Chapter 25 — Storm Water Management

Article III — Storm Water Management Requirements

Article IV — Drainage Plan Requirements

Article V — Inspections

Article VI — Fees and Expenses

Article VII — Maintenance Responsibilities

Article VIII — Enforcement

Appendix

Article I — General Provisions

§ 25-101   Statement of Findings.

The Borough Council of the Borough of Alburtis finds that:

(a) Problem Identified. Inadequate management of accelerated runoff of storm water 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 storm water, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge, and threatens public health and safety.

(b) Response Required. A comprehensive program of storm water 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 the Borough of Alburtis and all the people of the Commonwealth, their resources, and the environment.

§ 25-102   Purpose.

The purpose of this Chapter is to promote the public health, safety, and welfare within the Little Lehigh Creek Watershed by minimizing the damages described in § 25-101(a) 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 groundwaters where appropriate;

(d) Maintain the existing flows and quality of streams and water courses in the Borough and the Commonwealth;

(e)   Preserve and restore the flood carrying capacity of streams; and

(f)   Provide for proper maintenance of all permanent storm water management structures which are constructed in the Borough.

§ 25-103   Statutory Authority.

This Chapter is adopted under authority granted by the Storm Water Management Act, Act of October 4, 1978, Pa. Laws 864, No. 167, as amended, 32 PA. STAT. ANN. § 680.1 *et seq.*, and the Borough Code, Act of February 1, 1966, 1965 Pa. Laws 1656, No. 581, as amended, 53 PA. STAT. ANN. § 45101 *et seq.*

§ 25-104   Applicability.

(a)   In General.   This Chapter shall apply to the entire Borough, since all of the Borough is located within the Little Lehigh Creek Watershed. Detailed maps of the entire Little Lehigh Creek Watershed are included in the Storm Water Management Plan, including Figure 2 and Plate I.

(b)   Regulated Activities.   The following activities are defined as "Regulated Activities" and shall be regulated by this Chapter, except those which satisfy the exemption described in subsection (c) :

    (1)   Land development.

    (2)   Subdivision.

    (3)   Construction of new or additional impervious surfaces (driveways, parking lots, etc.).

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

    (5)   Diversion or piping of any natural or man-made stream channel.

    (6)   Installation of storm water systems or appurtenances thereto.

(c)   Exempt Activities.   Any proposed Regulated Activity, except those defined in paragraphs (5) or (6) of subsection (b), which, when considered together with all other Regulated Activities involving the Development Site and commonly-controlled contiguous property which qualified for this exemption since November 9, 1988, would create 10,000 square feet or less of additional impervious cover is exempt from meeting the provisions of this Chapter, except § 25-108. For development taking place in stages, the entire development plan must be used in determining conformance with these criteria. Additional impervious cover shall include, but not be limited to, any roof, parking, or driveway areas, and any new streets and sidewalks constructed as part of or for the proposed Regulated Activity. Any areas which may be designed to initially be semi-pervious (*e.g.*, gravel, crushed stone, porous pavement, etc.) shall be considered impervious areas for purposes of this subsection (c)

§ 25-105   Repealer.

Any ordinance of the Borough inconsistent with any of the provisions of this Chapter is hereby repealed to the extent of the inconsistency only. This Section shall be effective as of the original passage of Ordinance 263, and as of the date of passage of this Chapter and each amendment to this Chapter.

§ 25-106   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.

§ 25-107   Compatibility with Other Ordinance Requirements.

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

§ 25-108   Duty of Persons Engaged in the Development of Land.

Notwithstanding any provision of this Chapter to the contrary, including waiver and exemption provisions, any landowner and any person engaged in the alteration or development of land which may affect storm water runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety, or other property. Such measures shall include such actions as are required to manage the rate, volume, and direction of resulting storm water runoff in a manner which otherwise adequately protects persons and property from possible injury.

Article II — Definitions

§ 25-201   In General.

For purposes of this Chapter, the terms defined in the remaining sections of this Article shall have the meanings indicated, whether with or without initial capital letters, unless the context in which they are used clearly indicates a different meaning.

§ 25-202   Act.

The term "Act" shall mean the Storm Water Management Act, Act of October 4, 1978, Pa. Laws 864, No. 167, as amended, 32 PA. STAT. ANN. § 680.1 *et seq.*

§ 25-203   Cistern.

The term "Cistern" shall mean an underground reservoir or tank for storing rainwater.

§ 25-204   Closed Depression.

The term "Closed Depression" shall mean a distinctive bowl-shaped depression in the land surface in a karst area. It is characterized by internal drainage, varying magnitude, and an unbroken ground surface.

§ 25-205   Conservation District.

The term "Conservation District" shall mean the Lehigh County Conservation District.

§ 25-206   Culvert.

The term "Culvert" shall mean a pipe, conduit, or similar structure, including appurtenant works, which carries surface water.

§ 25-207   Dam.

The term "Dam" shall mean an artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or any other fluid or semifluid, or any refuse bank, fill, or structure for highway, railroad, or other purposes which does or may impound water or any other fluid or semifluid.

§ 25-208   DEP.

The term "DEP" shall mean the Pennsylvania Department of Environmental Protection.

§ 25-209   Design Storm.

The term "Design Storm" shall mean the magnitude of precipitation from a storm event measured in probability of occurrence (*e.g.*, 50-yr. storm) and duration (*e.g.*, 24-hour), and used in computing storm water management control systems.

§ 25-210   Detention Basin.

The term "Detention Basin" shall mean a basin designed to retard storm water runoff by temporarily storing the runoff and releasing it at a predetermined rate.

§ 25-211   Developer.

The term "Developer" shall mean a person, partnership, association, corporation, or other entity, or any responsible person therein or agent thereof, that undertakes any Regulated Activity.

§ 25-212   Development Site.

The term "Development Site" shall mean the specific tract of land for which a Regulated Activity is proposed.

§ 25-213   Drainage Easement.

The term "Drainage Easement" shall mean a right granted by a land owner to a grantee, allowing the use of private land for storm water management purposes.

§ 25-214   Drainage Plan.

The term "Drainage Plan" shall mean the documentation of the proposed storm water management controls, if any, to be used for a given Development Site, the contents of which are established in § 25-403.

§ 25-215   Erosion.

The term "erosion" shall mean the removal of soil particles by the action of water, wind, ice, or other geological agents.

§ 25-216   Freeboard.

The term "freeboard" shall mean the incremental depth in a storm water management structure above that required to convey the design runoff event, provided as a safety factor of design.

§ 25-217   Groundwater Recharge.

The term "Groundwater Recharge" shall mean replenishment of existing natural underground water supplies.

§ 25-218   Impervious Surface.

The term "Impervious Surface" shall mean a surface which prevents the percolation of water into the ground.

§ 25-219   Infiltration Structure.

The term "Infiltration Structure" shall mean a structure designed to direct runoff into the ground (*e.g.*, a french drain, seepage pit, or seepage trench).

§ 25-220   Land Development.

The term "Land Development" shall mean —

(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; or

(b) a subdivision of land.

§ 25-221   "Local" Runoff Conveyance Facilities.

The term "'Local' Runoff Conveyance Facilities" shall mean any natural channel or man-made conveyance system which has the purpose of transporting runoff from a site to the Mainstem.

§ 25-222   Mainstem (main channel).

The terms "Mainstem" or "main channel" shall mean any stream segment or other conveyance used as a reach in the Little Lehigh Creek hydrologic model used to prepare the Storm Water Management Plan.

§ 25-223   Manning Equation (Manning formula).

The terms "Manning equation" or "Manning formula" shall mean 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, first presented in 1889

by Robert Manning. "Open channels" may include closed conduits so long as the flow is not under pressure. The Manning equation is:

$$Q = VA, \quad \text{and} \quad V = \frac{k}{n}\left(\frac{A}{P}\right)^{2/3} S^{1/2},$$

where "Q" represents discharge (flow rate), "V" represents velocity, "A" represents area, "n" is the Manning coefficient, "P" represents the wetted perimeter, "S" represents the channel slope, and "k" is a constant for unit conversion.

§ 25-224   NPDES Regulations.

The term "NPDES regulations" shall mean the regulations issued by DEP currently found at 25 PA. CODE Ch. 92, to implement the National Pollutant Discharge Elimination System within Pennsylvania, and the applicable portions of the regulations issued by the U.S. Environmental Protection Agency to implement the National Pollutant Discharge Elimination System, currently found at 40 C.F.R. Parts 122, 123, 124, 125, 129, 133, 136, 400-471, and 503.

§ 25-225   NRCS.

The term "NRCS" shall mean the Natural Resource Conservation Service of the U.S. Department of Agriculture (formerly known as the Soil Conservation Service).

§ 25-226   Peak Discharge.

The term "Peak Discharge" shall mean the maximum rate of flow of storm runoff at a given point and time resulting from a specified storm event.

§ 25-227   Rational Method.

The term "Rational Method" shall mean 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, "i" is the rainfall intensity in inches per hour, and "A" is the area of the tract in acres. Runoff coefficient "c" values to be used for Rational Method calculations under this Chapter are set forth in Appendix ¶ 25-F, which is incorporated herein by reference.

§ 25-228   Reach.

The term "reach" shall mean any of the natural or man-made runoff conveyance channels used for modeling purposes, in developing the Storm Water Management Plan, to connect the subareas and transport flows downstream.

§ 25-229   Regulated Activities.

The term "Regulated Activities" shall mean actions or proposed actions which impact upon proper management of storm water runoff and which are governed by this Chapter as specified in § 25-104(b).

§ 25-230   Release Rate.

The term "Release Rate" shall mean the percentage of the pre-development peak rate of runoff for a Development Site to which the post-development peak rate of runoff must be controlled to avoid peak flow increases throughout the watershed.

§ 25-231   Return Period.

The term "Return Period" shall mean the average interval in years over which an 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 (25) years.

§ 25-232   Runoff.

The term "Runoff" shall mean that part of precipitation which flows over the land.

§ 25-233   Seepage Pit / Seepage Trench.

The terms "Seepage Pit" or "Seepage Trench" shall mean an area of excavated earth filled with loose stone or similar material and into which surface water is directed for infiltration into the ground.

§ 25-234   Soil-Cover-Complex Method.

The term "Soil-Cover-Complex Method" shall mean a method of runoff computation developed by NRCS which is based upon relating soil type and land use/cover to a runoff parameter called a Curve Number.

§ 25-235   Storage Indication Method.

The term "Storage Indication Method" shall mean 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.

§ 25-236   Storm Drainage Problem Areas.

The term "Storm Drainage Problem Areas" shall mean those areas in the Borough which lack adequate storm water collection and/or conveyance facilities and which present a hazard to persons or property. These areas are documented in Appendix ¶ 25-B (which is incorporated herein by reference) or formally identified by the Borough Engineer in a report to Council.

§ 25-237   Storm Sewer.

The term "Storm Sewer" shall mean 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.

§ 25-238   Storm Water Management Plan.

The term "Storm Water Management Plan" shall mean the *Little Lehigh Creek Watershed —Act 167— Storm Water Management Plan Update* prepared by the Lehigh Valley Planning Commission, dated June 1999; adopted by Lehigh County on September 22, 1999 and Berks County on November 18, 1999; and approved by the Pennsylvania Department of Envirnomental Protection in June 2000. A copy of the Storm Water Management Plan is on file at the offices of the Borough Secretary and the Lehigh Valley Planning Commission, and additional copies may be obtained from the Lehigh Valley Planning Commission.

§ 25-239   Stream.

The term "Stream" shall mean a watercourse.

§ 25-240   Subarea.

The term "Subarea" shall mean the smallest unit of watershed breakdown for hydrologic modeling purposes for which the runoff control criteria have been established in the Storm Water Management Plan.

§ 25-241   Subdivision.

The term "Subdivision" shall mean 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.

§ 25-242   Swale.

The term "Swale" shall mean a low lying stretch of land which gathers or carries surface water runoff.

§ 25-243   Watercourse.

The term "Watercourse" shall mean any channel of conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

§ 25-244   WATERSHED.

The term "WATERSHED" means the computer-based hydrologic modeling technique as adapted to the Little Lehigh Creek Watershed for the Storm Water Management Plan. This model was written by Tarsi Software Laboratories and uses the same algorithms found in the Penn State Runoff Quality Model (PSRM-QUAL), which is an update of the Penn State Runoff Model (PSRM) used in the previous storm water management plan for the Little Lehigh Creek Watershed. The WATERSHED model has been "calibrated" to reflect actual flow values in the Little Lehigh Creek Watershed by adjusting key model input parameters.

Article III — Storm Water Management Requirements

§ 25-301   General Requirements.

(a) **Storm Drainage Systems Required.** Storm drainage systems shall be provided in order to permit unimpeded flow of natural watercourses except as modified by storm water detention facilities or open channels consistent with this Chapter.

(b) **Points of Concentrated Drainage Discharge.** The existing points of concentrated drainage discharge onto adjacent property shall not be altered without written approval of the affected property owner(s).

(c) **Areas of Existing Diffused Drainage Discharge.** 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 Chapter. 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.

(d) **Watercourses Which Traverse a Site.** Where a site is traversed by watercourses other than those for which a 100-year floodplain is defined by the Borough, drainage easements shall be provided conforming substantially with the line of such watercourses. The width of any easement shall be adequate to provide for unimpeded flow of storm runoff based on calculations made in conformance with § 25-304 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 storm water within any portion of the easement. Also, periodic maintenance of the easement to ensure proper runoff conveyance shall be required. Watercourses for which the 100-year floodplain is formally defined are subject to the applicable Borough floodplain regulations.

(e) **State Highway Rights-of-Way.** Any drainage facilities or structures required by this Chapter that are located on State highway rights-of-way shall be subject to approval by the Pennsylvania Department of Transportation.

(f) **Construction of Open Channels.** When it can be shown that, due to topographic conditions, natural drainage swales on the site cannot adequately provide for drainage, open 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.

(g) **Minimization of Erosion.** Storm drainage facilities and appurtenances shall be so designed and provided as to minimize erosion in watercourse channels and at all points of discharge.

(h) **Volume Controls.** Consideration shall be given to the design and use of volume controls for storm water management, where geology and soils permit. Areas of suitable geology for volume controls shall be determined by the Council, considering the recommendations of the Borough Engineer and the presentation of the applicant. Documentation of the suitability of the soil for volume controls shall be provided by the applicant. Volume controls shall be acceptable in areas of suitable geology where the soils are designated as well drained in the County Soil Survey. Other soils may be acceptable for use of volume controls based on site-specific soils evaluations provided by the applicant.

§ 25-302   Storm Water Management Districts.

(a) **Mapping of Storm Water Management Districts.** To implement the provisions of the Little Lehigh Creek Storm Water Management Plan, the Borough is hereby divided into

Storm Water Management Districts consistent with the Little Lehigh Creek Release Rate Map presented in the Storm Water Management Plan as Plate I. The boundaries of the Storm Water Management Districts are shown on Plate I of the Storm Water Management Plan, which is incorporated herein by reference. The Borough is encompassed by portions of subareas 25, 27, 112, 118, and 120 under the Storm Water Management Plan. A copy of the Alburtis portion of Plate I of the Storm Water Management Plan, showing the subarea boundaries, is included as Appendix ¶ 25-A. *See* § 25-303(b) for the method of determining the exact location of the Storm Water Management District boundaries.

   (b) Description of Storm Water Management Districts. Two types of Storm Water Management Districts are provided under the Storm Water Management Plan, namely Conditional No Detention Districts and Dual Release Rate Districts, as described below. There are only Dual Release Rate Districts within the Borough.

      (1) Conditional No Detention Districts. Within these districts, the capacity of the "local" runoff conveyance facilities (as defined in § 25-221) must be calculated to determine if adequate capacity exists. For this determination, the developer must calculate peak flows assuming that the site is developed as proposed, and that the remainder of the local watershed is in the existing condition. The developer must also calculate peak flows assuming that the entire local watershed is developed per current zoning and that all new development would use the runoff controls specified by this Chapter. The larger of the two peak flows calculated will be used in determining if adequate capacity exists. If adequate capacity exists to safely transport runoff from the site to the main channel (as defined in § 25-222), these watershed areas may discharge post-development peak runoff without detention facilities. If the capacity calculations show that the "local" runoff conveyance facilities lack adequate capacity, the developer shall either use a 100% release rate control or provide increased capacity of downstream elements to convey increased peak flows consistent with § 25-303(n). Any capacity improvements must be designed to convey runoff from development of all areas tributary to the improvement consistent with the capacity criteria specified in § 25-303(c). By definition, a storm drainage problem area associated with the "local" runoff conveyance facilities indicates that adequate capacity does not exist.

      (2) Dual Release Rate Districts. Within these districts, the 2-year post-development peak runoff must be controlled to thirty percent (30%) of the pre-development 2-year runoff peak. Further, the 10-year, 25-year, and 100-year post-development peak runoff must be controlled to the stated percentage of the pre-development peak as set forth below and on Plate I of the Storm Water Management Plan, which varies from 50% to 100% depending upon location in the watershed:

Subarea	10/25/100 Year Release Rate
25	50%
27	50%
112	80%
118	80%
120	60%

§ 25-303   Storm Water Management District Implementation Provisions.

(a) **Satisfaction of Release Rate Requirements.**   Any storm water management controls required by this Chapter and subject to dual release rate criteria shall meet the applicable release rate criteria (*see* § 25-302(b)(2)) for each of the 2-, 10-, 25-, and 100-year return period runoff events, consistent with the calculation methodology specified in § 25-304.

(b) **Determination of District Boundaries.**   The exact location of the Storm Water Management District boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot (2') topographic contours provided as part of the Drainage Plan. The District 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.). The physical feature is the downstream limit of the subarea and the subarea boundary is drawn from that point up slope to each topographic divide along the path perpendicular to the contour lines.

(c) **Criteria for Downstream Capacity Analyses.**   Any downstream capacity analysis conducted in accordance with this Chapter shall use the following criteria for determining adequacy for accepting increased peak flow rates:

(1) **Channels or Swales: 2-year event.**   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 DEP *Soil Erosion and Sedimentation Control Manual* (April 1990). Permissible velocities from the DEP Manual for selected channels are presented in Appendix ¶25-H.

(2) **Channels or Swales: 25-year event.**   Natural or man-made channels or swales must be able to convey the increased 25-year return period runoff peak without creating any hazard to persons or property.

(3) **Other Facilities.**   Culverts, bridges, storm sewers, or any other facilities which must pass or convey flows from the tributary area must be designed in accordance with the DEP Chapter 105 regulations, 25 PA. CODE Ch. 105 (relating to Dam Safety and Waterway Management) (if applicable) and, at a minimum, pass the increased 25-year return period runoff.

(d) **Development in One Release Rate Category Subarea.**   For a proposed development site located within one release rate category subarea, the total runoff from the site shall meet the applicable release rate criteria. For development sites with multiple directions of runoff discharge, individual drainage directions 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.

(e) **Development in Multiple Release Rate Category Subareas.**   For a proposed development site located within two or more release rate category subareas, the peak discharge rate from any subarea shall be the pre-development peak discharge for that subarea multiplied by the applicable release rate. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by subarea. An exception to the preceding portions of this subsection (e) may be granted by the Borough if discharges from multiple subareas recombine in proximity to the site. In that case, peak discharges in any direction may be a 100% release rate provided that the overall site discharge meets the weighted average release rate.

(f)   Development in Release Rate Subarea and Conditional No Detention Subarea.

For a proposed development site located partially within a release rate category subarea(s) and partially within a conditional no detention subarea(s), a significant portion of the site area subject to the release rate control may not be drained to the discharge point(s) located in the no detention area except as part of a "No Harm" or hardship waiver procedure.

(g)   Drainage to Closed Depressions. Within a release rate category area, for a proposed development site which has significant areas which drain to a closed depression(s), the design release from the site must be the *lesser* of—

> **(1)**   the applicable release rate flow assuming no closed depressions; or
>
> **(2)**   the existing peak flow actually leaving the site.

In cases where paragraph (2) would result in an unreasonably small design release, the design discharge of less than or equal to the release rate will be determined by the available downstream conveyance capacity to the main channel calculated using § 25-303(c) and the minimum orifice criteria.

(h)   Effect of Off-Site Flows. Off-site areas which drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site using the capacity criteria in § 25-303(c) and the detention criteria in § 25-304.

(i)   Phased Developments. For development sites proposed to take place in phases, all detention ponds shall be designed to meet the applicable release rate(s) applied to all site areas tributary to the proposed pond discharge direction. All site tributary areas will be assumed as developed, regardless of whether all site tributary areas are proposed for development at that time. However, for sites with multiple detention ponds in series, only the downstream pond must be designed to the stated release rate.

(j)   Sites Where Development Impact Area is Significantly Smaller Than the Total Site Area. Where the site area to be impacted by a proposed development activity differs significantly from the total site area, only the proposed impact area shall be subject to the release rate criteria. The impact area includes any proposed cover or grading changes.

(k)   No Change to Both the Rate and Volume of Runoff Discharged. Development proposals which, through groundwater recharge or other means, do not increase the rate and volume of runoff discharged from the site compared to the pre-development condition are not subject to the release rate provisions of this Chapter.

(l)   "No Harm" Option.

(1)   In General. For any proposed development site not located in a conditional no detention district, the developer has the option of using a less restrictive runoff control (including no detention) if the developer can prove that special circumstances exist for the development site and that "no harm" would be caused by discharging at a higher runoff rate than that specified by the Storm Water Management Plan and this Chapter. For purposes of this paragraph (1), "special circumstances" shall mean any hydrologic or hydraulic aspects of the development itself not

specifically considered in the development of the Storm Water Management Plan runoff control strategy. Proof of "no harm" must be shown from the development site through the remainder of the downstream drainage network to the confluence of the Little Lehigh Creek with the Lehigh River. Proof of "no harm" must be shown using the capacity criteria specified in § 25-303(c) if downstream capacity analysis is a part of the "no harm" justification.

(2) Analysis Considerations. Attempts to prove "no harm" based upon downstream peak flow versus capacity analysis shall be governed by the following provisions:

(A) Peak Flow Values. The peak flow values to be used for downstream areas for the design return period storms (2-, 10-, 25- and 100-year) shall be the values from the calibrated WATERSHED model for the Little Lehigh Creek Watershed. These flow values are reproduced in Appendix ¶ 25-I, which is incorporated herein by reference.

(B) Allocation of Available Downstream Capacity. Any available capacity in the downstream conveyance system as documented by a developer may be used by the developer only in proportion to his development site acreage relative to the total upstream undeveloped acreage from the identified capacity (*i.e.*, if his site is 10% of the upstream undeveloped acreage, he may use up to 10% of the documented downstream available capacity).

(C) Increased Flow Rates at Problem Areas. Developer-proposed runoff controls which would generate increased peak flow rates at documented storm drainage problem areas are, by definition, precluded from successful attempts to prove "no harm," except in conjunction with proposed capacity improvements for the problem areas consistent with § 25-303(n).

(3) Submission. Any "no harm" justifications shall be submitted by the developer as part of the Drainage Plan submission per Article IV.

(m) Regional Detention Alternatives. For certain areas within the Little Lehigh Creek Watershed, it may be more cost-effective to provide one control facility for more than one development site than to provide an individual control facility for each development site. The initiative and funding for any 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 shall 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 version of the WATERSHED Model as developed for the Storm Water Management Plan.

(n) Capacity Improvements.

(1) Local Drainage Network Capacity Deficiency. In certain instances, primarily within the conditional 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 can prove that it is feasible to provide capacity improvements to relieve the capacity deficiency in the local drainage network, then the capacity improvements may be provided by the developer in lieu of runoff controls on the development site. Peak flow calculations are to be made assuming that the local watershed is in the existing condition and then assuming that the local watershed is developed per current zoning and using the specified runoff controls. Any capacity improvements must be designed using the *larger* of the above peak flows and the capacity criteria specified in § 25-303(c). All new development in the entire subarea(s)

within which the proposed development site is located shall be assumed to implement the developer's proposed discharge control, if any.

      (2) Other Circumstances. Capacity improvements may also be provided as necessary to implement any regional detention alternatives or to implement a modified "no harm" option which proposes specific capacity improvements to provide that a less stringent discharge control will not create any harm downstream.

    (o) Compatibility with NPDES Requirements. Any proposed Regulatory Activity for which a permanent storm water quality control detention basin in required under the NPDES regulations shall use the more stringent runoff control requirements between this Chapter and the NPDES regulations.

§ 25-304   Calculation Methodology.

    (a) Approved Methodologies. Storm water runoff from all development sites shall be calculated using either the rational method or the soil-cover-complex methodology.

    (b) Verification of Detention Basin Design. The design of any detention basin intended to meet the requirements of this Chapter shall be verified by routing the design storm hydrograph through the proposed basin using the storage indication method. For basins designed using the modified rational method technique, the design hydrograph for routing shall be either the Universal Rational Hydrograph or the modified rational method trapezoidal hydrograph which maximizes detention volume.

    (c) Freeboard. All storm water detention facilities shall provide a minimum 1.0 foot freeboard above the maximum pool elevation associated with the 2- through 25-year runoff events. A 0.5 foot freeboard shall be provided above the maximum pool elevation of the 100-year runoff event. The freeboard shall be measured from the maximum pool elevation to the invert of the emergency spillway. The 2- through 100-year storm events shall be controlled by the primary outlet structure. An emergency spillway for each basin shall be designed to pass the 100-year return frequency storm peak basin inflow rate with a minimum 0.5 foot freeboard measured to the top of the basin. The freeboard criteria shall be satisfied considering any offsite areas tributary to the basin as developed, as applicable. If this detention facility is considered to be a dam under the DEP Chapter 105 regulations, 25 PA. CODE Ch. 105 (relating to Dam Safety and Waterway Management), the design of the facility must be consistent with those regulations, and may be required to pass a storm greater than the 100-year event.

    (d) Circular Orifice Diameter. The minimum circular orifice diameter for controlling discharge rates from detention facilities shall be three (3) inches, *provided* that as much of the site runoff as practical is directed to the detention facilities.

    (e) Rainfall Calculations.

      (1) Soil-Cover-Complex Method. All calculations using the soil-cover-complex method shall use—

(A) the NRCS Type II 24-hour rainfall distribution. (A graphic and tabular presentation of the NRCS Type II 24-hour rainfall distribution is reproduced in Appendix ¶ 25-C, which is incorporated herein by reference.); and

(B) the following 24-hour rainfall depths for the various return periods, taken from the *PennDOT Intensity–Duration–Frequency Field Manual (May 1986)* for Region 4:

Return Period	24-Hour Rainfall Depth
1 year	2.40 inches
2 year	3.00 inches
5 year	3.60 inches
10 year	4.56 inches
25 year	5.52 inches
50 year	6.48 inches
100 year	7.44 inches

(2) Rational Method. 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 presented in Appendix ¶ 25-D, which is incorporated herein by reference.

(f) Runoff Calculations.

(1) Soil-Cover-Complex Method. Runoff Curve Numbers (CN's) to be used in the soil-cover-complex method shall be based upon the matrix presented in Appendix ¶ 25-E, which is incorporated herein by reference.

(2) Rational Method. Runoff coefficients for use in the Rational Method shall be based upon the table presented in Appendix ¶ 25-F, which is incorporated herein by reference.

(g) Volume Controls. Proposed volume controls shall be designed with sufficient storage volume for a 100-year return period event, unless proposed in combination with rate controls to achieve the required performance standard across all return periods. For the return period(s) to be solely controlled by the volume control, the storage volume shall equal or exceed the volume of the Universal Rational Hydrograph for the drainage area to the volume control.

(h) Time of Concentration Calculations.

(1) Flow Types. All time of concentration calculations shall use a segmental approach, which may include one or all of the following flow types:

(A) Overland Flow. Overland Flow (sheet flow) calculations shall use either the NRCS average velocity chart (Figure 15.2 of Technical Release-55, 1975) or the modified kinematic wave travel time equation (equation 3-3, NRCS TR-55, June 1986). If using the modified kinematic wave travel time equation, the overland flow length shall be limited to 50 feet for designs using the Rational Method, and limited to 150 feet for designs using the soil-cover-complex method.

(B) Shallow Concentrated Flow. Shallow Concentrated Flow travel times shall be determined from the watercourse slope, type of surface, and the velocity from Figure 3-1 of NCRS TR-55, June 1986.

(C) Open Channel Flow. Open Channel Flow travel times shall be determined from velocities calculated by the Manning equation. Bankfull flows shall be used for determining velocities. Manning 'n' values shall be based on the table presented in Appendix ¶ 25-G, which is incorporated herein by reference.

(D) Pipe Flow. Pipe Flow travel times shall be determined from velocities calculated using the Manning equation, assuming full flow and the Manning 'n' values from Appendix ¶ 25-G.

(2) Common Time of Concentration.

(A) Pre-Development. All pre-development calculations for a given discharge direction shall be based on a common time of concentration, considering both on-site and any off-site drainage areas.

(B) Post-Development. All post-development calculations for a given discharge direction shall be based on a common time of concentration, considering both on-site and any off-site drainage areas.

(i) Capacity of Watercourses. The Manning equation shall be used to calculate the capacity of watercourses. Manning 'n' values used in the calculations shall be consistent with the table presented in Appendix ¶ 25-G. Pipe capacities shall be determined by methods acceptable to the Borough Engineer.

(j) DEP Dam Safety and Waterway Management Regulations. DEP's Chapter 105 regulations, 25 Pa. Code Ch. 105 (relating to Dam Safety and Waterway Management), apply to the construction, modification, operation, and/or maintenance of both existing and proposed dams, water obstructions, and encroachments throughout the watershed. Criteria for design and construction of storm water management facilities according to this Chapter may not be the same criteria that are used in the permitting of dams under the Dam Safety Program. The requirements of both this Chapter and the DEP Chapter 105 regulations must be satisfied where both are applicable.

Article IV — Drainage Plan Requirements

§ 25-401   General Requirements.

For any of the Regulated Activities of this Chapter, prior to the final approval of subdivision and/or land development plans, or 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.

§ 25-402   Exemptions.

(a) **Impervious Cover.** Any Regulated Activity which would create 10,000 square feet or less of additional impervious cover is exempt from the Drainage Plan preparation provisions of this Chapter. (*See* § 25-104(c) for those Regulated Activities which are exempt from all of the provisions of this Chapter except § 25-108.) This criteria shall apply to the total proposed development even if development is to take place in stages (*i.e.*, the impervious cover associated with the total development shall be used to compare to the exemption minimum, not merely the individual stage impervious cover). Pre-development impervious cover is that which is in place as of November 9, 1988. Additional impervious cover shall include, but not be limited to, any roof, parking, or driveway areas, and any new streets and sidewalks constructed as part of or for the proposed Regulated Activity. Any areas designed to initially be gravel, crushed stone, porous pavement, etc. shall be assumed to be impervious for the purposes of comparison to the exemption criteria.

(b) **Prior Drainage Plan Approval.** Any Regulated Activity for which a Drainage Plan was previously prepared as part of a subdivision or land development proposal that received Preliminary Plan approval from the Borough prior to January 10, 2001 or prior to any subsequent amendment to this Chapter is exempt from the requirement of preparing an additional or supplemental Drainage Plan to comply with the changes made to this Chapter after the date of such Preliminary Plan approval, *provided* that the approved Drainage Plan included design of storm water facilities consistent with ordinance provisions in effect at the time of Preliminary Plan approval, and no part of the subdivision or land development is then subject to changes or amendments to the zoning, subdivision, or other governing ordinance or plan made after the date of Preliminary Plan approval under Section 508(4) of the Municipalities Planning Code, 53 PA. STAT. ANN. § 10508(4). If significant revisions are made to the Drainage Plan after the effective date of any changes made to this Chapter after the Preliminary Plan approval, preparation of a new Drainage Plan, subject to the then-current provisions of this Chapter, shall be required.

§ 25-403   Drainage Plan Contents.

The following items shall be included in the Drainage Plan:

(a) **General.**

    (1) General description of project.

    (2) General description of proposed permanent storm water controls.

(b) **Maps.** Map(s) of the project area and off-site drainage areas impacting the project, showing:

    (1) The location of the project relative to highways, municipalities, and other identifiable landmarks.

    (2) Existing contours at intervals of two (2) feet. In areas of steep slopes (greater than 15%), five-foot (5') contour intervals may be used.

    (3) Streams, lakes, ponds, or other bodies of water.

(4) Other physical features, including existing drainage swales, wetlands, closed depressions, sinkholes, and areas of natural vegetation to be preserved.

(5) Locations of proposed underground utilities, sewers, and water lines.

(6) An overlay showing soil types and boundaries based on the Lehigh County Soil Survey, latest edition.

(7) Proposed changes to land surface and vegetative cover.

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

(9) Final contours at intervals of two (2) feet. In areas of steep slopes (greater than 15%), five-foot (5') contour intervals may be used.

(10) Storm Water Management District boundaries.

(11) A schematic showing all tributaries contributing flow to the site and all existing man-made features beyond the property boundary that would be affected by the project.

(c) **Storm Water Management Controls.**

(1) All storm water management controls must be shown on a map and described, including:

(A) Groundwater 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.

(B) 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.

(2) All calculations, assumptions, and criteria used in the design of the control device or method must be shown.

(d) **Maintenance Program.** A maintenance program for all storm water management control facilities must be included. This program must include the proposed ownership of the control facilities, the maintenance requirements for the facilities, and detail the financial responsibility for the required maintenance.

§ 25-404   Plan Submission.

(a) **Subdivisions or Land Development.** For Regulated Activities specified in § 25-104(b)(1) or (2):

(1) **To the Borough.** Two (2) copies of the Drainage Plan shall be submitted by the developer to the Zoning Officer as part of the Preliminary Plan submission for the subdivision or land development. One (1) copy shall be distributed to Council, and one (1) copy shall be distributed to the Borough Engineer.

(2) **To the Lehigh Valley Planning Commission.** Two (2) copies of the Drainage Plan shall be submitted by the developer to the Lehigh Valley Planning Commission as part of

the Preliminary Plan submission for an advisory review of the Drainage Plan for consistency with the Storm Water Management Plan. The Lehigh Valley Planning Commission will provide written comments to the developer and the Borough, within a time frame consistent with established procedures under the Municipalities Planning Code, 53 PA. STAT. ANN. § 10101 *et seq.*, as to whether the Drainage Plan has been found to be consistent with the Storm Water Management Plan.

(b) **Impervious Surface, New Buildings, or Additions.** For Regulated Activities specified in § 25-104(b)(3) or (4), the Drainage Plan shall be submitted by the developer to the Borough Zoning Officer as part of the building permit application.

(c) **Storm Water Systems; Diversion or Piping of Stream Channel.** For Regulated Activities specified in § 104(b)(5) or (6): One (1) copy of the Drainage Plan shall be submitted by the developer to the Lehigh Valley Planning Commission for coordination with the DEP permit application process under Chapter 105 (relating to Dam Safety and Waterway Management) or Chapter 106 (relating to Flood Plain Management) of DEP's Regulations, 25 PA. CODE Ch. 105 & 106.

§ 25-405   Drainage Plan Review.

(a) **By the Borough Engineer.** The Borough Engineer shall review the Drainage Plan for consistency with the Storm Water Management Plan as implemented by this Chapter, and with any additional storm drainage provisions contained in Chapter 22 (relating to Subdivision and Land Development) or Chapter 21 (relating to Zoning).

(b) **Effect on Subdivision/Land Development and Building Permit Applications.** The Borough shall not approve any subdivision or land development (concerning Regulated Activities described in § 104(b)(1) or (2)) or building permit application (concerning Regulated Activities described in § 104(b)(3) or (4)) if the Drainage Plan has been found to be inconsistent with the Storm Water Management Plan. The initial determination of consistency or inconsistency with the Storm Water Management Plan shall be made by the Borough Engineer, but any interested party may appeal that determination to Council. Hearings and a decision on the appeal shall be held and rendered in accordance with the procedures set forth in § 21-1806 (relating to Zoning—Zoning Hearing Board—Hearings) and any additional requirements of the Local Agency Law, 2 PA. CONS. STAT. §§ 101 *et seq.*, 551 *et seq.*

§ 25-406   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 initially by the Borough Engineer, subject to appeal as provided under § 25-405) shall require a resubmission of the modified Drainage Plan consistent with § 25-404, subject to review per § 25-405.

§ 25-407 Hardship Waiver Procedure.

(a) **In General.** Council may hear requests for waivers from any or all of the provisions of this Chapter where it is alleged that the provisions of this Chapter inflict unnecessary hardship upon the applicant. The waiver request shall be in writing on an application form promulgated by the Borough and accompanied by the requisite fee based upon a fee schedule adopted by the Borough. A copy of the completed application form shall be provided to each of the following: Borough, Borough Engineer, Borough Solicitor, and the Lehigh Valley Planning Commission. The application shall fully document the nature of the alleged hardship.

(b) **Necessary Findings.** Council may grant a waiver under this Section *provided* that *all* of the following findings are made in a 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 this Chapter in the Storm Water Management District in which the property is located;

(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 Chapter, including the "no harm" provisions of § 25-303(l), 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;

(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; and

(5) That financial hardship is not the criteria for granting of the waiver.

(c) **Conditions.** In granting any waiver under this Section, Council may attach such reasonable conditions and safeguards as it may deem necessary to implement the purposes of the Act and this Chapter. All waivers shall include a condition that the applicant remains obligated to satisfy the requirements of § 25-108.

Article V — Inspections

§ 25-501 Schedule of Inspections.

(a) **In General.** The Borough Engineer or his designee shall inspect all phases of the installation of the permanent storm water control facilities and the completed installation.

(b) **Revocation of Permits.** If at any stage of the work the Borough Engineer determines that the permanent storm water control facilities are not being installed in accordance with the

approved development plan, the borough shall revoke any existing permits until a revised development plan is submitted and approved as required by § 25-406.

Article VI — Fees and Expenses

§ 25-601   In General.

Council may, from time to time, by ordinance or resolution, establish a fee to defer the Borough's costs for Drainage Plan review and processing. Until further action by Council, the fee shall be equal to the amount described in § 25-602. The applicant shall deposit an estimate of the total fee, as approved by the Borough Engineer, at the time the Drainage Plan is filed, and shall pay any additional billings in excess of the amount deposited within thirty (30) calendar days after the date of billing. No permits shall be issued if any outstanding billing remains unpaid, and any issued permit shall be revoked if an outstanding billing is not paid by its due date.

§ 25-602   Expenses Covered by Fees.

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

(a) The review of the Drainage Plan by the Borough 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 Chapter, correct violations, and assure the completion of stipulated remedial actions.

(f) Administrative and clerical costs.

Article VII — Maintenance Responsibilities

§ 25-701   Maintenance Responsibilities.

The maintenance responsibilities for permanent storm water runoff control facilities shall be determined based upon the type of ownership of the property which is controlled by the facilities

(a) **Single Entity Ownership.** In all cases where the permanent storm water runoff control facilities are designed to manage runoff from property in a single entity ownership as defined below, the maintenance responsibility for the storm water control facilities shall be with the single entity owner. The single entity owner shall enter into an agreement with the Borough which specifies that the owner will properly maintain the facilities consistent with accepted practice as determined by the Borough Engineer. The agreement shall provide for regular inspections by the Borough and contain such provisions as necessary to ensure timely correction of any maintenance deficiencies by the single entity owner. A single entity shall be defined as an individual, association, public or private corporation, partnership, firm, trust, estate, or any other legal entity empowered to own real estate.

(b) **Multiple Ownership.**

(1) **In General.** In cases where the property controlled by the permanent storm water control facilities shall be in multiple ownership (*i.e.*, many individual owners of various portions of the property), the developer shall dedicate the permanent storm water control facilities to the Borough for maintenance. The developer shall pay a fee to the Borough corresponding to the present worth of maintenance of the facilities in perpetuity. The annual maintenance cost for the facilities shall be estimated by the Borough Engineer. The fee shall be reasonable and related to the terrain features reflecting on both design and maintenance. The developer may appeal the Borough Engineer's estimate to Council, which shall hear and decide the matter in accordance with the Local Agency Law, 2 PA. CONS. STAT. §§ 101 *et seq.*, 551 *et seq.*

(2) **Private Party Maintenance.** In certain multiple ownership situations, the Borough may benefit by transferring the maintenance responsibility for permanent storm water control facilities to an individual, entity, or group of individuals and/or entities owning property within the controlled area. These individuals and/or entities may have the permanent storm water control facilities adjacent to their lots or otherwise have an interest in the proper maintenance of the facilities. In these instances, the Borough and the individual(s) and/or entities may enter into a formal agreement for the maintenance of the facilities. The agreement shall provide for regular inspections by the Borough and contain such provisions as necessary to ensure timely correction of any maintenance deficiencies.

Article VIII — Enforcement

§ 25-801 Right-of-Entry.

Upon presentation of the proper credentials, duly authorized representatives of the Borough may enter at reasonable times upon any property within the Borough to investigate or ascertain the condition of the subject property in regard to any aspect regulated by this Chapter. All persons who apply for and receive a permit under this Chapter shall be deemed to have consented, for themselves, their heirs, personal representatives, successors, and assigns, to the aforesaid entry by Borough representatives without the need for an administrative search warrant.

§ 25-802 Notification of Violations.

In the event that a person fails to comply with the requirements of this Chapter, or fails to conform to the requirements of any permit issued under this Chapter, the Borough Engineer shall provide the person with written notification of the violation(s). Such notification shall set forth the nature of the violation(s) and establish a reasonable time limit(s) for correction of the violation(s), considering the scope of work involved and the protection of the public health, safety, and welfare and the risk of damage to other property, but not considering the cost of the work. Failure to cure the violations within the time period(s) specified shall subject such person to the penalty provisions of this Chapter. All such penalties shall be cumulative, and the Borough may resort to one or more penalties and/or remedies concurrently or successively. It is the responsibility of the owner of real property on which any Regulated Activity is proposed to occur, is occurring, or has occurred, to comply with the requirements of this Chapter.

§ 25-803 Criminal Penalties.

Any person who shall violate this Chapter, and fail to timely cure such violations after notice under § 25-802, shall be guilty of a summary offense, and upon conviction thereof, shall be sentenced to pay a fine of up to one thousand dollars ($1,000.00) for each violation, plus costs. Each day that a given violation continues shall constitute a separate violation. These penalties are imposed pursuant to Sections 3301 and 3308 of the Borough Code, 53 PA. STAT. ANN. §§ 48301, 48308.

§ 25-804 Civil Remedies.

Any activity in violation of this Chapter which is not timely cured after notice under § 25-802, is declared to be a public nuisance. The Borough may abate such nuisance, and the Borough Solicitor is hereby authorized to institute suits to restrain, prevent, or abate such violations and recover damages, in equity or at law, each in accordance with the applicable provisions of Sections 15 and 16 of the Act, 32 PA. STAT. ANN. §§ 680.15 and 680.16., Section 1202(5) of the Borough Code, 53 PA. STAT. ANN. § 46205(5), and/or Sections 511, 515.1, or 515.3 of the Mu-

nicipalities Planning Code, 53 PA. STAT. ANN. §§ 10511, 10515.1, 10515.3, or other applicable authority.

§ 25-805   Denial or Revocation of Permits.

In the event any person shall violate this Chapter and fail to timely cure such violation(s) after notice under § 25-802, the appropriate Borough officials are hereby authorized to deny any permit application, or revoke any permit previously granted, which relies upon, requires, or is dependent upon, compliance with the provisions of this Chapter which have been violated.

Appendix

¶ 25-A   **Map of Storm Water Management Districts / Subareas Within the Borough of Alburtis.**
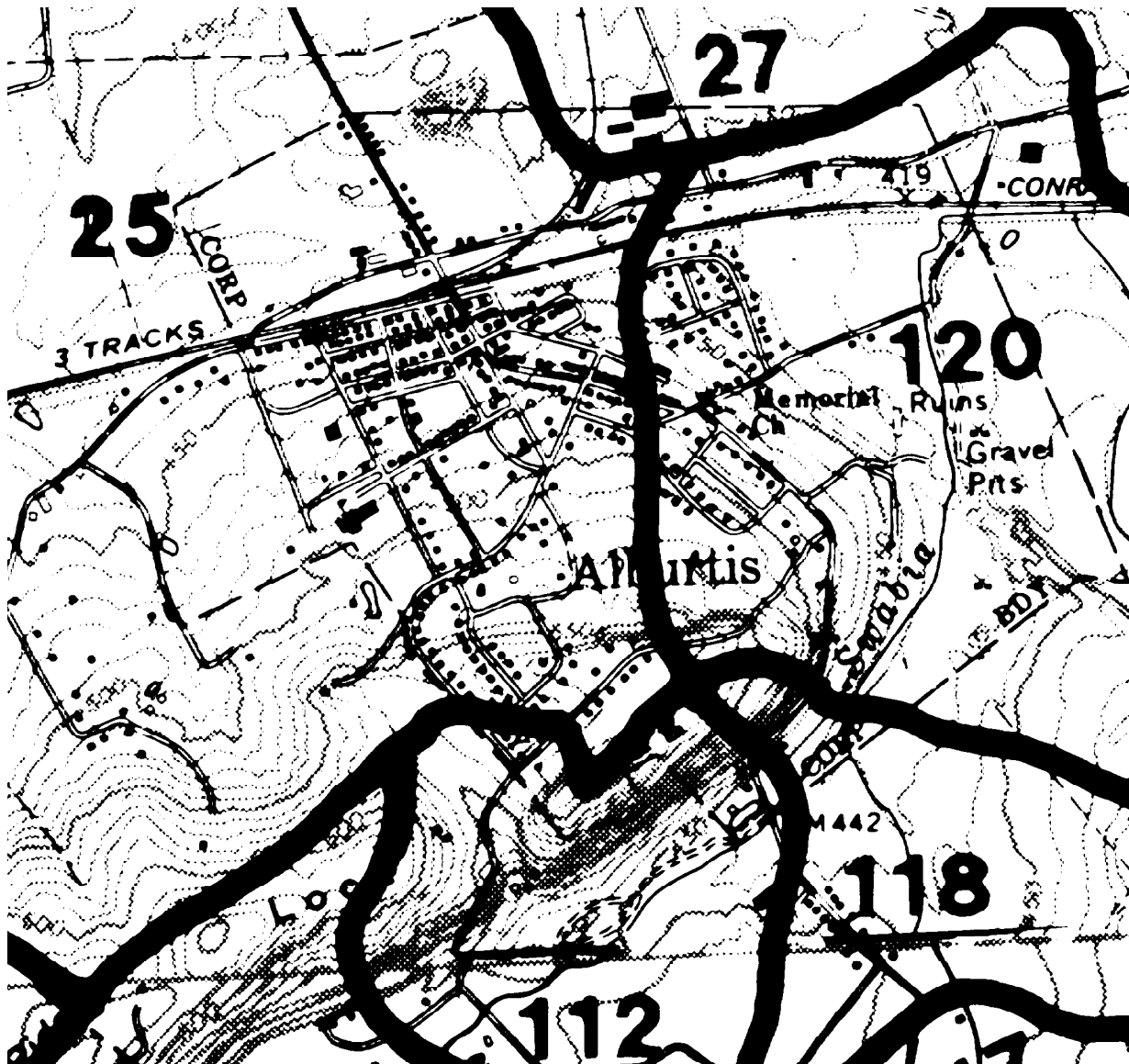
¶ 25-B Storm Drainage Problem Areas in the Borough.
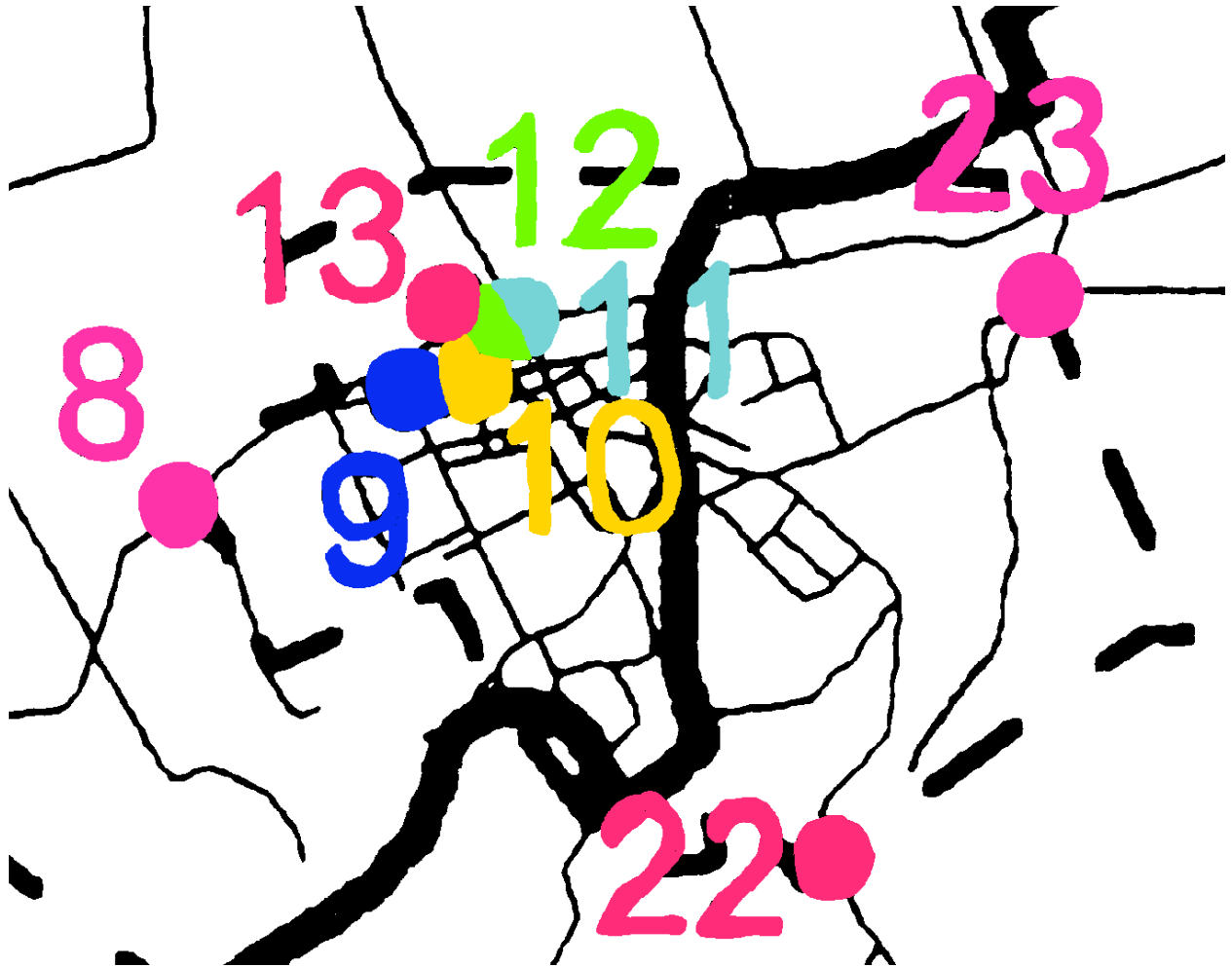
No.	Location	Problem Description	Subarea No.	Reach No.	Proposed Solution
8	Front Street – west end	Street Flooding	25	-	Enlarged Culvert
9	Front & Walnut Sts.	Street & Field Flooding	25	-	Enlarged Culvert
10	Front & Chestnut Sts.	Street Flooding	25	-	Enlarged Culvert
11	Main & East Penn Ave.	Street & Property Flooding	25	-	Storm Sewers
12	West Penn Ave.	Street & Building Flooding	25	-	Enlarged Culvert
22	Franklin St. at Borough line South	Street Flooding	112	111	Church St. Bridge Replacement
23	Church St. at Borough line East	Street Flooding	120	118	Bridge Replacement & Channel Dredging/Realignment

¶ 25-C   NRCS Type II 24-Hour Rainfall Distribution.

Hour/Min	P_x/P_{24}		Hour/Min	P_x/P_{24}
1 00	.0107		12 20	.6925
2 00	.0222		12 40	.7361
3 00	.0345		13 00	.7639
4 00	.0479		13 20	.7850
5 00	.0626		13 40	.8023
6 00	.0790		14 00	.8170
6 20	.0849		14 20	.8299
6 40	.0910		14 40	.8415
7 00	.0975		15 00	.8520
7 20	.1043		15 20	.8616
7 40	.1114		15 40	.8705
8 00	.1190		16 00	.8788
8 20	.1270		16 20	.8866
8 40	.1356		16 40	.8940
9 00	.1449		17 00	.9009
9 20	.1549		17 20	.9075
9 40	.1659		17 40	.9138
10 00	.1781		18 00	.9199
10 20	.1918		19 00	.9365
10 40	.2077		20 00	.9515
11 00	.2266		21 00	.9651
11 20	.2506		22 00	.9776
11 40	.2843		23 00	.9892
12 00	.3773		24 00	1.0000

HOURS

P_x/P_{24}*

*P_x/P_{24} equals cumulative percentage rainfall as a fraction of the total 24 hour rainfall.

¶ 25-D   Intensity–Duration–Frequency Curves.
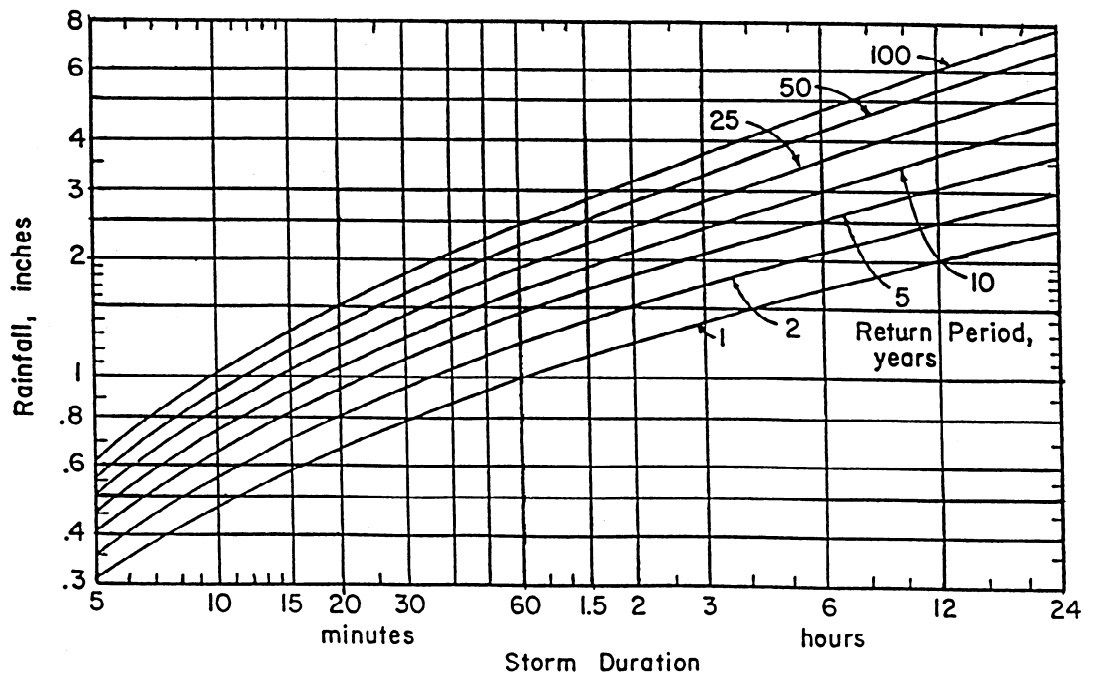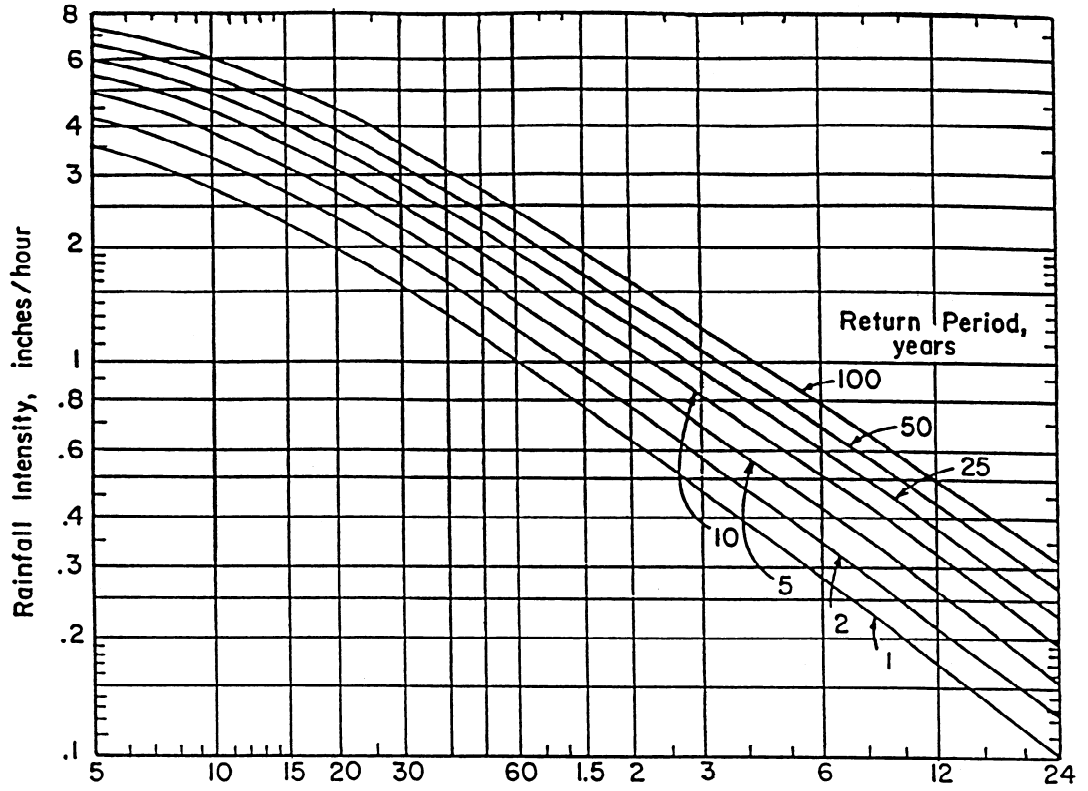
*Source:Pennsylvania Dept. of Transp. Design Rainfall Curves (1986).

¶ 25-E   Runoff Curve Numbers and Percent Impervious Values.

Cover Description		Curve numbers for hydrologic soil group**			
Land Use/Cover Type	Average percent impervious area	A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, etc.):					
Good condition (grass cover greater than 75%) . .		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way) .		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Urban districts:					
Commercial and business . . .	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
⅛ acre or less (townhouses)	65	77	85	90	92
¼ acre	38	61	75	83	87
⅓ acre	30	57	72	81	86
½ acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Woods		30	55	70	77
Agriculture		Refer to Table 2-2b in source document (TR55) by crop type and treatment.			

*Source: Natural Resources Conservation Service Technical Release No. 55, Second Edition, June 1986.

**Hydrologic Soil Group based on the County Soil Survey latest edition.

¶ 25-F   Runoff Coefficients for the Rational Method.

| | HYDROLOGIC SOIL GROUP AND SLOPE RANGE** | | | | | | | | | | | |
LAND USE	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated[A]	ª0.18 / ᵇ0.23	0.23 / 0.29	0.28 / 0.34	0.24 / 0.30	0.29 / 0.36	0.33 / 0.40	0.30 / 0.36	0.34 / 0.41	0.38 / 0.45	0.33 / 0.39	0.37 / 0.44	0.41 / 0.48
Pasture[B]	0.09 / 0.12	0.13 / 0.17	0.17 / 0.23	0.19 / 0.24	0.24 / 0.30	0.29 / 0.36	0.27 / 0.33	0.31 / 0.38	0.36 / 0.43	0.31 / 0.37	0.35 / 0.42	0.39 / 0.46
Meadow, Lawn[C]	0.05 / 0.07	0.08 / 0.12	0.12 / 0.17	0.15 / 0.19	0.20 / 0.25	0.24 / 0.30	0.23 / 0.28	0.28 / 0.34	0.32 / 0.39	0.28 / 0.33	0.32 / 0.39	0.36 / 0.43
Forest, Woods	0.03 / 0.04	0.05 / 0.08	0.08 / 0.12	0.11 / 0.15	0.16 / 0.21	0.20 / 0.26	0.20 / 0.25	0.25 / 0.31	0.29 / 0.36	0.25 / 0.31	0.30 / 0.37	0.34 / 0.41
Gravel	0.24 / 0.30	0.29 / 0.36	0.33 / 0.40	0.32 / 0.38	0.36 / 0.43	0.40 / 0.47	0.35 / 0.42	0.39 / 0.46	0.43 / 0.50	0.37 / 0.44	0.41 / 0.48	0.44 / 0.51
Parking, Other Impervious	0.72 / 0.84	0.76 / 0.88	0.80 / 0.92	0.72 / 0.84	0.76 / 0.88	0.80 / 0.92	0.72 / 0.84	0.76 / 0.88	0.80 / 0.92	0.72 / 0.84	0.76 / 0.88	0.80 / 0.92
Residential, Commercial, Industrial And Other "Developed"	Runoff coefficients should be calculated based upon weighted average of impervious area coefficients and pervious area coefficients from above based upon soil type, slope and the particular development proposal.											

*Based on Rossmiller Equation for translating NRCS curve numbers into Rational Method 'c' values.

**Hydrologic Soil Group based on the county soil survey latest edition.

a—Runoff coefficients for storm recurrence intervals less than 25 years.

b—Runoff coefficients for storm recurrence intervals of 25 years or more.

[A]Represents average of cultivated land with and without conservation treatment from TR-55, January 1975. These values are consistent with several categories of cultivated lands from TR-55, June 1986.

[B]Represents grasslands in fair condition with 50% to 75% grass cover.

[C]Represents grasslands in good condition with greater than 75% grass cover.

¶ 25-G   Manning 'n' Values.

MANNING 'n' VALUES BY TYPICAL REACH DESCRIPTION

Reach Description	Manning 'n'
Natural stream, clean, straight, no rifts or pools	0.030
Natural stream, clean, winding, some pools and shoals	0.040
Natural stream, winding, pools, shoals, stony with some weeds	0.050
Natural stream, sluggish with deep pools and weeds	0.070
Natural stream or swale, very weedy or with timber under brush	0.100
Concrete pipe, culvert or channel	0.012
Corrugated metal pipe	0.012-0.027*

*Depending upon type and diameter.

ROUGHNESS COEFFICIENTS (MANNING 'n') FOR SHEET FLOW

Surface Description	Manning 'n'[1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.050
Cultivated soils:	
Residue cover < = 20%	0.060
Residue cover > 20%	0.170
Grass:	
Short grass prairie	0.150
Dense grasses[2]	0.240
Bermuda grass	0.410
Range (natural)	0.130
Woods:[3]	
Light underbrush	0.400
Dense underbrush	0.800

[1]The n values are a composite of information compiled by Engman (1986).
[2]Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass and native grass mixtures.
[3] When selecting n, consider cover to a height of about 0.1 ft. this is the only part of the plant cover that will obstruct sheet flow.

¶ 25-H   Permissible Velocities for Selected Channels.

CHANNEL LINING	PERMISSIBLE CHANNEL VELOCITY (FEET PER SECOND)		
Vegetation[1]			
Grass Mixture	4.0	-	5.0
Kentucky Bluegrass	5.0	-	7.0
Kentucky 31 Tall Fescue	3.0	-	6.0
Red Clover or Red Fescue	2.5	-	3.5
Red Top	2.5	-	3.5
Red Canarygrass	3.0	-	4.0
Sericea Lespedeza	2.5	-	3.5
Sudan Grass	2.5	-	3.5
Weeping Lovegrass	2.5	-	3.5
Bare Earth, Easily Eroded[2]			
Fine Sand	1.5		
Sand Loam	1.75		
Silt Loam or Alluvial Silts, Loose	2.0		
Firm Loam	2.50		
Bare Earth, Erosion Resistant[2]			
Fine Gravel	2.5		
Stiff Clay or Alluvial Silts, Firm	3.75		
Loam to Cobbles (Graded)	3.75		
Silt to Cobbles (Graded or Course Gravel)	4.0		
Cobbles and Stones or Shales and Hardpans	6.0		
Rock Lined			
6" Rip Rap	9.0		
9" Rip Rap	11.5		
12" Rip Rap	13.0		

[1] Maximum permissible velocities dependent on soil erodibility and slope.

[2] Maximum permissible velocities in bare earth channels - for straight channels where slopes <0.02 ft./ft.

Source: Department of Environmental Protection, *Erosion and Sediment Pollution Control Program Manual*, April 1990.

¶ 25-I Calibrated WATERSHED Peak Flow Values for the Little Lehigh Creek Watershed.

SUBAREA NO.	1 YEAR SUBAREA PEAK	1 YEAR TOTAL PEAK	2 YEAR SUBAREA PEAK	2 YEAR TOTAL PEAK	10 YEAR SUBAREA PEAK	10 YEAR TOTAL PEAK	25 YEAR SUBAREA PEAK	25 YEAR TOTAL PEAK	100 YEAR SUBAREA PEAK	100 YEAR TOTAL PEAK
Little Lehigh Creek										
1	20.1 (cfs)	20.1	41.6 (cfs)	41.6 (cfs)	157.8 (cfs)	157.8	253.2 (cfs)	253.2	504.4 (cfs)	504.4
2	26.3	43.6	58.4	96.7	226.9	378.6	364.7	608.4	730.9	1210.4
3	26.4	26.4	51.1	51.1	158.6	158.6	250.7	250.7	488.1	488.1
4	39.8	101.5	71.0	202.9	192.6	684.6	295.3	1071.2	551.5	2036.5
5	30.8	30.8	47.9	47.9	140.1	140.1	217.8	217.8	405.7	405.7
6	52.8	52.8	81.6	81.6	194.6	194.6	304.8	304.8	692.9	692.9
7	8.8	90.3	16.6	144.2	48.2	356.6	73.8	554.9	133.2	1128.8
8	38.3	117.7	81.7	206.6	254.8	571.3	405.7	884.7	801.6	1738.8
9	45.8	213.8	74.7	423.9	185.4	1361.7	275.4	2087.5	509.2	3811.4
10	61.6	232.2	107.9	477.3	266.0	1482.3	395.1	2225.6	728.1	3938.5
11	31.1	251.0	54.5	518.5	149.7	1572.0	229.5	2341.3	439.1	4073.5
Toad Creek										
12	32.5	32.5	54.9	54.9	122.2	122.2	176.1	176.1	314.5	314.5
13	87.0	114.5	126.6	171.2	250.6	346.7	338.4	475.8	541.0	782.5
14	44.4	44.4	65.3	65.3	131.4	131.4	181.7	181.7	302.5	302.5
15	17.8	175.6	24.4	258.3	44.4	509.4	58.2	690.4	88.2	1113.2
16	48.9	212.3	75.9	316.8	166.5	623.4	235.9	844.5	405.3	1384.2
17	39.9	39.9	65.1	65.1	160.8	160.8	235.8	235.8	427.1	427.1
18	4.5	241.5	9.8	367.5	31.7	790.0	50.2	1104.5	98.1	1875.1
19	100.0	227.0	160.6	370.6	384.4	886.4	562.4	1272.5	1007.9	2125.6
20	28.9	28.9	54.9	54.9	175.8	175.8	277.1	277.1	537.1	537.1
21	14.7	261.8	33.1	448.3	109.9	1113.6	175.1	1597.0	345.3	2639.7
22	7.2	260.1	15.4	445.2	48.6	1102.7	77.1	1578.7	147.6	2604.9
Little Lehigh Creek										
23	3.5	469.5	7.1	930.7	21.2	2476.0	33.1	3534.3	61.4	5882.1
24	14.0	472.1	29.4	930.5	91.2	2464.8	143.2	3519.0	275.6	5841.5
25	56.2	56.2	87.7	87.7	197.8	197.8	283.3	283.3	495.1	495.1
26	35.8	505.0	62.4	983.2	167.9	2561.6	256.2	3644.7	486.0	6005.5
27	22.3	510.6	36.1	991.7	86.7	2572.4	127.2	3656.7	228.7	6010.8
Schaefer Run										
28	31.0	31.0	48.2	48.2	108.0	108.0	158.2	158.2	286.8	286.8
29	23.6	22.0	38.4	38.4	91.5	91.5	135.0	135.0	228.4	228.4
30	50.5	98.1	84.7	160.8	217.1	360.0	327.9	518.9	585.6	862.4
31	20.6	20.6	35.4	35.4	88.0	88.0	127.1	127.1	220.1	220.1
32	23.0	141.1	39.6	229.2	98.9	515.4	142.9	740.0	238.5	1237.2
33	15.4	15.4	26.8	26.8	70.1	70.1	106.1	106.1	186.9	186.9
34	21.3	171.6	39.7	288.0	115.1	664.8	176.5	943.0	326.8	1569.8
35	21.6	21.6	36.5	36.5	91.5	91.5	139.8	139.8	265.6	265.6
36	16.9	206.7	30.4	349.3	80.7	807.3	122.8	1149.2	222.9	1917.8
37	19.5	19.5	34.8	34.8	89.6	89.6	134.5	134.5	239.8	239.8
38	16.7	235.8	33.4	404.4	98.9	955.2	154.4	1371.0	295.7	2281.9
39	3.7	235.3	7.7	403.8	23.3	955.4	36.5	1365.9	69.8	2279.5
40	24.6	24.6	42.9	42.9	109.2	109.2	162.1	162.1	293.1	293.1
41	67.2	87.0	115.0	150.1	295.8	394.3	445.2	595.5	837.8	1100.2

SUBAREA NO.	1 YEAR SUBAREA PEAK	1 YEAR TOTAL PEAK	2 YEAR SUBAREA PEAK	2 YEAR TOTAL PEAK	10 YEAR SUBAREA PEAK	10 YEAR TOTAL PEAK	25 YEAR SUBAREA PEAK	25 YEAR TOTAL PEAK	100 YEAR SUBAREA PEAK	100 YEAR TOTAL PEAK
Schaefer Run, cont.										
42	8.7 (cfs)	94.0	16.9 (cfs)	164.9	48.5 (cfs)	441.0	74.6 (cfs)	666.7	141.3 (cfs)	1229.0
43	7.1	331.8	14.7	573.7	45.0	1393.9	70.5	2023.4	134.5	3449.8
44	27.7	27.7	51.3	51.3	138.9	138.9	210.0	210.0	389.8	389.8
45	67.1	373.7	100.1	650.2	200.4	1578.1	276.7	2281.5	457.7	3867.2
46	133.2	393.3	185.6	673.6	345.2	1599.8	458.7	2296.5	710.8	3851.1
47	15.2	404.9	30.5	696.5	89.0	1665.1	137.6	2387.2	261.3	4004.1
48	11.6	404.5	22.0	699.3	68.0	1674.7	104.7	2394.9	205.9	3992.4
49	18.1	18.1	31.3	31.3	79.8	79.8	119.2	119.2	213.2	213.2
50	22.0	39.3	39.7	69.2	106.6	181.7	161.1	273.5	298.6	501.0
51	56.6	73.5	84.4	114.8	166.3	263.2	225.5	371.8	366.0	658.2
52	6.0	77.9	9.6	121.3	23.1	277.6	34.0	391.8	61.9	682.5
53	12.4	448.3	20.6	770.0	50.6	1811.8	75.5	2566.2	139.3	4231.8
54	23.0	457.2	38.7	779.7	97.8	1817.7	146.9	2562.2	273.2	4216.8
55	25.7	25.7	39.9	39.9	88.3	88.3	125.9	125.9	218.9	218.9
56	16.4	468.4	25.9	795.4	61.7	1838.6	90.4	2581.4	163.2	4222.4
57	17.2	469.7	28.9	793.8	75.3	1824.5	113.7	2557.8	212.7	4170.1
58	35.9	35.9	61.0	61.0	158.4	158.4	238.8	238.8	443.5	443.5
59	71.2	100.4	119.4	169.6	293.1	428.6	437.9	645.2	795.9	1160.5
60	24.1	123.7	40.5	207.7	103.5	528.9	157.5	785.1	297.2	1410.5
61	23.9	131.2	42.5	233.8	116.7	612.1	179.3	914.4	343.2	1603.5
62	12.8	12.8	21.7	21.7	57.0	57.0	86.6	86.6	159.1	159.1
63	28.7	40.8	53.4	73.5	146.5	192.6	224.5	286.3	406.2	505.2
64	2.2	171.8	4.2	300.4	10.9	753.1	15.5	1093.9	24.9	1867.2
65	16.5	184.7	32.1	325.8	93.4	820.5	144.6	1194.0	276.5	2030.3
66	28.9	5.6	48.7	11.3	124.4	46.2	188.4	69.4	353.8	95.4
67	4.6	190.3	8.0	333.3	24.3	852.9	36.5	1254.2	66.3	2120.1
68	8.3	197.3	15.7	345.7	43.1	878.2	66.1	1285.9	126.9	2159.1
69	37.9	37.9	58.0	58.0	127.6	127.6	181.7	181.7	316.4	316.4
70	34.4	218.3	56.9	388.4	124.3	970.4	179.1	1403.4	314.9	2324.5
71	73.9	73.9	103.1	103.1	188.0	188.0	242.9	242.9	361.4	361.4
72	59.3	235.7	86.4	410.6	165.2	1011.5	218.9	1455.2	336.3	2396.1
73	20.5	20.5	38.2	38.2	104.3	104.3	158.6	158.6	285.7	285.7
74	35.1	252.5	53.4	434.7	115.9	1050.5	163.8	1503.6	280.5	2447.8
75	13.1	263.8	26.8	453.1	82.2	1083.5	128.6	1538.0	246.6	2489.7
76	232.6	232.6	342.7	342.7	673.1	673.1	904.7	904.7	1427.2	1427.2
77	175.1	400.0	251.1	578.1	482.1	1099.7	639.0	1455.0	979.5	2229.8
78	84.7	429.6	120.9	603.1	232.8	1107.1	309.0	1450.6	476.7	2205.1
79	25.0	409.8	36.4	571.6	69.1	1032.2	92.4	1348.1	146.1	2040.2
80	40.7	640.8	62.6	906.7	133.9	1708.2	187.6	2269.2	317.6	3510.5
81	73.8	654.0	110.1	923.1	222.0	1746.8	301.9	2323.7	483.8	3605.2
82	158.7	668.7	218.6	948.3	390.6	1797.4	500.9	2385.8	762.3	3698.0
83	12.2	12.2	26.5	26.5	85.6	85.6	135.9	135.9	265.7	265.7
84	20.2	891.8	29.0	1347.1	56.3	3064.5	76.6	4264.9	124.5	6809.1
85	27.5	890.6	47.1	1351.3	123.4	3061.3	188.0	4257.2	355.6	6787.4
Little Lehigh Creek										
86	11.5	1263.7	16.9	2164.2	34.4	5079.1	47.3	7120.2	77.8	11576.6

SUBAREA NO.	1 YEAR SUBAREA PEAK	1 YEAR TOTAL PEAK	2 YEAR SUBAREA PEAK	2 YEAR TOTAL PEAK	10 YEAR SUBAREA PEAK	10 YEAR TOTAL PEAK	25 YEAR SUBAREA PEAK	25 YEAR TOTAL PEAK	100 YEAR SUBAREA PEAK	100 YEAR TOTAL PEAK
Little Lehigh Creek, cont.										
87	100.8	1275.1	150.2	2186.2	315.0	5128.1	434.7	7180.4	714.0	11649.5
88	62.7	62.7	97.6	97.6	222.8	222.8	319.2	319.2	557.5	557.5
89	18.6	18.6	27.7	27.7	57.5	57.5	80.2	80.2	135.8	135.8
90	34.7	98.7	49.4	146.9	91.3	312.0	120.3	437.1	183.9	744.7
91	34.1	106.8	52.1	160.1	112.5	351.2	158.1	499.9	268.6	866.9
92	12.9	1305.2	19.4	2241.4	41.6	5243.9	58.4	7330.0	99.4	11860.6
93	11.8	1306.9	20.8	2242.7	54.6	5242.7	83.4	7324.0	159.3	11840.3
94	32.9	32.9	54.8	54.8	137.1	137.1	205.4	205.4	381.3	381.3
95	6.8	36.9	14.4	64.0	46.3	172.3	73.2	266.2	142.5	507.7
96	13.5	1328.0	22.8	2276.7	55.3	5299.5	81.7	7389.4	149.4	11919.2
97	22.9	22.9	34.3	34.3	68.1	68.1	92.5	92.5	149.3	149.3
98	20.0	1333.7	32.0	2284.6	75.6	5309.2	110.3	7402.6	197.8	11931.7
99	44.6	44.6	63.7	63.7	123.6	123.6	166.4	166.4	266.5	266.5
100	9.0	1336.1	17.2	2287.4	48.6	5311.0	75.9	7399.3	148.7	11917.6
101	2.9	1335.8	4.5	2286.8	10.9	5309.2	15.7	7395.8	27.6	11910.3
102	87.9	1337.2	128.9	2288.4	261.0	5304.4	355.6	7382.0	576.2	11873.1
103	43.0	43.0	63.0	63.0	126.4	126.4	171.2	171.2	276.1	276.1
104	43.8	43.8	65.4	65.4	140.6	140.6	195.4	195.4	327.0	327.0
105	18.8	1344.0	31.5	2298.4	81.7	5316.4	123.0	7392.8	229.9	11879.5
106	3.0	1343.0	6.3	2295.9	20.0	5308.3	31.5	7379.4	61.5	11852.4
107	15.8	1342.2	25.2	2294.3	56.5	5302.5	80.5	7369.8	141.2	11832.9
Swabia Creek										
108	99.5	99.5	172.7	172.7	489.6	489.6	738.3	738.3	1402.1	1402.1
109	78.0	75.6	144.6	137.2	368.7	343.4	555.8	514.8	1043.3	972.0
110	15.0	189.8	26.8	333.7	61.8	881.2	88.4	1352.5	148.5	2533.5
111	26.1	199.9	46.8	353.1	109.2	948.3	159.9	1439.5	292.7	2696.0
112	27.1	210.8	44.4	379.8	104.2	1016.8	150.5	1544.2	268.9	2780.6
113	22.7	22.7	36.1	36.1	87.3	87.3	122.3	122.3	212.7	212.7
114	21.9	21.9	35.7	35.7	91.3	91.3	129.1	129.1	230.9	230.9
115	26.4	67.3	54.8	116.9	190.7	349.8	293.9	518.4	554.0	947.9
116	9.7	9.7	18.4	18.4	50.8	50.8	75.2	75.2	132.9	132.9
117	11.3	86.4	20.2	152.7	52.8	450.4	79.1	645.0	141.1	1172.8
118	16.1	304.3	27.2	530.4	71.5	1482.6	108.2	2237.8	200.9	4015.1
119	16.0	16.0	28.3	28.3	81.3	81.3	128.1	128.1	251.5	251.5
120	51.5	296.4	81.5	552.4	194.0	1588.7	284.4	2376.5	517.9	4239.6
121	28.0	294.3	46.2	557.7	115.1	1620.8	171.7	2413.5	316.1	4272.2
122	13.8	13.8	29.4	29.4	91.4	91.4	143.2	143.2	274.4	274.4
123	39.2	206.4	64.8	583.8	163.7	1638.8	247.6	2401.2	464.0	4156.5
124	53.8	309.3	77.5	588.2	147.4	1642.2	195.9	2395.0	305.1	4116.8
125	100.6	318.6	143.8	605.8	270.8	1667.9	357.3	2426.2	549.0	4150.6
126	37.0	37.0	68.1	68.1	205.0	205.0	308.1	308.1	586.9	586.9
127	58.3	93.6	80.8	143.1	155.3	337.5	205.5	475.1	328.1	827.5
128	45.7	337.0	64.3	652.2	125.1	1763.8	169.1	2542.9	265.6	4311.1
129	30.0	338.7	45.5	657.9	95.3	1772.5	131.7	2551.5	218.2	4306.0
130	50.7	50.7	84.6	84.6	203.7	203.7	292.9	292.9	529.6	529.6
131	53.1	92.8	78.1	142.1	158.5	301.9	220.5	418.7	370.9	739.1

SUBAREA NO.	1 YEAR SUBAREA PEAK	1 YEAR TOTAL PEAK	2 YEAR SUBAREA PEAK	2 YEAR TOTAL PEAK	10 YEAR SUBAREA PEAK	10 YEAR TOTAL PEAK	25 YEAR SUBAREA PEAK	25 YEAR TOTAL PEAK	100 YEAR SUBAREA PEAK	100 YEAR TOTAL PEAK
Swabis Creek, cont.										
132	111.5	437.4	160.6	718.9	317.9	1877.1	426.8	2672.8	682.1	4449.8
133	43.7	432.1	67.0	727.0	147.8	1871.0	210.4	2649.9	364.7	4381.5
Little Lehigh Creek										
134	1.8	1450.5	6.1	2473.2	18.3	5642.7	28.2	7816.6	49.7	12476.2
135	2.6	1450.3	6.8	2472.4	19.8	5640.8	29.3	7815.3	49.7	12474.2
136	27.5	27.5	45.7	45.7	106.2	106.2	153.7	153.7	276.8	276.8
137	31.7	55.5	51.5	90.5	126.1	213.8	181.2	297.6	321.2	530.9
138	88.1	133.4	128.5	200.3	256.4	412.2	346.5	531.7	557.3	862.2
139	32.8	1463.6	53.9	2489.7	135.3	5665.9	201.5	7844.9	372.8	12511.1
140	32.1	1460.3	47.7	2482.9	123.5	5649.7	176.9	7819.6	307.0	12462.9
141	23.6	1461.2	39.7	2483.0	94.0	5646.7	136.4	7808.6	243.7	12437.1
Leibert Creek										
142	15.6	15.6	25.3	25.3	65.7	65.7	97.3	97.3	173.9	173.9
143	50.3	59.6	84.8	97.4	193.0	213.8	276.7	295.3	489.7	519.7
144	16.3	65.3	29.3	112.6	80.3	274.6	126.6	407.2	245.7	732.3
145	15.1	15.1	26.5	26.5	78.2	78.2	122.4	122.4	234.4	234.4
146	5.7	20.4	13.5	39.8	36.5	113.7	57.3	177.9	111.3	335.1
147	52.1	109.6	89.8	202.7	206.0	509.3	297.8	760.6	529.5	1368.1
148	17.9	116.6	34.8	225.0	115.9	572.0	177.6	836.7	342.5	1476.3
149	25.6	130.4	40.2	242.5	91.9	622.8	130.7	913.7	227.0	1612.8
150	35.6	157.2	54.7	265.7	120.2	683.7	167.1	1002.3	280.9	1759.5
151	48.1	187.9	68.5	300.9	133.1	720.4	176.5	1050.0	274.6	1833.8
152	200.0	199.6	288.5	287.0	567.8	561.3	755.1	744.7	1177.4	1156.8
153	81.2	435.1	116.2	635.8	222.2	1192.9	293.8	1517.2	451.7	2325.1
154	41.1	431.0	60.2	626.9	126.0	1197.3	171.8	1554.4	278.6	2433.1
Little Lehigh Creek										
155	2.2	1498.7	6.7	2536.3	20.5	5725.0	32.3	7900.4	62.1	12552.9
156	10.2	1496.9	17.0	2532.3	39.5	5714.1	57.2	7886.0	102.4	12524.9
157	16.7	16.7	24.4	24.4	56.6	56.6	79.5	79.5	137.2	137.2
158	71.4	1495.8	105.8	2527.9	240.7	5701.1	336.8	7863.5	577.5	12481.0
159	100.0	100.0	144.0	144.0	293.9	293.9	392.4	392.4	621.7	621.7
160	74.9	142.7	113.1	204.1	249.8	427.7	343.3	577.3	567.2	941.0
161	151.6	151.6	207.4	207.4	384.5	384.5	496.6	496.6	744.7	744.7
162	179.2	414.3	254.1	575.7	482.1	1021.4	633.4	1289.2	963.9	1901.0
163	9.4	1503.0	20.8	2538.1	84.6	5711.0	131.4	7871.3	258.2	12480.1
164	10.2	1501.6	16.0	2534.9	41.7	5701.8	59.7	7857.9	106.3	12455.0
165	16.6	16.6	25.9	25.9	62.0	62.0	89.3	89.3	159.1	159.1
166	54.8	1503.3	85.0	2536.0	200.9	5700.2	285.5	7853.8	498.0	12443.9
167	1.2	1503.2	3.2	2535.6	14.9	5699.7	23.2	7851.7	44.8	12440.1
168	74.2	1502.6	106.9	2533.5	216.2	5691.0	290.6	7838.0	460.3	12412.3
169	102.8	1502.6	148.2	2532.3	301.7	5685.0	406.7	7825.2	647.2	12385.5
170	61.8	1500.6	88.1	2527.4	180.6	5671.1	248.4	7803.2	403.0	12345.7
171	46.6	1498.8	66.2	2523.0	133.9	5657.8	178.7	7783.2	285.3	12308.9
Cedar Creek										
172	64.0	64.0	93.1	93.1	184.5	184.5	252.3	252.3	413.8	413.8
173	33.1	33.1	49.4	49.4	99.5	99.5	137.1	137.1	227.1	227.1

SUBAREA NO.	1 YEAR SUBAREA PEAK	1 YEAR TOTAL PEAK	2 YEAR SUBAREA PEAK	2 YEAR TOTAL PEAK	10 YEAR SUBAREA PEAK	10 YEAR TOTAL PEAK	25 YEAR SUBAREA PEAK	25 YEAR TOTAL PEAK	100 YEAR SUBAREA PEAK	100 YEAR TOTAL PEAK
Cedar Creek, cont.										
174	66.6	153.4	102.0	222.3	202.0	420.5	274.6	569.3	445.9	886.0
175	30.0	30.0	44.3	44.3	97.3	97.3	136.0	136.0	230.3	230.3
176	253.2	369.1	372.0	533.1	733.0	998.9	984.6	1301.4	1560.5	1972.5
177	51.4	375.8	77.5	540.7	175.9	1017.1	244.7	1316.1	410.6	2010.4
178	23.9	375.6	38.8	570.9	103.2	1037.1	149.6	1367.4	268.6	2131.5
179	112.1	112.1	163.7	163.7	322.6	322.4	431.1	430.8	673.1	672.5
180	15.6	438.8	22.2	659.7	51.2	1161.2	70.4	1526.4	114.6	2369.7
181	139.4	139.4	203.2	203.2	402.8	402.8	541.1	541.1	854.5	854.5
182	73.9	183.6	112.1	266.7	243.2	527.3	339.1	711.4	568.0	1141.7
183	137.3	137.3	184.3	184.3	319.2	319.2	417.1	417.1	612.9	612.9
184	16.4	104.0	25.6	143.2	54.2	252.4	76.1	322.6	132.1	473.7
185	3.8	270.2	6.2	381.9	14.8	723.4	21.2	963.7	36.1	1510.0
186	92.6	92.6	140.2	140.2	291.1	291.1	400.9	400.9	659.2	659.2
187	66.2	367.6	98.1	535.1	204.5	1059.9	286.6	1436.2	488.3	2291.3
188	133.4	133.4	182.4	182.4	347.7	347.7	460.2	460.2	720.3	720.3
189	158.1	421.6	224.7	608.5	429.1	1260.7	568.6	1713.0	882.7	2779.4
190	117.4	508.7	162.7	619.5	292.5	1290.8	376.1	1756.7	564.7	2803.5
191	75.4	510.6	108.0	628.8	210.7	1315.5	279.8	1798.9	433.5	2869.8
192	12.6	895.8	17.4	1277.0	35.4	2304.5	46.7	3142.1	74.5	5058.2
193	70.3	10.5	101.0	15.3	202.3	47.8	271.3	115.7	427.8	324.4
194	114.6	118.6	157.7	162.6	292.6	299.8	377.5	386.4	576.8	586.3
195	48.1	48.1	66.0	66.0	113.6	113.6	145.1	145.1	209.8	209.8
196	14.7	178.3	19.4	243.4	34.0	428.9	42.2	552.7	60.0	8369.2
197	74.9	74.8	104.9	104.8	197.1	196.7	257.2	257.2	392.8	391.3
198	31.5	276.8	44.1	378.9	94.5	656.5	129.7	854.1	215.0	1306.6
199	163.6	907.4	222.6	1259.2	428.3	2442.2	560.9	3303.2	881.6	5241.4
200	36.0	897.5	51.0	1245.8	98.7	2436.6	130.8	3293.0	202.2	5215.3
201	49.4	899.8	68.8	1246.7	127.9	2446.0	167.0	3290.5	256.2	5205.5
202	68.9	894.2	96.7	1244.1	179.2	2447.9	233.3	3290.2	349.7	5202.1
203	57.1	57.1	81.5	81.5	159.1	159.1	211.3	211.3	328.7	328.7
204	97.1	891.5	10.3	1247.6	254.5	2463.6	334.0	3307.6	525.6	5219.1
205	21.0	21.0	29.4	29.4	56.2	56.2	74.7	74.7	120.6	120.6
206	9.2	888.1	14.1	1244.9	34.5	2462.8	49.6	3303.2	86.9	5207.3
207	12.4	884.8	17.5	1241.1	36.2	2457.1	48.5	3297.5	79.0	5198.0
Little Lehigh Creek										
208	12.7	1545.7	18.9	2588.5	42.2	5753.7	58.8	7895.1	98.5	12443.2
209	336.1	1542.7	456.7	2579.5	819.9	5724.5	1071.7	7851.4	1623.6	12364.5
Trout Creek										
210	24.1	24.1	36.9	36.9	87.5	87.5	123.0	123.0	211.7	211.7
211	52.2	75.9	76.4	111.2	170.2	249.7	232.4	343.0	381.0	569.4
212	10.2	10.2	16.0	16.0	77.1	77.1	119.3	119.3	230.1	230.1
213	122.6	184.0	172.4	249.4	352.6	446.5	472.9	630.1	754.1	1086.6
214	79.5	250.4	116.3	341.9	283.4	682.9	394.2	876.0	664.3	1498.4
215	70.4	306.1	100.0	418.6	197.6	780.6	262.6	1003.0	407.4	1627.4
216	10.7	315.9	17.5	435.4	56.7	831.3	83.4	1072.8	152.7	1760.4
217	196.8	475.9	285.2	668.6	581.9	1133.8	782.7	1451.2	1240.4	2261.9
218	87.2	87.2	127.3	127.3	259.8	259.8	349.9	349.9	552.9	552.9

SUBAREA NO.	1 YEAR SUBAREA PEAK	1 YEAR TOTAL PEAK	2 YEAR SUBAREA PEAK	2 YEAR TOTAL PEAK	10 YEAR SUBAREA PEAK	10 YEAR TOTAL PEAK	25 YEAR SUBAREA PEAK	25 YEAR TOTAL PEAK	100 YEAR SUBAREA PEAK	100 YEAR TOTAL PEAK
Trout Creek, cont.										
219	223.1	271.0	314.7	378.2	584.5	705.2	762.5	919.3	1142.4	1351.1
220	66.4	704.4	89.5	971.8	165.5	1712.8	215.0	2105.6	332.2	3071.0
221	73.0	718.4	103.3	988.9	194.4	1759.2	354.6	2175.7	386.4	3168.9
222	68.6	704.3	92.6	968.5	175.3	1750.5	228.1	2190.2	353.9	3209.0
223	39.7	705.5	52.1	972.0	97.2	1753.7	127.7	2198.0	196.9	3219.9
Little Lehigh Creek										
224	6.5	1558.8	9.4	2596.9	20.9	5748.8	28.1	7877.3	44.2	12393.2
225	114.1	1551.7	156.6	2593.1	280.9	5737.4	365.5	7859.2	553.2	12360.8
226	132.8	1554.8	188.8	2594.7	367.5	5738.7	487.3	7859.5	753.2	12359.8

¶ 25-J   Disposition of Ordinance 263.

Ordinance 263	1981 Code, as added by Ord. 385	2003 Codified Ordinances
§ xx	§ 107-xx	§ 25-xx
Art. II	Art. II	Art. II
§ 702	§ 107-801	§ 25-801

¶ 25-K   Disposition of 1981 Code, Chapter 107.

1981 Code, as added by Ord. 385	2003 Codified Ordinances
§ 107-xx	§ 25-xx
¶¶ 107-A to 107-I	¶¶ 25-A to 25-I

¶ 25-L   Derivation of Former Unofficial Chapter 107 to 1981 Code.

In 1989, General Code Publishers Corp. printed an unofficial codification of Ordinance 263 to Chapter 107 of the 1981 Code. Borough Council never added Ordinance 263 to the 1981 Code, and did not formally adopt any of the numbering and stylistic changes made by General Code Publishers Corp. Council adopted a new Chapter 107 by Ordinance 385 in 2001.

A copy of the GCP unofficial Chapter 107 prior to Ordinance 385 is provided with the on-line and CD-ROM versions of the Codified Ordinances.

The provisions of the GCP unofficial Chapter 107 were derived from Ordinance 263 as follows:

Unofficial Chapter 107	Ordinance 263
§ 107-1	§ 101
§ 107-2	§ 102
§ 107-3	§ 103
§ 107-4	§ 104
§ 107-5	§ 107
§ 107-6	Art. II
§ 107-7	§ 301
§ 107-8	§ 302
§ 107-9	§ 303
§ 107-10	§ 304
§ 107-11	§ 401
§ 107-12	§ 402
§ 107-13	§ 403
§ 107-14	§ 404
§ 107-15	§ 405
§ 107-16	§ 406
§ 107-17	§ 407

Unofficial Chapter 107	Ordinance 263
§ 107-18	§ 501
§ 107-19	§ 601
§ 107-20	§ 602
§ 107-21	§ 701
§ 107-22	§ 702

¶ 25-M   Source Ordinances.

Ordinance 263   11-09-1988

Ordinance 385   01-10-2001

Ordinance 415   10-29-2003