Municipal Stormwater Management Plan

Evesham Township
984 Tuckerton Road
Marlton, NJ 08053

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ARH No. 35-01000.12

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Evesham 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 projects that disturb one or more acres of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity 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 mitigation projects are identified, this Municipal Stormwater Management Plan will be amended to include those projects.

Goals

The goals of this Municipal Stormwater Management Plan are to:

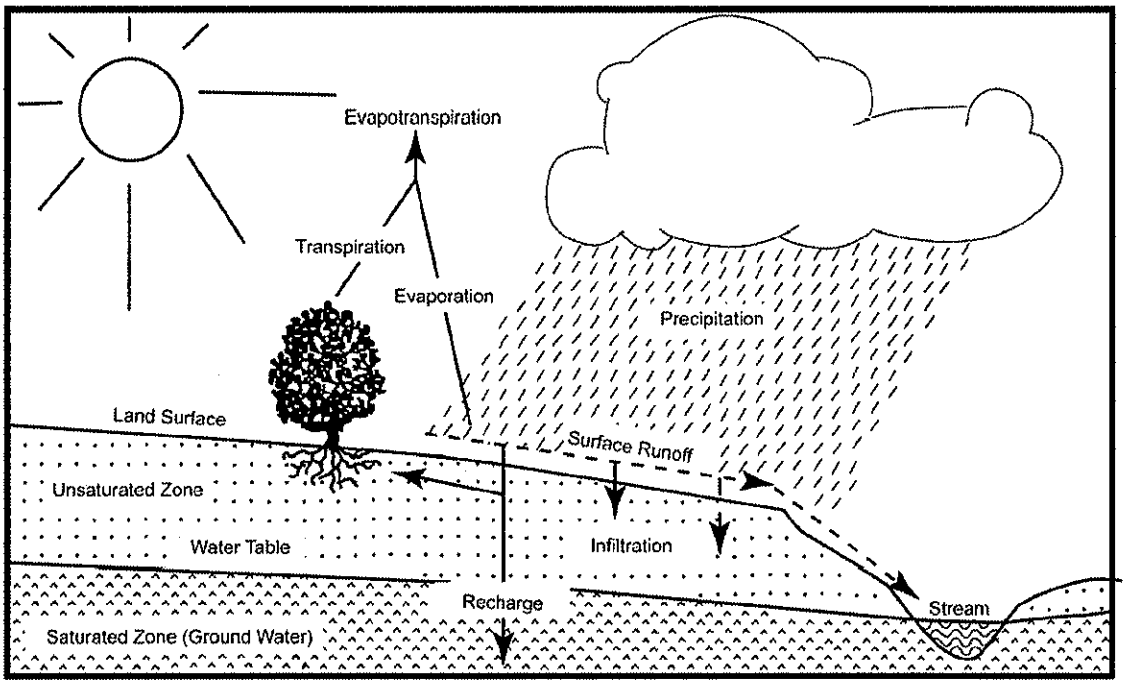
- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other 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 of a site and, ultimately, an entire watershed (See Figure 1). 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

Evesham Township encompasses a 30 square mile area in Burlington County, New Jersey. The population of the Township has increased from 21,508 in 1980, to 35,309 in 1990, to 42,275 in 2000. This population increase has resulted in considerable demand for new development; changes in the landscape have most likely increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure 2 illustrates the waterways in the Township. Figure 3 depicts the Township boundary on the USGS quadrangle maps.

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 biometrics related to benthic macroinvertebrate community dynamics.

The data generated from the AMNET sampling sites within and adjacent to Evesham Township indicates that most of the waterways at these sampling sites are moderately impaired. The waterways that have been classified as moderately impaired include South Branch of the Pennsauken Creek, Mullica River, Southwest Branch of the Rancocas Creek, Sharp Run and Kettle Run.

Barton Run, which is tributary to the Southwest Branch of the Rancocas Creek and Black Run, which is a tributary to Barton Run have both been identified as non-impaired. While these two (2) waterways have been classified as non-impaired, two unnamed tributaries that are upstream of Barton Run and Black Run have been identified as moderately 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 phosphorus concentrations and fecal coliform concentrations exceed the state's criteria. This is an indicator of impaired waterways and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each affected waterway.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering 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 source, which includes 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 adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

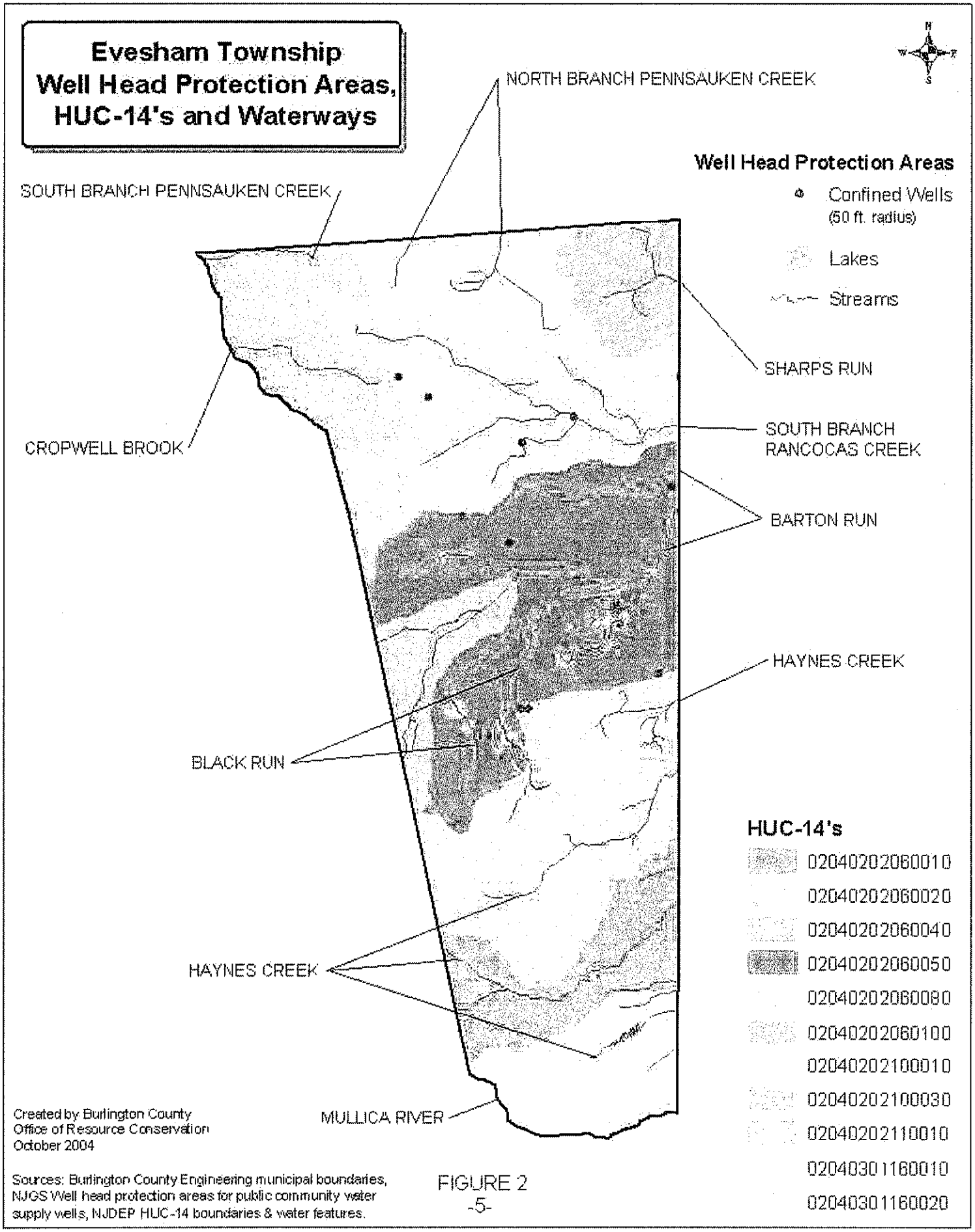

Evesham Township
Well Head Protection Areas,
HUC-14's and Waterways
NORTH BRANCH PENNSAUKEN CREEK
SOUTH BRANCH PENNSAUKEN CREEK
Well Head Protection Areas
Confined Wells
(50 ft. radius)
Lakes
Streams
SHARPS RUN
SOUTH BRANCH
RANCOCAS CREEK
CROPWELL BROOK
BARTON RUN
HAYNES CREEK
BLACK RUN
HAYNES CREEK
MULLICA RIVER
HUC-14's
02040202060010
02040202060020
02040202060040
02040202060050
02040202060080
02040202060100
02040202100010
02040202100030
02040202110010
02040301160010
02040301160020
Created by Burlington County
Office of Resource Conservation
October 2004
Sources: Burlington County Engineering municipal boundaries,
NJGS Well head protection areas for public community water
supply wells, NJDEP HUC-14 boundaries & water features.

FIGURE 2

Evesham Township
USGS Topography

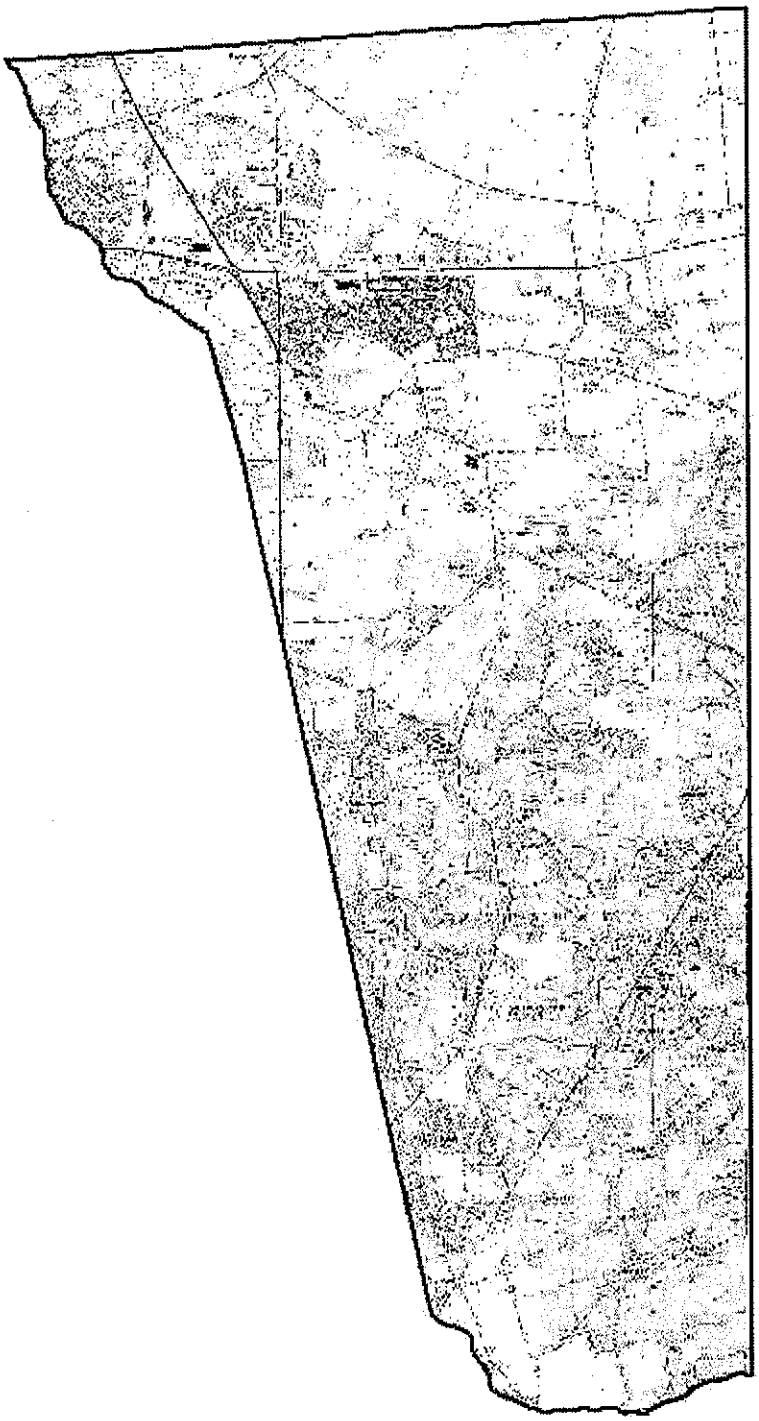


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FIGURE 3

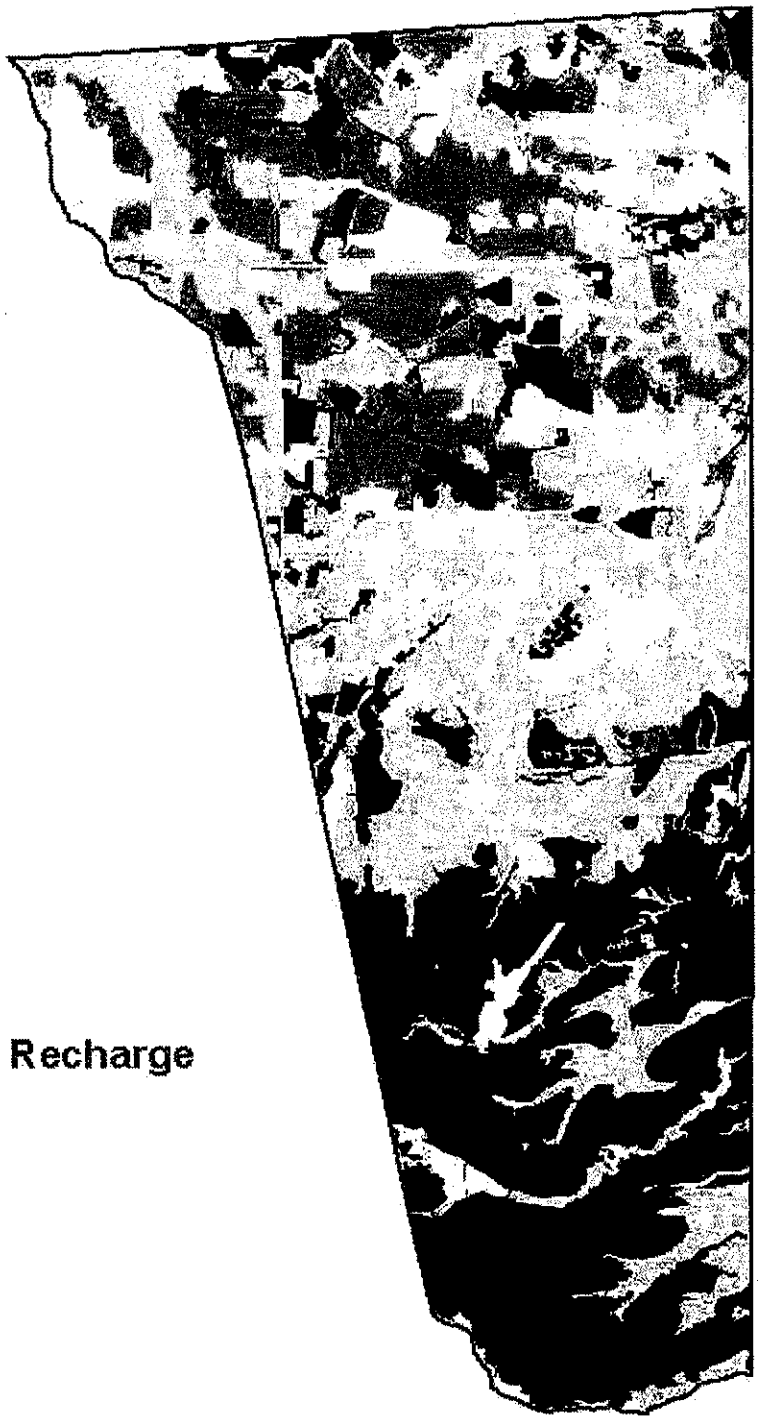
Sources: Burlington County Engineering
municipal boundaries, USGS topography

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.

In addition to water quality problems, the Township has experienced water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. These issues will require further study to identify the scope and magnitude of the water quantity problems encountered. As these problem areas are identified and quantified and mitigation plans are developed, this Municipal Stormwater Management Plan will be updated to address these problem areas and the proposed mitigation plans.

Wellhead protection areas, which are required as part of the MSWMP, are shown in Figure 2. A map of the groundwater recharge rates is shown in Figure 4.

Evesham Township Groundwater Recharge Rates & Wetlands



Groundwater Recharge

(Inches/year)

- 1 - 7
- 8 - 10
- 11 - 16

- wetlands

Created by Burlington County
Office of Resource Conservation
October 2004

FIGURE 4

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

Design and Performance Standards

The Township will adopt 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 adopted by the Township and submitted to the County for review and approval in accordance with statutory requirements.

A draft Stormwater Control Ordinance for Non-Pinelands Areas is included in Appendix A. A draft Stormwater Control Ordinance for Pinelands Areas is included in Appendix B. Evesham Township will adopt Stormwater Control Ordinances consistent with the statewide stormwater requirements at N.J.A.C. 7:8 and the regulations and standards contained in the Pinelands Comprehensive Management Plan at N.J.A.C. 7:50-6.84, for those lands in the Pinelands Area.

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. After construction of the project, the operation and maintenance of the stormwater management facilities shall be in accordance with required stormwater facility maintenance and repair schedule required to be submitted for review and approval at time of the development application submission.

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. It should be noted, however, that the following stream segments are listed on the State's file of impared waters (2004-303(d) list) and are required to have TMDL developed under the Clean Water Act:

- South Branch Pennsauken Creek @ Greentree Road
- Bartons Run @Tuckerton Road
- Bartons Run @ Jennings Lake
- Mullica River @ Jackson Road

In addition, a TMDL for Total Phosphorus is under development in the Rancocas Creek, which may impact certain areas within Evesham Township. Upon development of a TMDL or a Regional Stormwater Management Plan, this Municipal Stormwater Management Plan and the appropriate Township Ordinances will be updated to be consistent.

This Municipal Stormwater Management Plan is consistent with the requirements of the Pinelands Comprehensive Management Plan (CMP). Any future amendments to the CMP shall be incorporated into this Municipal Stormwater Management Plan to be consistent.

The Southern Medford and Evesham Resource Protection Plan is currently under development and is being coordinated through the Pinelands Commission. Upon adoption of the Southern Medford and Evesham Resource Protection Plan by Evesham Township, this Municipal Stormwater Management Plan and the appropriate Township Ordinances will be updated to be consistent.

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 Control Ordinances require 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 Master Plan and Ordinances have been reviewed in order to identfy the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. The recommended ordinances identified for revision are outlined below. Upon adoption, these ordinance revisions will be submitted to the county review agency for review and approval. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapters 62 of the Township Code, entitled Subdivision and Site Plan Design Standards and Chapter 160 of the Township Code entitled Zoning, were reviewed with regard to incorporating nonstructural stormwater management strategies. The recommended modifications are outlined below.

Chapter 62, Article IV: Stormwater Control should be revised to incorporate the Stormwater Control Ordinance requirements contained in Appendix A and Appendix B of this document.

Section 62-20: Shoulders allows the use of shoulders and / or drainage swales when certain criteria are met. This section should be amended to encourage the use of shoulders and drainage swales where site conditions warrant this design alternative.

Sections 62-56 D: Site Protection requires that all trees, natural features and other vegetation to be preserved shall be protected from equipment damage. This section should be amended to expand trees, natural features and other vegetation to include forested areas, to assure that leaf litter and other beneficial aspects of the forest are maintained in addition to the trees.

Section 62-57.E: Paving and Curbing requires all off-street parking, loading areas and driveways to be curbed unless otherwise specified by the Engineer and approved as part of the development application approval. This section should be amended to allow for 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 where deemed appropriate by the Engineer. This section should also be amended to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge where existing site and soil conditions support this paving methodology.

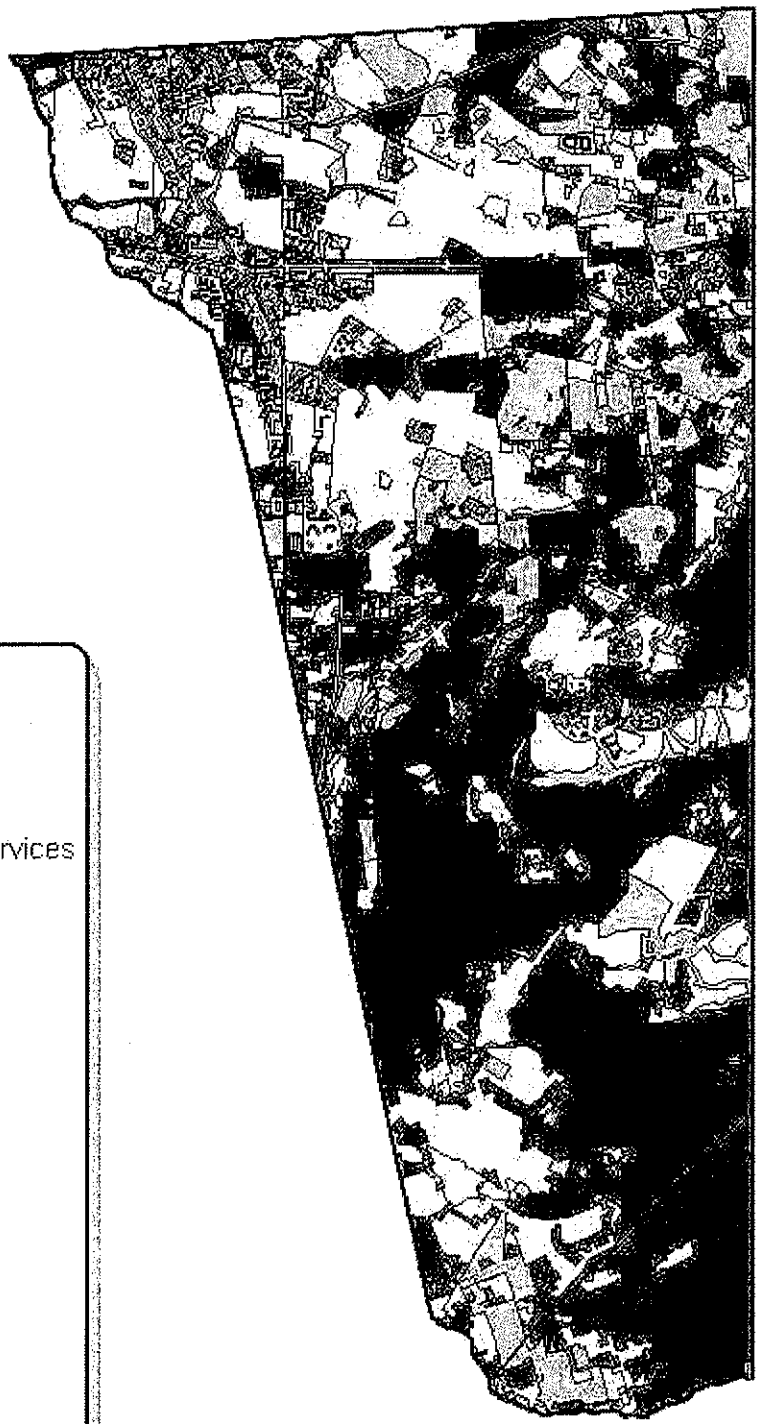
Section 160-5: Detention Basin – The Definition of Detention Basin precludes the construction of a Detention Basin in a buffer area. This definition should be revised to allow buffer areas to be used for stormwater management to the extent that the effectiveness of the buffer is not diminished. Disconnecting impervious surfaces and treating runoff from these impervious surfaces through buffer areas provides a natural filtering and improves water quality.

Section 160-19: Cluster Development is a method of developing land to set aside viable open spaces, conservation areas, flood plains, school sites, recreation areas and parks. Language should be added to promote the use of native vegetation where landscaped areas are required.

Land Use/Build-Out Analysis

A detailed land use analysis for the Township was conducted utilizing information about the Township based on HUC14 boundaries. A hydrologic unit code 14 (HUC14) is a specific drainage area defined by the U.S. Geological Survey. The total land area of Evesham Township is contained within eleven (11) HUC14s and is illustrated on Figure 2. For every land use zone located within each HUC14, pollutant loads were calculated based on developable area in the zone and the allowable impervious cover in the zone excluding NJDEP mapped wetland areas. Figures 4,5 and 6 illustrate the NJDEP mapped wetlands within the Township, the existing land use in the Township based on 1995/97 GIS information from NJDEP and the Township zoning map respectively. 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.

Evesham Township
Land Use Classification



Land Use

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

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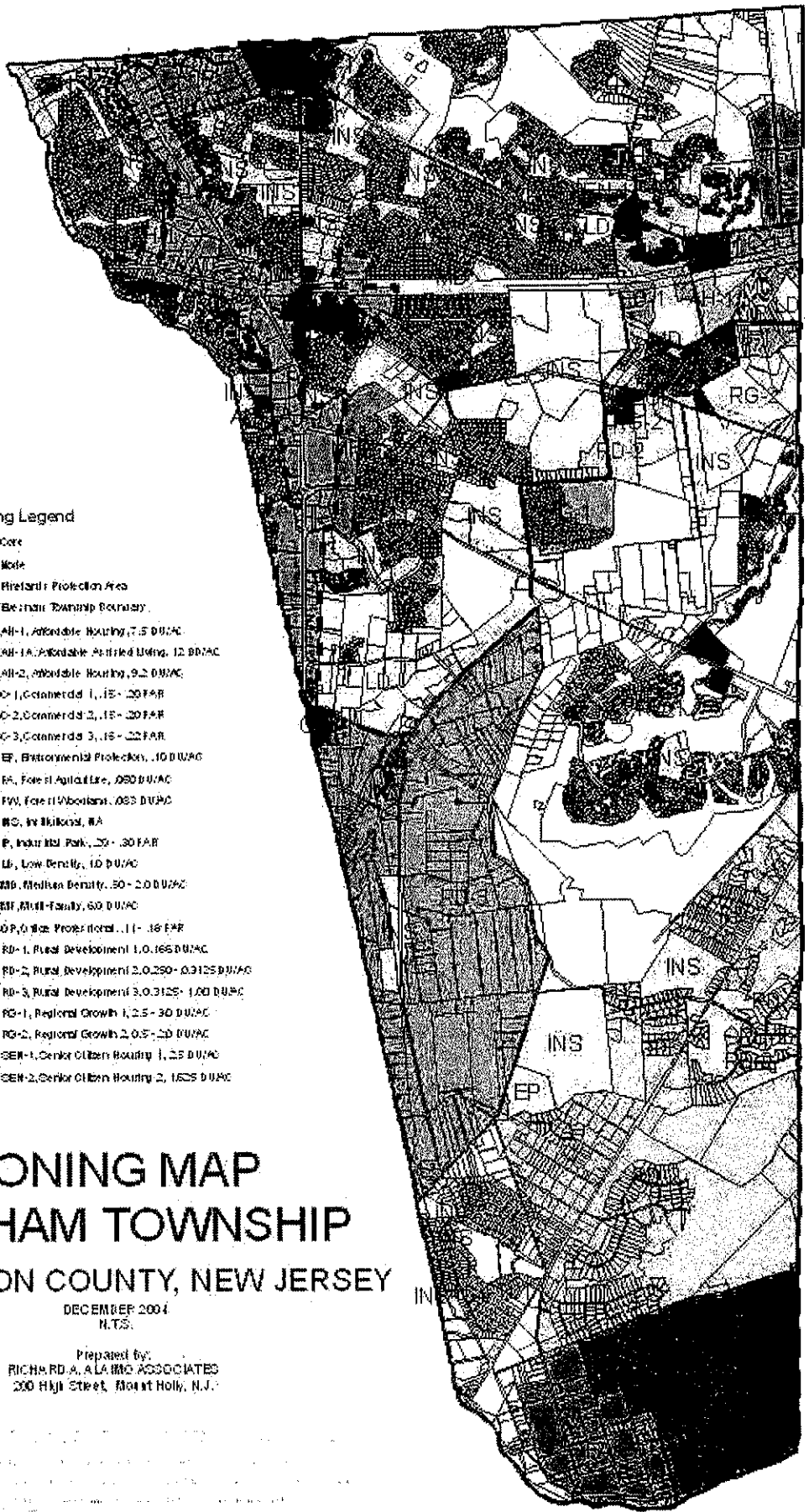
FIGURE 5

Sources. Burlington County Engineering municipal boundaries, DVRPC 2000 Land Use Data



ZONING MAP
EVESHAM TOWNSHIP
BURLINGTON COUNTY, NEW JERSEY

DECEMBER 2004
N.T.S.

Prepared by:
RICHARD A. ALAIMO ASSOCIATES
200 High Street, Mount Holly, N.J.

FIGURE 6

HUC14 and Zone	Total Area (Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Allowable Impervious (%)	Build-Out Impervious (Acres)
02040202060100					
Affordable Housing (AH-2)	0.39	0.00	0.39	50%	0.20
Commercial 1 (C-1)	0.15	0.00	0.15	60%	0.09
Industrial Park (IP)	125.91	94.20	31.71	70%	22.20
Low Density (LD)	524.22	287.20	237.02	15%	35.55
Multi-Family (MF)	1.97	0.00	1.97	45%	0.89
Senior Citizen Housing 1 (SEN-1)	126.48	119.15	7.33	55%	4.03
Senior Citizen Housing 2 (SEN-2)	159.51	127.47	32.04	55%	17.62
TOTALS	**938.63**	**628.02**	**310.61**	**26%**	**80.58**
02040202100040					
Affordable Assisted Living (AH-1A)	0.64	0.00	0.64	50%	0.32
Affordable Housing (AH-1)	49.28	0.13	49.15	50%	24.58
Commercial 1 (C-1)	523.64	38.00	485.64	60%	291.38
Commercial 2 (C-2)	34.97	0.98	33.99	70%	23.79
Commercial 3 (C-3)	61.34	0.00	61.34	70%	42.94
Industrial Park (IP)	149.07	11.55	137.52	70%	96.26
Institutional (INS)	107.13	37.47	69.66	65%	45.28
Medium Density (MD)	743.83	52.64	691.19	45%	311.04
Multi-Family (MF)	83.48	1.76	81.72	45%	36.77
TOTALS	**1,753.38**	**142.53**	**1,610.85**	**54%**	**872.36**
02040202100010					
Affordable Housing (AH-1)	35.30	5.47	29.83	50%	14.92
Commercial 2 (C-2)	73.37	5.76	67.61	70%	47.33
Institutional (INS)	64.48	11.78	52.70	65%	34.26
Low Density (LD)	558.11	267.02	291.09	15%	43.66
Medium Density (MD)	400.49	141.13	259.36	45%	116.71
Multi-Family (MF)	54.47	8.56	45.91	45%	20.66
Senior Citizen Housing 1 (SEN-1)	10.28	5.22	5.06	55%	2.78
TOTALS	**1,196.50**	**444.94**	**751.56**	**37%**	**280.32**

Table1: Build-Out Calculations for Evesham Township HUC14s

HUC14 and Zone	Total Area (Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Allowable Impervious (%)	Build-Out Impervious (Acres)
02040202060080					
Affordable Housing (AH-1)	135.26	83.53	51.73	50%	25.87
Affordable Housing (AH-2)	37.60	15.76	21.84	50%	10.92
Commercial 1 (C-1)	196.22	75.53	120.69	60%	72.41
Commercial 2 (C-2)	43.09	17.15	25.94	70%	18.16
Commercial 3 (C-3)	10.06	0.00	10.06	70%	7.04
Industrial Park (IP)	15.96	8.62	7.34	70%	5.14
Institutional (INS)	642.31	301.06	341.25	65%	221.81
Low Density (LD)	71.67	51.39	20.28	15%	3.04
Medium Density (MD)	1,667.28	269.31	1,397.97	45%	629.09
Multi-Family (MF)	47.51	24.37	23.14	45%	10.41
Office Professional (OP)	16.61	2.81	13.80	65%	8.97
Regional Growth 1 (RG-1)	128.71	71.34	57.37	45%	25.82
Regional Growth 2 (RG-2)	93.66	32.70	60.96	40%	24.38
Senior Citizen Housing 1 (SEN-1)	67.09	38.61	28.48	55%	15.66
Senior Citizen Housing 2 (SEN-2)	1.59	0.13	1.46	55%	0.80
TOTALS	**3,174.62**	**992.31**	**2,182.31**	**49%**	**1,079.53**
02040202110010					
Affordable Assisted Living (AH-1A)	6.21	1.05	5.16	50%	2.58
Commercial 1 (C-1)	248.96	53.17	195.79	60%	117.47
Institutional (INS)	8.34	4.28	4.06	65%	2.64
Medium Density (MD)	106.83	1.81	105.02	45%	47.26
Multi-Family (MF)	48.00	2.41	45.59	45%	20.52
TOTALS	**418.34**	**62.72**	**355.62**	**54%**	**190.47**

Table1: Build-Out Calculations for Evesham Township HUC14s

HUC14 and Zone	Total Area (Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Allowable Impervious (%)	Build-Out Impervious (Acres)
02040202060050					
Commercial 1 (C-1)	853.87	26.06	827.81	60%	496.69
Commercial 2 (C-2)	37.22	31.21	6.01	70%	4.21
Institutional (INS)	518.65	173.62	345.03	65%	224.27
Low Density (LD)	529.47	200.13	329.34	15%	49.40
Medium Density (MD)	643.01	108.80	534.21	45%	240.39
Multi-Family (MF)	92.62	0.00	92.62	45%	41.68
Office Professional (OP)	23.18	0.00	23.18	65%	15.07
Regional Growth 1 (RG-1)	129.19	56.03	73.16	45%	32.92
Regional Growth 2 (RG–2)	170.48	81.59	88.89	40%	35.56
Rural Development 1 (RD-1)	2,926.68	1,379.77	1,546.91	6%	92.81
Rural Development 2 (RD-2)	43.39	19.46	23.93	10%	2.39
Rural Development 3 (RD-3)	1,840.29	517.64	1,322.65	10%	132.27
TOTALS	**7,808.05**	**2,594.31**	**5,213.74**	**26%**	**1,367.65**
02040202060020					
Environmental Protection (EP)	48.58	2.16	46.42	5%	2.32
Institutional (INS)	372.45	40.50	331.95	65%	215.77
Rural Development 1 (RD-1)	824.24	386.11	438.13	6%	26.29
Rural Development 2 (RD-2)	1,265.32	232.18	1,033.14	10%	103.31
Rural Development 3 (RD-3)	348.08	9.84	338.24	10%	33.82
TOTALS	**2,858.67**	**670.79**	**2,187.88**	**17%**	**381.51**
02040202060040					
Commercial 1 (C-1)	9.59	1.81	7.78	60%	4.67
Commercial 2 (C-2)	16.25	8.92	7.33	70%	5.13
Institutional (INS)	85.28	46.08	39.20	65%	25.48
Low Density (LD)	297.46	190.33	107.13	15%	16.07
Medium Density (MD)	0.59	0.49	0.10	45%	0.05
Rural Development 3 (RD-3)	479.20	227.05	252.15	10%	25.22
TOTALS	**888.37**	**474.68**	**413.69**	**19%**	**76.61**

Table1: Build-Out Calculations for Evesham Township HUC14s

HUC14 and Zone	Total Area (Acres)	Wetlands/ Water Area (Acres)	Developable Area (Acres)	Allowable Impervious (%)	Build-Out Impervious (Acres)
02040202060010					
Forest Agriculture (FA)	10.36	0.00	10.36	2%	0.21
Forest Woodland (FW)	16.49	0.03	16.46	3.5%	0.58
Institutional (INS)	44.40	7.42	36.98	65%	24.04
Rural Development 1 (RD-1)	481.84	16.32	465.52	6%	27.93
Rural Development 2 (RD-2)	951.86	98.85	853.01	10%	85.30
Rural Development 3 (RD-3)	11.62	0.25	11.37	10%	1.14
TOTALS	**1,516.57**	**122.87**	**1,393.70**	**10%**	**139.19**
02040301160010					
Forest Agriculture (FA)	269.03	0.00	269.03	2%	5.38
Forest Woodland (FW)	703.83	203.19	500.64	3.5%	17.52
Rural Development 1 (RD-1)	12.44	0.00	12.44	6%	0.75
Rural Development 2 (RD-2)	47.28	15.18	32.10	10%	3.21
TOTALS	**1,032.58**	**218.37**	**814.21**	**3%**	**26.86**
02040301160020					
Forest Agriculture (FA)	120.77	5.61	115.16	2%	2.30
Forest Woodland (FW)	95.64	21.25	74.39	3.5%	2.60
Rural Development 1 (RD-1)	134.59	21.97	112.62	6%	6.76
TOTALS	**351.00**	**48.83**	**302.17**	**4%**	**11.66**

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

Source: NJDEP Stormwater BMP Manual 2004.

Table 3: HUC14 Nonpoint Source Loads at Build-Out

HUC14 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)
02040202060100								
Affordable Housing (AH-2)	High, Medium Density Residential	0.39	1.4	0.55	15	5.85	140	54.60
Commercial 1 (C-1)	Commercial	0.15	2.1	0.32	22	3.30	200	30.00
Industrial Park (IP)	Industrial	31.71	1.5	47.57	16	507.36	200	6,342.00
Low Density (LD)	Low Density, Rural Residential	237.02	0.6	142.21	5	1,185.10	100	23,702.00
Multi-Family (MF)	High, Medium Density Residential	1.97	1.4	2.76	15	29.55	140	275.80
Senior Citizen Housing 1 (SEN-1)	High, Medium Density Residential	7.33	1.4	10.26	15	109.95	140	1,026.20
Senior Citizen Housing 2 (SEN-2)	High, Medium Density Residential	32.04	1.4	44.86	15	480.60	140	4,485.60
TOTALS		**310.61**		**248.51**		**2,321.71**		**35,916.20**
02040202100040								
Affordable Assisted Living (AH-1A)	High, Medium Density Residential	0.64	1.4	0.90	15	9.60	140	89.60
Affordable Housing (AH-1)	High, Medium Density Residential	49.15	1.4	68.81	15	737.25	140	6,881.00
Commercial 1 (C-1)	Commercial	485.64	2.1	1,019.84	22	10,684.08	200	97,128.00
Commercial 2 (C-2)	Commercial	33.99	2.1	71.38	22	747.78	200	6,798.00
Commercial 3 (C-3)	Commercial	61.34	2.1	128.81	22	1,349.48	200	12,268.00
Industrial Park (IP)	Industrial	137.52	1.5	206.28	16	2,200.32	200	27,504.00
Institutional (INS)	Commercial	69.66	2.1	146.29	22	1,532.52	200	13,932.00
Medium Density (MD)	High, Medium Density Residential	691.19	1.4	967.67	15	10,367.85	140	96,766.60
Multi-Family (MF)	High, Medium Density Residential	81.72	1.4	114.41	15	1,225.80	140	11,440.80
TOTALS		**1,610.85**		**2,724.38**		**28,854.68**		**272,808.00**

Table 3: HUC14 Nonpoint Source Loads at Build-Out

HUC14 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)
02040202100010								
Affordable Housing (AH-1)	High, Medium Density Residential	29.83	1.4	41.76	15	447.45	140	4,176.20
Commercial 2 (C-2)	Commercial	67.61	2.1	141.98	22	1,487.42	200	13,522.00
Institutional (INS)	Commercial	52.70	2.1	110.67	22	1,159.40	200	10,540.00
Low Density (LD)	Low Density, Rural Residential	291.09	0.6	174.65	5	1,455.45	100	29,109.00
Medium Density (MD)	High, Medium Density Residential	259.36	1.4	363.10	15	3,890.40	140	36,310.40
Multi-Family (MF)	High, Medium Density Residential	45.91	1.4	64.27	15	688.65	140	6,427.40
Senior Citizen Housing 1 (SEN-1)	High, Medium Density Residential	5.06	1.4	7.08	15	75.90	140	708.40
TOTALS		**751.56**		**903.53**		**9,204.67**		**100,793.40**
02040202060080								
Affordable Housing (AH-1)	High, Medium Density Residential	51.73	1.4	72.42	15	775.95	140	7,242.20
Affordable Housing (AH-2)	High, Medium Density Residential	21.84	1.4	30.58	15	327.60	140	3,057.60
Commercial 1 (C-1)	Commercial	120.69	2.1	253.45	22	2,655.18	200	24,138.00
Commercial 2 (C-2)	Commercial	25.94	2.1	54.47	22	570.68	200	5,188.00
Commercial 3 (C-3)	Commercial	10.06	2.1	21.13	22	221.32	200	2,012.00
Industrial Park (IP)	Industrial	7.34	1.5	11.01	16	117.44	200	1,468.00
Institutional (INS)	Commercial	341.25	2.1	716.63	22	7,507.50	200	68,250.00
Low Density (LD)	Low Density, Rural Residential	20.28	0.6	12.17	5	101.40	100	2,028.00
Medium Density (MD)	High, Medium Density Residential	1,397.97	1.4	1,957.16	15	20,969.55	140	195,715.80
Multi-Family (MF)	High, Medium Density Residential	23.14	1.4	32.40	15	347.10	140	3,239.60
Office Professional (OP)	Commercial	13.80	2.1	28.98	22	303.60	200	2,760.00
Regional Growth 1 (RG-1)	High, Medium Density Residential	57.37	1.4	80.32	15	860.55	140	8,031.80
Regional Growth 2 (RG-2)	High, Medium Density Residential	60.96	1.4	85.34	15	914.40	140	8,534.40
Senior Citizen Housing 1 (SEN-1)	High, Medium Density Residential	28.48	1.4	39.87	15	427.20	140	3,987.20
Senior Citizen Housing 2 (SEN-2)	High, Medium Density Residential	1.46	1.4	2.04	15	21.90	140	204.40
TOTALS		**2,182.31**		**3,397.96**		**36,121.37**		**335,857.00**

Table 3: HUC14 Nonpoint Source Loads at Build-Out

HUC14 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)
02040202110010								
Affordable Assisted Living (AH-1A)	High, Medium Density Residential	5.16	1.4	7.22	15	77.40	140	722.40
Commercial 1 (C-1)	Commercial	195.79	2.1	411.16	22	4,307.38	200	39,158.00
Institutional (INS)	Commercial	4.06	2.1	8.53	22	89.32	200	812.00
Medium Density (MD)	High, Medium Density Residential	105.02	1.4	147.03	15	1,575.30	140	14,702.80
Multi-Family (MF)	High, Medium Density Residential	45.59	1.4	63.83	15	683.85	140	6,382.60
TOTALS		**355.62**		**637.76**		**6,733.25**		**61,777.80**
02040202060050								
Commercial 1 (C-1)	Commercial	827.81	2.1	1,738.40	22	18,211.82	200	347,680.20
Commercial 2 (C-2)	Commercial	6.01	2.1	12.62	22	132.22	200	2,524.20
Institutional (INS)	Commercial	345.03	2.1	724.56	22	7,590.66	200	144,912.60
Low Density (LD)	Low Density, Rural Residential	329.34	0.6	197.60	5	1,646.70	100	19,760.40
Medium Density (MD)	High, Medium Density Residential	534.21	1.4	747.89	15	8,013.15	140	104,705.16
Multi-Family (MF)	High, Medium Density Residential	92.62	1.4	129.67	15	1,389.30	140	18,153.52
Office Professional (OP)	Commercial	23.18	2.1	48.68	22	509.96	200	9,735.60
Regional Growth 1 (RG-1)	High, Medium Density Residential	73.16	1.4	102.42	15	1,097.40	140	14,339.36
Regional Growth 2 (RG–2)	High, Medium Density Residential	88.89	1.4	124.45	15	1,333.35	140	17,422.44
Rural Development 1 (RD-1)	Low Density, Rural Residential	1,546.91	0.6	928.15	5	7,734.55	100	92,814.60
Rural Development 2 (RD-2)	Low Density, Rural Residential	23.93	0.6	14.36	5	119.65	100	1,435.80
Rural Development 3 (RD-3)	Low Density, Rural Residential	1,322.65	0.6	793.59	5	6,613.25	100	79,359.00
TOTALS		**5,213.74**		**5,562.39**		**54,392.01**		**852,842.88**

Table 3: HUC14 Nonpoint Source Loads at Build-Out

HUC14 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)
02040202060020								
Environmental Protection (EP)	Low Density, Rural Residential	46.42	0.6	27.85	5	232.10	100	4,642.00
Institutional (INS)	Commercial	331.95	2.1	697.10	22	7,302.90	200	66,390.00
Rural Development 1 (RD-1)	Low Density, Rural Residential	438.13	0.6	262.88	5	2,190.65	100	43,813.00
Rural Development 2 (RD-2)	Low Density, Rural Residential	1,033.14	0.6	619.88	5	5,165.70	100	103,314.00
Rural Development 3 (RD-3)	Low Density, Rural Residential	338.24	0.6	202.94	5	1,691.20	100	33,824.00
TOTALS		**2,187.88**		**1,810.65**		**16,582.55**		**251,983.00**
02040202060040								
Commercial 1 (C-1)	Commercial	7.78	2.1	16.34	22	171.16	200	3,267.60
Commercial 2 (C-2)	Commercial	7.33	2.1	15.39	22	161.26	200	3,078.60
Institutional (INS)	Commercial	39.20	2.1	82.32	22	862.40	200	16,464.00
Low Density (LD)	Low Density, Rural Residential	107.13	0.6	64.28	5	535.65	100	6,427.80
Medium Density (MD)	High, Medium Density Residential	0.10	1.4	0.14	15	1.50	140	19.60
Rural Development 3 (RD-3)	Low Density, Rural Residential	252.15	0.6	151.29	5	1,260.75	100	15,129.00
TOTALS		**413.69**		**329.76**		**2,992.72**		**44,386.60**
02040202060010								
Forest Agriculture (FA)	Low Density, Rural Residential	10.36	0.6	6.22	5	51.80	100	621.60
Forest Woodland (FW)	Low Density, Rural Residential	16.46	0.6	9.88	5	82.30	100	987.60
Institutional (INS)	Commercial	36.98	2.1	77.66	22	813.56	200	15,531.60
Rural Development 1 (RD-1)	Low Density, Rural Residential	465.52	0.6	279.31	5	2,327.60	100	27,931.20
Rural Development 2 (RD-2)	Low Density, Rural Residential	853.01	0.6	511.81	5	4,265.05	100	51,180.60
Rural Development 3 (RD-3)	Low Density, Rural Residential	11.37	0.6	6.82	5	56.85	100	682.20
TOTALS		**1,393.70**		**891.69**		**7,597.16**		**96,934.80**

Table 3: HUC14 Nonpoint Source Loads at Build-Out

HUC14 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)
02040301160010								
Forest Agriculture (FA)	Low Density, Rural Residential	269.03	0.6	161.42	5	1,345.15	100	16,141.80
Forest Woodland (FW)	Low Density, Rural Residential	500.64	0.6	300.38	5	2,503.20	100	30,038.40
Rural Development 1 (RD-1)	Low Density, Rural Residential	12.44	0.6	7.46	5	62.20	100	746.40
Rural Development 2 (RD-2)	Low Density, Rural Residential	32.10	0.6	19.26	5	160.50	100	1,926.00
TOTALS		**814.21**		**488.53**		**4,071.05**		**48,852.60**
02040301160020								
Forest Agriculture (FA)	Low Density, Rural Residential	115.16	0.6	69.10	5	575.80	100	6,909.60
Forest Woodland (FW)	Low Density, Rural Residential	74.39	0.6	44.63	5	371.95	100	4,463.40
Rural Development 1 (RD-1)	Low Density, Rural Residential	112.62	0.6	67.57	5	563.10	100	6,757.20
TOTALS		**302.17**		**181.30**		**1,510.85**		**18,130.20**

Mitigation Plans

This 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. For projects in the Pinelands Area, exceptions to the stormwater management design and performance standards shall be considered only in cases where an applicant is able to demonstrate that such standards cannot be met on a particular parcel or where the Planning Board determines that stormwater management would be more effectively achieved through alternative measures.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. For lands located within the Pinelands, any off-site mitigation measures must occur within the Pinelands Area within the same drainage area as the parcel proposed for development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and 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.

    Groundwater Recharge

    Reserved

    Water Quality

    Reserved

    Water Quantity

    Reserved

    b. In order to consider an exemption for a proposed development in the Pinelands Area, it will be necessary for the Township to amend this section of the Stormwater Management Plan to identify specific mitigation projects and parcels within the Pinelands Area where mitigation may occur and have the amendment certified by the Pinelands Commission.

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 is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

Water Quality

Reserved

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 easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure. For projects in the Pinelands Area, the funding provided to the municipality must be equivalent to the cost of implementing and maintaining the stormwater management measures for which an exception is being granted and the municipality must expend any contributions collected within five (5) years of their receipt.

Appendix A.
Non-Pinelands Area &
Pinelands Area
Stormwater Control Ordinance
Adopted April 1, 2008

TOWNSHIP OF EVESHAM

ORDINANCE NO. 9-4-2008

AN ORDINANCE OF THE TOWNSHIP OF EVESHAM AMENDING THE LAND USE LEGISLATION WITHIN THE TOWNSHIP CODE OF THE TOWNSHIP OF EVESHAM BY REPEALING AND REMOVING CHAPTER 62, ARTICLE IV *STORMWATER CONTROL* THEREFROM AND SUBSTITUTING A NEW CHAPTER 62, ARTICLE IV THEREFOR TO BE ENTITLED *DESIGN, INSTALLATION, OPERATIONAL PERFORMANCE STANDARDS AND MAINTENANCE OF STORMWATER FACILITIES AND STORMWATER MANAGEMENT SYSTEMS*

WHEREAS, the Township Engineer has recommended the adoption of a new stormwater design and performance standards to be incorporated into the Land Use Legislation provisions of the Evesham Township Code; and

WHEREAS, the New Jersey Pinelands Commission has approved these proposed amendments according to law,

NOW, THEREFORE, BE IT ORDAINED by the Township Council of the Township of Evesham, County of Burlington, and State of New Jersey as follows:

SECTION 1. REPEAL AND REMOVAL OF CHAPTER 62, ARTICLE IV *STORMWATER CONTROL*

The Land Use Legislation provisions of the Code of the Township of Evesham are hereby amended by substitution. The existing Code provisions at Chapter 62, Article IV *Stormwater Control* are hereby repealed. New Code provisions to be entitled and referenced as Chapter 62, Article IV *Design, Installation, Operational Performance Standards and Maintenance of Stormwater Facilities and Stormwater Management Systems* are hereby adopted and shall read as follows:

<u>CODE SECTION 62-28</u> STORMWATER FACILITIES AND STORMWATER MANAGEMENT SYSTEMS IN NON-PINELANDS AREAS OF EVESHAM TOWNSHIP

The following *Standards and Measures For Stormwater Control Within Non-Pinelands Areas of Evesham Township* are hereby adopted (contained in Sections 1 through 10 below) and such provisions shall be applicable to govern the design, installation, operation and maintenance of stormwater facilities and stormwater management systems within those areas of Evesham Township which are Non-Pinelands areas. The penalty provisions of Code Section 62-34 shall be applicable to violations of the requirements and obligations imposed below.

Standards and Measures For Stormwater Control Within Non-Pinelands Areas of Evesham Township

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Section 10 **Maintenance and Repair**

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 relying on 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 in Non-Pinelands areas 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 Evesham 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.

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 or increasing impervious surface by one quarter acre (1/4 ac) or more. 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, [insert name of 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, agricultural, 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 (PA1)" 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 (PA1), 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.

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 muhlnebergi (bog turtle).

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality 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. 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.

E. Nonstructural Stormwater Management Strategies

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;

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 design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other 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.

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:

   $$R = A + B - (A \times B)/100$$

   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

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.

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		

Table 2: TSS, Phosphorous & Nitrogen Removal Rates for BMPs			
Best Management Practice	TSS Percent Removal Rate	Total Phosphorous Removal Rate (%)	Total Nitrogen Removal rate (%)
Bioretention Systems	90	60	30
Constructed Stormwater Wetland	90	50	30
Extended Detention Basin	40-60	20	20
Infiltration Structure	80	60	50
Manufactured Treatment Device	See Section 6.C	See N.J.A.C. 7:8-5.7(d)	See N.J.A.C. 7:8-5.7(d)
Sand Filter	80	50	35
Vegetative Filter Strip	60-80	30	30
Wet Pond	50-90	50	30

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.B.

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.

C. 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.

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 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 basin has an outlet structure, escape provisions shall be incorporated in or on the 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

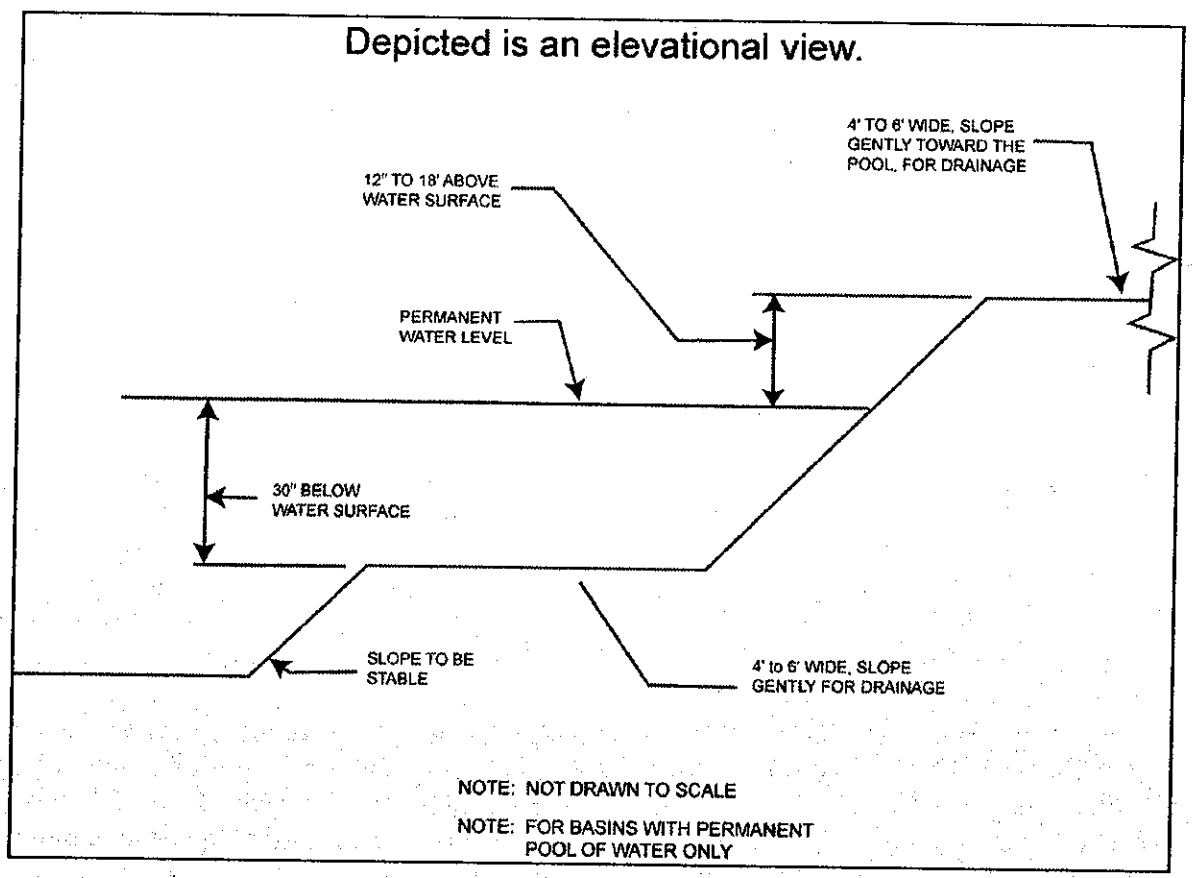
four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See Section 8.D for an illustration of safety ledges in a stormwater management 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



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.

2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.

3. The applicant shall submit six (6) paper copies and one on compact disk 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

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

The following information shall be required:

1. Topographic Base Map

The reviewing engineer may require upstream tributary drainage system information as necessary. A topographic base map of the site must be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may 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 flood plains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown.

2. Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of 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 or constraints on development.

3. Project Description and Site Plan(s)

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 shall also be provided.

4. Land Use Planning and Source Control Plan

   This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

5. Stormwater Management Facilities Map

   The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

   a. Total area to be disturbed, paved 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 manage 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. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 4 of this ordinance.

   b. When the proposed stormwater management control measures (e.g., infiltration basins) depends 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 design and planning of the stormwater management facility shall meet the maintenance requirements of an approved Stormwater Maintenance and Repair Plan conforming to Section 10 of this Ordinance.

8. Waiver from Submission Requirements

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.

Section 10: Maintenance and Repair

A. Applicability

1. Projects subject to review as in Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 10.C.

B. General Maintenance

1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.

2. The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

3. Responsibility for 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.

4. If the person responsible for maintenance identified under Section 10.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 10.B.7 below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.

5. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.

6. The person responsible for maintenance identified under Section 10.B.2 above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.

7. The person responsible for maintenance identified under Section 10.B.2 above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.

8. The person responsible for maintenance 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, the maintenance plan and the documentation required by Sections 10.B.6 and 10.B.7 above.

9. The requirements of Sections 10.B.3 and 10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.

10. 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, Evesham 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. Evesham 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, Evesham Township may immediately proceed to do so with its own forces and equipment and/or through contractors and shall bill the cost thereof to the responsible person.

C. 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.

CODE SECTION 62-29 **RESERVED**

CODE SECTION 62-30 **RESERVED**

CODE SECTION 62-31 STORMWATER FACILITIES AND STORMWATER MANAGEMENT SYSTEMS IN PINELAND AREAS OF EVESHAM TOWNSHIP

The following *Standards and Measures For Stormwater Control Within Pineland Areas of Evesham Township* are hereby adopted (contained in Sections 1 through 10 below) and such

provisions shall be applicable to govern the design, installation, operation and maintenance of stormwater facilities and stormwater management systems within those areas of Evesham Township which are Pinelands areas. The penalty provisions of Code Section 62-34 shall be applicable to violations of the requirements and obligations imposed below.

Standards and Measures For Stormwater Control Within The Pineland Areas of Evesham Township

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Section I. Scope and Purpose.

A. Purpose.

It is hereby determined that:

a) Land development projects and associated disturbance of vegetation and soil and changes in land cover, including increases in impervious cover, alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes. If inadequately or improperly managed, this stormwater runoff can deplete groundwater resources and increase flooding, stream channel erosion, and sediment transport and deposition. This stormwater runoff can also contribute to increased quantities of waterborne pollutants.

b) Increases of stormwater runoff, soil erosion and nonpoint source pollutants have occurred in the past as a result of land development, and contribute to the degradation of the water resources of Evesham Township.

c) Certain lands of Evesham Township lie within the Pinelands Area, and therefore, development in this portion of Evesham Township is subject to the requirements of the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.) and the implementing regulations and minimum standards contained in the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.) (CMP). The purpose and intent of these regulations and standards is to promote orderly development of the Pinelands so as to preserve and protect the significant and unique natural, ecological, agricultural, archaeological, historical, scenic, cultural and recreational resources of the Pinelands.

d) Pinelands Area resources are to be protected in accordance with Pinelands Comprehensive Management Plan at N.J.A.C. 7:50 et seq., New Jersey's Stormwater Management Rules at N.J.A.C. 7:8-1.1 et seq. and New Jersey's surface water quality antidegradation policies contained in the New Jersey Surface Water Quality Standards at N.J.A.C. 7:9B-1.1 et seq.

e) Increased stormwater rates and volumes and the sediments and pollutants associated with stormwater runoff from future development projects within the Pinelands Area have the potential to adversely affect Evesham Township's streams and water resources and the streams and water resources of downstream municipalities.

f) Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites.

g) It is in the public interest to regulate the discharge of stormwater runoff from "major development" projects, as defined in Section VII of this ordinance, conducted within the Pinelands Area, as provided in this ordinance, in order to control and minimize increases in stormwater runoff rates and volumes, to maintain groundwater recharge, and to control and minimize soil erosion, stream channel erosion and nonpoint source pollution associated with stormwater runoff.

Therefore, it is the purpose of this ordinance to establish minimum stormwater management requirements and controls for major development, consistent with the statewide stormwater requirements at N.J.A.C. 7:8, the regulations and standards contained in the Pinelands CMP, and the provisions of the adopted master plan and land use ordinances of Evesham Township.

B. Management Techniques.

1. In order to achieve the goals for stormwater control set forth in the Municipal Stormwater Management Plan, Evesham Township has identified the following management techniques:

a) Implementation of multiple stormwater management Best Management Practices (BMPs) may be necessary to achieve the performance standards for stormwater runoff quantity and rate, groundwater recharge, erosion control, and stormwater runoff quality established through this ordinance.

b) Compliance with the stormwater runoff quantity and rate, groundwater recharge, erosion control, and stormwater runoff quality standards established through N.J.A.C. 7:8-1.1 et seq., and this ordinance, shall be accomplished to the maximum extent practicable through the use of nonstructural BMPs, before relying on structural BMPs. Nonstructural BMPs are also known as Low Impact Development (LID) techniques.

c) Nonstructural BMPs shall include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater.

d) Source control plans shall be developed based upon physical site conditions and the origin, nature and the anticipated quantity or amount of potential pollutants.

e) Structural BMPs, where necessary shall be integrated with nonstructural stormwater management strategies and proper maintenance plans.

When using structural BMPs, multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, shall be used wherever possible to achieve the performance standards for water quality, quantity and groundwater recharge established through this ordinance before relying on a single, larger stormwater management measure to achieve these performance standards.

C. Applicability.

1. This ordinance shall apply to:

a) All site plans and subdivisions for major developments occurring within the Pinelands Area that require preliminary or final site plan or subdivision review; and

b) All major development projects occurring within the Pinelands Area undertaken by Evesham Township; and

c) All minor residential development occurring within the Pinelands Area that involves the construction of new roads; and

d) All minor non-residential development occurring within the Pinelands Area that involves the grading, clearing or disturbance of an area in excess of 5000 square feet within any five year period.

D. Procedures. In addition to other development review procedures set forth in the Code of Evesham Township, major development and where applicable, minor development located within the Pinelands Area shall comply with the stormwater management requirements and specifications set forth in this ordinance. New agricultural development that meets the definition of major development in Section VII of this ordinance shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of N.J.A.C. 7.8-5.4(b).

E. 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 ordinance, code, rule, regulation, statute, act or other provision of law.

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 or stringent provisions or higher standards shall control.

In the event that a regional stormwater management plan(s) is prepared and formally adopted pursuant to N.J.A.C. 7:8-1.1 et seq. for any drainage area(s) or watershed(s) of which Evesham Township is a part, the stormwater provisions of such a plan(s) shall be adopted by Evesham Township within one year of the adoption of a Regional Stormwater Management Plan (RSWMP) as an amendment to an Areawide Water Quality Management Plan. Local ordinances proposed to implement the RSWMP shall be submitted to the Pinelands Commission for certification within six months of the adoption of the RSWMP per N.J.A.C. 7:8 and the Pinelands CMP (N.J.A.C. 7:50.)

Section II. Requirements for a Site Development Stormwater Plan.

A. Submission of Site Development Stormwater Plan.

1. Whenever an applicant seeks municipal approval of a site development that is subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section II.C below as part 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 Evesham Township's land use ordinance or by the Pinelands Commission pursuant to N.J.A.C. 7:50-1.1 et seq.

2. The applicant shall demonstrate that the site development project meets the standards set forth in this ordinance.

3. The applicant shall submit six (6) paper copies and one copy on compact disk of the materials listed in the checklist for site development stormwater plans in accordance with Section II.C of this ordinance.

B. Site Development Stormwater Plan Approval.

1. The applicant's site development stormwater plan shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from whom 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 submission of all required plans and reports in electronic format on compact disk. All required engineering plans shall be submitted to Evesham Township in CAD Format, AutoCAD Version 15 or higher registered and rectified to NJ State Plane Feet NAD 83 or Shape File Format NJ State Plane Feet NAD 83. Reports shall be submitted in electronic file formats such as pdf, word processing, database or spreadsheet files. Six (6) paper copies and one copy on compact disk of all required plans and reports shall be submitted.

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 or Pinelands Waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown. Evesham Township may require upstream tributary drainage system information for use in evaluation of the application.

2. Environmental Site Analysis. The applicant shall submit a written description along with the drawings of the natural and man-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 BMP with side-by-side depiction of soil profile drawn 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(s). 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 will occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification for proposed changes in natural conditions shall 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 IV 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. i. through ix.) 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 <u>not</u> 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.

i. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

ii. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;

iii. Maximize the protection of natural drainage features and vegetation;

iv. Minimize the decrease in the "time of concentration" from pre-development to post-development;

v. Minimize land disturbance including clearing and grading;

vi. Minimize soil compaction;

vii. Provide low-maintenance landscaping that provides for the retention and planting of native plants and minimizes the use of lawns, fertilizers and pesticides, in accordance with N.J.A.C. 7:50-6.24;

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

ix. 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:

(1) Site design features that help to prevent accumulation of trash and debris in drainage systems;

(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) 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," as defined in Section VII of this ordinance, the applicant shall also demonstrate in the Land Use Planning and Source Control Plan that the requirements of Section IV have been met.

c) The use of nonstructural strategies to meet the performance standards in Section IV of this ordinance is not required for development sites creating less than one (1) acre of disturbance. However, each application for development and any other application where Evesham Township otherwise requires a landscaping plan shall contain a landscaping or revegetation plan in accordance with the CMP standards at N.J.A.C. 7:50-6.24(c).

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) The 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 manage and dispose of stormwater; and

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 (if applicable) and emergency spillway provisions with maximum discharge capacity of each spillway.

6. Calculations (groundwater recharge and stormwater runoff rate, volume and quality). 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 III. The standards for groundwater recharge and stormwater runoff rate, volume and quality required by Section IV shall be met using the methods, calculations and assumptions provided in Section III.

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 VI 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

   e) Copies of the inspection and maintenance reporting sheets.

8. <u>Exception from submission requirements</u>. An exception may be granted from submission of any of these required components (except 7. above, Inspection, Maintenance, and Repair Plan) if its absence will not materially affect the review process. However, items required pursuant to the application requirements in the Pinelands CMP (N.J.A.C. 7:50-4.2(b) shall be submitted to the NJ Pinelands Commission unless the Executive Director waives or modifies the application requirements.

Section III. Methodologies for the Calculation of Stormwater Runoff Rate and Volume, Stormwater Runoff Quality, and Groundwater Recharge.

A. Method of Calculating Stormwater Runoff Rate and Volume.

1. In complying with the Stormwater Runoff Quantity and Rate Standards in Section IV.B, the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds as amended and supplemented. Alternative methods of calculation may be utilized, provided such alternative methods are at least as protective as the NRCS methodology when considered on a regional stormwater management basis.

2. In calculating stormwater runoff using the NRCS methodology, the design engineer shall separately calculate and then combine the runoff volumes from pervious and directly connected impervious surfaces within a drainage area within the parcel.

3. Calculation of stormwater runoff from unconnected impervious surfaces shall be based, as applicable, upon the Two-Step method described in the current New Jersey Stormwater Best Management Practices Manual or the NRCS methodology.

4. In calculating stormwater runoff using the NRCS methodology, the design engineer shall use appropriate 24-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html.

5. When calculating stormwater runoff for pre-developed site conditions, the design engineer shall use the following criteria:

   a) When selecting or calculating Runoff Curve Numbers (CNs) for pre-developed project site conditions, the project site's land cover shall be assumed to be woods in good condition. However, another land cover may be used to calculate runoff coefficients if:

      i. Such land cover has existed at the site or portion thereof without interruption for at least five (5) years immediately prior to the time of application; and

      ii. The design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records.

   b) If more than one land cover has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations.

   c) All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

   d) In calculating pre-developed site stormwater runoff, the design engineer shall include the effects of all land features and structures, such as ponds, wetlands, depressions, hedgerows, and culverts that affect pre-developed site stormwater runoff rates and/or volumes.

e) Where tailwater will affect the hydraulic performance of a stormwater management measure, the design engineer shall include such effects in the measure's design.

B. Method of Calculating Stormwater Runoff Quality.

1. In complying with the Stormwater Runoff Quality Standards in Section IV.E, the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds, as amended and supplemented.

2. The design engineer shall also use the NJDEP Water Quality Design Storm, which is one and one-quarter (1.25) inches of rainfall falling in a nonlinear pattern in two (2) hours. Details of the Water Quality Design Storm are shown in Table 1.

3. Calculation of runoff volumes, peak rates, and hydrographs for the Water Quality Design Storm may take into account the implementation of nonstructural 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		

Source: N.J.A.C. 7:8-5.5 (a)

4. Total Suspended Solids (TSS) reduction calculations.

i. If more than one stormwater BMP in series is necessary to achieve the required eighty percent (80%) TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (A \times B) / 100, \text{ where:}$$

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

ii. If there is more than one onsite drainage area, the eighty percent (80%) 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. TSS removal rates for stormwater BMPs.

   a) For purposes of TSS reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. The BMP Manual may be obtained from the address identified in Section XII.A or found on the NJDEP's website at www.njstormwater.org. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2

   b) Alternative stormwater management measures, 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 Evesham Township. Any alternative stormwater management measure, removal rate or method of calculating the removal rate shall be subject to approval by Evesham Township and a copy shall be provided to the following:

      i. The Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, NJ, 08625-0418; and

      ii. The New Jersey Pinelands Commission, PO Box 7, New Lisbon, NJ, 08064.

Table 2: Pollutant Removal Rates for BMPs			
Best Management Practice	**TSS Percent Removal Rate**	**Total Phosphorus Percent Removal Rate**	**Total Nitrogen Percent Removal Rate**
Bioretention Systems	90	60	30
Constructed Stormwater Wetland	90	50	30
Extended Detention Basin	40-60 (final rate based upon detention time; see New Jersey BMP Manual, Chap. 9)	20	20
Infiltration basin	80	60	50
Manufactured Treatment Device	Pollutant removal rates as certified by NJDEP; see Section III.	Pollutant removal rates as certified by NJDEP; see Section III.	Pollutant removal rates as certified by NJDEP; see Section III.
Pervious Paving Systems	80 (porous paving)	60	50
	80 (permeable pavers with storage bed)		
	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)
Sand Filter	80	50	35
Vegetative Filter Strip (For filter strips with multiple vegetated covers, the final TSS removal rate should be based upon a weighted average of the adopted rates shown in Table 2, based upon the relative flow lengths through each cover type.)	60 (turf grass)	30	30
	70 (native grasses, meadow and planted woods)		
	80 (indigenous woods)		
Wet Pond / Retention Basin	50-90 (final rate based upon pool volume and detention time; see NJ BMP Manual)	50	30

Source: N.J.A.C. 7:8-5.5 (c) and New Jersey BMP Manual Chapter 4.

6. Nutrient removal rates for stormwater BMPs. For purposes of post-development nutrient load reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. If alternative

stormwater BMPs are proposed, the applicant shall demonstrate that the selected BMPs will achieve the nutrient removal standard required in Section IV.E.

C. Methods of Calculating Groundwater Recharge.

1. In complying with the groundwater recharge requirements in Section IV.C.1.a, the design engineer may calculate groundwater recharge in accordance with the New Jersey Groundwater Recharge Spreadsheet (NJGRS) computer program incorporated herein by reference as amended and supplemented. Information regarding the methodology is available in Section XI.A or from the New Jersey BMP Manual.

2. Alternative groundwater recharge calculation methods to meet these requirements may be used upon approval by the municipal engineer.

3. In complying with the groundwater recharge requirements in Section IV.C.1.b, the design engineer shall:

   a) Calculate stormwater runoff volumes in accordance with the USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Runoff Curve Numbers, as described in the NRCS National Engineering Handbook Part 630 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds as amended and supplemented; and

   b) Use appropriate 2-year, 24-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html.

4. When calculating groundwater recharge or stormwater runoff for pre-developed site conditions, the design engineer shall use the following criteria:

   a) When selecting land covers or calculating Runoff Curve Numbers (CNs) for pre-developed project site conditions, the project site's land cover shall be assumed to be woods. However, another land cover may be used to calculate runoff coefficients if:

      i. Such land cover has existed at the site or portion thereof without interruption for at least five (5) years immediately prior to the time of application; and

      ii. The design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records.

   b) If more than one land cover, other than woods, has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential (including woods) shall be used for the computations.

   c) All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

Section IV. Stormwater Management Performance Standards for Major Development.

A. Nonstructural Stormwater Management Strategies.

1. To the maximum extent practicable, the performance standards in Section IV shall be met by incorporating the nine (9) nonstructural strategies identified in Subchapter 5 of the NJ Stormwater Management Rules (N.J.A.C. 7:8-5), and set forth in Section II.C.4.a, into the design. The applicant shall identify within the Land Use Planning and Source Control Plan required by Section II.C.4 of this ordinance how each of the nine (9) nonstructural measures will be incorporated into the design of the project to the maximum extent practicable.

2. If the applicant contends that it is not practical for engineering, environmental or safety reasons to incorporate any of the nine (9) nonstructural strategies into the design of a particular project, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practical on the site. This rationale shall be submitted in accordance with the Checklist Requirements established by Section II to Evesham Township.

3. Existing trees and vegetation to be preserved shall be protected during construction activities in accordance with the "Standard for Tree Protection During Construction" provided in the NJ State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

4. In addition to all other requirements of this section, each application for development, and any other application where Evesham Township otherwise requires a landscaping plan, shall contain a landscaping or revegetation plan in accordance with the Pinelands CMP standards at N.J.A.C. 7:50-6.24(c).

5. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Section IV shall be dedicated to a government entity; shall be subjected to a conservation easement filed with the appropriate County Clerk's office; or shall be subjected to an equivalent form of restriction approved by Evesham Township that ensures that that measure, or equivalent stormwater management measure is maintained in perpetuity, as detailed in Section VI of this ordinance.

6. Guidance for nonstructural stormwater management strategies is available in the New Jersey BMP Manual, which may be obtained from the address identified in Section XII.A or found on the NJDEP's website at www.njstormwater.org.

7. Exception for development sites creating less than one (1) acre of disturbance. The use of nonstructural strategies to meet the performance standards in Section IV of this ordinance is not required for development sites creating less than one (1) acre of disturbance. However, the following requirements shall be met:

   a) Each application for development and any other application where Evesham Township otherwise requires a landscaping plan shall contain a landscaping or revegetation plan prepared in accordance with the Pinelands CMP standards (N.J.A.C. 7:50-6.24(c));

b) Existing trees and vegetation to be preserved shall be protected during construction activities in accordance with the "Standard for Tree Protection During Construction" provided in the NJ State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

B. Stormwater Runoff Quantity and Rate Standards.

1. There shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetland, wetlands transition area or surface waterbody. In addition, stormwater runoff shall not be directed in such a way as to increase the volume and/or rate of discharge into any surface water body from that which existed prior to development of the site.

2. To the maximum extent practical, there shall be no direct discharge of stormwater runoff onto farm fields so as to protect farm crops from damage due to flooding, erosion and long term saturation of cultivated crops and cropland.

3. The total runoff volume generated from the net increase in impervious surfaces by a ten (10) year, twenty-four (24) hour storm shall be retained and infiltrated onsite.

4. In addition, the design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Section III, complete one of the following:

   a) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, the post-developed stormwater runoff hydrographs from the project site for the 2, 10, and 100-Year storm events do not exceed, at any point in time, the site's pre-developed runoff hydrographs for the same storm events;

   b) 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;

   c) Design stormwater management measures so that the peak post-developed stormwater runoff rates from the project site for the two (2), ten (10) and one hundred (100) year storms are fifty, seventy-five and eighty percent (50%, 75% and 80%), respectively, of the site's peak pre-developed stormwater runoff rates for the same storms. Peak outflow rates from onsite stormwater measures for these storms shall be adjusted where necessary to account for the discharge of increased stormwater runoff rates from project site areas not controlled by the onsite measures. These percentages do not have to be applied to those portions of the project site that are not proposed for development at the time of application, provided that such areas are:

      i. Protected from future development by imposition of a conservation easement, deed restriction, or other acceptable legal measures; or

ii. Would be subject to review under these standards if they were proposed for any degree of development in the future.

5. In tidal flood hazard areas, a stormwater runoff quantity analysis in accordance with a, b, and c above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

6. The standards for stormwater runoff quantity and rate required by this section shall be met using the methods, calculations and assumptions provided in Section III.

C. Groundwater Recharge Standards.

1. For all major developments, the design engineer, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Section III, shall either:

a) Demonstrate through hydrologic and hydraulic analysis that the post-developed project site maintains 100 percent of the site's pre-developed average annual groundwater recharge volume; or

b) Demonstrate through hydrologic and hydraulic analysis that any increase in the project site's stormwater runoff volume for the two (2) year, twenty four (24) hour storm from pre-developed to post-developed conditions is infiltrated on-site.

2. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all site groundwater recharge measures so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface facilities in the vicinity of the groundwater recharge measure.

3. The standards for groundwater recharge required by this section shall be met using the methods, calculations and assumptions provided in Section III.

D. Erosion Control Standards. 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 its implementing regulations, N.J.A.C 2:90-1.1 through 1.4.

E. Stormwater Runoff Quality Standards.

1. There shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetland, wetland transition area or surface waterbody.

2. Stormwater management measures shall be designed to reduce the total suspended solids (TSS) load in the stormwater runoff from the post-developed site by eighty percent (80%) expressed as an annual average.

3. Stormwater management measures shall also be designed to reduce the nutrient load in the stormwater runoff from the post-developed site by the maximum extent practicable.

In achieving this reduction, the design of the development site shall include nonstructural and structural stormwater management measures that optimize nutrient removal while still achieving the groundwater recharge, runoff quantity and rate, and TSS removal standards in this section.

4. The standards for stormwater runoff quality required by this section shall be met using the methods, calculations, assumptions and pollutant removal rates provided in Section III.

F. Additional stormwater quality standards for high pollutant loading areas and areas where stormwater runoff is exposed to source material.

1. This subsection applies to the following areas:
   a) High pollutant loading areas (HPLAs); and
   b) Areas where stormwater is exposed to "source material."
2. For development in areas described in 1.a or 1.b above, in addition to the infiltration requirements specified in Section IV.B.2 and the groundwater recharge requirements specified in Section IV.C, the applicant shall demonstrate in the Land Use Planning and Source Control Plan required in Section II.C.4 that the following requirements have been met:
   a) The extent of the areas described in 1.a. and 1.b. above have been minimized on the development site to the maximum extent practicable;
   b) The stormwater runoff from the areas described in 1.a and 1.b above is segregated to the maximum extent practicable from the stormwater runoff generated from the remainder of the site such that co-mingling of the stormwater runoff from the areas described in 1.a and 1.b above and the remainder of the site will be minimized;
   c) The amount of precipitation falling directly on the areas described in 1.a and 1.b above is minimized to the maximum extent practicable by means of a canopy, roof or other similar structure and
   d) The stormwater runoff from or co-mingled with the areas described in 1.a and 1.b above for the Water Quality Design Storm, defined in Section III.B.Table 1 shall be subject to pretreatment by one or more of the following stormwater BMPs, designed in accordance with the New Jersey BMP Manual to provide 90 % TSS removal:
      i. Bioretention system;
      ii. Sand filter;
      iii. Wet ponds which shall be hydraulically disconnected by a minimum of 2 feet of vertical separation from the seasonal high water table and shall be designed to achieve a minimum 80%TSS removal rate.
      iv. Constructed stormwater wetlands; and/or
      v. Media filtration system manufactured treatment device with a minimum 80% TSS removal as verified by the New Jersey Corporation for Advanced Technology and as certified by NJDEP.

e) If the potential for contamination of stormwater runoff by petroleum products exists onsite, prior to being conveyed to the pretreatment BMP required in Section IV.F.2.d above, the stormwater runoff from the areas described in 1.a and 1.b above shall be conveyed through an oil/grease separator or other equivalent manufactured filtering device to remove the petroleum hydrocarbons. The applicant shall provide the reviewing agency with sufficient data to demonstrate acceptable performance of the device.

G. Threatened and Endangered Species and Associated Habitat Standards. Stormwater management measures shall address the impacts of the development on habitat for threatened and endangered species, in accordance with N.J.A.C. 7:8-5.2(c), N.J.A.C. 7:50-6.27, and 7:50-6.33 and 34.

H. Exceptions and Mitigation Requirements.

1. Exceptions from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements established by this ordinance may be granted, at the discretion of the Evesham Township, and subject to approval by the Pinelands Commission, provided that all of the following conditions are met:

a) The exception is consistent with that allowed by Evesham Township;

b) Evesham Township has an adopted and effective municipal stormwater management plan in accordance with N.J.A.C. 7:8-4.4, which includes a mitigation plan in accordance with N.J.A.C. 7:8-4.2(c)11, and is also certified by the Pinelands Commission. The mitigation plan shall identify what measures are necessary to offset the deficit created by granting the exception and the municipality shall submit a written report to the county review agency and the NJDEP describing the exception and the required mitigation. Guidance for developing municipal stormwater management plans, including mitigation plans, is available from the NJDEP, Division of Watershed Management and the New Jersey BMP Manual.

c) The applicant demonstrates that mitigation, in addition to the requirements of mitigation plan discussed in b) above, will be provided consistent with one of the following options:

i. Mitigation may be provided off-site, but within the Pinelands Area and within the same drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standard which is lacking on the development site due to the exception; or

ii. In lieu of the required mitigation, a monetary "in lieu contribution" may be provided by the applicant to Evesham Township in accordance with the following:

(a) The amount of the in lieu contribution shall be determined by Evesham Township, but the maximum in lieu contribution required shall be equivalent to the cost of implementing and maintaining the stormwater management measure(s) for which the exception is granted;

(b) The in lieu contribution shall be used to fund an off-site stormwater control mitigation project(s) located within the Pinelands Area, within the same

drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standards which is lacking on the development site. Such mitigation project shall be identified by Evesham Township in Evesham Township's adopted municipal stormwater management plan. The stormwater control project to which the monetary contribution will be applied shall be identified by Evesham Township at the time the exception is granted. The applicant shall amend the project description and site plan required in Section II.C.3 to incorporate a description of both the standards for which an on-site exception is being granted and of the selected off-site mitigation project.

(c) Evesham Township shall expend the in lieu contribution to implement the selected off-site mitigation project within five (5) years from the date that payment is received. Should Evesham Township fail to expend the in lieu contribution within the required timeframe, the mitigation option provided in Section IV.H.1.c. of this ordinance shall be void and Evesham Township shall be prohibited from collecting in lieu contributions.

2. An exception from strict compliance granted in accordance with H.1. above shall not constitute a waiver of strict compliance from the requirements of the Pinelands Comprehensive Management Plan at N.J.A.C. 7:50. An applicant should contact the Pinelands Commission to determine whether a waiver of strict compliance is also required in accordance with N.J.A.C. 7:50, Subchapter 4, Part V.

Section V. Design, Construction, and Safety Standards for Structural Stormwater Management Measures

A. General Design and Construction Standards

1. Structural stormwater management measures shall be designed to meet the standards established in this section. These standards have been developed to protect public safety, conserve natural features, create an aesthetically pleasing site and promote proper onsite stormwater management.

2. The following structural stormwater management measures may be utilized as part of a stormwater management system at a major land development in the Pinelands, provided that the applicant demonstrates that they are designed, constructed and maintained so as to meet the standards and requirements established by this ordinance. If alternative stormwater management measures are proposed, the applicant shall demonstrate that the selected measures will achieve the standards established by this ordinance.

   a) Bioretention systems;

   b) Constructed stormwater wetlands;

   c) Extended detention basins;

   d) Infiltration basins;

   e) Vegetated filter strips;

f) Infiltration basins and trenches;

g) Wet ponds with suitable liners;

h) Pervious paving systems; and

i) Manufactured treatment devices, provided their pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the NJDEP.

3. Structural stormwater management measures shall be designed to take into account the existing site conditions, including environmentally critical areas, wetlands, flood-prone areas, slopes, depth to seasonal high water table, soil type, permeability and texture, and drainage area and drainage patterns.

4. Structural stormwater management measures shall be designed and constructed 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 7.8 shall be deemed to meet this requirement); to minimize and facilitate maintenance and repairs; and to ensure proper functioning.

5. For all stormwater management measures at a development site, each applicant shall submit a detailed Inspection, Maintenance and Repair Plan consistent with the requirements of Section VI of this ordinance.

6. To the maximum extent practicable, the design engineer shall design structural stormwater management measures on the development site in a manner that:

   a) Limits site disturbance, maximizes stormwater management efficiencies, and maintains or improves aesthetic conditions;

   b) Utilizes multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, instead of a single larger structural stormwater management measure;

   c) Incorporates pretreatment measures. Pretreatment can extend the functional life and increase the pollutant removal capability of a structural stormwater management measure. Pretreatment measures may be designed in accordance with the New Jersey BMP Manual or other sources approved by the municipal engineer.

7. Stormwater management basins shall be designed in a manner that complements and mimics the existing natural landscape, including but not limited to the following design strategies:

   a) Use of natural, non-wetland wooded depressions for stormwater runoff storage; and

   b) Establishment of attractive landscaping in and around the basin that mimics the existing vegetation and incorporates native Pinelands plants, including, but not limited to, the species listed in N.J.A.C. 7:50-6.25 and 6.26.

8. Stormwater management basins shall be designed with gently sloping sides. The maximum allowable basin side slope shall be three (3) horizontal to one (1) vertical (3:1).

9. Guidance on the design and construction of structural stormwater management measures may be found in the New Jersey BMP Manual. Other guidance sources may also be used upon approval by the municipal engineer.

10. After all construction activities and required field testing have been completed on the development site, as-built plans depicting design and as-built elevations of all stormwater management measures shall be prepared by a Licensed Land Surveyor and submitted to the municipal engineer. Based upon the municipal engineer's review of the as-built plans, all corrections or remedial actions deemed by the municipal engineer to be necessary due to the failure to comply with the standards established by this ordinance and/or any reasons of public health or safety shall be completed by the applicant.

B. Design and Construction Standards for Stormwater Infiltration BMPs.

1. Stormwater infiltration BMPs, such as bioretention systems with infiltration, dry wells, infiltration basins, pervious paving systems with storage beds, and sand filters with infiltration, shall be designed, constructed and maintained to completely drain the total runoff volume generated by the basin's maximum design storm within seventy-two (72) hours after a storm event. Runoff storage for greater times can render the BMP ineffective and may result in anaerobic conditions, odor and both water quality and mosquito breeding problems.

2. Stormwater infiltration BMPs shall be designed, constructed and maintained to provide a minimum separation of at least two (2) feet between the elevation of the lowest point of the bottom of the infiltration BMP and the seasonal high water table.

3. A stormwater infiltration BMP shall be sited in suitable soils verified by field-testing to have permeability rates between one (1) and twenty (20) inches per hour. If such site soils do not exist or if the design engineer demonstrates that it is not practical for engineering, environmental or safety reasons to site the stormwater infiltration BMP(s) in such soils, then the stormwater infiltration BMP(s) may be sited in soils verified by field testing to have permeability rates in excess of twenty (20) inches per hour, provided that a bioretention system, designed, installed and maintained in accordance with the New Jersey BMP Manual, is installed to meet one of the following conditions:

   a) The bioretention system is constructed as a separate measure designed to provide pretreatment of stormwater and to convey the pretreated stormwater into the infiltration BMP; or

   b) The bioretention system is integrated into and made part of the infiltration BMP and, as such, does not require an underdrain system. If this option is selected, the infiltration BMP shall be designed and constructed so that the maximum water depth in the bioretention system portion of the BMP during treatment of the stormwater quality design storm is twelve (12) inches in accordance with the New Jersey BMP Manual.

4. The minimum design permeability rate for the soil within a BMP that relies on infiltration shall be one-half (0.5) inch per hour. A factor of safety of two (2) shall be applied to the soil's field-tested permeability rate to determine the soil's design permeability rate. For example, if the field-tested permeability rate of the soil were four (4) inches per hour, its design permeability rate would be two (2) inches per hour). The minimum design

permeability rate for the soil within a stormwater infiltration basin shall also be sufficient to achieve the minimum seventy-two (72) hour drain time described in 1. above. The maximum design permeability shall be ten (10) inches per hour.

5. A soil's field tested permeability rate shall be determined in accordance with the following:

   a) The pre-development field test permeability rate shall be determined according to the methodologies provided in Section XI.C.3 of this ordinance;

   b) The results of the required field permeability tests shall demonstrate a minimum tested infiltration rate of one (1) inch per hour;

   c) After all construction activities have been completed on the site and the finished grade has been established in the infiltration BMP, post-development field permeability tests shall also be conducted according to the methodologies provided in Section XI.C.3 of this ordinance;

   d) If the results of the post-development field permeability tests fail to achieve the minimum required design permeability rates in 5 above utilizing a factor of safety of two (2), the stormwater infiltration BMP shall be renovated and re-tested until such minimum required design permeability rates are achieved; and

   e) The results of all field permeability tests shall be certified by a Professional Engineer and transmitted to the municipal engineer.

6. To help ensure maintenance of the design permeability rate over time, a six (6) inch layer of K5 soil shall be placed on the bottom of a stormwater infiltration BMP. This soil layer shall meet the textural and permeability specifications of a K5 soil as provided at N.J.A.C. 7:9A, Appendix A, Figure 6, and be certified to meet these specifications by a Professional Engineer licensed in the State of New Jersey. The depth to the seasonal high water table shall be measured from the bottom of the K5 sand layer.

7. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all stormwater infiltration basins so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface structures in the vicinity of the stormwater infiltration basin.

8. The design engineer shall conduct a groundwater mounding analysis, as defined in Section VII, of all stormwater infiltration BMPs. The mounding analysis shall be conducted in accordance with the requirements in Section XI.C.3.l. Where the mounding analysis identifies adverse impacts, the stormwater infiltration BMP shall be redesigned or relocated as appropriate.

9. Stormwater infiltration BMPs shall be constructed in accordance with the following:

a) To avoid sedimentation that may result in clogging and reduce the basin's permeability rate, stormwater infiltration basins shall be constructed according to the following:

i. Unless the conditions in (ii) below are met, a stormwater infiltration basin shall not be placed into operation until its drainage area is completely stabilized. Instead, upstream runoff shall be diverted around the basin and into separate, temporary stormwater management facilities and sediment basins. Such temporary facilities and basins shall be installed and utilized for stormwater management and sediment control until stabilization is achieved in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

ii. If the design engineer determines that, for engineering, environmental or safety reasons, temporary stormwater management facilities and sediment basins cannot be constructed on the site, the stormwater infiltration basin may be placed into operation prior to the complete stabilization of its drainage area provided that the basin's bottom during this period is constructed at a depth at least two (2) feet higher than its final design elevation. All other infiltration BMP construction requirements in this section shall be followed. When the drainage area is completely stabilized, all accumulated sediment shall be removed from the infiltration BMP, which shall then be excavated to its final design elevation in accordance with the construction requirements of this section and the performance standards in Section IV.

b) To avoid compaction of subgrade soils of BMPs that rely on infiltration, no heavy equipment such as backhoes, dump trucks or bulldozers shall be permitted to operate within the footprint of the BMP. All excavation required to construct a stormwater infiltration BMP shall be performed by equipment placed outside the BMP. If this is not possible, the soils within the excavated area shall be renovated and tilled after construction is completed to reverse the effects of compaction. In addition, post-development soil permeability testing shall be performed in accordance with B.5 of this section.

c) Earthwork associated with stormwater infiltration BMP construction, including excavation, grading, cutting or filling, shall not be performed when soil moisture content is above the lower plastic limit.

C. Safety Standards for Structural Stormwater Management Measures

1. If a structural 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.

2. A trash rack is a device intended to intercept runoff-borne trash and debris that might otherwise block the hydraulic openings in an outlet structure of a structural stormwater management measure. Trash racks shall be installed upstream of such outlet structure

openings as necessary to ensure proper functioning of the structural stormwater management measure 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 not adversely affect the hydraulic performance of either the outlet structure opening it is protecting or the overall outlet structure.

c) The trash rack shall have sufficient net open area under clean conditions to limit the peak design storm velocity through it to a maximum of 2.5 feet per second.

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 pounds per square foot.

3. An overflow grate is a device intended to protect the opening in the top of a stormwater management measure outlet 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;

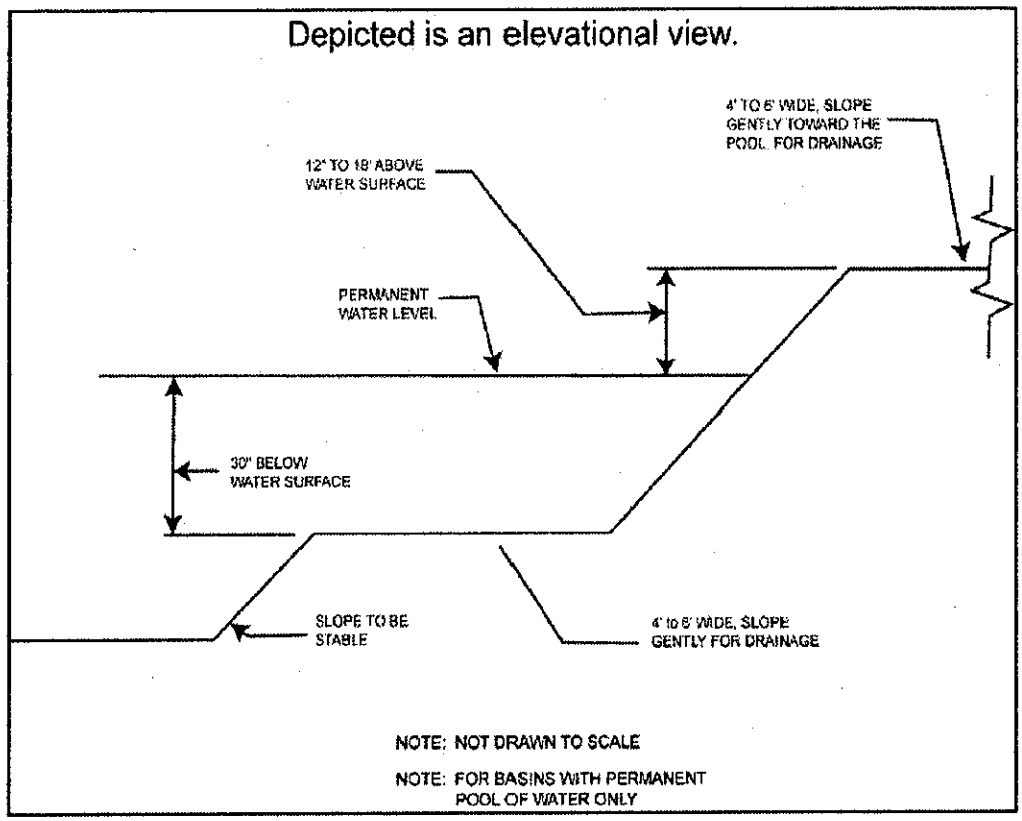
   b) The overflow grate spacing shall be no more than two (2) inches across the smallest dimension; and

   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 three hundred (300) pounds per square foot.

4. The maximum side slope for an earthen dam, embankment, or berm shall not be steeper than three (3) horizontal to one (1) vertical (3:1).

5. Safety ledges shall be constructed on the slopes of all new structural stormwater management measures 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 (4) to six (6) feet in width. One step shall be located approximately two and one-half (2½) feet below the permanent water surface, and the second step shall be located one (1) to one and one-half (1½) feet above the permanent water surface. See a) below, for an illustration of safety ledges in a stormwater management basin.

   a) Illustration of safety ledges.



Source: N.J.A.C. 7:8-6 Appendix A.

Section VI. Inspection, Maintenance and Repair of Stormwater Management Measures.

A. Applicability. Projects subject to review pursuant to Section I.C of this ordinance shall comply with the requirements of Sections VI.B and VI.H 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 II.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 VI.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 a 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 VI.B.4 above is not a public agency, the maintenance plan and any future revisions based on Section VI.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 VI.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 VI.B.2 above shall submit the updated Inspection, Maintenance and Repair Plan to Evesham Township when the Inspection, Maintenance and Repair Plan is updated.

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

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 associated appurtenance of the measure; removal of sediment, debris, or trash; restoration of 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, Evesham 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. Evesham 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, Evesham Township may immediately proceed to do so with its own forces and equipment and/or through contractors and shall bill the cost thereof to the responsible person.

G. Requirements for Inspection, Maintenance 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 banks, repair erosion at inflow structure(s);
2. After every storm exceeding one (1) inch of rainfall: Inspect the stormwater infiltration BMP to verify that the facility drains 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. Removal and replacement of the K5 sand layer and accumulated sediment may be required to restore the original infiltration rate.
3. Four times per year (quarterly): Inspect stormwater infiltration BMPs for clogging and excessive debris and sediment accumulation within the 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. Additional guidance for the inspection, maintenance and repair of stormwater infiltration BMPs can be found in the New Jersey BMP Manual.

H. Financing of Inspection, Maintenance and Repair of Stormwater BMP's.

The means of providing permanent financing of the inspection, maintenance and repair of stormwater BMP's shall be identified and detailed in the inspection Maintenance and Repair Plan and shall be subject to approval by the municipality. Permanent financing of the inspection, maintenance and repair of stormwater BMP's shall be accomplished by:

1. The assumption of the inspection and maintenance program by a municipality, county, public utility or homeowner's association.

Section VII. 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. When used in this ordinance, the following terms shall have the meanings herein ascribed to them.

"Evesham Township" means the Planning Board, Zoning Board of Adjustment or other board, agency or official of Evesham Township with authority to approve or disapprove subdivisions, site plans, construction permits, building permits or other applications for development approval. For the purposes of reviewing development applications and ensuring compliance with the requirements of this ordinance, Evesham Township may designate the municipal engineer or other qualified designee to act on behalf of Evesham Township.

"Aquaculture" means the propagation, rearing and subsequent harvesting of aquatic organisms in controlled or selected environments, and their subsequent processing, packaging and marketing, including but not limited to, activities to intervene in the rearing process to increase production such as stocking, feeding, transplanting and providing for protection from predators.

"Certification" means either a written statement signed and sealed by a licensed New Jersey Professional Engineer attesting that a BMP design or stormwater management system conforms to or meets a particular set of standards or to action taken by the Commission pursuant to N.J.A.C. 7:50-3, Part II or Part IV. Depending upon the context in which the term is use, the terms "certify" and "certified" shall be construed accordingly.

"Compaction" means the increase in soil bulk density caused by subjecting soil to greater-than-normal loading. Compaction can also decrease soil infiltration and permeability rates.

"Construction" means the construction, erection, reconstruction, alteration, conversion, demolition, removal or equipping of buildings, structures or components of a stormwater management system including but not limited to collection inlets, stormwater piping, swales and all other conveyance systems, and stormwater BMPs.

"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.

"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.

"Design permeability" means the tested permeability rate with a factor of safety of two (2) applied to it (e.g., if the tested permeability rate of the soils were four (4) inches per hour, the design rate would be two (2) inches per hour).

"Development" means the change of or enlargement of any use or disturbance of any land, the performance of any building or mining operation, the division of land into two or more parcels, and the creation or termination of rights of access or riparian rights including, but not limited to:

1. A change in type of use of a structure or land;
2. A reconstruction, alteration of the size, or material change in the external appearance of a structure or land;
3. A material increase in the intensity of use of land, such as an increase in the number of businesses, manufacturing establishments, offices or dwelling units in a structure or on land;
4. Commencement of resource extraction or drilling or excavation on a parcel of land;
5. Demolition of a structure or removal of trees;
6. Commencement of forestry activities;
7. Deposit of refuse, solid or liquid waste or fill on a parcel of land;
8. In connection with the use of land, the making of any material change in noise levels, thermal conditions, or emissions of waste material; and
9. Alteration, either physically or chemically, of a shore, bank, or flood plain, seacoast, river, stream, lake, pond, wetlands or artificial body of water.

In the case of development on agricultural land, i.e. lands used for an agricultural use or purpose as defined at N.J.A.C. 7:50-2.11, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Boards (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.

"Development, major" means any division of land into five or more lots; any construction or expansion of any housing development of five or more dwelling units; any construction or expansion of any commercial or industrial use or structure on a site of more than three acres; or any "development," grading, clearing or disturbance of an area in excess of five thousand square feet (5,000 ft^2). Disturbance for the purpose of this ordinance is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting or removing of vegetation.

"Development, minor" means all development other than major development.

"Drainage area" means a geographic area within which stormwater, sediments, or dissolved materials drain to a BMP, a stormwater management system, a particular receiving waterbody or a particular point along a receiving waterbody.

"Environmentally critical area" 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 animal species; threatened or endangered plants of the Pinelands pursuant to N.J.A.C. 7:5-6.27(a); large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. T & E habitat constitutes habitat that is critical for the survival of a local population of threatened and endangered species or habitat that is identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program, whichever is more inclusive. Threatened and endangered wildlife shall be protected in conformance with N.J.A.C. 7:50-6.33.

"Exception" means the approval by the approving authority of a variance or other material departure from strict compliance with any section, part, phrase or provision of this ordinance. An exception may be granted only under certain specific, narrowly defined conditions described herein and does not constitute a waiver of strict compliance with any section, part, phrase or provision of the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.).

"Extended detention basin" means a facility constructed through filling and/or excavation that provides temporary storage of stormwater runoff. It has an outlet structure that detains and attenuates runoff inflows and promotes the settlement of pollutants. An extended detention basin is normally designed as a multi-stage facility that provides runoff storage and attenuation for both stormwater quality and quantity management. The term "stormwater detention basin" shall have the same meaning as "extended detention basin."

"Finished grade" means the elevation of the surface of the ground after completion of final grading, either via cutting, filling or a combination thereof.

"Grading" means modification of a land slope by cutting and filling with the native soil or re-distribution of the native soil, which is present at the site.

"Groundwater" means water below the land surface in a zone of saturation.

"Groundwater mounding analysis" means a test performed to demonstrate that the groundwater below a stormwater infiltration basin will not "mound up," encroach on the unsaturated zone, break the surface of the ground at the infiltration area or downslope, and create an overland flow situation.

"Heavy Equipment" means equipment, machinery, or vehicles that exert ground pressure in excess of eight (8) pounds per square inch.

"High Pollutant Loading Area" means an area in an industrial or commercial development site: where solvents and/or petroleum products are loaded/unloaded, stored, or applied; where pesticides are

loaded/unloaded or stored; 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; where recharge would be inconsistent with NJDEP-approved remedial action work plan or landfill closure plan; and/or where a high risk exists for spills of toxic materials, such as gas stations and vehicle maintenance facilities. The term "HPLA" shall have the same meaning as "High Pollutant Loading Area."

"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 precipitation enters the soil through its surface.

"In lieu contribution" means a monetary fee collected by Evesham Township in lieu of requiring strict on-site compliance with the groundwater recharge, stormwater runoff quantity and/or stormwater runoff quality standards established in this ordinance.

"Install" means to assemble, construct, put in place or connect components of a stormwater management system.

"Mitigation" means acts necessary to prevent, limit, remedy or compensate for conditions that may result from those cases where an applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in N.J.A.C. 7:8, in an adopted regional stormwater management plan, or in a local ordinance which is as protective as N.J.A.C. 7:8, and an exception from strict compliance is granted by Evesham Township and the Pinelands Commission.

"New Jersey Stormwater Best Management Practices Manual" means guidance developed by the New Jersey Department of Environmental Protection, in coordination with the New Jersey Department of Agriculture, the New Jersey Department of Community Affairs, the New Jersey Department of Transportation, municipal engineers, county engineers, consulting firms, contractors, and environmental organizations to address the standards in the New Jersey Stormwater Management Rules, N.J.A.C. 7:8. The BMP manual provides examples of ways to meet the standards contained in the rule. An applicant may demonstrate that other proposed management practices will also achieve the standards established in the rules. The manual, and notices regarding future versions of the manual, are available from the Division of Watershed Management, NJDEP, PO Box 418, Trenton, New Jersey 08625; and on the NJDEP's website, www.njstormwater.org. The term "New Jersey BMP Manual" shall have the same meaning as "New Jersey Stormwater Best Management Practices Manual."

"NJDEP" means the New Jersey Department of Environmental Protection.

"NJPDES" means the New Jersey Pollutant Discharge Elimination System as set forth in N.J.S.A. 58:10A-1 et seq. and in N.J.A.C. 7:14A.

"NJPDES permit" means a permit issued by the NJDEP pursuant to the authority of the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., and N.J.A.C. 7:14A for a discharge of pollutants.

"Nonpoint source" means:

1. Any human-made or human-induced activity, factor, or condition, other than a point source, from which pollutants are or may be discharged;
2. Any human-made or human-induced activity, factor, or condition, other than a point source, that may temporarily or permanently change any chemical, physical, biological, or radiological characteristic of waters of the State from what was or is the natural, pristine condition of such waters, or that may increase the degree of such change; or
3. Any activity, factor, or condition, other than a point source, that contributes or may contribute to water pollution.

The term "NPS" shall have the same meaning as "nonpoint source."

"Nonstructural BMP" means a stormwater management measure, strategy or combination of strategies that reduces adverse stormwater runoff impacts through sound site planning and design. Nonstructural BMPs include such practices as minimizing site disturbance, preserving important site features, reducing and disconnecting impervious cover, flattening slopes, utilizing native vegetation, minimizing turf grass lawns, maintaining natural drainage features and characteristics and controlling stormwater runoff and pollutants closer to the source. The term "Low Impact Development technique" shall have the same meaning as "nonstructural BMP."

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

"Permeability" means the rate at which water moves through a saturated unit area of soil or rock material at hydraulic gradient of one, determined as prescribed in N.J.A.C. 7:9A-6.2 (Tube Permeameter Test), N.J.A.C. 6.5 (Pit Bailing Test) or N.J.A.C. 6.6 (Piezometer Test). Alternative permeability test procedures may be accepted by the approving authority provided the test procedure attains saturation of surrounding soils, accounts for hydraulic head effects on infiltration rates, provides a permeability rate with units expressed in inches per hour and is accompanied by a published source reference. Examples of suitable sources include hydrogeology, geotechnical, or engineering text and design manuals, proceedings of American Society for Testing and Materials (ASTM) symposia, or peer-review journals. Neither a Soil Permeability Class Rating Test, as described in N.J.A.C. 7:9A-6.3, nor a Percolation Test, as described in N.J.A.C. 7:9A-6.4, are acceptable tests for establishing permeability values for the purpose of complying with this ordinance.

"Permeable" means having a permeability of one (1) inch per hour or faster. The terms "permeable soil," "permeable rock" and "permeable fill" shall be construed accordingly.

"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.

"Pinelands Commission" or "Commission" means the Commission created pursuant Section 5 of the Pinelands Protection Act, N.J.S.A. 13:18A-5.

"Pinelands CMP" means the New Jersey Pinelands Comprehensive Management Plan (N.J.A.C. 7:50 1.1 et seq).

"Point source" means any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

"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 substances (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, suspended solids, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, groundwaters or surface waters of the State, or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

"Professional Engineer" means a person licensed to practice Professional Engineering in the State of New Jersey pursuant to N.J.S.A. 48:8-27 et seq.

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

"Replicate" means one of two or more soil samples or tests taken at the same location (within five feet of each other) and depth, within the same soil horizon or substratum. In the case of fill material, replicate tests are tests performed on sub-samples of the same bulk sample packed to the same bulk density.

"Sand" means a particle size category consisting of mineral particles, which are between 0.05 and 2.0 millimeters in equivalent spherical diameter. Also, a soil textural class having 85 percent or more of sand and a content of silt and clay such that the percentage of silt plus 1.5 times the percentage of clay does not exceed 15, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Seasonally high water table" means the upper limit of the shallowest zone of saturation which occurs in the soil, identified as prescribed in N.J.A.C. 7:9A-5.8.

"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, which is not a rock substratum, including sediments below the biologically active and/or weathered zones.

"Source material" means any material(s) or machinery, located at an industrial facility, which 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.

"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 infiltration BMP" means a basin or other facility constructed within permeable soils that provides temporary storage of stormwater runoff. An infiltration BMP does not normally have a structural outlet to discharge runoff from the stormwater quality design storm. Instead, outflow from an infiltration BMP is through the surrounding soil. The terms "infiltration measure" and "infiltration practice" shall have the same meaning as "stormwater infiltration basin."

"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. This includes, but is not limited to, structural and nonstructural stormwater Best Management Practices described in the New Jersey BMP Manual and designed to meet the standards for stormwater control contained within this ordinance. The terms "stormwater Best Management Practice" and "stormwater BMP" shall have the same meaning as "stormwater management measure."

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

"Suitable soil" means unsaturated soil, above the seasonally high water table, which contains less than fifty percent (50%) by volume of coarse fragments and which has a tested permeability rate of between one (1) and twenty (20) inches per hour.

"Surface water" means any waters of the State, which are not groundwater.

"Time of concentration" means the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed.

"Total Suspended Solids" means the insoluble solid matter suspended in water and stormwater that is separable by laboratory filtration in accordance with the procedure contained in the "Standard Methods for the Examination of Water and Wastewater" prepared and published jointly by the American Public Health Association, American Water Works Association and the Water Pollution Control Federation. The term "TSS" shall have the same meaning as "Total Suspended Solids."

"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.

"Waters of the State" means the ocean and its estuaries, all springs, streams and bodies of surface and groundwater, whether natural or artificial, within the boundaries of New Jersey or subject to its jurisdiction.

"Water table" means the upper surface of a zone of saturation.

"Well" means a bored, drilled or driven shaft, or a dug hole, which extends below the seasonally high water table and which has a depth which is greater than its largest surface dimension.

"Wetlands" mean those lands, which are inundated or saturated by water at a magnitude, duration and frequency sufficient to support the growth of hydrophytes. Wetlands include lands with poorly drained or very poorly drained soils as designated by the National Cooperative Soils Survey of the Soil Conservation Service of the United States Department of Agriculture. Wetlands include coastal wetlands and inland wetlands, including submerged lands. The "New Jersey Pinelands Commission Manual for Identifying and Delineating Pinelands Area Wetlands: A Pinelands Supplement to the Federal Manual for Identifying and Delineating Jurisdictional Wetlands," dated January, 1991, as amended, may be utilized in delineating the extent of wetlands based on the definitions of wetlands and wetlands soils contained in this section, N.J.A.C. 7:50 2.11, 6.4 and 6.5. The term "wetland" shall have the same meaning as "wetlands."

"Wet pond" means a stormwater facility constructed through filling and/or excavation that provides both permanent and temporary storage of stormwater runoff. It has an outlet structure that creates a permanent pool and detains and attenuates runoff inflows and promotes the settling of pollutants. A stormwater retention basin can also be designed as a multi-stage facility that also provides extended detention for enhanced stormwater quality design storm treatment and runoff storage and attenuation for stormwater quantity management. The term "stormwater retention basin" shall have the same meaning as "wet pond."

Section VIII. RESERVED

Section IX. RESERVED

Section X. RESERVED

Section XI. Appendices.

A. Methods for Calculating Groundwater Recharge.

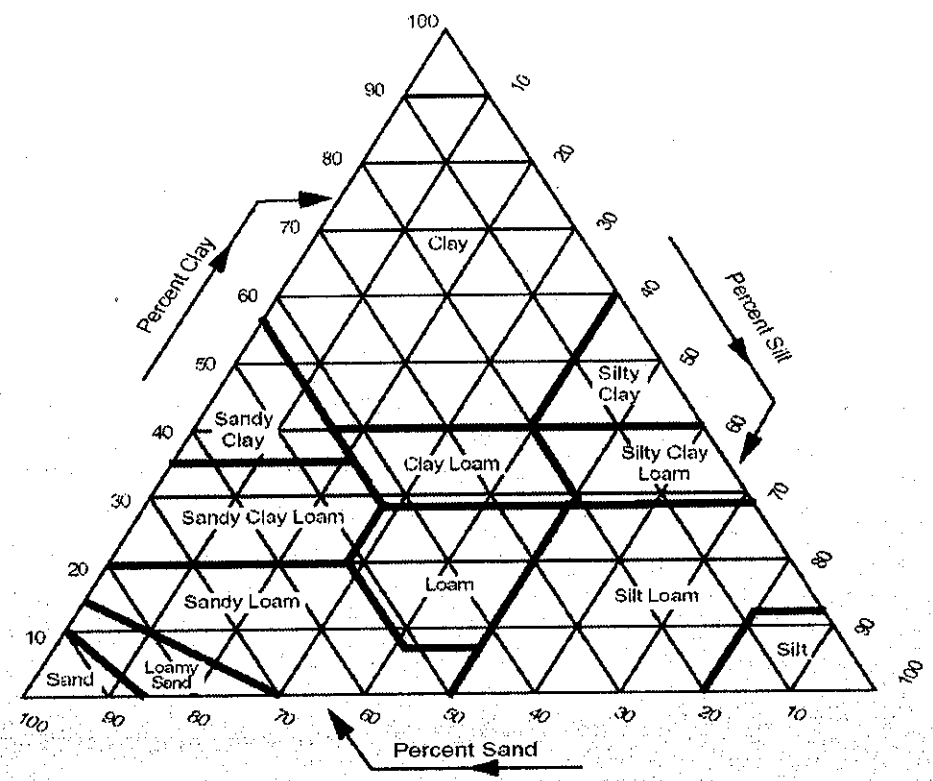
1. The New Jersey Geological Survey Report GSR-32: A Method for Evaluating Ground-Water Recharge Areas in New Jersey. Available at http://www.njgeology.org/geodata/dgs99-2.htm.
2. The New Jersey Groundwater Recharge Spreadsheet (NJGRS). Available in the New Jersey BMP Manual, Chapter 6, at http://www.njstormwater.org/bmp_manual2.htm.

B. NJDEP Nonstructural Stormwater Management Strategies Point System.

The New Jersey Stormwater Management Rules at N.J.A.C. 7:8-5.2(a), and Section IV.A. of this Ordinance, require nonstructural stormwater management strategies to be incorporated into the site design of a major development. A total of nine strategies are to be used to the maximum extent practical to meet the groundwater recharge, stormwater quality and stormwater quantity requirements of the rules prior to to utilizing structural stormwater management measures. The New Jersey Nonstructural Stormwater Management Strategies Point System(NSPS) provides a tool to assist planners, designers and regulators in determining the strategies have been used to the "maximum extent practical" at a major development as required by the rules. The New Jersey Nonstructural Stormwater Management Strategies Point System (NSPS) User's Guide and Spreadsheet are available at http://www.njstormwater.org.

C. Soils.

1. 1. USDA Soil Textural Triangle.



Source: US Department of Agriculture.

2. Definitions. For the purposes of this appendix, the following terms shall have the meanings herein ascribed to them.

"A-horizon" means the uppermost mineral horizon in a normal soil profile. The upper part of the A-horizon is characterized by maximum accumulation of finely divided, dark colored organic residues, known as humus, which are intimately mixed with the mineral particles of the soil.

"Artesian zone of saturation" means a zone of saturation which exists immediately below a hydraulically restrictive horizon, and which has an upper surface, which is at a pressure greater than atmospheric, either seasonally or throughout the year.

"Chroma" means the relative purity or strength of a color, a quantity that decreases with increasing grayness. Chroma is one of the three variables of soil color as defined in the Munsell system of classification.

"Clay" means a particle size category consisting of mineral particles, which are smaller than 0.002 millimeters in equivalent spherical diameter. Also, a soil textural class having more than 40 percent clay, less than 45 percent sand, and less than 40 percent silt, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Clay loam" means a soil textural class having 27 to 40 percent clay and 20 to 45 percent sand, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Coarse fragment" means a rock fragment contained within the soil which is greater than two millimeters in equivalent spherical diameter or which is retained on a two-millimeter sieve.

"County soil survey report" means a report prepared by the US Department of Agriculture, Natural Resources Conservation Service which includes maps showing the distribution of soil mapping units throughout a particular county together with narrative descriptions of the soil series shown and other information relating to the uses and properties of the various soil series.

"Direct supervision" means control over and direction of work carried out by others with full knowledge of and responsibility for such work.

"Equivalent spherical diameter" of a particle means the diameter of a sphere, which has a volume equal to the volume of the particle.

"Excessively coarse horizon" means a horizon of limited thickness within the soil profile which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

"Excessively coarse substratum" means a substratum below the soil profile which extends beyond the depth of soil profile pits and borings and which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

"Extremely firm consistence" means a type of soil material whose moist aggregated mass crushes only under very strong pressure; cannot be crushed between the thumb and forefinger and shall be broken apart bit by bit.

"Firm consistence" means a type of soil material who's moist aggregated mass crushes under moderate pressure between the thumb and forefinger but resistance is distinctly noticeable.

"Hard consistence" means a type of soil material whose dry aggregated mass is moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between the thumb and forefinger.

"Hue" means the dominant spectral color, one of the three variables of soil color defined within the Munsell system of classification.

"Hydraulically restrictive horizon" means a horizon within the soil profile which slows or prevents the downward or lateral movement of water and which is underlain by permeable soil horizons or substrata. Any soil horizon which has a saturated permeability less than one (1.0) inch per hour is hydraulically restrictive.

"Hydraulically restrictive substratum" means a substratum below the soil profile which slows or prevents the downward or lateral movement of water and which extends beyond the depth of profile pits or borings or to a massive substratum. A substratum which has a saturated permeability less than one (1.0) inch per hour is hydraulically restrictive.

"Loamy sand" means a soil textural class, as shown in Section XI.C.1 (USDA Soil Textural Triangle), that has a maximum of 85 to 90 percent (85-90%) sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of fifteen (15); or a minimum of 70 to 85 percent (70-85%) sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of thirty (30).

"Lower plastic limit" means the moisture content corresponding to the transition between the plastic and semi-solid states of soil consistency. This corresponds to the lowest soil moisture content at which the soil can be molded in the fingers to form a rod or wire, one-eighth (1/8) inches in thickness, without crumbling.

"Mottling" means a color pattern observed in soil consisting of blotches or spots of contrasting color. The term "mottle" refers to an individual blotch or spot. The terms "color variegation," "iron depletion" and "iron concentration" are equivalent to the term "mottling." Mottling due to redoximorphic reactions is an indication of seasonal or periodic and recurrent saturation.

"Munsell system" means a system of classifying soil color consisting of an alpha-numeric designation for hue, value and chroma, such as "7.5 YR 6/2," together with a descriptive color name, such as "strong brown."

"O-horizon" means a surface horizon, occurring above the A-horizon in some soils, which is composed primarily of undecomposed or partially decomposed plant remains, which have not been incorporated into the mineral soil.

"Perched zone of saturation" means a zone of saturation which occurs immediately above a hydraulically restrictive horizon and which is underlain by permeable horizons or substrata, which are not permanently or seasonally saturated.

"Piezometer" means a device consisting of a length of metal or plastic pipe, open at the bottom or perforated within a specified interval, and used for the determination of depth to water, permeability or hydraulic head within a specific soil horizon or substratum.

"Platy structure" is characterized by a soil aggregate, which has one axis distinctly shorter than the other two and are oriented with the short axis vertical.

"Regional zone of saturation" means a zone of saturation, which extends vertically without interruption below the depth of soil borings and profile pits.

"Sandy clay" means a soil textural class having 35 percent (35%) or more of clay and 45 percent (45%) or more of sand, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Sandy loam" means a soil textural class, as shown in Section XI.C.1 (USDA Soil Textural Triangle), that has a maximum of 20 percent clay, and the percentage of silt plus twice the percentage of clay exceeds 30, and contains 52 percent or more sand; or less than 7 percent clay, less than 50 percent silt, and between 43 and 52 percent sand.

"Silt" means a particle size category consisting of mineral particles, which are between 0.002 and 0.05 millimeters in equivalent spherical diameter. It also means a soil textural class having 80 percent or more of silt and 12 percent or less of clay, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Silt loam" means a soil textural class having 50 percent or more of silt and 12 to 27 percent of clay; or 50 to 80 percent of silt and less than 12 percent of clay, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Silty clay" means a soil textural class having 40 percent or more of clay and 40 percent or more of silt, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Silty clay loam" means a soil textural class having 27 to 40 percent of clay and less than 20 percent of sand, as shown in Section XI.C.1 (USDA Soil Textural Triangle).

"Soil aggregate" means a naturally occurring unit of soil structure consisting of particles of sand, silt, clay, organic matter, and coarse fragments held together by the natural cohesion of the soil.

"Soil color" means the soil color name and Munsell color designation determined by comparison of the moist soil with color chips contained in a Munsell soil color book.

"Soil consistence" means the resistance of a soil aggregate or clod to being crushed between the fingers or broken by the hands. Terms for describing soil consistence described are in N.J.A.C. 7:9A-5.3(h).

"Soil horizon" means a layer within a soil profile differing from layers of soil above and below it in one or more of the soil morphological characteristics including color, texture, coarse fragment content, structure, consistence and mottling.

"Soil log" means a description of the soil profile, which includes the depth, thickness, color, texture, coarse fragment content, mottling, structure and consistence of each soil horizon or substratum.

"Soil mapping unit" means an area outlined on a map in a County Soil Survey Report and marked with a letter symbol designating a soil phase, a complex of two or more soil phases, or some other descriptive term where no soil type has been identified.

"Soil phase" means a specific type of soil which is mapped by the Natural Resources Conservation Service and which belongs to a soil series described within the County Soil Survey Report.

"Soil profile" means a vertical cross-section of undisturbed soil showing the characteristic horizontal layers or horizons of the soil, which have formed as a result of the combined effects of parent material, topography, climate, biological activity and time.

"Soil series" means a grouping of soil types possessing a specific range of soil profile characteristics, which are described within the County Soil Survey Report. Each soil series may consist of several "soil phases" which may differ in slope, texture of the surface horizon or stoniness.

"Soil structural class" means one of the shape classes of soil structure described in N.J.A.C. 7:9A-5.3(g).

"Soil structure" means the naturally occurring arrangement, within a soil horizon, of sand, silt and clay particles, coarse fragments and organic matter, which are held together in clusters or aggregates of similar shape and size.

"Soil test pit" means an excavation made for the purpose of exposing a soil profile, which is to be described.

"Soil textural class" means one of the classes of soil texture defined within the USDA system of classification. (Soil Survey Manual, Agricultural Handbook No. 18, USDA Soil Conservation Service 1962.)

"Soil texture" means the relative proportions of sand, silt and clay in that portion of the soil, which passes through a sieve with two-millimeter openings.

"Static water level" means the depth below the ground surface or the elevation with respect to some reference level, of the water level observed within a soil profile pit or boring, or within a piezometer, after this level has stabilized or become relatively constant with the passage of time.

"Substratum" means a layer of soil or rock material present below the soil profile and extending beyond the depth of soil borings or profile pits.

"Unsuitable soil" means all soil other than suitable soil.

"USDA system of classification" means the system of classifying soil texture used by the United States Department of Agriculture, which defines 12 soil textural classes based upon the weight percentages of sand, silt and clay in that portion of the soil, which passes through a sieve with two-millimeter (2 mm) openings. The soil textural classes are shown graphically on the USDA Soil Textural Triangle, as shown in Section XI.C.1.

"Value" means the relative lightness or intensity of a color, one of the three variables of soil color defined within the Munsell system of classification.

"Very firm consistence" is characterized by a moist soil which crushes under strong pressure; barely crushable between thumb and forefinger.

"Very hard consistence" is characterized by a dry soil which is resistant to pressure, can be broken in the hands only with difficulty; not breakable between the thumb and forefinger.

"Zone of saturation" means a layer within or below the soil profile, which is saturated with ground water either seasonally or throughout the year. This includes both regional and perched zones.

3. Methods for Assessing Soil Suitability for Infiltration Stormwater Management BMPs. The results of a subsurface investigation shall serve as the basis for the site selection and design of stormwater infiltration BMPs. The subsurface investigation shall include, but not be limited to, a series of soil test pits and soil permeability tests conducted in accordance with the following:

   a) All soil test pits and soil permeability results shall be performed under the direct supervision of a Professional Engineer. All soil logs and permeability test data shall be accompanied by a certification by a Professional Engineer. The results and location (horizontal and vertical) of all soil test pits and soil permeability tests, both passing and failing, shall be reported to Evesham Township.

   b) During all subsurface investigations and soil test procedures, adequate safety measures shall be taken to prohibit unauthorized access to the excavations at all times. It is the responsibility of persons performing or witnessing subsurface investigations and soil permeability tests to comply with all applicable Federal, State and local laws and regulations governing occupational safety.

   c) A minimum of two (2) soil test pits shall be excavated within the footprint of any proposed infiltration BMP to determine the suitability and distribution of soil types present at the site. Placement of the test pits shall be within twenty (20) feet of the basin perimeter, located along the longest axis bisecting the BMP. For BMPs larger than ten thousand (10,000) square feet in area, a minimum of one (1) additional soil test pit shall be conducted within each additional area of ten thousand (10,000) square feet. The additional test pit(s) shall be placed approximately equidistant to other test pits, so as to provide adequate characterization of the subsurface material. In all cases, where soil and or groundwater properties vary significantly, additional test pits shall be excavated in order to accurately characterize the subsurface conditions below the proposed infiltration BMP. Soil test pits shall extend to a minimum depth of eight (8) feet below the lowest elevation of the basin bottom or to a depth that is at least two (2) times the maximum potential water depth in the proposed infiltration BMP, whichever is greater.

   d) A soil test pit log shall be prepared for each soil test pit. The test pit log shall, at a minimum, provide the elevation of the existing ground surface, the depth and thickness (in inches) of each soil horizon or substratum, the dominant matrix or background and mottle colors using the Munsell system of classification for hue, value and chroma, the appropriate textural class as shown on the USDA textural triangle, the volume percentage of coarse fragments (larger than two (2) millimeters in diameter), the abundance, size, and contrast of mottles, the soil structure, soil consistence, and soil moisture condition, using standard USDA classification terminology for each of these soil properties. Soil test pit logs shall identify the presence of any soil horizon, substratum or other feature that exhibits an in-place permeability rate less than one (1) inch per hour.

   e) Each soil test pit log shall report the depth to seasonally high water level, either perched or regional, and the static water level based upon the presence of soil mottles or other redoximorphic features, and observed seepage or saturation. Where redoxomorphic features including soil mottles resulting from soil saturation are present, they shall be interpreted to represent the depth to the seasonal high water table unless soil saturation or seepage is observed at a higher level. When the determination of the seasonally high water table shall be made in ground previously disturbed by excavation, direct observation of the

static water table during the months of January through April shall be the only method permitted.

f) Any soil horizon or substratum which exists immediately below a perched zone of saturation shall be deemed by rule to exhibit unacceptable permeability (less than one (1) inch per hour). The perched zone of saturation may be observed directly, inferred based upon soil morphology, or confirmed by performance of a hydraulic head test as defined at N.J.A.C. 7:9A-5.9.

g) Stormwater infiltration BMPs shall not be installed in soils that exhibit artesian groundwater conditions. A permeability test shall be conducted in all soils that immediately underlie a perched zone of saturation. Any zone of saturation which is present below a soil horizon which exhibits an in-place permeability of less than 0.2 inches per hour shall be considered an artesian zone of saturation unless a minimum one foot thick zone of unsaturated soil, free of mottling or other redoximorphic features and possessing a chroma of four or higher, exists immediately below the unsuitable soil.

h) A minimum of one (1) permeability test shall be performed at each soil test pit location. The soil permeability rate shall be determined using test methodology as prescribed in N.J.A.C. 7:9A-6.2 (Tube Permeameter Test), 6.5 (Pit Bailing Test) or 6.6 (Piezometer Test). When the tube permeameter test is used, a minimum of two replicate samples shall be taken and tested. Alternative permeability test procedures may be accepted by the approving authority provided the test procedure attains saturation of surrounding soils, accounts for hydraulic head effects on infiltration rates, provides a permeability rate with units expressed in inches per hour and is accompanied by a published source reference. Examples of suitable sources include hydrogeology, geotechnical or engineering text and design manuals, proceedings of American Society for Testing and Materials (ASTM) symposia, or peer-review journals. Neither a Soil Permeability Class Rating Test, as described in N.J.A.C. 7:9A-6.3, nor a Percolation Test, as described in N.J.A.C. 7:9A-6.4, are acceptable tests for establishing permeability values for the purpose of complying with this ordinance.

i) Soil permeability tests shall be conducted on the most hydraulically restrictive horizon or substratum to be left in place below the basin as follows. Where no soil replacement is proposed, the permeability tests shall be conducted on the most hydraulically restrictive horizon or substratum within four (4) feet of the lowest elevation of the basin bottom or to a depth equal to two (2) times the maximum potential water depth within the basin, whichever is greater. Where soil replacement is proposed, the permeability tests shall be conducted within the soil immediately below the depth of proposed soil replacement or within the most hydraulically restrictive horizon or substratum to a depth equal to two (2) times the maximum potential water depth within the basin, whichever is greater. Permeability tests may be performed on the most hydraulically restrictive soil horizons or substrata at depths greater than those identified above based upon the discretion of the design or testing engineer. The tested infiltration rate should then be divided by two (2) to establish the soil's design permeability rate. Such division will provide a 100% safety factor to the tested rate.

j) The minimum acceptable "tested permeability rate" of any soil horizon or substratum shall be one (1) inch per hour. Soil materials that exhibit tested permeability rates slower than one (1) inch per hour shall be considered unsuitable for stormwater infiltration. The maximum reportable "tested permeability rate" of any soil horizon or substratum shall be

no greater than twenty (20) inches per hour regardless of the rate attained in the test procedure.

k) After all construction activities have been completed on the development site and the finished grade has been established in the infiltration BMP, a minimum of one permeability test shall be conducted within the most hydraulically restrictive soil horizon or substratum below the as-built BMP to ensure the performance of the infiltration BMP is as designed. Hand tools and manual permeability test procedures shall be used for the purpose of confirming BMP performance. In addition, the infiltration BMP shall be flooded with water sufficient to demonstrate the performance of the BMP. Test results shall be certified to the municipal engineer.

l) A groundwater mounding analysis shall be provided for each stormwater infiltration BMP. The groundwater mounding analysis shall calculate the maximum height of the groundwater mound based upon the volume of the maximum design storm. The Professional Engineer conducting the analysis shall provide the municipal engineer with the methodology and supporting documentation for the mounding analysis used and shall certify to Evesham Township, based upon the analysis, that the groundwater mound will not cause stormwater or groundwater to breakout to the land surface or cause adverse impact to adjacent surface water bodies, wetlands or subsurface structures including but not limited to basements and septic systems. If there is more than one infiltration BMP proposed, the model shall indicate if and how the mounds will interact. The mounding analysis shall be calculated using the most restrictive soil horizon that will remain in place within the explored aquifer thickness unless alternative analyses is authorized by the municipal engineer. The mounding analysis shall be accompanied by a cross section of the infiltration BMP and surrounding topography and the mound analysis shall extend out to the point(s) at which the mound intersects with the preexisting maximum water table elevation.

m) The applicant shall demonstrate that stormwater infiltration BMPs meet the seventy-two (72) hour drain time requirement established in Section V.B.1 of this ordinance.

D. Pretreatment measures for infiltration BMPs. By reducing incoming velocities and capturing coarser sediments, pretreatment can extend the functional life and increase the pollutant removal capability of infiltration measures. Therefore, the installation of pretreatment measures is recommended for all development sites. Pretreatment measures may include, but are not limited to, the following:

1. Vegetative filter strips;
2. Bioretention systems. Used in conjunction with a bioretention system, the infiltration basin takes the place of the standard underdrain;
3. Sand filters;
4. Grassed swales; and
5. Detention basins.

E. Collection and Conveyance.

1. Bicycle-safe inlet grates. Site development plans that incorporate site design features that help to prevent discharge of trash and debris from drainage systems 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.

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:

   i. 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

   ii. A different grate, if each individual clear space in that grate has an area of no more than seven (7) square inches, or is no greater than one half (0.5) inch 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) square inches, or be no greater than two (2) inches across the smallest dimension.

c) This standard does not apply:

   i. 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;

   ii. Where flows from the water quality design storm as specified in Section III 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 (4 and 5/8) inches long and one and one-half (1.5) inches wide (this option does not apply for outfall netting facilities); or

      (b) A bar screen having a bar spacing of one-half (0.5) inch.

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

   iv. Where the NJDEP 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.

2. Catch basins. Catch basins are storm drain inlets with or without sumps. Catch basins may provide pretreatment for other stormwater BMPs by capturing large sediments. The sediment and pollutant removal efficiency of catch basins depends on the size of the sump and the

performance of routine maintenance to retain the available sediment storage space in the sump. Where catch basins with sumps are proposed, the minimum two feet separation between the bottom of the sump and seasonally high water table shall be provided.

3. Open or perforated conveyance piping. Where adequate separation to the seasonal high water table exists, stormwater from the development site may be conveyed to a stormwater basin via a system of perforated pipes. These pipes may be made of PVC or corrugated polyethylene and are available with perforations of varying size and spacing. Perforated pipe specifications shall be certified by a Professional Engineer. A Professional Engineer shall certify that perforated conveyance piping will not act to intercept the seasonal high water table and convey groundwater to the stormwater basin. All open or perforated stormwater conveyance systems shall be installed with a minimum separation of two (2) feet from the seasonal high water table.

Section XII. Additional Sources for Technical Guidance.

A. NJDEP Technical Guidance Sources.

1. New Jersey BMP Manual. Available from the Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey 08625; or online at http://www.njstormwater.org.
2. NJDEP Stormwater Management Facilities Maintenance Manual. Available from the Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey 08625; or online at http://njedl.rutgers.edu/ftp/PDFs/1188.pdf.

B. Additional Guidance Sources.

1. New Jersey Pinelands Commission, PO Box 7, 15 Springfield Road, New Lisbon, New Jersey 08064; Phone: 609-894-7300; Website: http://www.state.nj.us/pinelands.
2. State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey. Available from all State Soil Conservation Districts, including Burlington County Soil Conservation District, Tiffany Square, Suite 100, 1289 Route 38, Hainesport, New Jersey 08036; Phone: 609-267-7410; Fax: 609-267-3347; Website: http://bscd.org.
3. State Soil Conservation Districts. The local Soil Conservation District is the Burlington County Soil Conservation District, Tiffany Square, Suite 100, 1289 Route 38, Hainesport, New Jersey 08036; Phone: 609-267-7410; Fax: 609-267-3347; Website: http://bscd.org.
4. New Jersey Department of Transportation, PO Box 600, Trenton, NJ 08625-0600; Phone: 609-530-3536; Website: http://www.state.nj.us/transportation.

CODE SECTION 62-32 RESERVED

CODE SECTION 62-33 RESERVED

CODE SECTION 62-34 PENALTIES

A. For any and every violation of the provisions of Article IV of Chapter 62 of the Land Use provisions of the Code of the Township of Evesham (as herein amended), the owner, contractor or other person interested as lessee, tenant or otherwise in any lot, parcel of land or improvement where such violation has been committed or shall exist shall for each and every violation be punishable as provided in Chapter 1, General Provisions, Article I, of the Code of the Township of Evesham. For the purposes of this section, each day that a violation continues to exist shall be deemed to be a separate violation.

B. Nothing contained hereinabove shall be deemed to limit the right of any interested person to initiate the prosecution of any person or persons believed to have committed a violation of Article IV of Chapter 62 of the Land Use provisions of the Code of the Township of Evesham (as herein amended) or to commence any action at law or equity to compel an abatement of such violation.

CODE SECTION 62-35 RESERVED

CODE SECTION 62-36 RESERVED

CODE SECTION 62-37 RESERVED

CODE SECTION 62-38 RESERVED

SECTION 1.5 REPEAL OF CODE SECTION 160-49

The Land Use Legislation provisions of the Code of the Township of Evesham are hereby further amended to clarify that the existing Stormwater provisions within Pinelands areas are amended by substitution. The existing Code provisions at Chapter 160-49 *Stormwater Control in Pinelands Areas* are hereby repealed.and replaced by the new Code provisions at new Code Sections 62-31 et. seq. adopted and set forth in this Ordinance.

SECTION 2. SAVING CLAUSE

Except for Article IV of Chapter 62, amended by substitution hereinabove, all remaining provisions of Chapter 62 of the Land Use Provisions of the Code of the Township of Evesham are and shall remain in full force and effect.

SECTION 3. PUBLICATION AUTHORIZED UNDER NJSA 40:49-2.1

Inasmuch as this Ordinance amends The Land Use provisions of the Code of the Township of Evesham; and such amendments are in length six or more octavo pages of ordinary print, the Township Council does hereby authorize the publication of the said Ordinance pursuant to NJSA 40:49-2.1.

A. The Township Clerk is authorized to accomplish such publication by notice citing this ordinance by title, giving the brief summary of the main objectives or provisions of this ordinance listed below. The publication shall state copies of the complete Ordinance are on file for public examination and acquisition at the office of the municipal clerk. The publication

shall further state the time and place for the further consideration of the ordinance by the Township Council.

B. At least three copies of this Ordinance in its full length shall be placed on file in the Office of the Township Clerk and shall be made available for public inspection until final action is taken on this ordinance by the Council.

C. The Clerk shall arrange for copies of this ordinance in its full length to be sold by the municipality at a price not to exceed the cost of publication and distribution.

D. Upon passage of any such ordinance, notice of passage or approval shall be published in accordance with subsection d. of NJSA. 40:49-2. A copy of this ordinance and of any summary or summaries published in connection with its adoption pursuant to subsection A. or C. of this section shall be forthwith transmitted to the Tax Assessor of the municipality.

SECTION 4. INCONSISTENT ORDINANCES:

Any ordinances or portions thereof, which are inconsistent with the provisions of this Ordinance, are hereby repealed as of the effective date of this Ordinance.

SECTION 5. DECLARATION OF INVALIDITY:

If any provision of this ordinance, or the application of any such provision to any person or circumstance, shall be held invalid, the remainder of this ordinance shall not be affected thereby. The provisions found or held to be invalidated shall be stricken and the remaining provisions shall be considered severable and shall continue in full force and effect.

SECTION 6. EFFECTIVE DATE

This Ordinance shall take effect upon publication of the notice of its final adoption pursuant to N.J.S.A. 40:49-2(d) or 20 days after the vote of the Township Council finally adopting the Ordinance (N.J.S.A. 40: 69A-181), whichever is later.

ORDINANCE NO. 9-4-2008

ROLL CALL VOTE *Upon Introduction – March 4, 2008*						
COUNCIL MEMBER	INTRODUCED	SECONDED	AYE	NAYE	ABSTAIN	ABSENT
BROWN						X
MCKENNA		X	X			
SARCONE			X			
SCHMIDT	X		X			
MAYOR BROWN			X			

ROLL CALL VOTE *Upon Adoption – April 1, 2008*						
COUNCIL MEMBER	INTRODUCED	SECONDED	AYE	NAYE	ABSTAIN	ABSENT
BROWN		X	X			
MCKENNA			X			
SARCONE			X			
SCHMIDT	X		X			
MAYOR BROWN			X			

Adopted on second and final reading on

_____

_____
Mayor

Attest: _____
Clerk