes for which the runoff control criteria have been established in the Stormwater Management Plan.

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

Subwatershed - A segment or portion of the larger watershed encompassing a tributary or tributaries to the Lackawanna River.

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

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

Any term not defined in this Section shall be defined within the latest edition of "Webster's New Collegiate Dictionary".

ARTICLE III

STORMWATER MANAGEMENT REQUIREMENTS

SECTION 301. GENERAL REQUIREMENTS

- A. In order to provide more suitable sites for building and other uses, prevent adverse impact to properties adjoining and downstream of all proposed projects, and control erosion, the following requirements shall be met, and the project narrative, calculations, etc. shall be presented in an indexed three ring binder which delineates and describes each section.
- 1) For all subdivisions and land development proposals, a stormwater management plan is required in accordance with the Township's Stormwater Management Ordinance, showing all drainage within the watershed affecting the subject property and the erosion and sediment control procedures and facilities to be utilized.
 - 2) All land areas shall be graded to secure proper drainage away from buildings and to prevent the collection of stormwater in uncontrolled pools. Drainage provisions shall be of such design as to carry surface waters to the nearest practical and adequate street, storm drain, or natural water course. Developers must carry surface waters to the nearest practical storm drain or natural water course. The developer shall construct and/or install such drainage structures and/or pipes as required by the Springbrook Township Stormwater Management Ordinance and other applicable regulations to prevent erosion, damage, siltation and to satisfactorily carry off surface waters; such determination of adequacy by the Municipal Engineer shall be made, in part, on the basis of plans, specifications, and run-off tabulation to be submitted by the developer; such plans, specifications and calculations shall be prepared by the developer's engineer. Generally, the proposed rate of uncontrolled stormwater runoff from any subdivision or land development after full development shall not exceed the uncontrolled runoff prior to development; provided, however, that some areas may be candidates for direct discharge as set forth in the Stormwater Management Ordinance.
- B. Storm drainage systems shall be provided in order to permit unimpeded flow of natural watercourses except as modified by stormwater detention facilities or open channels consistent with this Ordinance.

- C. The existing points of concentrated drainage discharge onto adjacent property shall not be altered without written consent of the affected property owner(s), nor shall there be any increase in peak flow onto adjacent property without the written consent of the affected property owner(s). In the event that the above consent cannot be obtained, the Township may approve alteration of concentrated drainage discharge upon the posting of an appropriate bond, as determined by the Township Engineer, to indemnify the Township against any drainage claims by affected property owners.
- D. Areas of existing diffused drainage discharge onto adjacent property shall be managed such that, at minimum, the peak diffused flow does not increase in the general direction of discharge, except as otherwise provided in this Ordinance. If diffused flow is proposed to be concentrated and discharged onto adjacent property, the developer must document that there are adequate downstream conveyance facilities to safely transport the concentrated discharge or otherwise prove that no harm will result from the concentrated discharge. Areas of existing diffused drainage discharge shall be subject to any applicable release rate criteria in the general direction of existing discharge whether they are proposed to be concentrated or maintained as diffused drainage areas.
- E. Where a subdivision or land development is traversed by watercourses other than permanent streams, there shall be provided a drainage easement conforming substantially with the line of such watercourse. The width of the easement shall be adequate to provide for unimpeded flow of storm runoff based on calculations made in conformance with Section 304 for the 100-year return period runoff and to provide a freeboard allowance of one-half (0.5) foot above the design water surface level. The terms of the easement shall prohibit excavation, the placing of fill or structures, and any alterations which may adversely affect the flow of stormwater within any portion of the easement. Also, periodic maintenance of the easement to ensure proper runoff conveyance shall be required.
- F. Any drainage facilities required by this Ordinance that are located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation.
- G. When it can be shown that, due to topographic conditions, natural drainage swales on the site cannot adequately provide for drainage, open or closed channels may be constructed conforming substantially to the line and grade of such natural drainage swales. Capacities of open channels shall be calculated using the Manning equation.
- H. Storm drainage facilities and appurtenances shall be so designed and provided as to minimize erosion in watercourse channels and at all points of discharge.

- I. Consideration should be given to the design and use of volume controls for stormwater management, where geology permits.

SECTION 302. STORMWATER MANAGEMENT STUDY AREAS

- A. Mapping of Stormwater Management Detail Study Areas - In order to implement the provisions of the Lackawanna River Stormwater Management Plan, the Lackawanna River Watershed has been divided into 9 Detailed Study Areas (Subareas) consistent with the Lackawanna River Watershed Map presented in the Plan. The boundaries of the Subareas cross individual municipal boundaries as shown on the official map which is available for inspection in the Township offices. The requirements of this ordinance shall apply to both the "detailed study areas" and the "approximate study areas" delineated in the Township.
- B. Determination of Applicable Release Rate - All areas of the Lackawanna River watershed are subject to a release rate control/criteria. The release rate criteria only applies to the 100-year storm event. Additional control requirements for the mean-annual and 25-year events are post-to-predevelopment control as defined in Section 303.A. All portions of the watershed outside the nine detailed study areas have a release rate of 100 percent of post-to-predevelopment control, but remain subject to municipal approval as discussed in #3 below. These areas are designated on Plate 4 as areas numbered 10. Prior to proceeding with preparation of stormwater control calculations or drainage plans preparation, the plan preparer/developer should first determine the release rate as follows:
 1. Locate the proposed development property using Plate 4 of "The Plan".
 2. If the site is located within Area 10 and not near the border of detailed study areas 1 through 9, the applied release rate is to be 100 percent.
 3. If the site is located within Area 10 on Plate 4, the municipality must be contacted to verify that the release rate is 100 percent. Springbrook Township has portions of priority areas (subwatersheds 1 through 9) and non-priority areas (area 10) within their borders.
 4. If the site as identified from the maps is located near the border of a detailed subwatershed, its location shall be verified by the associated detailed study area map on file in the Township offices. Upon verification, the release rate shall be determined by #3 above or #5 below.

5. If the site is located within a detailed subwatershed 1 through 9, the exact site location shall be determined and drawn on the appropriate map. All subareas and their release rates which overlap the site shall be identified from the study area map and the tables in Appendix E hereof. The map and release rate identification should be confirmed by the municipality's engineer. A copy of the site location on the section of the subarea map shall be included as part of the drainage plan submission.

Once the release rate is defined and confirmed, stormwater analysis and design of control measures can proceed in accordance with the plan.

SECTION 303. STORMWATER MANAGEMENT DISTRICT IMPLEMENTATION PROVISIONS

- A. Any stormwater management controls required by this Ordinance and subject to release rate criteria shall meet the applicable release rate criteria, consistent with the calculation methodology specified in Section 304, as follows:
 1. Infill type developments (i.e., up to two single-family homes), or new driveways, additions or impervious surfaces less than 2,000 square feet total are to incorporate infiltration of the first 1.5 inches of runoff (i.e., one-half of the mean annual event) from impervious surfaces. At a minimum, infiltration facilities design/overflow capacity should be for the 10-year event. Post-to-pre flow control should be provided for the design capacity of the receiving storm sewer systems, but in no case less than the 10-year storm event.
 2. Unless qualified under #1 above, or where infiltration is not feasible, based on demonstration of site constraints and approved by the reviewing agency, the base design criteria shall be post-to-pre control of the mean annual and 25-year event is required. In addition, the 10-year event shall be routed through the proposed facility and routing calculation provided to the reviewing agency. The Township Engineer reserves the right to require additional controls in areas of flooding concern. 100-year control with applied release rates as determined by the procedures of Section 302 B is required in addition to the previous requirements.
- B. The exact location of the Stormwater Management Detailed Area boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours provided as part of the Drainage Plan (Refer to subarea maps on file in the Township offices). The Area boundaries as originally drawn coincide with topographic divides or, in certain instances, are drawn from the

intersection of the watercourse and a physical feature (such as the confluence with another watercourse or a potential flow obstruction e.g. road, culvert, bridge, etc.) to the topographic divide consistent with topography.

- C. Any downstream capacity analysis conducted in accordance with this Ordinance shall use the following criteria for determining adequacy for accepting increased peak flow rates:
1. Natural or man-made channels or swales must be able to convey the increased runoff associated with a 2 year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DER Soil Erosion and Sedimentation Control Manual (February, 1985).
 2. Natural or man-made channels or swales must be able to convey the increased 25-year return period runoff peak within their banks or otherwise not create any hazard to persons or property.
 3. Culverts, bridges, storm sewers or any other facilities which pass or convey flows from the tributary area must have sufficient capacity to pass or convey the increased flows associated with the 25-year return period runoff event, except for facilities located within a designated floodplain area which must be capable of passing or conveying the 100-year return period runoff. Any facilities which constitute stream enclosures per DER's Chapter 105 regulations shall be designed in accordance with the requirements of Chapter 105. Identified natural watercourses (streams, creeks) other than those regulated by DER which have continuous flow shall remain open and shall not be piped or covered unless required by the Governing Body of the Municipality upon recommendation of the Municipal Engineer.
- D. For a proposed development site located within only one release rate category area, the total runoff from the site shall meet the applicable release rate criteria. For development sites with multiple points of concentrated runoff discharge, individual drainage points may be designed for up to a 100% release rate so long as the total runoff from the site is controlled to the applicable release rate. This requirements shall also be subject to the provisions of Sections 301.C. and 301.D. hereof.
- E. For a proposed development site located within two or more release rate category areas, the maximum peak rate of runoff that may be discharged at any point is limited to the predevelopment peak rate of runoff at that point multiplied by the applicable release rate. The control rates shall apply regardless of any grading modifications

which may change the drainage area which discharges at a given point.

- F. For proposed development sites located partially within a release rate category area and partially within a provisional no detention area, in no event shall a significant portion of the site area subject to the release rate control be drained to the discharge point(s) located in the no detention area.

- G. Regional or Sub-Regional Detention Alternatives - For certain areas within the watershed, it may be more cost-effective to provide one control facility for an entire subarea, group of subareas, or portion of a subarea incorporating more than one development site than to provide an individual control facility for each development site. The initiative and funding for any regional or sub-regional runoff control alternatives are the responsibility of prospective developers. The design of any regional control basins must incorporate reasonable development of the entire upstream watershed. The peak outflow of a regional basin would be determined on a case-by-case basis using the hydrologic model of the watershed consistent with protection of the downstream watershed areas. "Hydrologic model" refers to the calibrated Lackawanna River version of the Penn State Runoff Model as developed for the Stormwater Management Plan.

The runoff from any proposed development shall be subject to evaluation which includes the anticipated runoff from other existing or proposed developments within the same watershed. Stormwater management facilities designed to serve more than one (1) property, or development, in the same watershed are encouraged in which case consultation with the Municipal Engineer is required prior to design.

The Township will be willing to consider provisions of joint detention facilities which will fulfill the requirements of this regulation. In such cases, a properly planned staged program of detention facilities may be approved by the Township in which compliance with some requirements may be postponed at early stages, while preliminary phases are being undertaken. This shall pertain to stormwater management only and not erosion and sedimentation pollution control.

- H. Capacity Improvements - In certain instances, primarily within the provisional no detention areas, local drainage conditions may dictate more stringent levels of runoff control than those based upon protection of the entire watershed. In these instances, if the developer could prove that it would be feasible to provide capacity improvements to relieve the capacity deficiency in the local drainage network, then capacity improvements could be provided by the developer in lieu of runoff controls on the development site. Any capacity improvements would be designed based upon development of all areas tributary to the proposed improvements and the capacity

criteria specified in Section 303.C. In addition, all new development upstream of a proposed capacity improvement shall be assumed to implement the applicable runoff controls consistent with this Ordinance except that all new development within the subarea(s) where the proposed development site is located shall be assumed to implement the developer's proposed discharge control, if any.

Capacity improvements may also be provided as necessary to implement any regional or subregional detention alternatives or to implement a modified "no harm" option which proposes specific capacity improvements to document the validity of a less stringent discharge control which would not create any harm downstream.

SECTION 304. CALCULATION METHODOLOGY

- A. Stormwater runoff from all development sites shall be calculated using a method acceptable to the review agency, either the Rational Method or a Soil-covered Complex Methodology.
- B. The design of any detention basin intended to meet the requirements of this Ordinance shall be verified by routing the design storm hydrograph through the proposed basin. For basins designed using the modified rational method technique, the detention volume shall, at minimum, equal the volume derived from the approximate routing process as contained in SCS Technical Release Number 55 (TR55, 1986), Chapter 6 (Figure 6-1).
- C. Stormwater runoff by methods other than the Rational Methods or TR-55 (i.e., 24 hour storm duration) shall be calculated utilizing the Penn State Runoff Model (PSRM) computer program. The proposed storm duration shall be specified or approved by the Township Engineer prior to submittal of the stormwater plans and reports.
- D. All calculations using the soil-cover-complex method shall use the Soil Conservation Service Type II 24-hour rainfall distribution. The 24-hour rainfall depths for the various return period to be used consistent with this Ordinance are taken from the PennDOT Intensity - Duration - Frequency Field Manual (May 1986).
- E. All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration and return periods and the Intensity - Duration - Frequency Curves as presented in:

Commonwealth of Pennsylvania
Department of Transportation
Design Manual, Part 2
Highway Design
Chapter 12

- F. Runoff Curve Numbers (CN's) to be used in the soil-cover-complex method shall be based upon the matrix presented in Appendix C.
- G. Runoff coefficients for use in the Rational Method shall be based upon the table presented in Appendix F.

SECTION 305. DESIGN STANDARDS

- A. The following standards shall be required as a minimum unless otherwise approved by the Governing Body of the Municipality upon recommendation of the Municipal Engineer.
- B. Design Features. Materials and methods of construction for all storm drainage facilities shall conform with all applicable Pennsylvania Department of Transportation Specifications. This requirement shall be the obligation of the parties who shall erect structures on any parcel within the subdivision/development. The developer shall include such requirement in the sales contract and in the deed restrictions.
- C. Unnatural Drainage. Wherever construction stops or concentrates the natural flow of storm drainage in such a way as to affect adjoining properties, approval of the owners shall be obtained in writing and a copy filed with the Township Secretary. Approval of plans by the Municipality does not authorize or sanction drainage affecting adjoining properties.
- D. Drainage from Non-Natural Sources. Water originating from other than natural sources, such as air-conditioning units, swimming pools, sump pumps, or other dry weather flow, wherever practicable, shall be discharged into natural watercourses on the property, or into the storm drainage system. These facilities shall not discharge water directly on to a road surface. No such discharge shall have an adverse impact on the use of such roadway. No discharge of toxic drainage will be permitted. This requirement shall be the obligation of the parties who shall erect structures on any parcel within the subdivision/development. The subdivider/developer shall include such requirement in the sales contract and in the deed restrictions.

- E. Design Flow Rate. The storm drain system shall be designed to carry a twenty five (25) year peak flow rate. The design twenty five (25) year peak flow rate into each inlet shall be indicated on the stormwater drainage plan. The 25 year flow rate shall be determined by the rational formula, $Q = CIA$. Alternative runoff calculation methodologies as set forth in the Ordinance may also be used where appropriate.

Appropriate values for the runoff coefficient can be found in Appendix F.

- F. Where applicable, the stormwater drainage system shall be designed consistent with the provisions of PA DEP Chapter 105 Rules and Regulations.

- G. Detention Facilities: All stormwater detention facilities shall be designed based on the following criteria. Due to the uniqueness of each stormwater detention basin and the variability of soil and other site conditions, these criteria may be modified or deleted at the discretion of the Township Engineer where warranted.

1. The basin is to be sodded or topsoiled and seeded, including the bottom, side slopes and all earthen dams and embankments. The use of "low maintenance" seeding specifications is strongly encouraged.
2. Suitable lining shall be required to all points of inflow to the basin where erosion and scour may occur.
3. An easement to allow maintenance crews to access the basin shall be established. The easement shall be of sufficient size to encompass the entire water surface ponding area, embankments, and outlet structure and shall be connected to a public right-of-way.
4. The design dimensions of the detention basin shall be maintained throughout construction unless it is to be used as a sedimentation basin during construction in the watershed. If so, it shall be immediately returned to design dimensions following the completion of such construction. If used as a temporary sedimentation basin, it shall be designed based upon DER standards for sedimentation basins.
5. Runoff from areas uphill or upstream from the development site may be passed across the development site without detention or storage. If it is more convenient, part or all of such water may be passed through the detention means described above, and an equal amount of water that originates on the site may be passed downhill or downstream. If any such upstream water enters

a detention structure, the amount of detention provided shall be increased accordingly.

6. The inlet and outlets for the basin should be located at the opposite ends of the basin if possible. The basin shall have a minimum bottom slope of one (1%) percent towards the primary outlet to assure positive drainage. Low flow channels may be required to convey small inflows to the basin outlet.
7. Side slopes shall be a maximum of three feet horizontal to one foot vertical (3:1), unless the design slopes are less than three (3) feet deep, in which case four to one (4:1) side slopes are required. The design engineer may propose steeper sideslopes if justifiable evidence is submitted.

Delete the following Section 305 (G) (8): (Ord. 2001-1)

- ~~8. Basins greater than three (3) feet deep shall be fenced the entire perimeter to keep out children. A basin less than three (3) feet deep may have three to one (3:1) sideslopes if fencing is provided. A gate shall be installed to allow access to the basin for maintenance.~~

Replace with the following Section 305 (G) (8): (Ord. 2001-1)

8. Basins shall be fenced around the entire perimeter to keep out children and unauthorized entry. Fences shall be a minimum of five (5) feet in height at all points and shall be constructed of chain link or close spaced mesh. A gate a minimum of twelve (12) feet in width shall be installed to allow access to the basin for maintenance. The gate shall be provided with a lock and keys provided to the Township.
9. The runoff entering the basin will result in the accumulation of sediment. Provision must be made for periodic removal of accumulated solid materials.
10. Responsibility for operation and maintenance of detention facilities installed, including periodic removal of accumulated materials, unless assumed by a governmental agency, shall remain with the owner of the property and shall be passed to any successor owner. In the case of development where lots are to be sold, permanent arrangements satisfactory to the Township Engineer and the Township Solicitor shall be made to ensure continued performance of these obligations.

11. In many instances, the provisions of separate detention facilities for a number of single sites may be more expensive and more difficult to maintain than provision of joint facilities for a number of sites.
12. All stormwater detention facilities shall provide a minimum of 1.0 foot freeboard above the maximum pool elevation associated with the 2-through 25-year runoff events. An emergency spillway shall be designed to pass the 100-year runoff event with a minimum 0.5 foot freeboard.
13. If the flow from the basin is proposed to be concentrated and discharged onto adjacent property, the developer must document that there are adequate downstream conveyance facilities to safely transport the concentrated discharge or otherwise prove that no harm will result from the concentrated discharge in accordance with Section 301.D.. Written permission from the adjacent landowner shall be obtained explaining that they understand the situation and will allow discharge onto their property.
14. Maximum velocities in emergency spillways shall be determined based on the velocity of the peak flow in the spillway resulting from the routed emergency spillway hydrograph. Where maximum velocities exceed those contained in the latest Pennsylvania DER Sedimentation and Erosion Control Manual, suitable lining shall be provided.

15. The minimum top width of all basin embankments shall be as follows:

<u>Height, Feet</u>	<u>Top Width, Feet</u>
0-2	2
2-4	4
4-6	6

16. All detention basin routings will be performed using acceptable routing methods. Selected time increments will be of short enough duration to allow reasonable approximation of the inflow hydrograph.
17. Safety ledges shall be constructed on the side slopes of all detention basins having a permanent pool of water. The ledges shall be four (4) to six (6) feet in width and located approximately two and one-half (2 1/2) to three (3) feet below and one (1) to one and one-half (1 1/2) feet above the permanent water surface. Side slopes shall conform to subsections (7) and (8) above.
18. Where the project consists of more than one phase, the stormwater controls shall be designed so that the rate of runoff for the ultimate build-out condition

is consistent with the release rate specified in the plan. The outlet structure may have to be modified for the first phase. The stormwater detention basin shall be constructed prior to the construction of the first phase.

19. Any detention basin, or other structure, intended to meet the requirements of this Ordinance which require a Dam Safety Permit from DER shall be designed consistent with the provisions of the Dam Safety and Encroachments Act and the DER Chapter 105 Rules and Regulations.

H. Manholes. Manholes shall be constructed at all changes in horizontal or vertical alignment; shall be spaced not more than three hundred (300) feet apart on pipe of twenty-four(24) inches internal diameter or less, and not more than five hundred (500) feet apart where larger sizes are installed. Inlets may be substituted for manholes where they will serve a useful purpose. Frame and grate assemblies shall have a minimum diameter of 30 inches.

I. Inlets. Inlet spacing shall be so arranged that ninety-five (95%) percent of the gutter flow will be captured. Inlets at street intersections shall be placed on the tangent and not on the curved portions. The gutter adjacent to and immediately upgrade from the inlet shall be so warped as to direct the water into the inlet. Calculations of inlet capture and bypass flows shall be performed in accordance with the procedures outlined in HEC-12, Drainage of Highway Pavements. Calculations shall be submitted for inlets along curb lines.

J. Castings. Manhole and inlet castings, together with their covers or gratings shall conform to the Standards of the Pennsylvania Department of Transportation as may be in effect at the time the design is submitted. Grates shall be "bicycle safe" design.

K. STORM PIPES

1. Location. Wherever practicable, storm drains shall be located within the right-of-way of the street; they shall be protected by a cover of at least eighteen (18) inches.

2. Size and Grade. Storm drains shall have a minimum internal diameter of fifteen (15) inches and a minimum grade of 0.5 percent (1/2 of 1%) unless otherwise approved by the Municipal Engineer.

3. Match Crowns. The crowns of all pipes tying into an inlet or manhole shall be set at equal elevations.

4. Diversion of Runoff. All storm drain pipes shall be designed to carry the runoff into a detention basin or similar facility utilized to control the rate of runoff.
5. Stormwater Roof Drains. Stormwater roof drains and pipes shall not discharge water directly onto a road surface or road right-of-way. Where storm drains are accessible, the roof drain shall be connected thereto. This requirement shall be the obligation of the parties who shall erect structures on any parcel within the subdivision/development. The subdivider/developer shall include such requirement in the sales contract and in the deed restrictions.
6. Stormwater discharge shall be carried by conduit to prevent excessive surface flow on or across streets, sidewalks, drives, parking areas, and any other paved surface or traveled way. Culverts or bridges shall be required at all stream crossings of any street or road-way using design criteria for a twenty-five-year peak flow rate; provided, however, that where bridges are constructed, the design criteria shall be for a fifty-year peak flow rate. Natural swales or open drains shall be used only where there is no danger to structures or abutting property.
7. Pipe Capacity. The capacity of all pipe culverts shall, as a minimum, provide the required carrying capacity as determined by the following sources:

United States Department of Commerce
Bureau of Public Roads
Hydraulic Engineering Circular No. 5
Hydraulic Charts for the Selection of Highway Culverts and
Hydraulic Engineering Circular No. 10
Capacity Charts for the Hydraulic Design of Highway Culverts

8. Pipes discharging to swales or natural watercourses shall be provided with end sections. Rock apron protection shall be provided and designed in accordance with PA DEP Chapter 102 guidelines.

L. SWALES

1. The Manning equation shall be used to calculate the capacity of watercourses. Manning "n" values used in the calculation shall be based upon lining, depth, velocity and hydraulic properties in accordance with the information contained in Appendix G.

2. The depth of the swales shall be increased for freeboard requirements as determined by the procedures outlined in PA DEP Chapter 102.
3. When open drainage ways are used for the disposal of stormwater, The Planning Commission shall review the following:
 - (a) Safety - steep banks and deep pools shall be avoided.
 - (b) Erosion - adequate measures shall be taken, such as seeding, sodding, paving, or other measures as necessary to prevent erosion of banks and the scouring of the channel bottom.
 - (c) Stagnation - design of open drainage ways shall not create stagnant pools or swampy areas.
4. Provision shall be made in the design of new swales so that subsequently installed pipes for driveways shall not alter or impede the performance of the swales.
5. A water surface profile study shall be performed in accordance with the U.S. Army Corps of Engineers HEC-2 procedures and submitted for review, when, upon recommendation of the Township Engineer and approved by the Governing Body of the Municipality, such study is determined to be required.

ARTICLE IV

DRAINAGE PLAN REQUIREMENTS

SECTION 401. GENERAL REQUIREMENTS

Except as otherwise provided in Sections 105 and 406 hereof, for any of the Regulated Activities of this Ordinance, prior to the issuance of any permit, or the commencement of any land disturbance activity, the owner, subdivider, developer or his agent shall submit a Drainage Plan for approval. Where such activity is subject to review and approval under the Township's Subdivision and Land Development Ordinance, such Drainage Plan shall be submitted as part of the Preliminary Application.

SECTION 402. DRAINAGE PLAN CONTENTS

- A. The Storm Drainage Plan shall be prepared by a Professional Engineer licensed to practice engineering in the Commonwealth of Pennsylvania. The plan shall consist of three (3) parts:
 - 1. PART I - A narrative report for the review of proposed site plans, conditional uses, subdivisions, and zoning district amendments. The narrative report shall be a general statement of the project giving the purpose and engineering assumptions and calculations for control measures and facilities. The following information shall be included:
 - a) Completed application form.
 - b) Written description of the project.
 - c) Written description of accelerated runoff control plan.
 - d) Written description of erosion and sedimentation control plan.
 - e) Expected project time schedule, including anticipated start and completion dates, staging schedule.
 - f) Project's stormwater district, location, and watershed characteristics.
 - g) On-site detention methods.
 - h) Hydraulic and hydrologic calculations, assumptions, criteria, methodology and basis of design.
 - i) Maintenance Program - A maintenance program for all stormwater management control facilities must be included. This program must include the proposed ownership of the control facilities, the maintenance requirements for the facilities, and the financial responsibilities for the required maintenance.

2. Preliminary Plans - A comprehensive plan, in preliminary form (or in combined preliminary and final form), designed to safely handle the stormwater runoff, detain the increased stormwater runoff, and control erosion and sedimentation. The plan shall provide, and be accompanied by, maps or other descriptive material indicating the feasibility of the plan and showing the following:
 - a) The extent and area of each watershed tributary to the existing and future drainage channels in the development.
 - b) The street storm sewers and other storm drains to be built, the basis of their design, and outfall and outlet locations and elevations, receiving streams or channel and its high water elevation, the functioning of the drains during high water conditions.
 - c) The parts of the proposed street system where pavements are planned to be depressed sufficiently to convey or temporarily store overflow from storm sewers and over-the-curb resulting from the heavier rain storms and the outlets for such overflow.
 - d) Existing streams and flood plains to be maintained, and new channels to be constructed, their locations, cross sections and profiles.
 - e) Proposed culverts and bridges to be built, their materials, elevations, waterway openings and basis of design.
 - f) Existing detention ponds and basins to be maintained, enlarged, or otherwise altered and new ponds or basins to be built and the basis of their design.
 - g) The estimated location and percentage of the total development of land area which will be used for impervious surfaces after construction is completed.
 - h) The slope, type, and size of all proposed and existing sewer and other waterways.
 - i) All existing topographic conditions of the site, including elevations, watercourses, trees and other sufficient natural features.
 - j) All existing building, sewers, waterlines and other significant man-made features.
 - j) Estimated depth, shape, size and storage of any proposed retention facility.
 - k) One or more typical cross sections of all existing and proposed channels or other open drainage facilities, showing the elevation of the existing land and the proposed changes thereto, together with the high water elevations expected from the 100-year storm under the controlled conditions called for by this ordinance, and the relationship of structures,

streets and other utilities.

- m) A site plan showing the dimensions of the site with existing and proposed structures properly located, together with contours of the terrain after proposed grading.
- n) Delineation of wetland boundaries.
- o) A map of the location of the project relative to highways, municipalities or other identifiable landmarks; normally the base map should be the appropriate United States Geologic Survey quadrangle map or portion thereof.
- p) Existing and proposed contours at a vertical interval of two (2') feet if the general slope of the site is less than fifteen percent (15%) and vertical intervals of five (5) feet if the general slope of the site is greater than fifteen percent (15%).
- q) Streams, lakes, ponds, wetlands, or other bodies of water within the project area, including the average surface height or top of impoundment.
- r) Other physical features including existing drainage swales and areas of natural vegetation to be preserved.
- s) Ground water recharge methods such as seepage pits, beds or trenches. When these structures are used, the locations of septic tank infiltration areas and wells must be shown.
- t) Other control devices or methods such as roof-top storage, semi-pervious paving materials, grass swales, parking lot ponding, vegetated strips, detention or retention ponds, storm sewers, etc.
- u) Locations of proposed underground utilities, sewers and water lines.
- v) An overlay showing soil types and boundaries.
- w) Proposed locations and extent of changes to land surface and vegetative cover.
- x) Proposed locations of structures, roads, paved areas and buildings.
- y) Subwatershed boundaries applicable to the site.

3. PART III - Final Plan - Upon approval of the preliminary plan, a final plan shall be submitted to the Municipal Engineer. The final plan shall provide all descriptive material and maps previously submitted and required prior to the final plan, in addition to the following items:

- a) All calculations, assumptions and criteria used in the design of the storm sewer system, detention facilities and sediment and erosion control operations.
- b) All plans and profiles of proposed storm sewers and open channels including horizontal and vertical controls, elevations, sizes, slopes and materials.

- c) Locations, dimensions and design details required for the construction of all facilities.
- d) For all detention basins, a plot or tabulation of storage volumes with corresponding water surface elevations and of the basin outflow rates for those water surface elevations.
- e) For all detention basins, design hydrographs of inflow and outflow for the peak design flows from the site under natural and developed conditions.
- f) A description of operation for all detention basins.
- g) Contours of finished project site that adequately describe the final topography.
- h) The staging of earthmoving activities and program of operation.
- i) All information relative to the design and operation of emergency spillways.
- j) Emergency routing or outfall should be shown for storm runoff in the event of failure of offsite drainage structures.
- k) When major control facilities, such as retention basins, are planned, soil structures and characteristics shall be investigated. Plans and data prepared by a licensed professional engineer or geologist with experience and education in soil mechanics shall be submitted. These submissions should consider and offer design solutions for frost heave potential, shrink-swell potential, soil bearing strength, water infiltration, soil settling characteristics, fill and backfilling procedures and soil treatment techniques as required to protect the improvements or structures.
- l) All erosion and sedimentation control measures, temporary as well as permanent, and sufficient detail in order to clearly indicate effectiveness of the plan.
- m) Project specification relative to stormwater control, erosion and sedimentation.
- n) Jurisdictional determination by ACOE on wetlands portions of the subdivision or land development parcel(s).

SECTION 403. PLAN SUBMISSION

A. For Regulated Activities specified in Sections 104.E. and 104.F.:

1. The Drainage Plan shall be submitted by the developer to the County Planning agency for coordination with the DER permit application process under Chapter 105 (Dam Safety and Waterway Management) or Chapter 106 (Flood Plain Management) of DER's Rules and Regulations.

2. Two (2) copies of the Drainage Plan shall be submitted.
- B. For all other Regulated Activities:
1. The Drainage Plan shall be submitted by the developer to the Township Engineer as part of the Preliminary Application submission for the subdivision or land development.
 2. Eight (8) copies of the Drainage Plan shall be submitted.
 3. Distribution of the Drainage Plan will be as follows:
 - a) One (1) copy to the Springbrook Township Board of Supervisors.
 - b) One (1) copy to the Springbrook Township Engineer.
 - c) Two (2) copies to the Springbrook Township Planning Commission.
 - d) Two (2) copies to the Lackawanna County Regional Planning Commission.
 - e) Two (2) copies to Lackawanna County Conservation District.

SECTION 404. DRAINAGE PLAN REVIEW

- A. The Township Engineer shall review the Drainage Plan for consistency with the adopted Lackawanna River Stormwater Management Plan as embodied by this ordinance and against any additional storm drainage provisions contained in the Springbrook Township Subdivision and Land Development or Zoning Ordinance, as applicable and provide his or her findings to the Springbrook Township Planning Commission within 30 days of receipt of the Drainage Plan.
- B. The County Planning agency shall provide an advisory review of the Drainage Plan for consistency with the Lackawanna River Stormwater Management Plan.
- C. For Regulated Activities specified in Sections 104.A., 104.B., 104.C. and 104.D., the County Planning agency shall provide written comments to the Township of Springbrook within 30 days of receipt of the application by the County Planning agency consistent with established procedures under Act 247, as to whether the Drainage Plan has been found to be consistent with the Stormwater Management Plan.
- D. For Regulated Activities specified in Sections 104.E. and 104.F., the Township Planning Commission shall notify DEP whether the Drainage Plan is consistent with the Stormwater Management Plan and forward a copy of the review letter to the

developer and any other interested party(ies).

- E. Springbrook Township shall not approve any subdivision or land development or building permit application if the Drainage Plan has been found to be inconsistent with the Stormwater Management Plan as determined by the Township Engineer. The Township of Springbrook shall provide the developer with a written approval or denial of the proposal no later than 90 days following the date of the regular meeting of the Governing Body, except as otherwise required for subdivisions and land developments under the Township's Subdivision and Land Development Ordinance.

SECTION 405. MODIFICATION OF PLANS

A modification to a submitted Drainage 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 Drainage Plan (as determined by the Township Engineer) shall require a resubmission of the modified Drainage Plan consistent with Section 403 subject to review per Section 404 of this Ordinance.

SECTION 406. HARDSHIP WAIVER PROCEDURE

Subject to review by the Township Planning Commission and the Township Engineer, the Springbrook Township Board of Supervisors may hear requests for waivers where it is alleged that the provisions of this Ordinance inflict unnecessary hardship upon the applicant. The waiver request shall be in writing on an application form promulgated by the Township and accompanied by the requisite fee based upon the fee schedule set forth for hearings under the Springbrook Township Zoning Ordinance. A copy of the completed application form shall be provided to each of the following: the Township Supervisors, the Township Planning Commission, the Township Engineer, the Township solicitor and the County Planning agency. The application shall fully document the nature of the alleged hardship.

Springbrook Township may grant a waiver provided that all of the following findings are made in the given case:

1. That there are unique physical circumstances or conditions, including irregularity of lot size or shape, or exceptional topographical or other physical conditions peculiar to the particular property, and that the unnecessary hardship is due to such conditions, and not the circumstances or conditions generally created by the provisions of the Ordinance.
2. That because of such physical circumstances or conditions, there is no possibility that

the property can be developed in strict conformity with the provisions of this Ordinance, including the "no harm" provisions, and that the authorization of a waiver is therefore necessary to enable the reasonable use of the property;

3. That such unnecessary hardship has not been created by the applicant; and
4. That the waiver, if authorized, will represent the minimum waiver that will afford relief and will represent the least modification possible of the regulation in issue.

In granting any waiver, the governing body may attach such reasonable conditions and safeguards as it may deem necessary to implement the purposes of Act 167 and this Ordinance.

ARTICLE V

INSPECTION, ENFORCEMENT, PENALTIES

SECTION 501. SCHEDULE OF INSPECTIONS

- A. The Township Engineer or his designee shall inspect all phases of the installation of the permanent stormwater control facilities and the completed installation as set forth in the approved Drainage Plan. Inspection of all phases of installation of the control facilities shall be continuous and the inspection of the completed installation shall be conducted by the engineer or his designee within 30 days after written notification of the completion by the developer.

- B. If at any stage of the work the Township Engineer determines that the permanent stormwater control facilities are not being installed in accordance with the approved development plan, the Township Engineer acting on behalf of the governing body shall revoke any existing permits until the work is brought into compliance with the approved plan or a revised development plan is submitted and approved as required by Section 405.

SECTION 502. ENFORCEMENT

In addition to all those who may by law have the authority to enforce and/or prosecute, it is specifically designated that it shall be the duty of the Township Engineer on behalf of the governing body to enforce this Ordinance.

SECTION 503. ENFORCEMENT REMEDIES AND PENALTIES

Any violation of this ordinance shall be subject to the enforcement, and prevention provisions of Sections 701 and 702 of the Township's Subdivision and Land Development Ordinance.

ARTICLE VI

FEEES AND EXPENSES

SECTION 601. GENERAL

Fees shall be sufficient to cover municipal costs for Drainage Plan review and processing in accordance with the Springbrook Township Subdivision and Land Development Ordinance, as described in Section 602 hereof.

SECTION 602. EXPENSES COVERED BY FEES

The fees required by this Ordinance shall, at a minimum, cover:

- A. The review of the Drainage Plan by the Municipal Engineer.
- B. The site inspection.
- C. The inspection of required controls and improvements during construction.
- D. The final inspection upon completion of the controls and improvements required in the Plan.
- E. Any additional work required to enforce any permit provisions, regulated by this Ordinance, correct violations and assure the completion of stipulated remedial actions.
- F. Township costs for the administration of the Ordinance.

ARTICLE VII

MAINTENANCE RESPONSIBILITIES

SECTION 701. MAINTENANCE RESPONSIBILITIES

The Maintenance responsibilities for permanent stormwater runoff control facilities shall be as follows:

- A. Ownership by the Township - If the Township accepts the offer of dedication of the permanent facilities, the developer shall pay a fee to the Township corresponding to the present worth of maintenance of the facilities for a ten-year period. The estimated annual maintenance cost for the facilities shall be based on a fee schedule to be prepared by the Township Engineer.

The maintenance fee shall cover the costs of:

1. Review by the Township Engineer for facility compliance with the previously approved plans.
 2. Inspection of the facility, required controls and associated systems.
 3. Any additional work required to enforce permit provisions and/or correct violations.
 4. Actual cost of maintenance improvements.
- B. Ownership by Others - In those instances where the Township does not accept the offer of dedication of permanent stormwater runoff control facilities, such facilities shall be owned by the developer, another individual, or a group of individuals residing in the controlled area, such as a Homeowners Association, as shall be determined by the Governing Body. When ownership shall not be by the Township, as described above, the owner shall enter into an agreement with the Governing Body which specifies that the owner will properly maintain the facilities consistent with accepted practices as determined by the Township Engineer. The Agreement shall provide for regular inspections by the agents of the Township and contain such provisions as shall be necessary to ensure timely correction of any maintenance deficiencies by the owner(s); and, the owner shall post a bond with the Township corresponding to the present worth of the maintenance of the facilities for a ten-year period. The amount of such bond shall be determined by the Township Engineer.

The maintenance fee shall cover the costs of:

1. Review by the municipal engineer for facility compliance with the previously approved plans.
2. Inspection of the facility, required controls and associated systems.
3. Any additional work required to enforce permit provisions and/or correct violations.

SECTION 702. RIGHT OF ENTRY

Upon presentation of the proper credentials, duly authorized representatives of the Township of Springbrook may enter at reasonable times upon any property within the Township to investigate or ascertain whether proper maintenance is being provided for any stormwater management facilities for which Springbrook Township is not directly responsible for maintenance, as provided in Section 701.

ARTICLE VIII

ADOPTION

SECTION 801. ADOPTION

This Stormwater Management Ordinance shall take full force and effect from the date of passage. This ordinance, however, shall have no effect on subdivision and/or land development plans pending at the time of passage of this ordinance or within sixty (60) days of said passage as long as the plans were on file with the Township Planning Commission.

SECTION 802. PUBLIC HEARING

The public hearing for this ordinance was held on _____.

SECTION 803. ADOPTION DATE

The date of adoption of this ordinance was _____.

Chairman, Board of Supervisors

Township Secretary

Township Solicitor

APPENDIX A

STORMWATER MANAGEMENT ORDINANCE APPLICATION

APPENDIX B

TR-20 MODELING EFFORT - SECTION 4.6 SUPPLEMENT

APPENDIX C

PRIORITY WATERSHED RUNOFF CURVE NUMBERS BY SUBAREA

APPENDIX D
PRIORITY WATERSHED PEAK FLOW TABLES

APPENDIX E

PRIORITY WATERSHED RELEASE RATES BY SUBAREA

APPENDIX F

RUNOFF COEFFICIENTS TO BE UTILIZED FOR RATIONAL FORMULA

APPENDIX G

CRITERIA FOR THE SELECTION OF MANNINGS "n" FOR SWALE DESIGN