

Municipal Stormwater Management Plan

**Riverside Township
Scott and Pavilion Avenues
Riverside, NJ 08075**

**April 1, 2005
July 28, 2006 (Revised)**

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Riverside Township, Burlington County, New Jersey ("the Township") to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as any development that provides for disturbing one or more acres of land or increasing impervious surface by one-quarter acre or more. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

A "build-out" analysis has been included in this plan based upon existing zoning and land available for development. The plan also addresses the review and update of existing ordinances, the Township Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this Municipal Stormwater Management Plan are to:

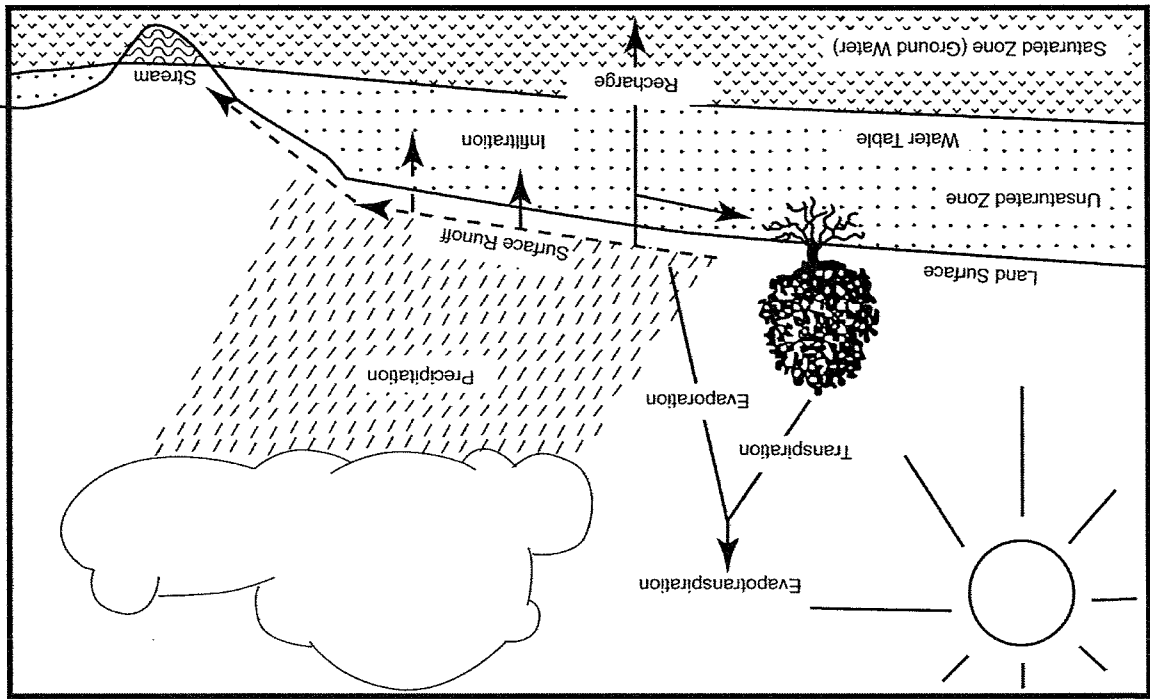
- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

Figure 1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

Riverside Township encompasses a 1.64 square mile area in Burlington County, New Jersey. The population of the Township increased from 7,941 in 1980, to 7,974 in 1990 and decreased to 7,911 in 2000. The Township is essentially built out, with very few parcels available for future development. Any redevelopment in the future will be at sites already constructed, particularly sites near the NJT River Line and public transportation. Changes in the development landscape are not anticipated. Increased stormwater runoff volumes and pollutant loads to municipal waterways are not expected to occur. Figure 2 illustrates the waterways in the Township. Figure 3 depicts the Township boundary on the USGS Quadrangle Map.

The storm water collection system presently operating in Riverside Township consists of curbed and guttered streets that transport runoff to catch basins and inlets. The catch basins and inlets act as infiltration pits, with storm runoff percolating to groundwater. There are four detention basins throughout the Township that collect stormwater from a piped system. The detention basins are drained by pumping to the creek or river. The detention basins are identified as:

1. Hooton Pond Basins
2. Licenthd Pond Basin
3. Henry Street Pond Basin
4. American Legion Drive Pond Basin

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biomarkers related to benthic macroinvertebrate community dynamics. Riverside Township is bordered on the north by the Ramocas Creek. Although there are no AMNET locations within Riverside Township, segments of the Ramocas Creek outside of Riverside Township has previously been classified as severely impaired. In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the instream total

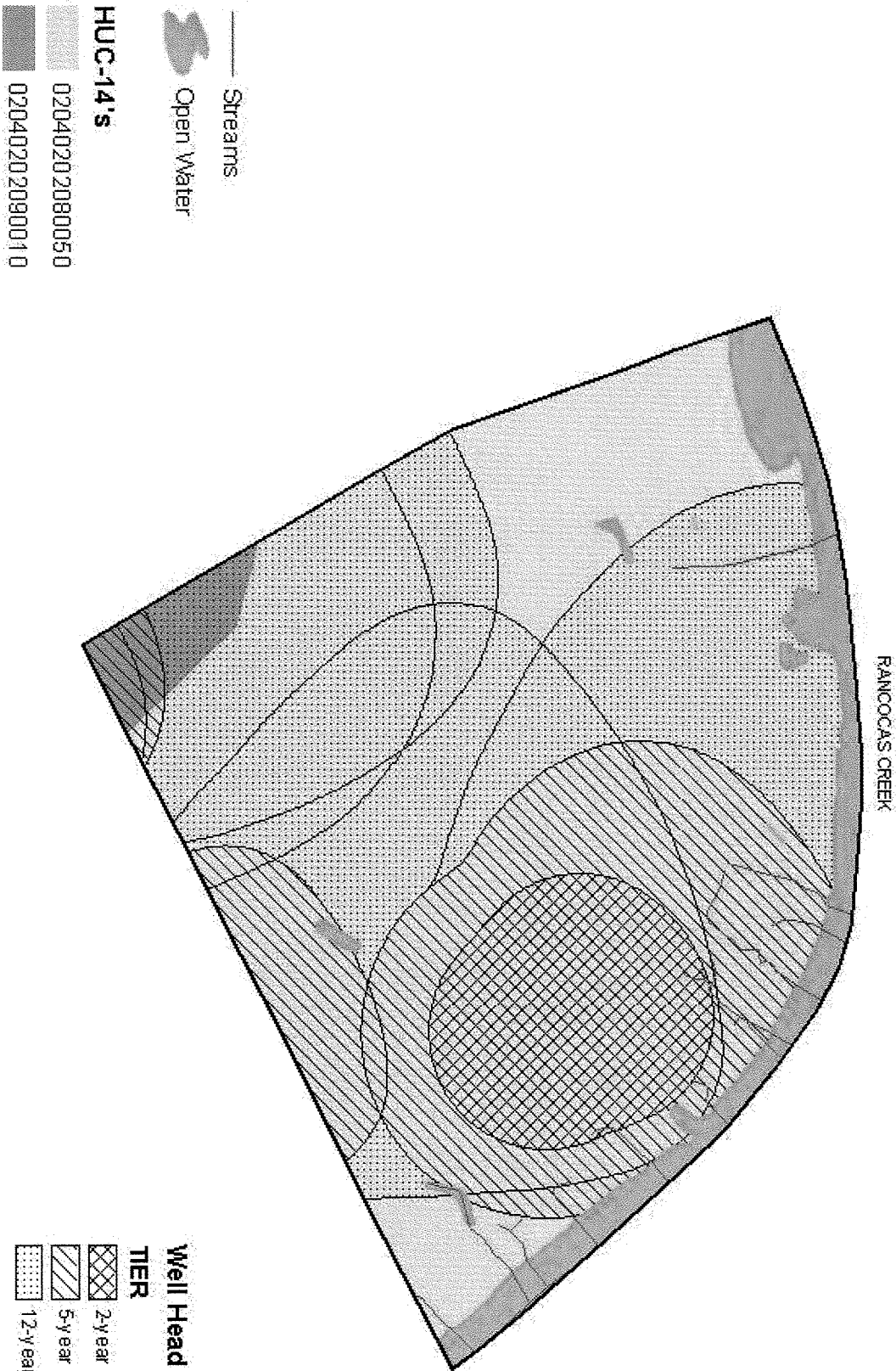
In addition to water quality problems, the Township has observed a minor water quantity problems. During severe storm events, the stream crossing Monroe Street by the DPW yard does not have adequate capacity, thereby causing a backwater effect and flooding at the entrance to the DPW yard. The Township also experiences flooding problems during long duration storm events at scattered locations throughout the Township. Groundwater recharge is accomplished by using the catch basins as infiltration pits throughout the community.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the Federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing a reduction of water quality standards or interference with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint sources, which include stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of restrictive ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

A Total phosphorus concentrations of the Rancocas Creek frequently exceed the states criteria. A Total Maximum Daily Load (TMDL) for total phosphorus is currently under development in the Rancocas Creek by NJDEP. NJDEP is required to develop a Total Maximum Daily Load (TMDL) for the pollutants for each waterway. The Township's goal is to be consistent with the short and long term management strategies adopted by NJDEP in the TMDL report. Should future TMDL's be adopted by NJDEP for a watershed located partially or wholly within Riverside Township, appropriate measures will be adopted into the stormwater management plan and ordinances.

Riverside Township Well Head Protection Areas HUC-14's and Waterways



Created by: Burlington County
Office of Resource Conservation
October 2004

FIGURE 2

Sources: Burlington County Engineering municipal boundaries,
NJGS Well head protection areas for public community water
supply wells, NJDEP HUC-14 boundaries & water features

Riverside Township USGS Topography

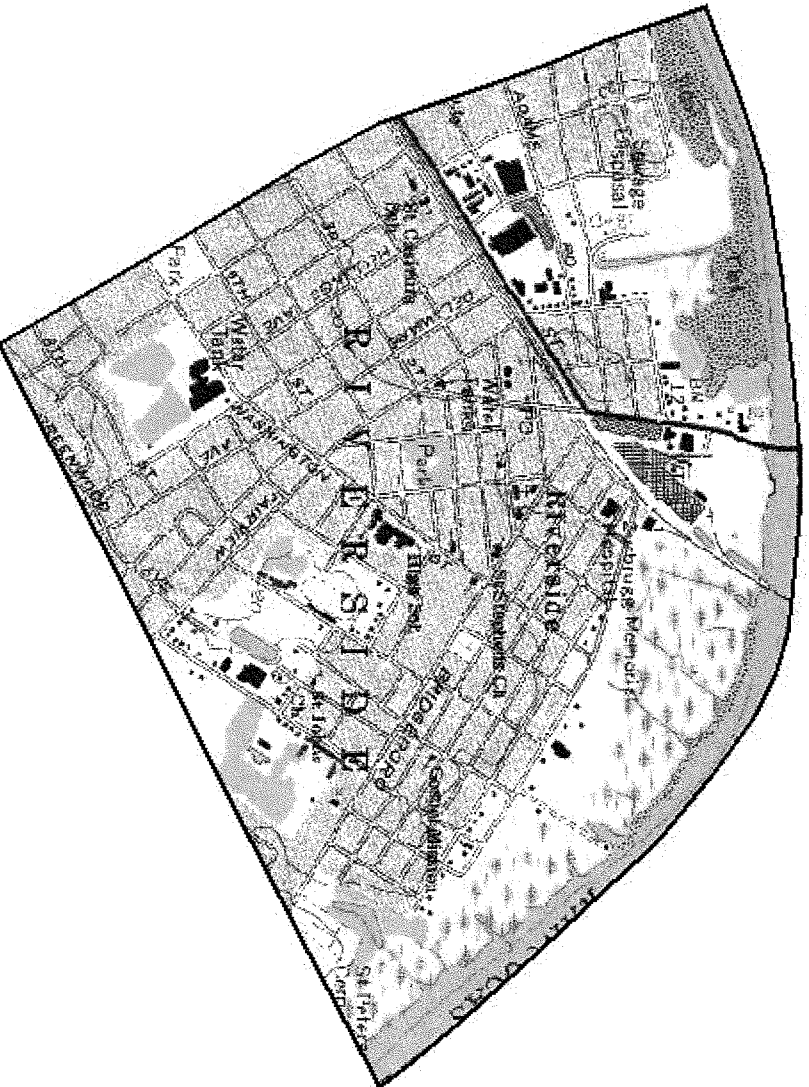
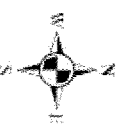
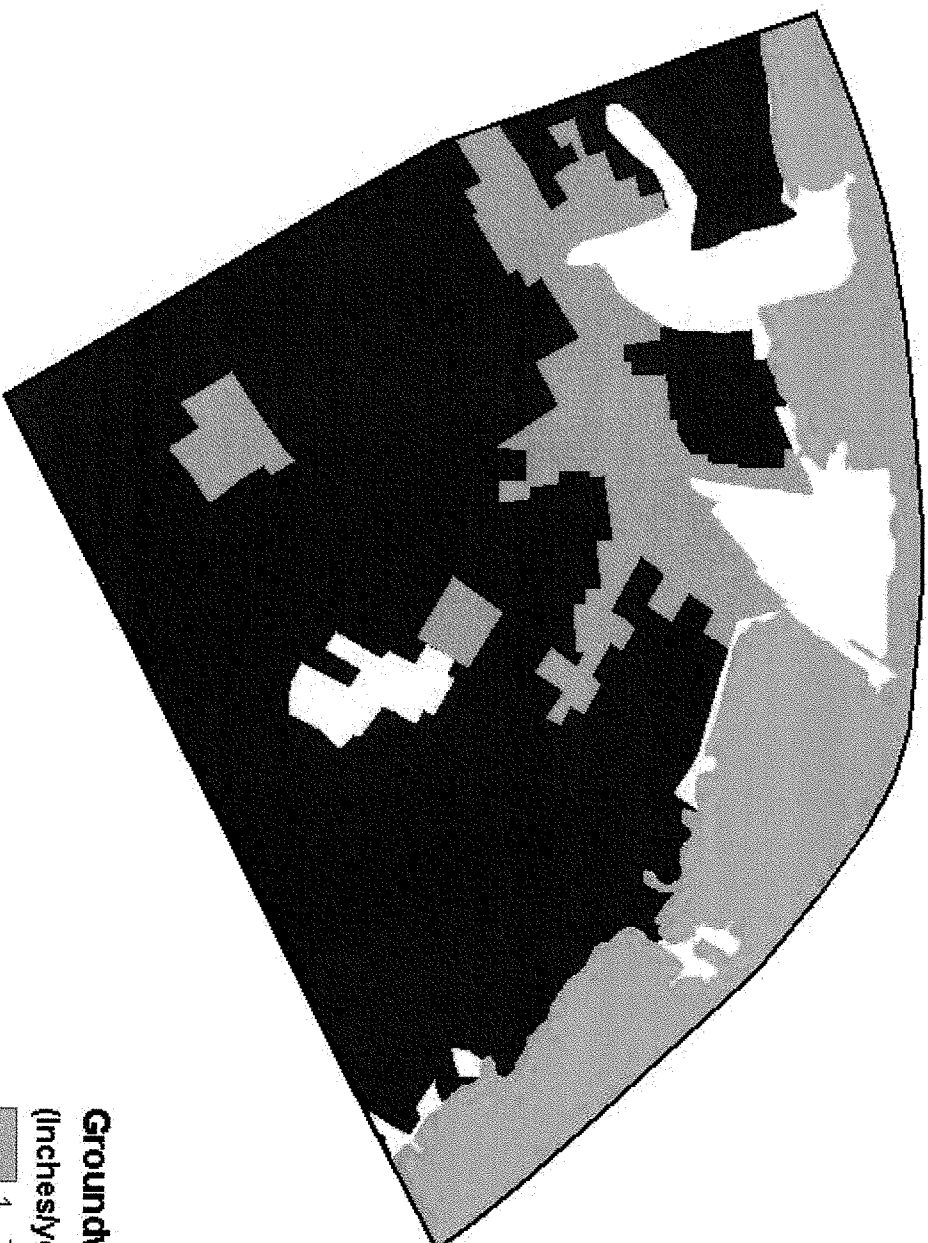
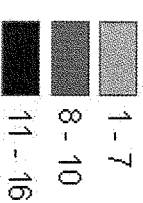


FIGURE 3

Riverside Township Groundwater Recharge Rates and Wetlands



Groundwater Recharge
(Inches/Year)



 Wetlands

Created by Burlington County
Office of Resource Conservation
October 2004

Sources: Burlington County Engineering municipal boundaries,
NJDEP wetlands, NJGS groundwater recharge rates.
Breakdown of recharge rates based on state-wide values determined by NJGS.

FIGURE 4

Design and Performance Standards

Stormwater Management Ordinance for the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the county for review and approval within 24 months of the effective date of the Stormwater Management Rules.

During construction, Township inspectors will observe the construction of the project to verify that the stormwater management measures are constructed in general conformance with approved plans. A copy of the Stormwater Control Ordinance is included in Appendix A.

The Township is in the process of developing Maintenance Plans (in accordance with the BMP) to assure the continued maintenance of its existing stormwater facilities. The Township currently, and will continue to, operate and maintain its existing facilities.

Plan Consistency

The Township is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Township; therefore this plan does not need to be consistent with any Regional Stormwater Management Plans (RSWMPs) nor any TMDLs. The Township is aware a TMDL for total phosphorus in the Rancocas Creek is under development. Upon completion, the TMDL requirements will be implemented into the Riverside MSWMP and Stormwater Control Ordinance. A Regional Stormwater Management Plan Guidance document was developed by the Soil District(s) dated January, 2005 for Mason Creek. If any RSWMPs or additional TMDLs are developed in the future, the township will participate in the preparation and implementation.

This MSWMP is consistent with the mission statement and goals of the "Management Plan of the Rancocas Creek Watershed," dated March, 2003.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report inconsistencies to the local Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Township has reviewed the Master Plan and ordinances and has provided a list of the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within 24 months of the effective date of the Stormwater Management Rules. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapter 255 of the Township Code, entitled "Land Development Ordinance" was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes are proposed to be made to "Part 4: Design Standards" of Chapter 255 to incorporate these strategies.

Section 255-89. Landscaping. The intent and purpose of this article is to "preserve elements of the existing landscape" and "to provide consistent landscaping proposals with existing foliage". The language of this section will be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. This section will be amended to require the preservation of natural wood tracts and limit land disturbance for new construction.

Section 255-92. Buffering and Screening. The section will be amended to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. Requirements for buffer widths will be added.

Section 255-84. Curbs and Gutters. This section requires that concrete curb, monolithic concrete curbs and gutter or granite block curbing be installed. The section will be amended to allow curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas.

Section 255-88. Stormwater Management Ordinance. This section establishes minimum stormwater management requirements and controls for land development and incorporates structural BMP's in preference to structural solutions. Non-structural, low impact solutions will be emphasized. Groundwater recharge standards are a required element of the Stormwater Management Ordinance.

Section 255-67. Off-Tract Improvements. This section contains wording that requires off-tract improvements to meet the design and performance requirements enumerated in Chapter 255. Land Development Ordinance.

Section 255-83. Off Street Parking and Loading. Paragraphs H. Curbs and I. Drainage require concrete or Belgian block curbing to define the limits of parking, pedestrian access and landscaping as well as control drainage. Paragraph G. Variances permits the applicant to request a variance for the number of parking spaces required, if demonstrated. Item G.4. requires "Landscaped Parking" as compensation. This section will be amended to allow for flush curb with curb stop, or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language will be added to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events

into storm sewers. This section will be amended to allow pervious paving to be used in areas to provide overflow parking, vertical parking structures and shared parking.

Table 1. Riverside Township. Schedule of District Regulations. The Maximum Lot Cover (percent) will be reviewed in an attempt to reduce the percent impervious coverage for each zone, particularly the S-D Special Development District which incorporates the requirements of the other use districts into the guidelines. The permitted maximum lot coverages vary from 70% for the I-1 district, 75% for the I-2 district and 80% for the R-1, R-2, R-3, C-1 and C-2 districts. The SD Zone permitted impervious coverages refer to the Bulk Requirements of the other districts, depending upon the use.

The Ordinance will be amended to notify applicants that compliance with the Design and Performance Standards of the MSWMP is necessary.

Land Use/Build-Out Analysis

A detailed land use analysis for the Township was conducted. Figure 2 illustrates the HUC14s within the Township. Figure 4 illustrates the NJDEP mapped wetlands within the Township. Figure 5 illustrates the existing land use in the Township based on DVRPC 2000 Land Use Data. The Township zoning map is shown in Figure 6. The build-out calculations for impervious cover are shown in Table 1. Table 2 presents the pollutant loading coefficients by land cover. The pollutant loads at full build-out are presented in Table 3.

Since a large quantity of TSS, TN and TP loading occurs from the Non-Point Source loads at Build-Out in the Residential Zones (R-1 particularly), attention will be given to increase quality, decrease surface flow, and increase groundwater recharge in these areas of Riverside Township.

Riverside Township Land Use Classification



Land Use

	Agriculture		Recreation
	Commercial		Residential
	Community Services		Transportation
	Manufacturing		Utility
	Military		Vacant
	Mining		Water
	Parking		Wooded

Created by Burlington County
Office of Resource Conservation
October 2004
Sources: Burlington County Engineering municipal
boundaries, DVRPC 2000 Land Use Data

FIGURE 5

RIVERSIDE TOWNSHIP ZONING MAP

Prepared By:
Richard A. Alaimo Association of Engineers
N.T.S.
FEBRUARY 2005

FIGURE 6

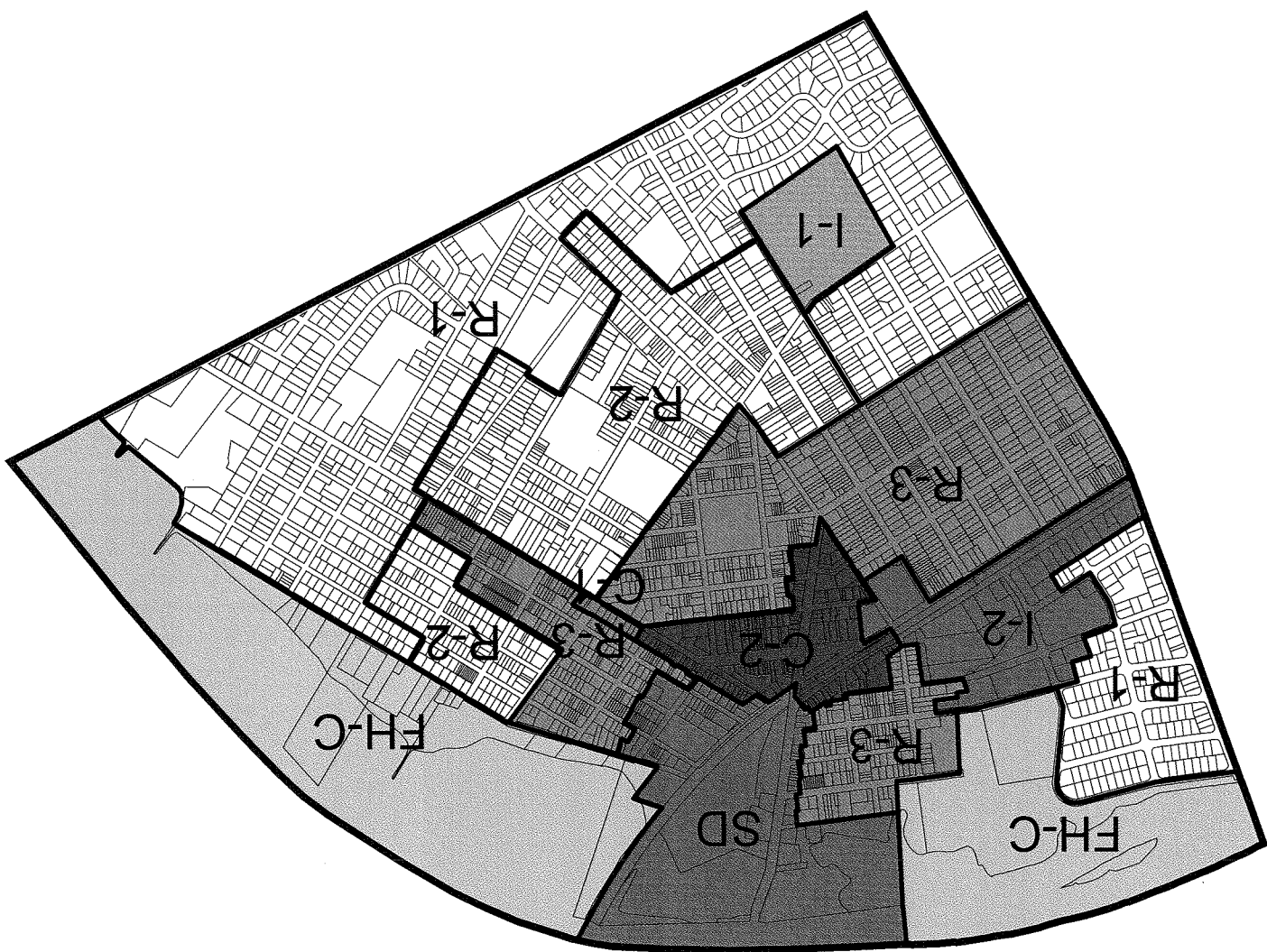
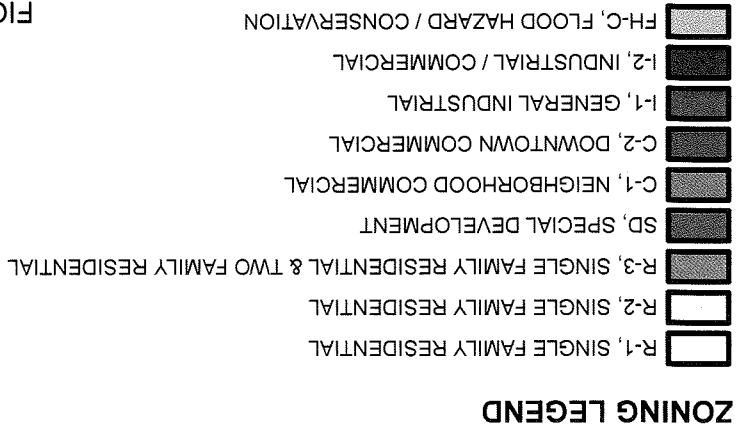


TABLE 1: BUILD-OUT CALCULATIONS FOR RIVERSIDE TOWNSHIP

HUC14 and Zone					
Total Area (Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Allowable Impervious (%)	Build-Out Impervious (Acres)	
02040202090010					
General Industrial (I-1)	11.31	0.00	75%	8.48	
Industrial/Commercial (I-2)	9.18	0.00	70%	6.43	
Single-Family Residential (R-1)	77.24	0.00	80%	61.79	
Single-Family Residential & Two-Family Residential (R-3)	44.82	0.00	80%	35.86	
TOTALS					
142.55	0.00	142.55	79%	112.56	
02040202080050					
Neighborhood Commercial (C-1)	1.67	0.00	80%	1.34	
Downtown Commercial (C-2)	32.97	0.00	95%	31.32	
Flood Hazard/Conservation (FH-C)	234.29	116.25	70%	82.63	
General Industrial (I-1)	8.07	0.00	75%	6.05	
Industrial/Commercial (I-2)	35.45	0.00	70%	24.82	
Single-Family Residential (R-1)	229.26	0.60	80%	182.93	
Single-Family Residential (R-2)	139.08	0.00	80%	111.26	
Single-Family Residential & Two-Family Residential (R-3)	139.18	0.63	80%	110.84	
Special Development (SD)	86.88	14.65	80%	57.78	
TOTALS					
906.85	132.13	774.72	79%	608.97	

TABLE 2: POLLUTANT LOADS BY LAND COVER

Land Cover	Total Phosphorus Load (lbs/acre/year)	Total Nitrogen Load (lbs/acre/year)	Total Suspended Solids Load (lbs/acre/yr)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1.0	10	120
Agricultural	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

TABLE 3: HUC-14 NONPOINT SOURCE LOADS AT BUILD-OUT FOR RIVERSIDE TOWNSHIP

HUC-14 and Zone	Build-Out Zoning	Developable Area (Acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
02040202090010								
General Industrial (I-1)	Industrial	11.31	1.5	16.97	16	180.96	200	2,262.00
Industrial/Commercial (I-2)	Commercial	9.18	2.1	19.28	22	201.96	200	1,836.00
Single-Family Residential (R-1)	High, Medium Density Residential	77.24	1.4	108.14	15	1,158.60	140	10,813.60
Single-Family Residential & Two-Family Residential (R-3)	High, Medium Density Residential	44.82	1.4	62.75	15	672.30	140	6,274.80
TOTALS		142.55		207.13		2,213.82		21,186.40
02040202080050								
Neighborhood Commercial (C-1)	Commercial	1.67	2.1	3.51	22	36.74	200	334.00
Downtown Commercial (C-2)	High, Medium Density Residential	32.97	1.4	46.16	15	494.55	140	4,615.80
Flood Hazard/Conservation (FH-C)	Barrenland/Transitional Area	118.04	0.5	59.02	5	590.20	60	7,082.40
General Industrial (I-1)	Industrial	8.07	1.5	12.11	16	129.12	200	1,614.00
Industrial/Commercial (I-2)	Commercial	35.45	2.1	74.45	22	779.90	200	7,090.00
Single-Family Residential (R-1)	High, Medium Density Residential	228.66	1.4	320.12	15	3,429.90	140	32,012.40
Single-Family Residential (R-2)	High, Medium Density Residential	139.08	1.4	194.71	15	2,086.20	140	19,471.20
Single-Family Residential & Two-Family Residential (R-3)	High, Medium Density Residential	138.55	1.4	193.97	15	2,078.25	140	19,397.00
Special Development (SD)	High, Medium Density Residential	72.23	1.4	101.12	15	1,083.45	140	10,112.20
TOTALS		774.72		1,005.16		10,708.31		101,729.00

Mitigation Plan

This mitigation plan **Mitigation Plan** is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality or quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

- a. The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Township Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

Option 1 – Groundwater Recharge

- Retrofit the existing stormwater management basins under Township jurisdiction to provide groundwater recharge.
- Retrofit existing Township facilities (ie., municipal building, library, etc.) with dry wells to provide groundwater recharge.

Option 2 – Water Quality

- Retrofit the existing stormwater management basin under Township jurisdiction to provide water quality measures.
- Retrofit the existing parking facilities at the various municipal facilities to provide the removal of 80 percent of the total suspended solids.

Option 3 – Water Quantity

- Install stormwater management measures in the open space at various municipal facilities to reduce the peak flow from the upstream development on the receiving streams.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance or exemption is given because the 80 percent TSS requirement is not met, the selected project may address water quality

impacts due to fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

Groundwater Recharge

- Install measures on other property owned by developer within the Township.

Water Quality

- Provide goose management measures, including public education at Municipal Parks.

Water Quantity

- Provide beaver management measures, including public education.

3. Another source of potential mitigation projects is within the "Prioritization of Potential Streambank Stabilization and Habitat Restoration Projects in the Ranococas Creek Watershed" prepared by the Burlington County Soil Conservation District. Other sources of potential mitigation projects would include Masons Creek Regional Stormwater Management Plan Guidance Document and any future watershed studies done within the municipality.

4. The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easements for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

Wellhead Protection

The Township is evaluating a number of alternatives to address additional development restrictions in the Wellhead Protection Areas noted in Figure 2.

APPENDIX A

2006-#23

RIVERSIDE TOWNSHIP

STORMWATER CONTROL ORDINANCE

Revised July 28, 2006

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Section 1: Scope and Purpose

A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques shall be explored before structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for "major development," as defined in Section 2.

C. Applicability

1. This ordinance shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:

a. Non-residential major developments; and

b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This ordinance shall also be applicable to all major developments undertaken by Riverside Township.

D. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of development approvals under the subdivision and site plan review process and 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. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

This ordinance is intended to supersede those paragraphs and standards listed in the Riverside Code where they are in conflict with this ordinance.

Section 2: Definitions

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

“CAFRA Planning Map” means the geographic depiction of the boundaries for Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

“CAFRA Centers, Cores or Nodes” means those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

“Compaction” means the increase in soil bulk density.

“Core” means a pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

“County review agency” means an agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

A county water resource association created under N.J.S.A. 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

“Department” means the New Jersey Department of Environmental Protection.

“Designated Center” means a State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

“Design engineer” means a person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

“Development” means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq. In the case of development of agricultural lands, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A. 4:1C-1 et seq.

“Drainage area” means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

“Environmentally critical areas” means an area or feature which is of significant environmental value, including but not limited to: stream corridors, natural heritage priority sites, habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department’s Landscape Project as approved by the Department’s Endangered and Nongame Species Program.

“Empowerment Neighborhood” means a neighborhood designated by the Urban Coordinating Council “in consultation and conjunction with” the New Jersey Redevelopment Authority pursuant to N.J.S.A. 55:19-69.

“Erosion” means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

“Impervious surface” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

“Infiltration” is the process by which water seeps into the soil from precipitation.

“Major development” means any “development” that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

“Municipality” means any city, borough, town, township, or village.

“Node” means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

“Nutrient” means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

“Person” means any individual, corporation, company, partnership, firm, association, municipality, or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq.

“Pollutant” means any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, and construction waste or runoff, or other residue discharged directly or indirectly to the land, ground waters or surface waters of the State, or to a domestic treatment works. “Pollutant” includes both hazardous and nonhazardous pollutants.

“Recharge” means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

“Sediment” means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

“Site” means the lot or lots upon which a major development is to occur or has occurred.

“Soil” means all unconsolidated mineral and organic material of any origin.

“State Development and Redevelopment Plan Metropolitan Planning Area (PAI)” means an area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state’s future redevelopment and revitalization efforts.

“State Plan Policy Map” is defined as the geographic application of the State Development and Redevelopment Plan’s goals and statewide policies, and the official map of these goals and policies.

“Stormwater” means water resulting from precipitation (including rain and snow) that runs off the land’s surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.

“Stormwater runoff” means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

“Stormwater management basin” means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

“Stormwater management measure” means any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

“Tidal Flood Hazard Area” means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

“Urban Coordinating Council Empowerment Neighborhood” means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

“Urban Enterprise Zones” means a zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et. seq.

“Urban Redevelopment Area” is defined as previously developed portions of areas:

Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PAI),
Designated Centers, Cores or Nodes;

Designated as CAFRA Centers, Cores or Nodes;

Designated as Urban Enterprise Zones; and

Designated as Urban Coordinating Council Empowerment Neighborhoods.

“Waters of the State” means the ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

“Wetlands” or “wetland” means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

Section 3: General Standards

A. Design and Performance Standards for Stormwater Management Measures

1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in Section 4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.

2. The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.

Note: Alternative standards shall provide at least as much protection from stormwater-related loss of groundwater recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in N.J.A.C. 7:8-5.

Section 4: Stormwater Management Requirements for Major Development

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 10. A major development is defined as one which ultimately disturbs one (1) or more acres of land.

- B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlenbergi* (bog turtle).

- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff requirements of Sections 4.F and 4.G:

1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;

2. Nonstructural stormwater management strategies incorporated into site design shall:
 1. To the maximum extent practicable, the standards in Sections 4.F and 4.G shall be met by incorporating nonstructural stormwater management strategies set forth at Section 4.E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.
 2. Nonstructural stormwater management strategies incorporated into site design shall:
 - a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
 - b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
 - c. Maximize the protection of natural drainage features and vegetation;
- E. Nonstructural Stormwater Management Strategies
 1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
 2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.F and 4.G to the maximum extent practicable;
 3. The applicant demonstrates that, in order to meet the requirements of Sections 4.F and 4.G, existing structures currently in use, such as homes and buildings, would need to be condemned; and
 4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.F and 4.G that were not achievable on-site.
- D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
 2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and
 3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
 1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
 2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.F and 4.G to the maximum extent practicable;
 3. The applicant demonstrates that, in order to meet the requirements of Sections 4.F and 4.G, existing structures currently in use, such as homes and buildings, would need to be condemned; and
 4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.F and 4.G that were not achievable on-site.

d. Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;

e. Minimize land disturbance including clearing and grading;

f. Minimize soil compaction;

g. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;

h. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;

i. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:

(1) Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Section 4.E.3. below;

(2) Site design features that help to prevent discharge of trash and debris from drainage systems;

(3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and

(4) When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

3. Site design features identified under Section 4.E.2.i.(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 4.E.3.c below.

a. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:

(1) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or

(2) A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.

b. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.

c. This standard does not apply:

(1) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;

(2) Where flows from the water quality design storm as specified in Section 4.G.1 are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:

a. A rectangular space four and five-eighths inches long and one and one-half inches wide (this option does not apply for outfall netting facilities); or

b. A bar screen having a bar spacing of 0.5 inches.

(3) Where flows are conveyed through a trash rack that has parallel bars with one-inch (1") spacing between the bars, to the elevation of the water quality design storm as specified in Section 4.G.1; or

(4) Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

4. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Sections 4.F and 4.G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.

5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org.

F. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

1. This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.
 - a. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.
 - b. The minimum design and performance standards for groundwater recharge are as follows:
 - (1) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 5, either:
 - (a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or
 - (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.
 - (2) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (3) below.
 - (3) The following types of stormwater shall not be recharged:
 - (a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with Department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and
 - (b) Industrial stormwater exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

- (4) The design engineer shall assess the hydraulic impact on the groundwater table and subsurface structures in the vicinity or downgradient of the groundwater recharge area.
- c. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 5, complete one of the following:
- (1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
 - (2) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;
 - (3) Design stormwater management measures so that the post-construction peak runoff rates for the 2, 10 and 100 year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or
 - (4) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.
2. Any application for a new agricultural development that meets the definition of major development at Section 2 shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For the purposes of this section, "agricultural development" means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

G. Stormwater Runoff Quality Standards

1. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80 percent of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

Table 1: Water Quality Design Storm Distribution

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

2. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in Section 7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, New Jersey, 08625-0418.
3. If more than one BMP in series is necessary to achieve the required 80 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (AXB)/100$$

Where

R = total TSS percent load removal from application of both BMPs, and
 A = the TSS percent removal rate applicable to the first BMP
 B = the TSS percent removal rate applicable to the second BMP

Table 2: TSS Removal Rates for BMPs	
Best Management Practice	TSS Percent Removal Rate
Bioretention Systems	90
Constructed Stormwater Wetland	90
Extended Detention Basin	40-60
Infiltration Structure	80
Manufactured Treatment Device	See Section 6.C
Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

4. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site in which case the removal rate can be demonstrated through a calculation using a weighted average.
5. Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in Sections 4.F and 4.G.

6. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in Section 7.

7. In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.

8. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

- a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:

- (1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided.

- (2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.

b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards For Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq.

c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard for Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:

(1) Stabilization measures shall not be placed within 150 feet of the Category One waterway;

(2) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;

(3) Temperature shall be addressed to ensure no impact on the receiving waterway;

(4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;

(5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and

(6) All encroachments proposed under this section shall be subject to review and approval by the Department.

d. A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Section 4.G(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.

e. Paragraph G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.

Section 5: Calculation of Stormwater Runoff and Groundwater Recharge

A. Stormwater runoff shall be calculated in accordance with the following:

1. The design engineer shall calculate runoff using one of the following methods:

- a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds; or

- b. The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.

2. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term “runoff coefficient” applies to both the NRCS methodology at Section 5.A.1.a and the Rational and Modified Rational Methods at Section 5.A.1.b. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).

3. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.

4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 – Urban Hydrology for Small Watersheds and other methods may be employed.

5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following:

1. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at <http://www.state.nj.us/dep/njgs/>; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427 Trenton, New Jersey 08625-0427; (609) 984-6587.

Section 6: Standards for Structural Stormwater Management Measures

A. Standards for structural stormwater management measures are as follows:

1. Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).
2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch (1") spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than one-third (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 8.D.

3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement.

4. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.
5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.

B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by Section 4 of this ordinance. Manufactured treatment devices may be used to meet the requirements of Section 4 of this ordinance, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

Section 7: Sources for Technical Guidance

- A. Technical guidance for stormwater management measures can be found in the documents listed at 1 and 2 below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey, 08625; telephone (609) 777-1038.

1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.

2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.
- B. Additional technical guidance for stormwater management measures can be obtained from the following:

1. The "Standards for Soil Erosion and Sediment Control in New Jersey" promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540;
2. The Rutgers Cooperative Extension Service, 732-932-9306; and

3. The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

Section 8: Safety Standards for Stormwater Management Basins

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.

The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

- B. Requirements for Trash Racks, Overflow Grates and Escape Provisions

1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:

- a. The trash rack should be constructed primarily of bars aligned in the direction of flow with one (1) inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the bars shall be spaced no greater than one-third (1/3) the width of the hydraulic opening it is protecting or six inches, whichever is less. Transverse bars aligned perpendicular to flow should be sized and spaced as necessary for rack stability and strength.
- b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
- c. The trash rack shall have sufficient net open area under clean conditions. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.
- d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs./ft sq.
2. An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:
 - a. The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.
 - b. The overflow grate spacing shall be no less than two inches across the smallest dimension.
 - c. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs./ft sq.
3. For purposes of this paragraph 3, escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:
 - a. If a stormwater management measure has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide readily accessible means of ingress and egress from the outlet structure. With the prior approval of the reviewing agency identified in Section 8.C a free-standing outlet structure may be exempted from this requirement.
 - b. Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than two and one-half feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the

permanent water surface. See Section 8.D for an illustration of safety ledges in a stormwater management basin.

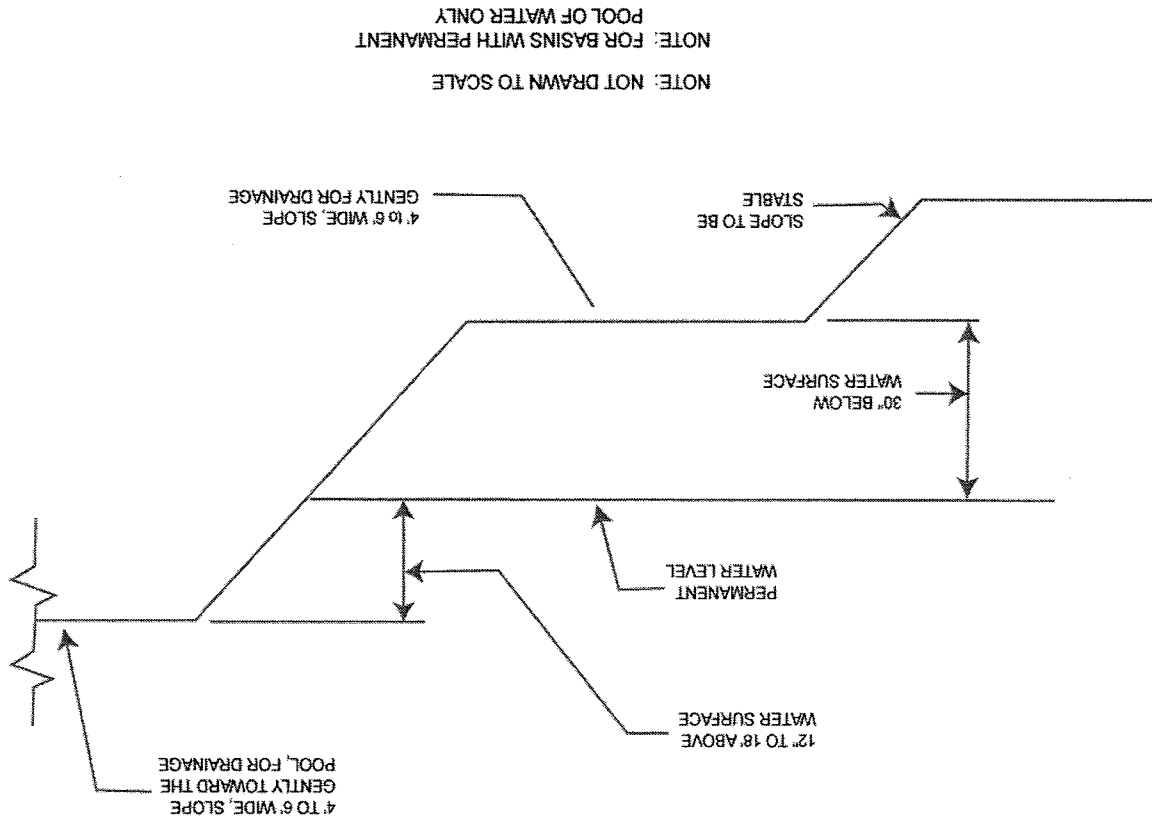
- c. In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

C. Variance or Exemption from Safety Standards

1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

D. Illustration of Safety Ledges in a New Stormwater Management Basin

Depicted is an elevational view.



Section 9: Requirements for a Site Development Stormwater Plan

A. Submission of Site Development Stormwater Plan

1. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 9.C below as part of the submission of the applicant's application for subdivision or site plan approval. These required components are in addition to any other information required under any provisions of Riverside Township's land use ordinance.

2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.
3. The applicant shall submit three (4) copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this ordinance.

B. Site Development Stormwater Plan Approval

1. The applicant's Site Development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.

C. Checklist Requirements

Any application for approval of a major development shall include at least the following information. All required engineering plans shall be submitted to the Riverside Township in CAD Format 15 or higher, registered and rectified to NJ State Plane NAD 83 or Shape Format NJ State Plane NAD 83, and all other documents shall be submitted in both paper and commonly used electronic file formats such as PDF, word processing, database or spreadsheet files. Three (3) copies of each item shall be submitted. The municipality may choose to revise these criteria for consistency with their own software requirements.

1. Topographic Base Map

The applicant shall submit a topographic base map of the site which extends a minimum of two hundred (200) feet beyond the limits of the proposed development, at a scale of one (1) inch = two hundred (200) feet or greater, showing one (1) foot contour intervals. The map shall indicate the following: existing surface water drainage, shorelines, steep slopes, soils, highly erodible soils, perennial or intermittent streams that drain into or upstream of any Category One Waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing surface and subsurface human-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown. Riverside Township may require upstream tributary drainage system information as necessary.

2. Environmental Site Analysis

The applicant shall submit a written description along with the drawings of the natural and human-made features of the site and its environs. This description should include:

- a. A discussion of environmentally critical areas, soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual or environmentally sensitive features and to those that provide particular opportunities for or constraints on development; and
- b. Detailed soil and other environmental conditions on the portion of the site proposed for installation of any stormwater BMPs, including, at a minimum: soils report based on onsite soil tests; locations and spot elevations in plan view of test pits and permeability tests; permeability test data and calculations; and any other required soil data (e.g., mounding analyses results) correlated with location and elevation of each test site; cross-section of proposed stormwater BMO with side-by-side depiction of soil profile drawing to scale and seasonal high water table elevation identified; and any other information necessary to demonstrate the suitability of the specific proposed structural and nonstructural stormwater management measures relative to the environmental conditions on the portion(s) of the site proposed for implementation of those measures.

3. Project Description and Site Plan

The applicant shall submit a map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high ground water elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.

4. Land Use Planning and Source Control Plan

- a. The applicant shall submit a detailed Land use Planning and Source Control Plan which provides a description of how the site will be developed to meet the erosion control, groundwater recharge and stormwater runoff quantity and quality standards at Section 4 through use of nonstructural or low impact development techniques and source controls to the maximum extent practicable before relying on structural BMPs. The Land Use Planning and Source Control Plan shall include a detailed narrative and associated illustrative maps and/or plans that specifically address how each of the following nine(9) nonstructural strategies identified in Subchapter 5 of the NJDEP Stormwater Management Rules (N.J.A.C. 7:8-5) and set forth below (4.a.(1), through (9),) will be implemented to the maximum extent practicable to meet the standards at Section IV of this ordinance on the site. If one or more of the nine (9) nonstructural strategies will not be implemented on the site, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practicable on the site.

- (1) Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
- (2) Minimize impervious and break up or disconnect the flow of runoff over impervious surfaces;
- (3) Maximize the protection of natural drainage features and vegetation;
- (4) Minimize the decrease in the pre-development "time of concentration";
- (5) Minimize land disturbance including clearing and grading;
- (6) Minimize soil compaction and all other soil disturbance;
- (7) Provide low-maintenance landscaping that provides for the retention and planting of native plants and minimizes the use of lawns, fertilizers and pesticides;
- (8) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and
- (9) Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls shall include, but are not limited to:
 - i. Site design features that help to prevent accumulation of trash and debris in drainage systems;
 - ii. Site design features that help to prevent discharge of trash and debris from drainage systems;
 - iii. Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
 - iv. Applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules, when establishing vegetation after land disturbance.
- b. For sites where stormwater will be generated from "high pollutant loading areas" or where stormwater will be exposed to "source material", the applicant shall also demonstrate in the Land Use Planning and Source Control Plan that the requirements of Section 4 have been met.
- c. The use of nonstructural strategies to meet the performance standards in Section 4 of this ordinance is not required for development sites creating less than one (1) acre of disturbance. However, each application for major development and any other application where Riverside Township otherwise requires a landscaping plan shall

contain a landscaping or revegetation plan. In addition, the applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Riverside Township Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval.

5. Stormwater Management Facilities Map

The applicant shall submit a map, at the same scale as the topographic base map, depicting the following information:

- a. Total area to be disturbed, paved and/or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.
- b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.

6. Calculations

- a. The applicant shall submit comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 5 of this ordinance. The standards for groundwater recharge and stormwater runoff rate, volume and quality required by Section 4 shall be met using the methods, calculations and assumptions provided in Section 5.
- b. When the proposed stormwater management control measures (e.g., infiltration basins) depend on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on onsite boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.

7. Inspection, Maintenance and Repair Plan

The applicant shall submit a detailed plan describing how the proposed stormwater management measure(s) shall meet the maintenance and repair requirements of Section 10 of this ordinance. Said plan shall include, at a minimum, the following elements:

- a. The frequency with which inspections will be made;
- b. The specific maintenance tasks and requirements for each proposed structural and nonstructural BMP;
- c. The name, address and telephone number for the entity responsible for implementation of the maintenance plan;
- d. The reporting requirements; and

Section 10: Maintenance and Repair

8. Waiver from Submission Requirements
 - e. Copies of the inspection and maintenance reporting sheets.
- The municipal official or board reviewing an application under this ordinance may, in consultation with the municipal engineer, waive submission of any of the requirements in Sections 9.C.1 through 9.C.6 of this ordinance when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

- A. Applicability
- Projects subject to review pursuant to Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 10.C below.
- B. General Inspection, Maintenance and Repair Plan
1. The design engineer shall prepare an Inspection, Maintenance and Repair Plan for the stormwater management measures, including both structural and nonstructural measures incorporated into the design of a major development. This plan shall be submitted as part of the Checklist Requirements established in Section 9.C. Inspection and maintenance guidelines for stormwater management measures are available in the New Jersey BMP Manual.

2. The Inspection, Maintenance and Repair Plan shall contain the following:

- a. Accurate and comprehensive drawings of the site's stormwater management measures;
- b. Specific locations of each stormwater management measure identified by means of longitude and latitude as well as block and lot number;

- c. Specific preventative and corrective maintenance tasks and schedules for such tasks for each stormwater BMP;

- d. Cost estimates, including estimated cost of sediment, debris or trash removal; and
- e. The name, address and telephone number of the person or persons responsible for regular inspections and preventative and corrective maintenance (including repair and replacement). If the responsible person or persons is a corporation, company, partnership, firm, association, municipality or political subdivision of this State, the name and telephone number of an appropriate contact person shall also be included.

3. The person responsible for inspection, maintenance and repair identified under Section 10.B.2 above shall maintain a detailed log of all preventative and corrective maintenance performed for the site's stormwater management measures, including a record of all

inspections and copies of all maintenance-related work orders in the Inspection, Maintenance and Repair Plan. Said records and inspection reports shall be retained for a minimum of five (5) years.

4. If the Inspection, Maintenance and Repair Plan identifies a person other than the developer (for example, a public agency or homeowners' association as having the responsibility for inspection and maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate stormwater management measure to such person under an applicable ordinance or regulation.

5. If the person responsible for inspection, maintenance and repair identified under Section 10.B.3 above is not a public agency, the maintenance plan and any future revisions based on Section 10.B.6 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan shall be undertaken.
6. The person responsible for inspection, maintenance and repair identified under Section 10.B.2 above shall evaluate the effectiveness of the Inspection, Maintenance and Repair Plan at least once per year and update the plan and the deed as needed.
7. The person responsible for inspection, maintenance and repair identified under Section 10.B.2 above shall submit the updated Inspection, Maintenance and Repair Plan and the documentation required by Sections 10.B.2 and 10.B.3 above to Riverside Township once a year.

8. The person responsible for inspection, maintenance and repair identified under Section 10.B.2 above shall retain and make available, upon request by any public entity with administrative, health, environmental or safety authority over the site Inspection, Maintenance and Repair Plan and the documentation required by Sections 10.B.2 and 10.B.3.

- C. Responsibility for inspection, repair and maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.

- D. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including, but not limited to: repairs or replacement to any eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; repair or replacement of linings; and restoration of infiltration function.

- E. Stormwater management measure easements shall be provided by the property owner as necessary for facility inspections and maintenance and preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities. The purpose of the easement shall be specified in the maintenance agreement.

F. In the event that the stormwater management measure becomes a public health nuisance or danger to public safety or public health, or if it is in need of maintenance or repair, Riverside Township shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or the municipal engineer's designee. Riverside Township, at its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair within the allowable time, Riverside Township may immediately proceed to do so with its own forces and equipment and/or through contractors. The costs and expenses of such maintenance and repair by Riverside Township shall be entered on the tax roll as a special charge against the property and collected with any other taxes levied thereon for the year in which the maintenance and repair was performed.

G. Requirements for Inspection and Repair of Stormwater BMPs that rely on infiltration

If a stormwater infiltration BMP is incorporated into the design of a major development, the applicant shall include the following requirements in its Inspection, Maintenance and Repair Plan:

1. Once per month (if needed): Mow side slopes, remove litter and debris, stabilize eroded bands, repair erosion at inflow structures(s);
2. After every storm exceeding one (1) inch of rainfall: Ensure that infiltration BMPs drain completely within seventy-two (72) hours after the storm event. If stored water fails to infiltrate seventy-two (72) hours after the end of the storm, corrective measures shall be taken. Raking or tilling by light equipment can assist in maintaining infiltration capacity and break up clogged surfaces;
3. Four times per year (quarterly): Inspect stormwater infiltration BMPs for clogging and excessive debris and sediment accumulation with BMP, remove sediment (if needed) when completely dry;
4. Two times per year: Inspect for signs of damage to structures, repair eroded areas, check for signs of petroleum contamination and remediate;
5. Once per year: Inspect BMPs for unwanted tree growth and remove if necessary, disc or otherwise aerate bottom of infiltration basin to a minimum depth of six (6) inches; and
6. After every storm exceeding one (1) inch of rainfall, inspect and, if necessary remove and replace K5 sand layer and accumulated sediment, to restore original infiltration rate.
7. Additional guidance for the inspection, maintenance and repair of stormwater infiltration BMPs can be found in the New Jersey BMP Manual.

H. Maintenance Guarantee

1. The applicant shall provide a maintenance guarantee in accordance with N.J.S.A. 40:55D-53 to ensure that all stormwater management measures required under the provisions of this ordinance will be maintained in accordance with the specifications established herein.
 2. Additionally, for those stormwater management measures that are to be inspected, maintained and repaired by a public agency, the Riverside Township shall collect an up-front fee from the applicant in the amount the Riverside Township determines is needed to provide long-term inspection, maintenance and repair of all stormwater management measures. This up-front fee shall be placed in a dedicated cash management account and expended by the Riverside Township for the sole purpose of conducting inspection, maintenance and repair activities for all stormwater management measures required under the applicant's major development application approval. The calculation of the fee shall be based upon the Inspection, Maintenance and Repair Plan (Plan) required to be prepared by the applicant and approved by the Riverside Township. The Plan shall include an estimate of the present value of the cost to inspect, maintain and repair the stormwater management measure(s) in accordance with the Plan for the useful life of those measure(s). The Riverside Township shall furnish the applicant their published hourly rates as prescribed by their salary ordinance for public works' and other personnel having responsibilities determined by the Riverside Township and the applicant to account for the reconstruction of stormwater management measures that are reasonably anticipated to be subject to long term failure. After an agreed number of years, depending on the type of measure(s), the measure(s) will need to be reconstructed. The amount shall be based on the future value of the measure(s) being reconstructed. Both inflation rates and bank interest rates shall be based on the ten year average published in the Wall Street Journal or other approved publication. Interest accruing in the account must also be accounted for at an agreed upon interest rate, to arrive at an amount. The costs for reconstructing the measure(s) shall be taken from the engineer's probable cost estimate that is utilized to determine the amount of the required performance guarantee. It is acceptable to attach a percentage of failure to certain line items in the estimate.
 3. Additionally, for those stormwater management measures that are to be inspected, maintained and repaired by a homeowners association, condominium association or some other form of non-public ownership, no fee shall be collected by the Riverside Township. Instead, the ownership entity shall establish and maintain a fund for the annual inspection and testing program, annual maintenance and repair program and annual contribution to a contingency fund for long-term reconstruction.
- The initial costs agreed to for the annual inspection and testing program and annual maintenance and repair program shall be based upon actual itemized proposals offered to the applicant by prospective vendors. The annual cost expended on inspection, testing and maintenance shall be reported to the Riverside Township to verify that maintenance is not being deferred and to inform the Riverside Township on the magnitude of those services.

The contingency fund shall require sufficient funds to be committed for long-term reconstruction of the stormwater management measure(s). Major reconstruction activities will necessitate proper financial planning. After an agreed number of years, depending on the type of measure(s), the measure(s) will need to be reconstructed. The contingency fund in the financial schedule shall be based on the future value of the measure being reconstructed. Both inflation rates and bank interest rates shall be based on the ten year average published in the Wall Street Journal or other approved publication. Interest accruing in the account must also be accounted for at an agreed upon interest rate, to arrive at an annual contribution amount.

I. Nothing in this section shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

J. Violations and Penalties

Any person who violates or neglects to comply with any provision of the ordinance established herein or notice issued pursuant thereto shall, upon conviction, be liable to the penalty established in the Riverside Township code.

Section 11: Mitigation Projects

A "Mitigation" project as may be required by the Riverside Township Stormwater Management Plan (MSWMP) must satisfy the following requirements. Additional information may be found in the NJDEP "Draft Guidance for the Development of Municipal Mitigation Plans – November 8, 2005":

A. Impact from noncompliance. Provide a table to show the required values, and the values provided in the project, and include an alternatives analysis demonstrating that on-site compliance was maximized.

B. Narrative and supporting information regarding the need for the waiver.

1. The waiver cannot be due to a condition created by the applicant. If the applicant can provide compliance with the Stormwater Management rules through a reduction in the scope of the project, the applicant has created the condition and a waiver cannot be issued.
2. A discussion and supporting information of the site conditions that would not allow the construction of a stormwater management facility to provide compliance with these requirements, AND/OR if the denial of the application would impose an extraordinary hardship on the applicant brought about by circumstances peculiar to the subject property. Site conditions to be considered are soil type, the presence of karst geology, acid soils, a high groundwater table, unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare, and safety.
3. Sensitive Receptor. Identify the sensitive receptor related to the performance standard from which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive receptor. Sensitive receptors are areas with specific sensitivity to impacts of stormwater, whether through changes in stormwater runoff quality, stormwater runoff quantity, and groundwater recharge. Within each municipality, a mitigation plan must

identify the sensitive receptors that are critical to accomplishing the goals of the Municipal Stormwater Management Plan.

a. Examples of sensitive receptors are listed below:

(1) Stormwater Quality:

Trout associated waters
Impoundments
Threatened and endangered species habitats
Drinking water supplies
Category One waters
Impaired waterways

(2) Stormwater Quantity:

Inadequate culvert
Property subject to flooding
Eroding streams
Category One waters
Freshwater and Coastal wetlands

(3) Groundwater Recharge:

Springs, seeps, wetlands
White cedar swamps
Threatened and endangered species sensitive to groundwater changes
Streams with low base flow
Aquifers
Category One waters

C. Design of the Mitigation Project: Provide the design details of the mitigation project. This includes, but is not limited to, drawings, calculations, and other information needed to evaluate the mitigation project.

D. Responsible Party: List the party or parties responsible for the construction and the maintenance of the mitigation project. Documentation must be provided to demonstrate that the responsible party is aware of, has authority to perform, and accepts the responsibility for the construction and maintenance of the mitigation project. Under no circumstance shall the responsible party be an individual single-family homeowner.

E. Maintenance: Include a maintenance plan that addresses the maintenance criteria at NJAC 7:8-5,8 as part to the mitigation plan. In addition, if the maintenance responsibility is being transferred to the municipality or another entity, the entity responsible for the cost of the maintenance must be identified. The municipality may provide the option for the applicant to convey the mitigation project to the municipality, if the applicant provides for the cost of maintenance in perpetuity.

F. Permits: Obtain any and all necessary local, State, or other applicable permits for the mitigation measure or project. These must be obtained prior to the municipal approval of the project for which mitigation is being provided.

G. Construction: Demonstrate that the construction of the mitigation project coincides with the construction of the proposed project. A certificate of occupancy or final approval by the municipality for the application project cannot be issued until the mitigation project or measure receives final approval. Any mitigation projects proposed by the municipality to offset the stormwater impacts of that municipality's own projects must be completed within 6 months of the completion of the municipal project, in order to remain in compliance with their NJPDES General Permit.

Section 12: Effective Date

This ordinance shall take effect immediately upon the approval by the county review agency, or sixty (60) days from the receipt of the ordinance by the county review agency if the county review agency should fail to act.

Section 13: Severability

If the provisions of any section, subsection, paragraph, subdivision, or clause of this ordinance shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision, or clause of this ordinance.

Riverside Twp Clerk

From: BCT PublicNotices [bctpublicnotices@phillyburbs.com]
Sent: Monday, November 27, 2006 10:34 AM
To: Riverside Twp Clerk
Subject: RE: Public Notice Introduction of Stormwater Control Ordinance

BCT RECEIVED. PUBLISHING NOV. 28, 06 FOR YOU
THANK YOU, CAROL

-----Original Message-----

From: Riverside Twp Clerk [mailto:riversidetwpclerk@comcast.net]
Sent: Monday, November 27, 2006 10:16 AM
To: BCT PublicNotices
Cc: 'Meghan Jack'; riversidetwpclerk@comcast.net
Subject: Public Notice Introduction of Stormwater Control Ordinance

Hi Carol,

Please publish the attached ASAP

AFFIDAVIT PLEASE.

Thank you,

Susan M. Dydek

11/27/2006

State of New Jersey County of Burlington

SS

RECEIVED
NOV 30 2006
B.K.

PATRICIA VIGNEAU being
duly sworn or affirmed according to
law, deposes and says that she is
the BILLING MANAGER
(Manager or designated Agent)

of the BURLINGTON TIMES, INC.
Publisher of the "Burlington County
Times" a daily newspaper of general
circulation, printed in the state of New
Jersey and published and having its
publication office at 4284 Route
130 N., Willingboro, Burlington
County, New Jersey, and entered as
second-class mail matter under the
United States in the Post Office at
Willingboro, N.J.; that said newspaper
was established on October 6, 1958
under the name "Burlington County
Times," that since January 15, 1968
said newspaper has been regularly
printed and published and entered in
said county, and that a facsimile of the
notice appears hereto, exactly as
published in said newspaper.

November 28, 2006

I in said subject matter of advertising; and all of the allegations in this statement as to the

of publication are true.

ing to law and subscribed to
day of November 2006

BILLING MANAGER

[Signature]

RIVERSIDE TOWNSHIP
NOTICE OF SECOND
READING AND
FINAL PASSAGE OF
ORDINANCE 2006-23
STORMWATER
CONTROL ORDINANCE

Ordinance 2006-23,
"Stormwater Control Or-
dinance" was passed on
first reading at the regu-
lar public meeting of the
Township Committee of
the Township of River-
side on November 22,
2006. The Ordinance will
be further considered for
final passage after sec-
ond reading and public
hearing at the regularly
scheduled meeting to be
held at 1 Scott Street,
Riverside, New Jersey on
December 27, 2006 at
7:30 PM, at which time
and place any persons
desiring to be heard upon
the same will be given
the opportunity to be
heard. This notice is
made in summary form in
accord with N.J.S.A.
40:49-2(a).

The Ordinance: (1)
states a scope and pur-
pose, (2) provides a defi-
nition section, (3) creates
general stormwater
standards, (4) provides
requirements for major
development, (5) pro-
vides calculation meth-
ods, (6) creates stand-
ards for structural
stormwater management
measures, (7) provides
sources for technical
guidance, (8) sets forth
safety standards for ba-
sins, (9) requires site de-
velopment stormwater
plans, (10) provides reg-
ulation for maintenance
and repair, (11) provides
for mitigation projects,
(12) establishes an effec-
tive date, and (13) pro-
vides for severability of
provisions.

Copies of this ordinance
will be made available at
the Municipal Clerk's of-
fice to members of the
general public who shall
request same during nor-

The time, before

A.D.

Ann Clark

My Commission expires on
May 04, 2010

[Signature]