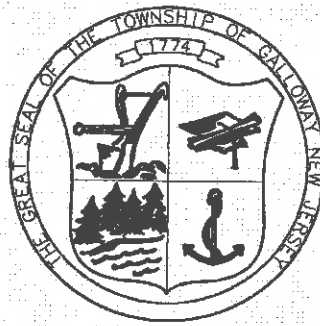


THE TOWNSHIP OF GALLOWAY
ATLANTIC COUNTY, NEW JERSEY

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GALLOWAY TOWNSHIP



Municipal Stormwater Management Plan

January 11, 2007

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Galloway ("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 and addresses all required elements as described in N.J.A.C. 7:8 Stormwater Management Rules.

Under the Municipal Land Use Law (MLUL), a municipal stormwater management plan is an integral part of any master plan. The municipal planning board has the authority under the MLUL to prepare and adopt or amend all or part of the municipal stormwater management plan into the township's master plan. This plan documents the strategy for the Township of Galloway to address the impacts of stormwater runoff from new development and redevelopment projects, and provides a structure and process for addressing such impacts.

The Galloway Township Municipal Stormwater Master Plan and subsequent to this, the Stormwater Control Ordinance shall conform to the applicable regional stormwater management plan. This plan is being undertaken by the Atlantic County Department of Regional Planning and Development. In accordance with N.J.A.C. 7:8-4.4 (d), the County Department of Regional Planning and Development must review and either approve, conditionally approve, or disapprove the Municipal Stormwater Master Plan within 60 days of receipt. Upon approval by the County Department of Regional Planning and Development, the Galloway Township Stormwater Management Plan will become effective.

This 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 acre 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 intent of the plan is to provide long-term operation and maintenance measures for existing and future stormwater facilities. The implementation of design and performance standards for new major development including the implementation of maintenance provisions and compliance with safety standards will be accomplished through the adoption of the new Stormwater Control Ordinance by Township Council. The new Stormwater Control Ordinance will comply with the provisions of State Stormwater Management Standards (N.J.A.C. 7:8) and the Model Pinelands Stormwater Control Ordinance.

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

Plan Procedure

On February 2, 2004, Galloway Township was issued a New Jersey Pollutant Discharge Elimination System (NJPDES) General Permit, to discharge stormwater, from the New Jersey Department of Environmental Protection (NJDEP). Galloway Township was assigned a unique NJPDES permit number NJG0152447 (NJ0141852). The permit was issued on February 2, 2004 and became effective on March 3, 2004 and expires February 28, 2009. It was received by Dixon Associates without prior notice on March 26, 2004.

Tier A municipalities, of which Galloway Township is one, are required to develop, implement, and enforce a stormwater program. This program shall be designed to reduce the discharge of pollutants from the municipality's small MS4's (Municipal Separate Storm Sewer System) to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Federal Act and State Act by including the Statewide Basic Requirements (SBR's).

Tier A municipalities shall prepare and implement a written Stormwater Pollution Prevention Plan (SPPP) that describes the Tier A municipality's stormwater program and serves as the mechanism for the implementation of the Statewide Basic Requirements.

Within twelve months of the effective date of permit authorization (March 3, 2004), Tier A municipalities shall adopt a municipal stormwater management plan pursuant to the Stormwater Rules N.J.A.C. 7:8-4, and control the passage of solids and floatable materials through the Tier A municipality's small MS4's.

Within twelve months from the adoption of the municipal stormwater management plan, Tier A municipalities shall adopt a stormwater control ordinance to implement that plan, and shall submit the adopted municipal stormwater management plan and ordinance(s) to the appropriate county review agency for approval.

In accordance with N.J.A.C. 7:8-4.3, Galloway Township must adopt a municipal stormwater management plan as an integral part of its master plan and official map. The deadline is as established in the Stormwater General Permit.

Plan Requirements and Goals

In accordance with N.J.A.C. 7:8-4.2(c), a municipal stormwater management plan shall, at a minimum:

1. Describe how the municipal stormwater management plan will achieve the goals of stormwater management planning set forth at N.J.A.C. 7:8-2.3;
2. Include maps showing water bodies based on Soil Surveys published by the U.S. Department of Agriculture; the U.S. Geological Survey Topographic Map, 7.5 minute quadrangle series; or other sources of information depicting water bodies in similar or greater detail;

3. Map groundwater recharge areas and well head protection areas based on maps prepared by the Department under N.J.S.A. 58:11A-13 or a municipal ordinance;
4. Describe how the municipal stormwater management plan incorporates design and performance standards in N.J.A.C. 7:8-5 or alternative design and performance standards adopted as a part of a regional stormwater management plan or water quality management plan;
5. Describe how adequate long-term operation as well as preventative and corrective maintenance (including replacement) of the selected stormwater management measures will be ensured;
6. Describe how the plan will ensure compliance with Safety Standards for Stormwater Management Basins under N.J.A.C. 7:8-6;
7. Describe how the municipal stormwater management plan is coordinated with the appropriate Soil Conservation District and any other stormwater management plans, including any adopted regional stormwater management plan, prepared by any stormwater management planning agency related to the river basins or drainage areas to which the plans and/or ordinances apply;
8. Evaluate the extent to which the municipality's entire master plan (including the land use plan element), official map and development regulations (including the zoning ordinance) implement the principles expressed in N.J.A.C. 7:8-5.3(b). This evaluation shall also be included (with updating as appropriate) in the reexamination report adopted under N.J.S.A. 40:55D-89;
9. Include a map of the Township showing:
 - i. Projected land uses assuming full development under existing zoning, and
 - ii. The hydrologic unit code 14 (HUC14) drainage areas as defined by the United States Geological Survey; and an estimate, for each HUC14 drainage area, of the total acreage in the Township of impervious surface and associated future nonpoint source pollutant load assuming full build out of the projected land uses.
10. At the option of the Township, document that it has a combined total of less than one square mile of vacant or agricultural lands rather than provide the information required in (c) 8 and 9 above. Agricultural lands may be excluded if the development rights to these lands have been permanently purchased or restricted by covenant, easement or deed. Vacant or agricultural lands in environmentally constrained areas may be excluded if the documentation also includes an overlay map of these areas at the same scale as the map under (c) 10i below.
 - i. Documentation shall include an existing land use map at an appropriate scale to display the land uses of each parcel within the Township. Such a map shall display the following land uses: residential (which may be divided into single family, two-to-four family, and other multi-family), commercial, industrial, agricultural, parkland, other public uses, semipublic uses, and vacant land;

11. In order to grant a variance or exemption from the design and performance standards in N.J.A.C. 7:8-5, include a mitigation plan that identifies what measures are necessary to offset the deficit created by granting the variance or exemption. The mitigation plan shall ensure that mitigation is completed within the drainage area and for the performance standard for which the variance or exemption was granted;
12. Include a copy of the recommended implementing stormwater control ordinance(s) requiring stormwater management measures, and
13. The municipal stormwater management plan may also include a stream corridor protection plan to address protection of areas adjacent to waterbodies. For waterbodies subject to N.J.A.C. 7:8-5.5(h), the plan shall provide, at a minimum, protections equivalent to those provided at N.J.A.C. 7:8-5.5(h) and be approved by the NJDEP.

The goals of this MSWMP are to:

1. reduce flood damage, including damage to life and property;
2. minimize, to the extent practical, any increase in stormwater runoff from any new development;
3. reduce soil erosion from any development or construction project;
4. assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
5. maintain groundwater recharge;
6. prevent, to the greatest extent feasible, an increase in nonpoint pollution;
7. maintain the integrity of stream channels for their biological functions, as well as for drainage;
8. 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
9. protect public safety through the proper design and operation of stormwater management facilities.

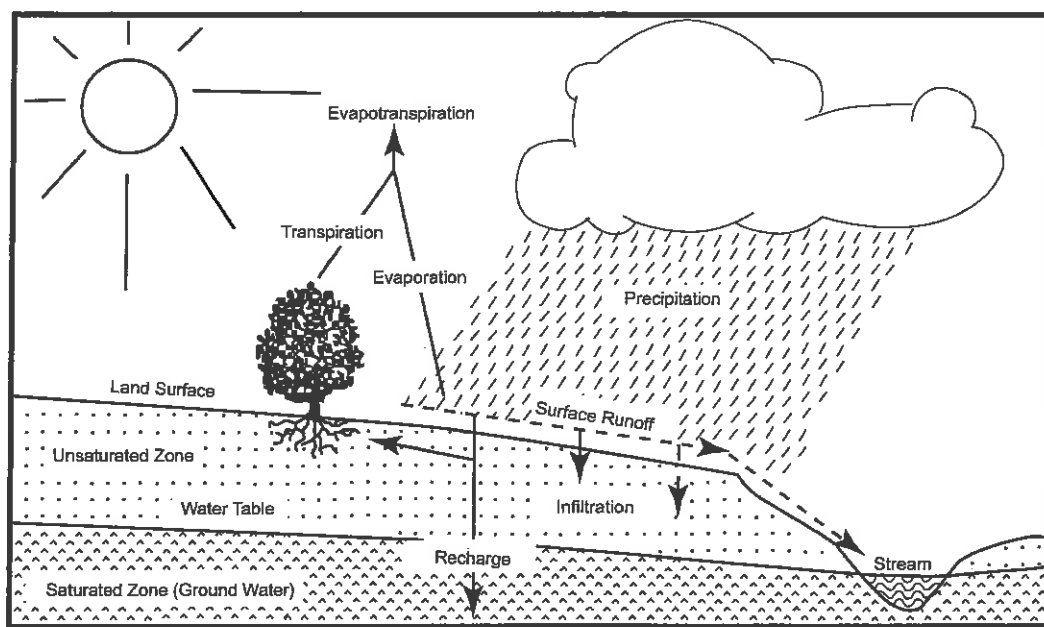
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan 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 alter the hydrologic cycle (Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a

site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration that, 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

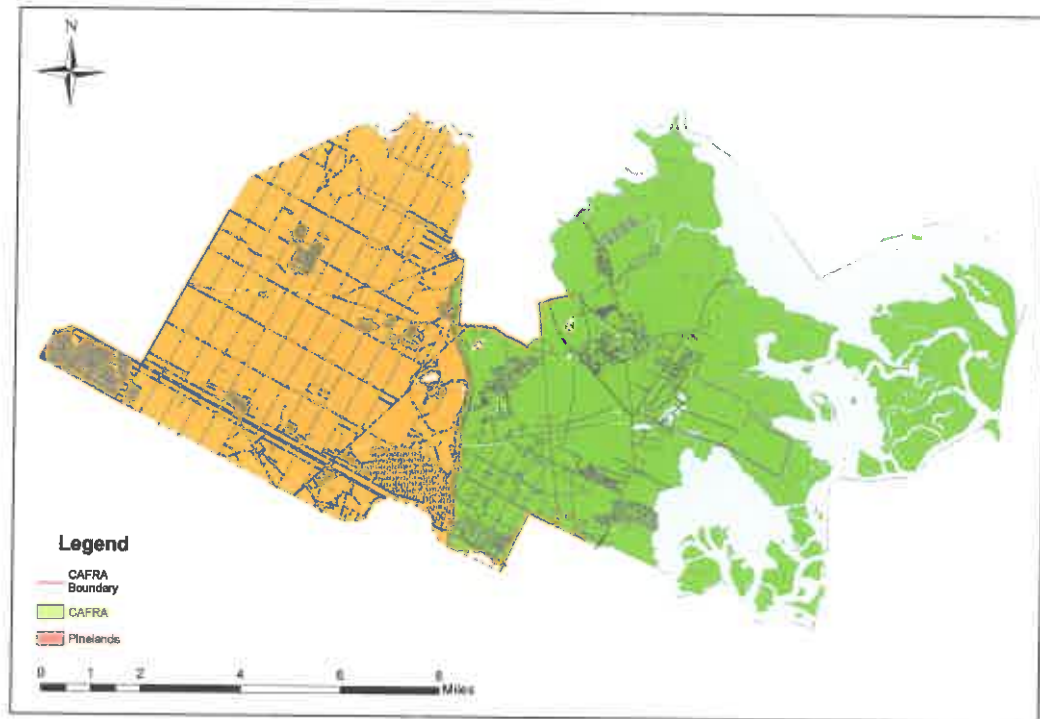
along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

Galloway Township encompasses 114.8 square miles in the northeastern portion of Atlantic County. This area consists of 24.31 square miles of water area and 90.49 square miles of land area. The Township is bordered on the east by Reeds Bay; to the south by the City of Absecon, Egg Harbor Township and Hamilton Township; to the west by Egg Harbor City and Mullica Township; and to the north by the Mullica River and the Borough of Port Republic. The majority of the Township's stormwater flows to the Mullica River and Reed's Bay. Only a few drainage areas, all along the southern portion of the Township, are part of the Great Egg Harbor Watershed.

Galloway Township is bisected by the Garden State Parkway. The area east of the Parkway is under the jurisdiction of the Coastal Atlantic Facilities Review Act (CAFRA) as regulated by the New Jersey Department of Environmental Protection, Bureau of Land Use Regulation. The area west of the Parkway is within the New Jersey Pinelands Protection Area as regulated by the New Jersey Pinelands Commission. Both of these regulatory agencies have specific standards which govern property development beyond what is required for non-CAFRA and non-Pinelands areas. Figure 2 displays the limits of the CAFRA and Pinelands jurisdictional areas.

Figure 2: CAFRA and Pinelands Jurisdictions within Galloway Township



Galloway Township is a designated growth municipality under the New Jersey Pinelands regulations with a total population of 31,209 according to 2000 census data. This number represents an increase from the 1990 census population of 23,330. Regional developmental pressures have spurred an increase in development within the Township. The rural community has seen a marked increase in development impacts from the growth experienced over the last ten years. Negative impacts include:

1. Increased traffic on municipal roadways resulting in a greater impact on existing infrastructure;
2. Increased roadway construction resulting in an increase in public works maintenance manhours;
3. Increased lot clearing resulting in a greater amount of sediment in stormwater runoff;
4. Increased population resulting a greater degree of roadside pollution;
5. Increased stormwater systems resulting in an increase in municipal stormwater maintenance responsibilities;
6. Clustered development which has reduced natural infiltration capacity and resulted in an increase in stormwater runoff.

Figure 3 illustrates the waterways in the Township. Figure 4 depicts the Township boundary on the USGS quadrangle maps.

Figure 3: Galloway Township and Its Waterways

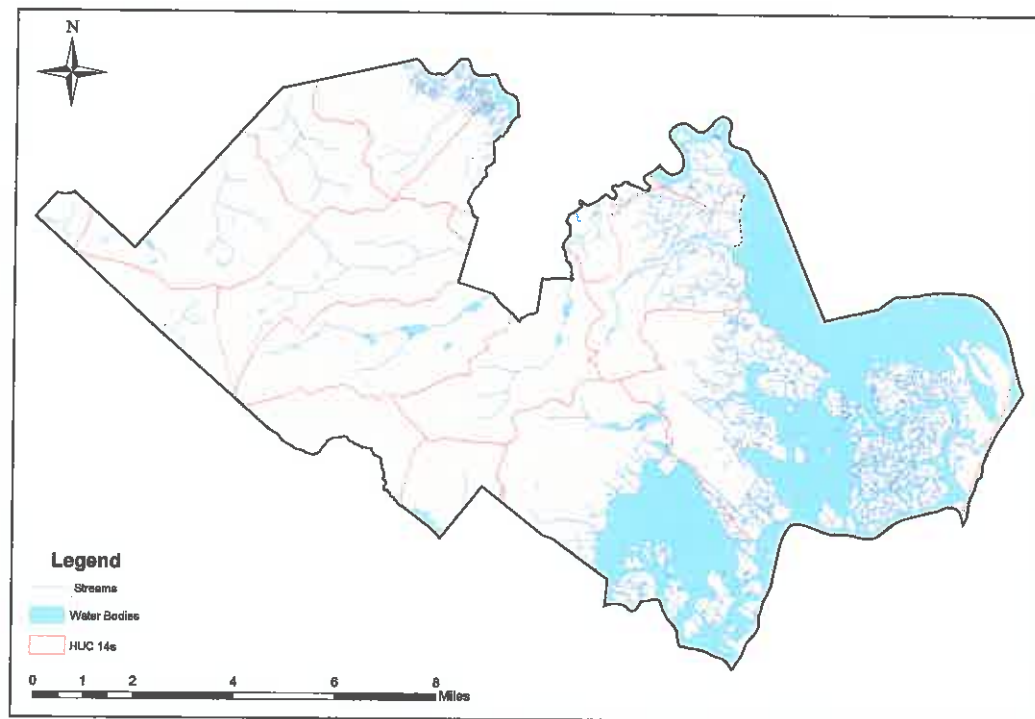
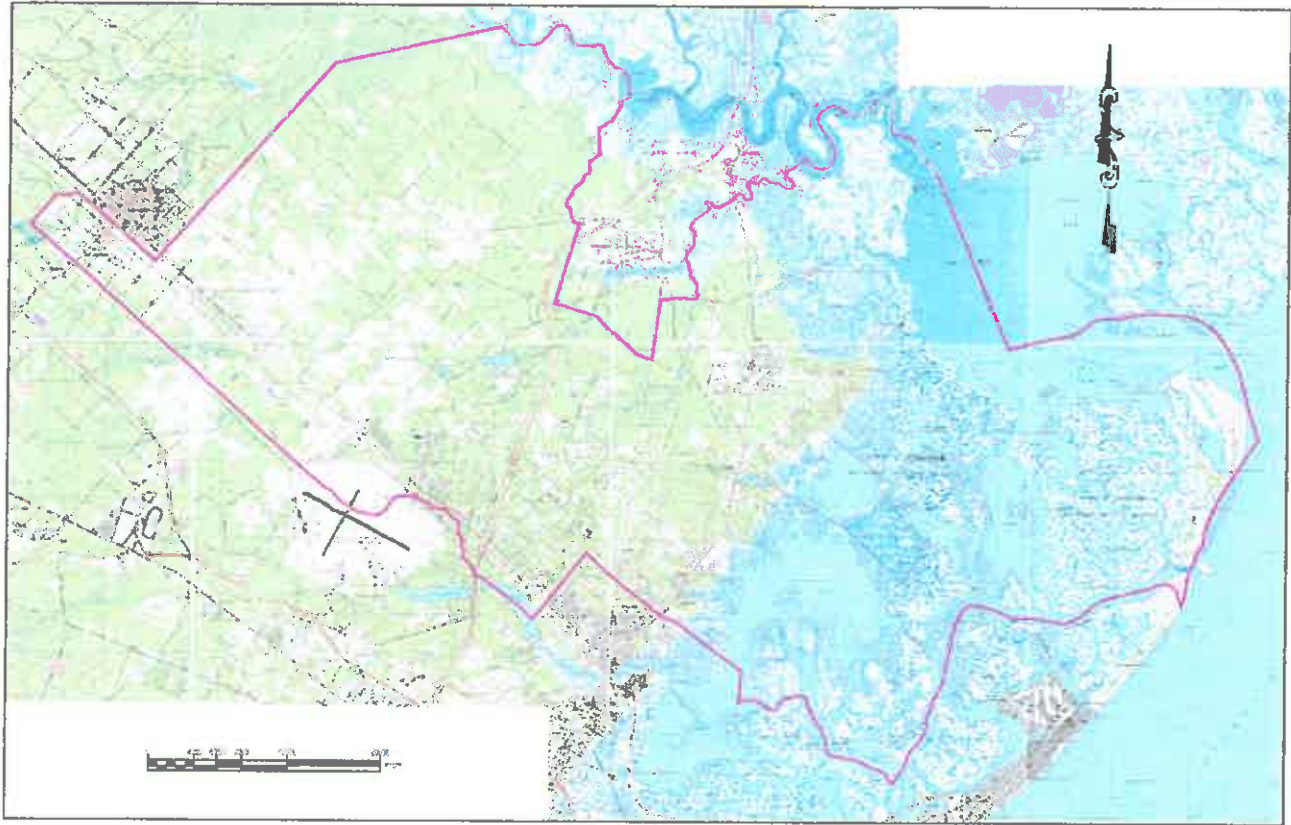


Figure 4: Galloway Township Boundary on USGS Quadrangle Map



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 Mullica River serves as the northern border of Galloway Township (exclusive of the portion of the Township that borders Port Republic). AMNET has identified two tributaries that feed the Mullica River and flow through Galloway Township as impaired. Clarks Mill Creek which flows through the Germainia section of the Township and Mattix Run near Old Port Republic Road as moderately impaired. A portion of the municipality flows to the Absecon Reservoir at the southern border of the Township. The tributary that flows to the reservoir at the Galloway/Absecon border and the White Horse Pike is identified as also being moderately impaired.

A Total Maximum Daily Load (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 improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs. Implementation plans to address TMDL requirements would be initiated as part of a regional stormwater management plan which would be prepared by the County Planning Agency.

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.

Figures 5 and 6 show the groundwater recharge and wellhead protection areas located in the Township, as required as part of the MSWMP.

Figure 5: Groundwater Recharge Areas in the Township

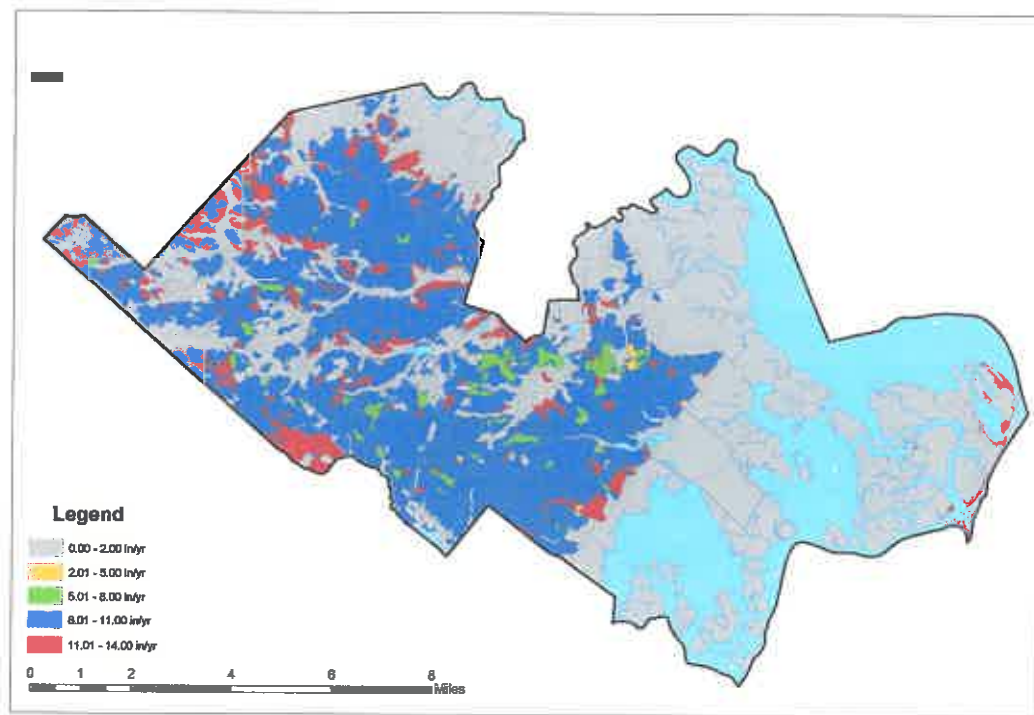
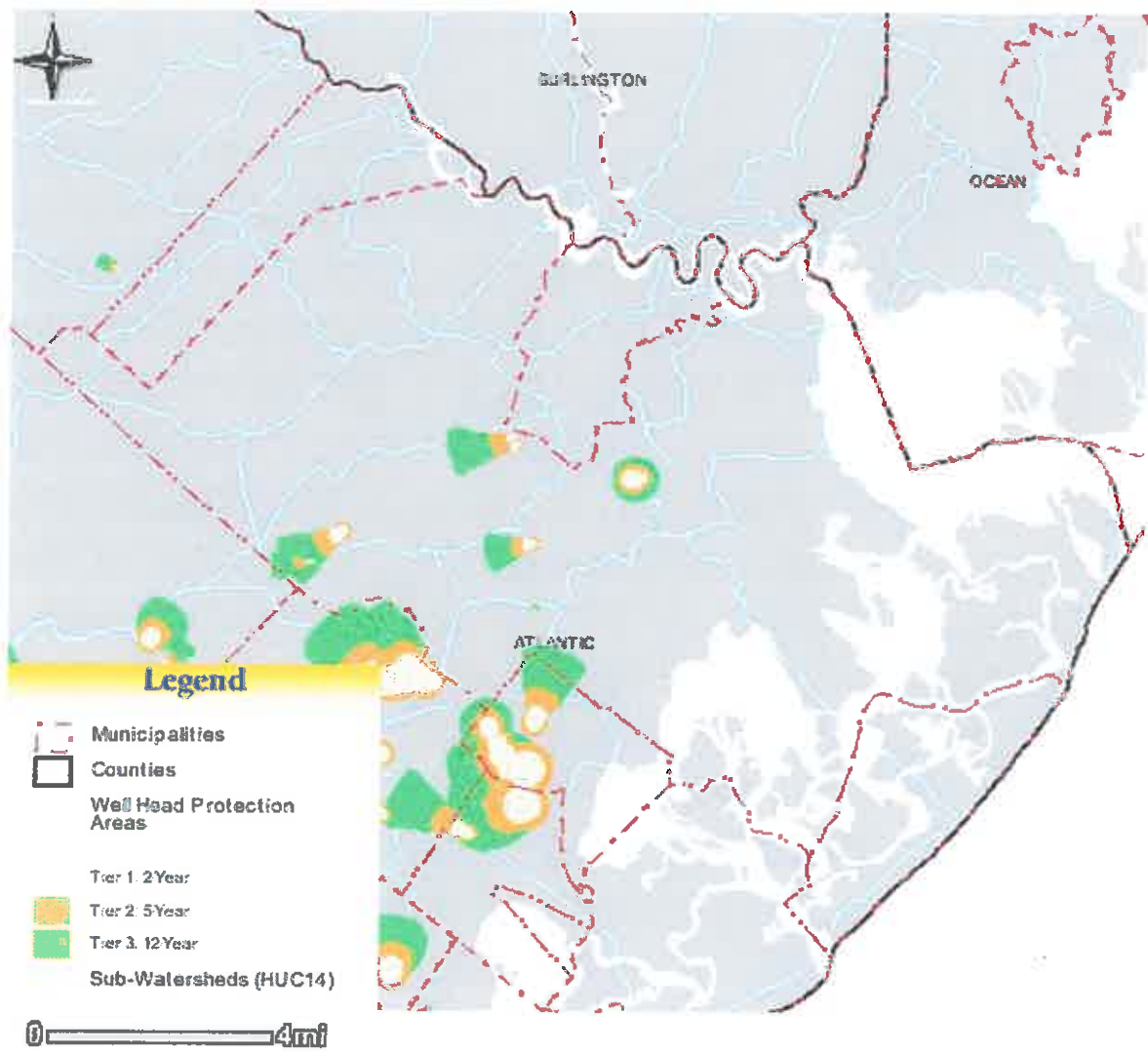


Figure 6: Wellhead Protection Areas in the Township



Design and Performance Standards

Upon the effective date of permit authorization, the Tier A Permit requires Tier A municipalities to ensure that any residential development and redevelopment project (including projects operated by the municipality itself) that are subject to the Residential Site Improvement Standards (RSIS) for stormwater management at N.J.A.C. 5:21-7 and that disturb one acre or more comply with those standards, when conflict exists between the NJDEP stormwater requirements and the RSIS, the NJDEP's standards control.

The Township will adopt 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 facilities consistent with the stormwater management rules in 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. Adopted design and performance standards will meet all of the regulations of the Pinelands Commission N.J.A.C. 7:50-6.84, for all of those lands located within the Pinelands. The Stormwater Control Ordinances shall be adopted within one year of adoption of the MSWMP or for townships with areas located within the Pinelands Protection area by January 1, 2007. These standards will apply to all major development.

The maintenance requirements in N.J.A.C. 7:8-5.8 is among the most important design and performance standards. 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). Stormwater management facilities shall be regularly maintained to insure they function at a design capacity, and to prevent health hazards associated with debris build up and stagnant water.

Maintenance and upkeep responsibilities depend on the ownership of the facilities and should be clearly defined in the Stormwater Maintenance Plan.

During construction, inspectors on behalf of the township will observe the construction of approved projects to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The Township is currently not within a Regional Stormwater Management Planning Area and no total maximum daily loads (TMDLs) have been developed for waters within the Township; therefore consistency with any adopted regional stormwater management plan (RSWMP) or TMDL limits is currently not required. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated for consistency as necessary.

The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards.

During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

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. New development subject to the Residential Site Improvement Standards will immediately be required to comply with the stormwater rules, NJAC 7:8.

Galloway Township is located partially within the Coastal Zone and partially within the Pinelands Management Area. It is the intent of this Municipal Stormwater Management Plan to comply with the adopted state stormwater standards, barring any exceptions noted herein or as may be amended. It is also the intent of the Township to comply with those requirements of the Pinelands Comprehensive Management Plan (CMP) and any future amendments to the Comprehensive Management Plan, amendments will be incorporated into the Township's Municipal Stormwater Management Plan and Land Use Ordinance as necessary.

Nonstructural Stormwater Management Strategies

The Township's Master Plan and development ordinances have been reviewed. Provided herein are a list of the sections in the Township land use and zoning ordinances that are proposed for modification to incorporate nonstructural stormwater management strategies. Once the ordinance texts are completed, they will be submitted to the county review agency and Pinelands Commission for review and approval. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapter 233 of the Township Code, titled "Land Management", was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes are recommended to this Chapter to incorporate these strategies.

Article II - Definitions

Section 233-4, "Terms Defined" should be amended to include the following definitions:

MAJOR DEVELOPMENT, NON-PINELANDS AREAS – Pursuant to N.J.A.C. 7:8 – 1.2, "Major development" outside of the Pinelands Area of the Township means any "development" that provides for and ultimately disturbs one or more acres of land or increasing impervious surface by one-quarter acre or more. Disturbance is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

MAJOR DEVELOPMENT, PINELANDS AREAS – 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 ft²). 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.

IMPERVIOUS SURFACE - Pursuant to N.J.A.C. 7:8 – 1.2, “Impervious surface” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

WETLANDS - Pursuant to N.J.A.C. 7:8 – 1.2, “Wetlands” or “Wetland” means an area that is inundated or saturated by surface water or groundwater 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.

SPECIAL WATER RESOURCE PROTECTION AREA – Pursuant to N.J.A.C. 7:8 – 5.5(h), “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. Areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, and exceptional fisheries significance of those established Category One waters.

Article III – General Provisions

Section 233-11, “Parking Regulations” provides standards for calculating the minimum number of parking spaces for development. These requirements are based on the number of dwelling units and/or gross floor area. This section provides the Planning Board with the ability to allow for some of the parking spaces to remain unpaved with sufficient documentation from the applicant that fewer spaces would be appropriate. This section also allows the Planning Board to approve alternative materials in lieu of blacktop paving.

Section 233-12, “Stream Encroachment” should be amended to add a section D which states, “Pursuant to N.J.A.C. 7:8, Applications for stream encroachment shall preserve and maintain a special water resource protection area in accordance with N.J.A.C. 7:8-5.5(h)”.

Section 233-16, “Buffer Requirements” requires buffer areas along all lot lines separating nonresidential uses from residential uses. The ordinance states that natural vegetation shall be retained within the buffer. Additional language should be added to this section promoting the use of native vegetation for landscape enhancement of the buffers. Native vegetation requires less fertilization and watering than non-native species. Additionally, language should be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Article IV – Zoning Districts

Galloway Township is currently divided into eight non-Pinelands zoning districts and twenty-three Pinelands zoning districts. The non-Pinelands area consists of the following districts: Conservation, Residential Compatibility, Neighborhood Residential, Community Commercial,

Conditional Industrial, Commercial Highway, Professional Office and Community Village Commercial.

The Pinelands area of Galloway Township consists of the following zoning districts: Preservation Area; Forest Area (FA-5, FA-20 and FA Wet); Agricultural Production; Rural Development (R-5 Residential, R-5C Rural Development Cluster, and RCR Resort Commercial Rural); Pinelands Villages and Towns (Village Residential, Town Residential, Village Commercial, Town Commercial, Town Industrial, HC-1 and HC-2 Highway Commercial, and VR-3.2 Residential); Regional Growth Area (R Residential, R-1 Residential, Industrial, Industrial Residential Development, HC-1 and HC-2 Highway Commercial, Professional Offices); Government Institution and Federal District.

In addition to the zoning districts identified above, the Galloway Township Land Management Code allows for professional offices as a conditional use on lots fronting U.S. Route 9 and U.S. Route 30, and neighborhood commercial uses as conditional use on lots fronting U.S. Route 9, where otherwise not permitted.

The Galloway Township master plan is set up to encourage commercial and professional office growth along its major transportation corridors. Commercial development currently exists and further development is encouraged along Route 9 within the Smithville Planned Unit Development and the Community Commercial District and also as part of the neighborhood commercial overlay along the state highways within the Township. Commercial development exists and is promoted within the Community Village Commercial District of the "Downtown" area of the municipality centered on the intersections of two County roadways, Jimmie Leeds Road (County Route 561) and Pitney Road (County Route 634). Professional office development is encouraged along Jimmie Leeds Road and Chris Gaupp Drive as ancillary to the existing Atlantic City Medical Center and the Richard R. Stockton College of New Jersey both located along Jimmie Leeds Road. Commercial development is also encouraged along the State highway U.S. Route 30 (also known as the White Horse Pike) in the Highway and Village Commercial Zones. The Township is currently reviewing its Master Plan to improve the commercial viability along the Route 30 corridor.

Permitted impervious surface site coverage within the Galloway Township Land Management Code range from 30% in the residential districts (40% & 50% in the Pinelands residential growth areas) to 60% in the commercial districts.

Although each zone has a maximum allowable percent impervious surface, the Township Code will be amended to remind developers that satisfying the percent impervious requirements will not relieve them of responsibility of complying with the design and performance standards for stormwater management measures contained in Chapter 233-55, "Stormwater Management". The Township is evaluating the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge as described in Chapter 233-55. A detailed description of how to develop a mitigation plan is included in this Municipal Stormwater Management Plan.

Article VII – Improvement and Construction Standards

Section 233-37, “Streets” describes the requirements for streets in the Township. The Township has several street classifications, ranging from “Collector Arterial,” which has a minimum right-of-way of 66 feet, to “Minor,” which has a minimum right-of-way of 50 feet. Street paving widths are a function of the number of units served and whether a street is curbed. The design of new streets as part of a residential subdivision are required to be in accordance with the “Residential Site Improvement Standards”. Evaluation of street requirements should remain within the purview of the Municipal Review Boards and the Municipal Engineer.

Section 233-43, “Common Open Space and Recreation Requirements” establishes a minimum open space preservation requirement by zoning district for prime and non-prime agricultural soils. This section should be amended to include language encouraging the use of common open space to disconnect impervious surfaces and as filter strips where feasible and practical.

Section 233-45, “Parking Areas” defines minimum parking space and pavement construction requirements. The minimum parking space area is identified as 180 square feet with a minimum width of 9’. It has been the policy of the Planning Board to require a minimum parking stall width of 10’ along all building frontages to accommodate the increase in larger design vehicles. The Board has historically granted waivers to allow for 9’ x 18’ parking spaces in non-frontage spaces which have resulted in a reduction of impervious cover. It is recommended that decisions for a reduction of parking space size continued to be reviewed by the Board on a case-by-case basis dependent on such issues as proposed use, site circulation and overall parking density. Galloway Township has previously permitted the use of porous pavement in site development. Review of the performance of porous pavement has yielded less than satisfactory results. Porous pavement has been prone to clogging thereby minimizing its success as a stormwater management measure. Additionally, porous pavement has been more prone to structural failure than standard non-porous pavement in high traffic areas. Therefore, while its use would be supported in overflow parking and low volume parking areas, it is not recommended for use in medium and high traffic areas. The evaluation of its use would be on a case-by-case basis as determined by the Board Engineer.

Section 233-47, “Curbs and Gutters” requires that concrete curbs and/or gutters are required for major subdivisions and planned developments, but may be waived by the Planning Board if the applicant proposes an acceptable drainage system not requiring curbs and gutters. This section should be amended to allow for curb cuts or flush curbs with curb stops in commercial development to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas. Flush curb should be defined as having a negative reveal to prohibit stormwater ponding at the curb face. The use of vegetated swales in lieu of curbing shall be reviewed on a case-by-case basis. Factors such as lot density, driveway crossings, slope, design section and maintenance must all be considered in the design of such systems to avoid problems frequently encountered with their use such as clogging, trash and sediment build-up, ponding and excessive vegetation.

Section 233-50, “Bikeways” provides an alternative to concrete sidewalks as required in Section 233-49, “Sidewalks”. Bike paths are permitted in lieu of sidewalks depending on the

development's location in relation to schools, recreation areas, shopping facilities and other populated areas. This section should be amended to include a provision that allows the use of porous pavement in lieu of the specified bituminous pavement standard. The use of porous pavement shall be at the discretion of the Board Engineer subject to the provisions of Section 233-55, "Stormwater Management" for both design and maintenance.

Section 233-51, "Shade Trees" requires a minimum of two shade trees per 100' of lot frontage to be planted in the front yard unless an equivalent number of trees are preserved. This section should be amended to include provisions that require the applicant to demonstrate that appropriate measures will be taken to preserve existing trees scheduled to remain in accordance with section 233-52 – "Tree Removal and Protection". This should include a restriction of development within the limits of the tree canopy of those trees to be preserved.

Section 233-52, "Tree Removal and Protection" was amended on May 9, 2006, by Ordinance 1654 to encourage the protection of trees in the Township through the establishment of protective regulations in order to control and, to the extent possible, ameliorate problems caused by flooding, wildfires, soil erosion, air and noise pollution. This ordinance recognizes that the preservation of mature trees and forested areas is a key strategy in the management of environmental resources, particularly watershed management, air quality, and ambient heating and cooling. This complies with minimizing land disturbance, which is a nonstructural stormwater management strategy.

Section 233-55, "Stormwater Management" has undergone substantial revisions as part of the adoption of the revisions to the municipal stormwater control ordinance in accordance with the NJDEP's Model Stormwater Ordinance and New Jersey Pinelands Commission's Model Stormwater Ordinance provided on July 19, 2006. Revisions include provisions to incorporate non-structural stormwater management strategies and the refinement of performance standards to provide for an increased level of water quality, groundwater recharge and a decrease in off-site runoff.

Section 233-57, "Pinehurst Stormwater Requirements" will be revised in accordance with the Pinelands Commission's Model Draft Stormwater Control Ordinance. Additionally, the Township may wish to include construction of portions of the Pinehurst master drainage plan as part of a mitigation plan for variance relief.

Section 233-61, "Floodplain Performance Standards" should be revised to include the following statement: "Development within a flood plain shall be in compliance with the special water resource protection area standards in accordance with N.J.A.C. 7:8-5.5(h)".

A new section titled, "Lot Disturbance" should be added which places restrictions on lot clearing for residential subdivisions. Currently whole tracts of land are being clear cut resulting in a loss of natural native vegetation and creating detrimental environmental impacts such as an increase in soil erosion and stormwater runoff. The following language addresses lot disturbance issues:

Lot Disturbance

- A. Applicants for subdivision approval must demonstrate to the satisfaction of the Planning or Zoning Board Engineer that lot disturbance has been minimized. This shall be accomplished through the design of street grading to as close as possible to existing grade to minimize severe cut or fill situations.
- B. For all residential applications, the initial clearing will be limited to the clearing necessary to construct all roadways and drainage facilities only. In no case will the developer be permitted to clear any building lots during this initial phase. All building lots may only be cleared on an individual basis upon the issuance of a building permit.
- C. The following is a schedule of lot disturbance permitted for various fee simple residential lot sizes. Of the trees to be preserved, a minimum of 25% of the deciduous trees must be preserved in the front yard of the home, a minimum of 25% of the deciduous trees must be preserved in the side yards, and a maximum of 50% of the deciduous preservation area may be in the rear yard of the home.

Lot Sizes (ft ²)	Maximum Lot Disturbance Permitted (%)
Less than 10,000	65
10,001 to 20,000	55
20,001 to 40,000	40
Over 40,000	20

- D. Townhomes and condominiums will have a maximum of 55% lot disturbance.
- E. Should the applicant not be able to meet the lot disturbance requirements, a landscaping plan must be submitted for approval by the Planning or Zoning Board that addresses all areas of additional disturbance. The applicant will be required to show the replacement of all trees removed in excess of the maximum lot disturbance regulations provided herein. The replacement trees shall be provided at a rate of one tree for each additional tree removed and shall be red or white oaks a minimum of six-inch caliper (diameter breast height) and twelve-foot to fifteen-foot planting height or a substitute approved by the Planning or Zoning Board. The applicant will also be required to flag and protect all eight-inch or greater diameter trees that are outside the building envelope to be saved as part of the landscaping plan.
- F. All individual plot plans must conform to all provisions of the lot disturbance requirements. All plot plans must contain the limits of disturbance, existing and proposed grading, existing trees to be preserved and any trees to be installed in conjunction with the landscaping plan. The Township Engineer will complete and inspection of all building lots prior to the issuance of a building permit to ensure compliance with the lot disturbance regulations.

G. Selective Clearing

- i. An owner or developer shall remove only such trees, vegetation and underbrush as is necessary to construct and install the structure and improvements authorized by the Planning or Zoning Board. Such clearing shall only be authorized subsequent to the applicant/developer having satisfactorily addressed all conditions of development approval.
- ii. A developer may be permitted to perform selective clearing to remove dead or damaged trees, underbrush and undesirable vegetation. The areas and the extent of selective clearing must be indicated on the plan of the development. All selective clearing must be approved by the Galloway Township Zoning Officer prior to the commencement of any clearing.
- iii. Where selective clearing is to occur in a required buffer area of a site or major subdivision, the developer shall be required to maintain a screening buffer in accordance with the buffer and landscape requirements of this chapter and shall be required to replace any planting removed in the course of selective clearing operations, which is required as part of the buffer.
- iv. All selective clearing operations shall be performed in strict accordance with all applicable state, federal and local regulations. All cleared material, including but not limited to trees, branches, stumps, brush, refuse and other deleterious matter, shall be removed from the site and disposed of in a lawful manner.

H. Protection of Downstream Drainage Structures

- i. Prior to commencement of clearing operations, developer must ensure that downstream drainage structures are adequately protected from soil migration that may occur during project construction. This includes direct runoff from the project site and construction vehicles. Prior to the issuance of a Certificate of Occupancy, immediate downstream drainage facilities shall be inspected for siltation by the Municipal Engineer. The developer will be directed to take appropriate measures to clean out any downstream structures affected by the development, at the Municipal Engineer's discretion.

A new section titled, "Lot Grading" should be added which identifies standards for lot grading for residential subdivisions. This section will establish minimum and maximum slopes for lot grading to secure proper drainage and prevent the collection of stormwater. Additionally, projects being constructed as cluster development are experiencing excess compaction in the yard areas during the building pad construction. The excess compaction has resulted in a reduction in the natural infiltration characteristics and created stormwater ponding problems. The following language addresses lot grading:

Lot Grading

- A. All lots, open spaces and planting areas shall be graded to secure proper drainage and to prevent the collection of stormwater. Grading shall be performed in such a manner which will minimize the damage to or destruction of trees growing on the land. Topsoil shall be provided and/or redistributed on the surface as cover and shall be stabilized by seeding or planting. Grading plans shall have been submitted with the preliminary and final plats, and any departure from these plans must be approved in accordance with the requirements of this chapter for the modification of improvements.
- B. Wherever possible, the land shall be graded so that the stormwater from each lot shall drain directly to the street via sheet flow through disconnected pervious surfaces. If impossible to drain directly to the street, it shall be directed to a system of interior yard drainage designed in accordance with this chapter.
- C. Unless otherwise required by this chapter, all tree stumps, masonry and other obstructions shall be removed to a depth of two feet below existing or finished grade, whichever is lower.
- D. The minimum slope for lawns and disturbed areas shall be one and one-half percent (1 ½%) and, for smooth, hard-finished surfaces other than roadways and parking lots, four tenths of one-percent (4/10 of 1%).
- E. The maximum grade for lawns and disturbed areas within five feet of a building shall be ten percent (10%) and, for lawns more than five feet from a building, twenty-five percent (25%); except that, for the driveway, the maximum grade shall be fifteen percent (15%).
- F. Lots shall be graded to provide positive drainage from the rear, side and front yard areas towards a downstream stormwater management system. In no case shall lots discharge directly towards building units of adjoining residential properties. In areas where conveyance swales are required, the design shall be in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey and the stormwater management provisions of this chapter.
- G. Retaining walls installed in slope-control areas shall be constructed of heavy timber or logs properly treated in accordance with environmental regulations, reinforced concrete, reinforced masonry or of other construction acceptable to the Board Engineer and shall be adequately designed and detailed on the final plat to carry all earth pressures, including any surcharges. The heights of retaining walls shall not exceed 1/3 of the horizontal distance from the foundation wall of any building to the face of the retaining wall.
- H. Protection Against Excessive Compaction
 - i. Upon completion of final lot grading and prior to the placement of topsoil in disturbed areas, the lot shall be inspected by the Municipal Engineer to ensure

the adequacy of ground slope and infiltrative capacity in the yard areas. At the Municipal Engineer's discretion, supporting documentation from the owner or developer regarding the adequacy of ground slope and infiltrative capacity may be required. This may include soil permeability testing and as-built survey information in designated areas.

- ii. Yard areas must equal or exceed the permeability rates of the property in its natural undeveloped state.
- iii. Areas which are determined to be excessively compacted shall be reconstituted to the satisfaction of the Municipal Engineer.

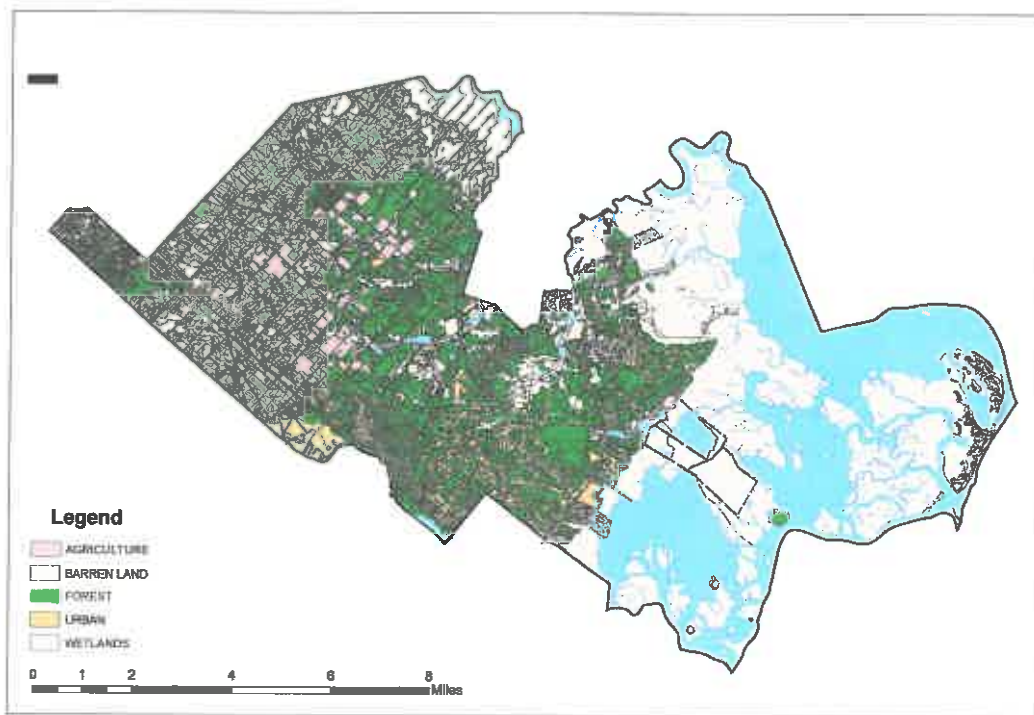
- I. As-Built Survey requirements to ensure the adequate construction of these lots to prevent against poor drainage conditions.

Land Use/Build-Out Analysis

A detailed land use analysis for the Township was conducted. Figure 7 illustrates the existing land use in the Township based on 1995/97 GIS information from NJDEP. Figure 8 illustrates the HUC14s within the Township. The Township zoning map is shown in Figure 9. Figure 10 illustrates the constrained lands within the Township. Table 1 contains a summary of the HUC14s in Galloway Township and stream impairment classifications in each HUC. The build-out calculations for impervious cover are shown in Table 2.

The pollutant loads at full build-out are presented in Table 3. Table 4 presents the pollutant loading coefficients by land cover.

Figure 7: Galloway Township's Existing Land Use



Legend

02040301170100	02040301210020
02040301170110	02040301210030
02040301170120	02040301210040
02040301170130	02040301210050
02040301220080	02040301220090
02040301220090	02040301220100
02040301220100	02040301220110
02040301220120	02040301220130
02040301220140	02040301220150
02040301220160	02040301220170
02040301220180	02040301220190
02040301220200	02040301220210
02040301220220	02040301220230
02040301220240	02040301220250
02040301220260	02040301220270
02040301220280	02040301220290
02040301220300	02040301220310
02040301220320	02040301220330
02040301220340	02040301220350
02040301220360	02040301220370
02040301220380	02040301220390
02040301220400	02040301220410
02040301220420	02040301220430
02040301220440	02040301220450
02040301220460	02040301220470
02040301220480	02040301220490
02040301220500	02040301220510
02040301220520	02040301220530
02040301220540	02040301220550
02040301220560	02040301220570
02040301220580	02040301220590
02040301220600	02040301220610
02040301220620	02040301220630
02040301220640	02040301220650
02040301220660	02040301220670
02040301220680	02040301220690
02040301220700	02040301220710
02040301220720	02040301220730
02040301220740	02040301220750
02040301220760	02040301220770
02040301220780	02040301220790
02040301220800	02040301220810
02040301220820	02040301220830
02040301220840	02040301220850
02040301220860	02040301220870
02040301220880	02040301220890
02040301220900	02040301220910
02040301220920	02040301220930
02040301220940	02040301220950
02040301220960	02040301220970
02040301220980	02040301220990
02040301221000	02040301221010
02040301221020	02040301221030
02040301221040	02040301221050
02040301221060	02040301221070
02040301221080	02040301221090
02040301221100	02040301221110
02040301221120	02040301221130
02040301221140	02040301221150
02040301221160	02040301221170
02040301221180	02040301221190
02040301221200	02040301221210
02040301221220	02040301221230
02040301221240	02040301221250
02040301221260	02040301221270
02040301221280	02040301221290
02040301221300	02040301221310
02040301221320	02040301221330
02040301221340	02040301221350
02040301221360	02040301221370
02040301221380	02040301221390
02040301221400	02040301221410
02040301221420	02040301221430
02040301221440	02040301221450
02040301221460	02040301221470
02040301221480	02040301221490
02040301221500	02040301221510
02040301221520	02040301221530
02040301221540	02040301221550
02040301221560	02040301221570
02040301221580	02040301221590
02040301221600	02040301221610
02040301221620	02040301221630
02040301221640	02040301221650
02040301221660	02040301221670
02040301221	

[illegible]

Figure 10: Wetlands and Water Land Uses within the Township – Constrained Land

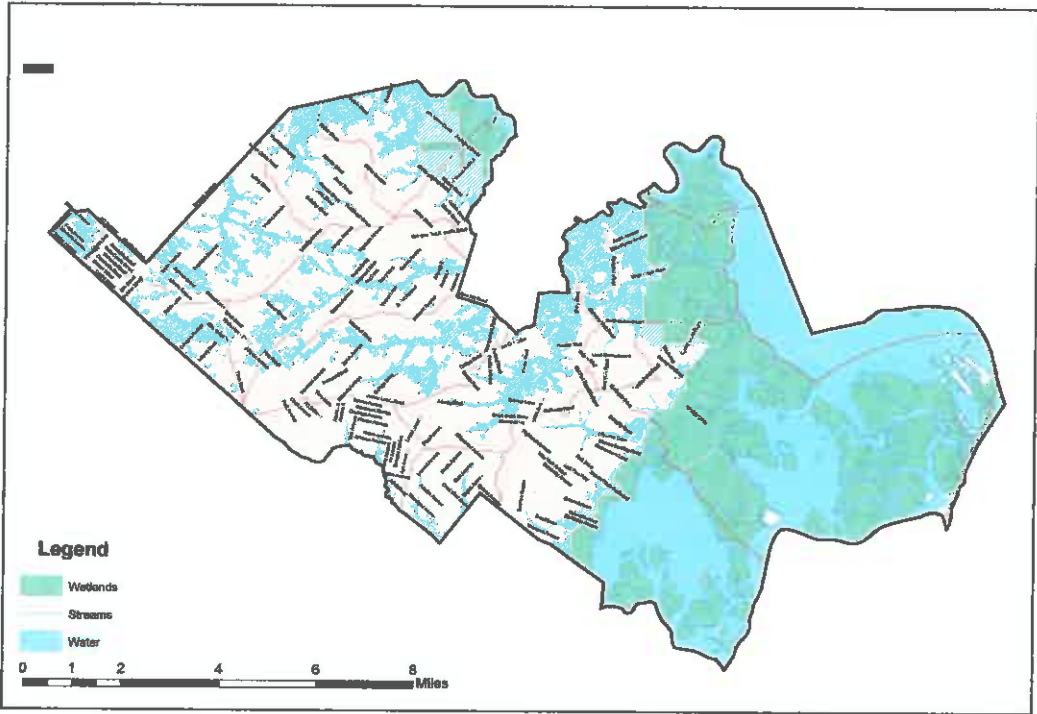


Table 1: Galloway Township HUC14s Summary

Watershed	HUC 14	Total Area		Total Area within Galloway Twp.		Stream Impairment
		acres	mile ²	acres	mile ²	
Mullica	02040301170100	3097	4.84	485	0.76	Non-impaired
Mullica	02040301170110	6283	9.82	4508	7.05	Non-impaired
Mullica	02040301170120	4868	7.61	2805	4.39	Non-impaired
Mullica	02040301170130	11056	17.28	3498	5.47	Non-impaired
Mullica	02040301200080	4292	6.71	1520	2.38	Non-impaired
Mullica	02040301200090	5579	8.72	5406	8.46	Moderately Impaired
Mullica	02040301200100	5346	8.35	5077	7.95	Non-impaired
Mullica	02040301200110	4486	7.01	4144	6.49	Moderately Impaired
Mullica	02040301200120	3725	5.82	1206	1.89	Non-impaired
Mullica	02040301210020	4686	7.32	4586	7.18	Non-impaired

Table 1: Galloway Township HUC14s Summary (Continued)

Watershed	HUC 14	Total Area		Total Area within Galloway Twp.		Stream Impairment
		acres	mile ²	acres	mile ²	
Mullica	02040301210010	4785	7.48	1459	2.28	Non-impaired
Mullica	02040301210040	12612	19.71	3622	5.66	Non-impaired
Mullica	02040301210030	19283	30.13	16272	25.24	Non-impaired
Mullica	02040302910010	20051	31.33	200	0.30	Non-impaired
Great Egg Harbor	02040302050020	12881	20.13	1790	2.71	Non-impaired
Great Egg Harbor	02040302020010	3756	5.87	2268	3.54	Moderately Impaired
Great Egg Harbor	02040302020030	3396	5.31	1692	2.64	Moderately Impaired
Great Egg Harbor	02040302010010	25166	39.32	10890	16.64	Non-impaired
Great Egg Harbor	02040302020040	5416	8.46	11	0.02	Non-impaired
		Galloway Township Totals		71440	111.80	

Table 2: Sample Build-Out Calculations for Three Galloway Township HUC14s

HUC14/Zone	Total Area (acres)	Constrained Land		Developable Area (acres)	Build-Out	
		Wetlands/ Water (acres)	Other (acres)		Impervious (%)	Impervious (acres)
02040301170100	485					
Town Residential	485	406	0	79	48	38
Totals	485	406	0	79	48	38
02040301170110	4508					
Agriculture	2326	1083	0	1243	17	211
Forest Area	133	0	0	133	1	1
Highway Commercial 2	296	161	0	135	60	81
Residential	342	0	0	342	13	44
Recreation Development	123	25	0	98	5	5
Resort Development Area	149	45	0	104	50	52
Town Residential	849	358	0	491	48	236
Town Industrial	147	75	0	72	60	43
Town Commercial	22	0	0	22	73	16
Village Commercial	5	0	0	5	60	3
Village Residential	11	0	0	11	40	4
Residential	105	20	0	85	40	34
Totals	4508	981	0	3411	24	731
02040301170120	2805					
Agriculture	307	26	0	281	17	48
Forest Area	706	265	0	441	1	4
Forest Area	503	268	0	235	1	2
Residential	1289	246	0	1043	13	136
Totals	2805	805	0	2000	10	190

Table 3: Sample Nonpoint Source Loads at Build-Out for Three Galloway Township HUC14s

HUC14/Zone	Developable Area (acres)	Nonpoint Source Loading		
		TP (lbs/yr)	TN (lbs/yr)	TSS (lbs/yr)
02040301170100				
Town Residential	79	103	790	23700
Totals	79	103	790	23700
02040301170110				
Agriculture	1243	1616	12430	372900
Forest Area	133	13	399	5320
Highway Commercial 2	135	284	2970	27000
Residential	342	205	1710	34200
Recreation Development	98	98	980	11760
Resort Development Area	104	135	1040	31200
Town Residential	491	295	2455	49100
Town Industrial	72	108	1152	14400
Town Commercial	22	46	484	4400
Village Commercial	5	11	110	1000
Village Residential	11	6	53	1056
Residential	85	51	425	8500
Totals	2741	2868	24208	560836
02040301170120				
Agriculture	281	365	2810	84300
Forest Area	441	44	1323	17640
Forest Area	235	24	705	9400
Residential	1043	626	5215	104300
Totals	2000	1059	10053	215640

Table 4: Pollutant Loads by Land Cover

Land Cover	Total Phosphorus Load	Total Nitrogen Load	Total Suspended Solids Load
	(lbs/acre/year)	(lbs/acre/year)	(lbs/acre/year)
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	10	120
Agricultural	1.3	10	300
Forest, Water and Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

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.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality 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. Qualifying mitigation projects available to compensate for the deficit from the performance standards resulting from the proposed project will be developed by the Municipal Engineer in coordination with the Township Infrastructure Committee.
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. Specific projects that can be used to address the mitigation option will be developed by the Municipal Engineer in coordination with the Township Infrastructure Committee.
3. Mitigation projects, for lands located with the Pinelands section of the Township, must be located within the Pinelands and within the same drainage area as the proposed project.

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 by the municipality, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the proposed mitigation, 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 with the Township expended said funding within 5 years of receipt.

**Proposed Amendment to Chapter 233-55 of the Land
Management Code**

of

Galloway Township – Stormwater Management

January 8, 2007

Proposed Amendment to Chapter 233-55 of the Land Management Code of Galloway Township – Stormwater Management

January 8, 2007

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

1. It is hereby determined that the lakes and waterways within the Township of Galloway of Atlantic County may be subject to flooding; that development tends to accentuate the possibility of such flooding by increasing stormwater runoff, due to alterations of the hydrologic response of the watershed in changing from the undeveloped to the developed condition; that such increased stormwater runoff produced by development of real property contributes to the possibility of increased quantities of waterborne pollutants and tends to increase channel erosion; that such increased stormwater runoff, increased erosion potential and increased pollution potential constitutes the possibility of the deterioration of the water resources of the Township of Galloway, the County of Atlantic and the State of New Jersey; and that such impacts can be controlled to some extent by the regulation of stormwater runoff from such development. It is determined that it is in the public interest to regulate the development of real property and to establish standards to regulate the additional discharge of stormwater runoff from such developments as provided in this chapter.
2. Certain areas of Galloway Township lie within the Pinelands Region of the township, and therefore, development in this portion of Galloway Township is subject to the requirements of the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.) and implementing the regulations and minimum standards contained in the Pinelands Comprehensive Management Plan (CMP) (N.J.A.C. 7:50-1.1 et seq.). The purpose and

intent of these regulations and standards is to the promote orderly development of the Pinelands Protection Area so as to preserve and protect the significant and unique natural, ecological, agricultural, archaeological, historical, scenic, cultural and recreational resources of the Pinelands.

3. It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for "major development," as defined in Section 2. While all development not defined as a "major development" in Section 2 is required to meet or exceed those general requirements for stormwater management as stated in Section 3. All developments are required to meet those standards for structural and nonstructural stormwater management measures as employed.

C. Goals and Techniques

1. Through this ordinance, the Township of Galloway has established the following goals for stormwater control:
 - a. To reduce flood damage, including damage to life and property;
 - b. To minimize any increase in stormwater runoff from new development;
 - c. To reduce soil erosion from any development or construction project;
 - d. To assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
 - e. To maintain groundwater recharge;
 - f. To minimize any increase in nonpoint pollution;
 - g. To maintain the integrity of stream channels for their biological functions, as well as for drainage;
 - h. To restore, protect, maintain and enhance the quality of the streams and water resources of the Township of Galloway and the ecological character and quality of the Pinelands Area;
 - i. To minimize pollutants in stormwater runoff from new and existing development in order to restore, protect, enhance and maintain the chemical, physical and biological integrity of the surface and groundwaters of the Township of Galloway, to protect public health and to enhance the domestic, municipal, recreational, industrial and other uses of water; and
 - j. To protect public safety through the proper design and operation of stormwater management basins.
2. In order to achieve the goals for stormwater control set forth in this ordinance, the Township of Galloway has identified the following stormwater 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.
- f. 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.

D. Applicability

1. All "development" as defined in Section 2 of this chapter is subject to the standards and criteria established within this chapter. This includes all site and subdivision plans that require approval by the Township Planning and/or Zoning Board.
2. This ordinance shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:
 - a. Non-residential major developments; and
 - b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.
3. This ordinance shall also be applicable to all major developments undertaken by the Township of Galloway.
4. The reviewing board or, in the case of individual dwellings or minor construction not subject to review by a Board, the Construction Official may waive or adjust individual standards as may be reasonable and within the purpose of the chapter stated in Subsection A of this section.
5. The applicant may request a waiver from the strict compliance with the standards if it can be demonstrated and documented that the enforcement of one or more of these standards will cause an undue hardship.

E. Procedure

1. Burden of proof. Whenever an applicant seeks a township approval of a development to which this chapter is applicable from any board or official of the Township, that applicant

shall be required to demonstrate that the project meets the standards set forth in this chapter.

2. Submission materials due. The applicant shall submit materials, as required by Section 11 hereof, to the Township Board or Official from which the applicant seeks township approval prior to or at the same time of submission of an application for township approval.
3. Review. The applicant's project shall be reviewed by the Township Board or Official from which the applicant seeks township approval. That Township Board or Official shall consult with the Township Engineer to determine if the project meets the standards set forth in this chapter.
4. Time for decision. The Township Board or Official shall promptly determine if the project meets the standards set forth in this chapter. The time for that determination should be the time permitted to review and act on the applicant's application for a Township approval.
5. Failure to comply. Failure of the applicant to demonstrate that the project meets the standards set forth in this chapter is reason to deny the applicant's underlying application for a township approval.
6. Variance. For good reason, the Township may grant a waiver of the standards given in Sections 3, 4, 6 and 7.

F. Compatibility with Other Permit and Ordinance Requirements

1. 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.
2. 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 the Township of Galloway is a part, the stormwater provisions of such a plan(s) shall be adopted within one year of the adoption of a Regional Stormwater Management Plan (RSWMP) as an amendment to an Arcawide 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 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.

“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.

“BMP” means Best Management Practice as defined in the New Jersey Stormwater Best Management Practices Manual.

“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.

“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-mornal loading.

“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.

“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:

1. A county planning agency; or
2. 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.

“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 is 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.

“Disturbance” is the placement of impervious surface or the exposure and/or movement of soil or bedrock or the clearing, cutting or removing of vegetation.

“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.
- "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 redistribution 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" – Pursuant to N.J.A.C. 7:8-1.2, "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.

"In Lieu Contribution" means a monetary fee collected by the Township of Galloway 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.

"Major Development, Non-Pinelands Areas" Pursuant to N.J.A.C. 7:8 – 1.2, "Major development" outside of the Pinelands Area of the Township means any "development" that provides for and ultimately disturbs one or more acres of land or increasing impervious surface by one-quarter acre or more.

"Major Development, Pinelands Areas" 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 ft²).

"Minor Development" means all development other than major development.

"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 the Township of Galloway and the Pinelands Commission.

"Municipality" means any city, borough, town, township, or village.

"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.

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

"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 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.
- "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 on the 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.

“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.

“Special Water Resource Protection Areas”—Pursuant to N.J.A.C. 7:8 – 5.5(h), “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. Areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, and exceptional fisheries significance of those established Category One waters.

“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 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 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.

"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.

"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.

"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."

"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:

1. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
2. Designated as CAFRA Centers, Cores or Nodes;
3. Designated as Urban Enterprise Zones; and
4. Designated as Urban Coordinating Council Empowerment Neighborhoods.

"Void Ratio" is the interstitial space between soil particles as calculated by the ratio of the volume of voids to the volume of solids.

"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.

"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” – Pursuant to N.J.A.C. 7:8-1.2, “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.

“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 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 presented in this section for general stormwater management control and those additional standards stated 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 stated in Section 4 apply 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.
3. For site improvements regulated under the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21, the RSIS shall apply in addition to Sections 3 and 4 except to the extent the RSIS are superseded by this section or alternative standards applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.
4. All development shall demonstrate through hydrologic and hydraulic analysis that quantity and quality standards are met as follows.
 - a. The total volume of runoff leaving the site from the post development condition shall not be greater than the total volume of runoff leaving the site from the pre-development condition, nor shall there be any alterations of the flow pattern of stormwater runoff from the site such that flooding, erosion, sedimentation, loss of water supply or other harmful effect will occur.
 - b. The volume of runoff resulting from the Water Quality design storm defined as 1.25 inches in a 2 hour period or the 1-year 24 hour Type III design storm shall be completely retained and infiltrated on site.
5. A minimum separation of two feet between the elevation of the lowest point of the bottom of the infiltration or detention facility and the seasonal high-water table shall be met, or a lesser separation when it is demonstrated that the separation, either due to soil conditions or when considered in combination with other stormwater management techniques, is adequate to protect groundwater quality. [Added 6-10-1997 by Ord. No. 1302]
6. In the Pinelands Area of the Township of Galloway, the following criteria shall also apply:
 - a. There shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetlands, wetlands transition area or surface waterbody. In addition, stormwater runoff shall not be directed in such a way as to increase the volume and

rate of discharge into any surface water body from that which existed prior to development of the parcel.

- b. 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.
 - c. Excessively and somewhat excessively drained soils as defined by the Soil Conservation Service should be avoided for the recharge of runoff wherever possible.
 - d. When and where possible, a positive, gravity flow discharge structure/pipe shall be constructed in such a manner so as to allow the complete drainage of the retention/detention basin to a stream, storm sewer or other point of positive drainage. This structure/pipe shall be designed in such a manner that it may be locked closed and cause the same effect as a dam to a lake. The locked condition shall keep the stormwater from draining from the basin.
 - i. If the drainage structure/pipe is under Township ownership, control and maintenance, it shall be the responsibility of the Director of Public Works to determine when and if the structure/pipe must be unlocked to drain the basin, to seek the approval of the Township Committee to do so and to give public notice to the Pinelands Commission if within the Pinelands Protection Area. The Director of Public Works shall be responsible to keep the keys for these locks, to routinely check to assure that they are normally locked and in good working order and to relock them upon completion of the maintenance of the basin.
 - ii. If the drainage/pipe structure is under private ownership, control and maintenance, it shall be the responsibility of the property owner to request permission from the Township Committee to unlock this structure/pipe and to give notice to the Pinelands Protection Area.
 - (a) In order to obtain such permission to open the locked structure/pipe, a statement, signed by the owner, must be presented stating that it is in the public's best interest that this structure/pipe be opened in order to drain the basin which has continued to retain water beyond its normal period, and that it must be drained in this manner to facilitate the maintenance of the basin. This statement must also indicate the date on which the structure/pipe will be closed and locked.
 - (b) Upon receipt of such permission, the property owner shall contact the Director of Public Works who shall exclusively maintain the keys for the lock for this structure/pipe and shall unlock it to drain and relock it upon completion of the maintenance of the basin.
7. Both retention and detention basins shall have the following improvements as further specified in the New Jersey Department of Transportation Standard Specifications for

Road and Bridge Construction, as amended, and New Jersey Department of Transportation Standard Construction Details, as amended:

- a. Headwalls and riprap.
- b. A chain link fence, four feet high, around the entire perimeter may be required by the Planning Board. In cases where a fence is required, a twelve-foot opening shall be provided for vehicular access to streets by means of a fifteen-foot-wide access right-of-way. The fence shall not extend into the building front yard setback area.
- c. An eighteen-inch berm around the inside of the basin.
- d. Landscaping is required around the entire perimeter, except where it faces planned open spaces or wooded areas or other natural or man-made visual separation existing between the facility and adjoining lands.

8. Wetlands.

- a. No land development shall be carried out within 50 feet of a wetland or in an area adjacent to a wetland area where the seasonal high-water table is three feet or less, unless the applicant can demonstrate that the proposed development will not result in significant adverse impact on any drainage structure.
- b. A significant adverse impact shall be deemed to exist if:
 - i. A drainage structure is affected through the increased runoff discharged to the wetlands;
 - ii. There is a change in the seasonal flow patterns;
 - iii. There is an alteration of the water table; or
 - iv. There is an increase in erosion and increased sedimentation of the wetlands.

9. Methods of management.

- a. The following is a list of various control methods which may be utilized in stormwater management systems, if appropriate. The choice of control techniques is not limited to the ones appearing on this list. However, it will be the policy of the Township to encourage the use of retention basins wherever possible. All plans submitted to the Township outside of the Pinelands Area must, if detention systems are not the chosen method, explain why an alternate method is proposed.
 - i. Detention/retention basins.
 - ii. Rooftop storage.
 - iii. Parking lot ponding.
 - iv. Porous pavement and concrete lattice block surface.
 - v. Grassed channels and vegetated strips.
 - vi. Routed flow over grass.
 - vii. Decreased impervious area coverage.
 - viii. French drains, porous pipes and dry wells.

- b. The use of other control methods which meet the criteria in this section will be permitted when approved by the Township Engineer. Various combinations of methods should be tailored to suit the particular requirements of the type of development and the topographic features of the project area.
- c. Regardless of the method used, the applicant will be required to provide a maintenance plan in accordance with Section 12 of this chapter.
- d. In addition to all other requirements of this section, each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved, protected and maintained according to the minimum standards established by provisions of the Township of Galloway Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval. Existing trees and vegetation 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.
- e. All submitted landscaping plans shall contain a revegetation plan in accordance with the Pinelands CMP standards at N.J.A.C. 7:50-6.24(c).

10. Drainage Easements.

- a. All stormwater management plans shall illustrate the pathway of positive outflow to the nearest stormwater easement, stream, lake, pond or other natural watercourse. Prior to receiving the final approval, the applicant shall obtain the necessary easements corresponding with the flow patterns illustrated on the plans should those patterns affect the present or future use of adjoining parcels by increasing the quantity of runoff over the adjoining parcel.
- b. Where a subdivision is traversed by a watercourse, surface or underground drainageway or drainage system, channel or stream, there shall be provided and dedicated a drainage right-of-way easement to the Township conforming substantially to the lines of such watercourse, and such further width or construction, or both, as will be adequate to accommodate expected stormwater runoff meeting any minimum widths and locations shown on any adopted Official Map and/or Master Plan and, as a minimum, that fixed in Section 2 defined as "stream corridor." Such easement dedication shall be expressed on the plan as follows: "Drainage and utility right-of-way easement granted to the Management Ordinance of the Township of Galloway."

11. Drainage structures in County or State right-of-way. Drainage structures which are located within state or Atlantic County highway rights-or-way shall be approved by the state or county agency, and a letter from that office indication such approval shall be directed to the administrator of the Planning Board and shall be received prior to the final plat approval, Drainage structures abutting a brook or stream whose drainage area, up to and including the subdivision or development, is greater than 50 acres or within a one-hundred-year floodplain shall be required to secure a stream encroachment permit from the New Jersey Department of Environmental Protection, in accordance with the latest criteria,

prior to authorization of final approval. A copy of said permit shall be forwarded to the Administrator of the Planning Board and attached to the final engineering plans.

Section 4: Stormwater Management Requirements for a 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 12. Designs should 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. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department's 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. Construction Management – major developments are required to construct, designed stormwater management facilities prior to the commencement of primary earthwork operations and to ensure the effect of the project site's clearing does not result in excessive stormwater runoff and the formation of uncontrolled ponding.
- D. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Section 4.I.2.a.i:
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.
- E. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Section 4.I.2.a.i 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 alternative analysis that through the use of nonstructural and structural stormwater management strategies and measures, the

alternative selected complies with the requirements of Section 4.I.2.a.i to the maximum extent practicable;

3. The applicant demonstrates that, in order to meet the requirements of Section 4.I.2.a.i, 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 E.3 above within the upstream drainage area of the receiving stream that would provide additional opportunities to mitigate the requirements of Section 4.I.2.a.i that were not achievable on-site.

F. Any application for a new agricultural development that meets the definition of major development in 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. Nonstructural Stormwater Management Strategies

1. To the maximum extent practicable, the standards in Sections 4.I.2.a.i shall be met by incorporating nonstructural stormwater management strategies set forth in Section 6 into the stormwater 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. 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 in Section 11 to the Township. A determination by the Township that this rationale is inadequate or without merit shall result in a denial of the application unless one of the following conditions are met:
 - a. The Land Use Planning and Source Control Plan is amended to include a description of how all nine (9) nonstructural measures will be implemented on the development site, and the amended Plan is approved by the Township;
 - b. The Land Use Planning and Source Control Plan is amended to provide an alternative nonstructural strategy or measure that is not included in the list of nine (9) nonstructural measures, but still meets the performance standards in Section 3 and 4, and the amended Plan is approved by the Township; or

- c. The Land Use Planning and Source Control Plan is amended to provide an adequate rationale for the contention that use of the particular strategy is not practical on the site, and the amended Plan is approved by the Township.
3. In addition to all other requirements of this section, each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved, protected and maintained according to the minimum standards established by provisions of the Township Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval. Existing trees and vegetation 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 major development within the Pinelands Area, and any other application where the Township otherwise requires a landscaping plan within the Pinelands Area, 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 3 and 4 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 the Township that ensures that that measure, or equivalent stormwater management measure is maintained in perpetuity, as detailed in Section 12 of this ordinance.
6. Guidance for nonstructural stormwater management strategies is available in the New Jersey BMP Manual, which may be obtained from the NJDEP's website at www.njstormwater.org.

H. Threatened and Endangered Species and Associated Habitat Standards.

1. Stormwater management measures shall avoid adverse 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.

I. Erosion Control, Groundwater Recharge and Runoff Quantity and Quality 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 developments.
 - 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.
2. The minimum design and performance standards for groundwater recharge are as follows:
 - a. The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations in Section 5, either:

- i. 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
 - ii. 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.
- b. For all major developments in the Pinelands Protection Area of the Township, in addition to the a.i and a.ii above, 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.
- c. This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to [d] below.
- d. The following types of stormwater shall not be recharged:
 - i. 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
 - ii. 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.
- e. The design engineer shall assess the hydraulic impact on the groundwater table through a groundwater mounding analysis and design the site so as to avoid adverse hydraulic impacts. The mounding analysis shall provide details and supporting documentation on the methodology used. 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 down gradient of the groundwater recharge area.

3. The minimum design and performance standards for stormwater runoff quantity are as follows:

- a. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations in Section 5, satisfy one of the following:
 - i. Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
 - ii. 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 2, 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;
 - iii. 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
 - iv. In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with i, ii and iii above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

4. The minimum design and performance standards for stormwater quality are as follows:

- a. 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. The calculation of the volume of runoff may take into account the implementation of non-structural and structural stormwater management measures.

- b. For purposes of TSS reduction calculations, see Section 5 for 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 9, or found on the Department's website at www.njstormwater.org. 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.
- c. 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:
 - i. $R = A + B - (AXB)/100$
 - (a) Where
 - (b) R = total TSS percent load removal from application of both BMPs, and
 - (c) A = the TSS percent removal rate applicable to the first BMP
 - (d) B = the TSS percent removal rate applicable to the second BMP
- d. 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.
- e. 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.I.
- f. 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.
- g. 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 Atlantic County Soil Survey, 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:

- i. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
 - (a) 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.
 - (b) Encroachment within the designated special water resource protection area under Subsection (a) 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.
- ii. 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.
- iii. 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:
 - (a) Stabilization measures shall not be placed within 150 feet of the Category One waterway;
 - (b) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;

- (c) Temperature shall be addressed to ensure no impact on the receiving waterway;
 - (d) 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;
 - (e) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
 - (f) All encroachments proposed under this section shall be subject to review and approval by the Department.
 - iv. 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.I.4.g 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 4.I.4.g. shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in 4.h. 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.
 - v. Paragraph 4.h. below 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.
- h. Stormwater Runoff Quality Exceptions
 - i. The preceding stormwater runoff quality standards shall not apply to the following major development sites:
 - (a) Major development sites where less than one quarter (0.25) acre of additional impervious surface is proposed; or
 - (b) Major residential development sites that create less than one (1) acre of disturbance.
 - ii. The TSS reduction requirement in Section 4.I.4.a shall not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the NJPDES rules (N.J.A.C. 7:14A) or in a discharge specifically exempt under a NJPDES permit from this requirement.

- iii. The stormwater runoff quantity and rate standards in Section 4.I shall still be met for all major development sites.
5. Additional stormwater quality standards for high pollutant loading areas and areas where stormwater runoff is exposed to source materials.
- a. This subsection applies to the following areas of a major development as defined in Section 2 of this ordinance:
 - i. High pollutant loading areas (HPLAs); and
 - ii. Areas where stormwater is exposed to "source material."
 - b. For a major development in areas described in a.i or a.ii above, in addition to the groundwater recharge requirements specified in Section 4.I.2, the applicant shall demonstrate in the Land Use Planning and Source Control Plan required in Section 11 that the following requirements have been met:
 - c. The extent of the areas described in a.i. and a.ii. above have been minimized on the development site to the maximum extent practicable;
 - d. The stormwater runoff from the areas described in a.i and a.ii 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 a.i and a.ii above and the remainder of the site will be minimized;
 - e. The amount of precipitation falling directly on the areas described in a.i and a.ii above is minimized to the maximum extent practicable by means of a canopy, roof or other similar structure that reduces the generation of stormwater runoff; and
 - f. The stormwater runoff from or co-mingled with the areas described in a.i and a.ii above for the Water Quality Design Storm shall be subject to pretreatment by one or more of the following stormwater BMP's, 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.
 - g. If the potential for contamination of stormwater runoff by petroleum products exists onsite, prior to being conveyed to the pretreatment BMP required in paragraph f above, the stormwater runoff from the areas described in a.i and a.ii 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.

J. 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 Township of Galloway, and subject to approval by the Pinelands Commission for those projects within the Pinelands Area, provided that all of the following conditions are met:
 - a. The exception is consistent with that allowed by Township of Galloway;
 - b. The Township of Galloway 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 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 the Township of Galloway in accordance with the following:
 - (a) The amount of the in lieu contribution shall be determined by the Township of Galloway, 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 the Township of

Galloway in the Township of Galloway's adopted municipal stormwater management plan. The stormwater control project to which the monetary contribution will be applied shall be identified by Township of Galloway at the time the exception is granted. The applicant shall amend the project description and site plan required in Section 11 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) The Township of Galloway 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 the Township of Galloway fail to expend the in lieu contribution within the required timeframe, the mitigation option provided in Section 4.J.1.c.ii of this ordinance shall be void and the Township of Galloway shall be prohibited from collecting in lieu contributions.
- d. For projects in the Pinelands Area an exception from strict compliance granted in accordance with J.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 5: Methodologies for Calculating Stormwater Runoff Quantity, Quality and Groundwater Recharge

A. Methods of Calculating Stormwater Runoff Quantity:

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

- a. In complying with the Stormwater Runoff Quantity and Rate Standards in Section 4.I.3, 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, incorporated herein by reference, 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.
 - 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.
6. Calculations shall be computed on the basis of all areas upstream of the parcel(s) in question. Peak rates of runoff shall be computed for the entire area and design release rates computed on the basis of pre-existing conditions for the entire watershed.
7. Major Subdivisions with an average lot size of less than one-half acres shall consider, for the purposes of runoff quantity calculations, any areas of tree preservation to have a post development runoff coefficient equivalent to grass in good hydrologic condition.
8. The maximum curve number values suitable for use in computing runoff values for on-site developed conditions are as follows:

Hydrologic Soil Group	Curve Number
A	25
B	55
C	70
D	77

NOTE: The above tables are intended as minimum design standards. They are not mandated design criteria.

9. Rainfall values for each of the storms used in designing stormwater facilities include (Type III rainfall distribution):

Storm Event	Total Rainfall (inches)
1-year	2.8
2-year	3.3
10-year	5.2
50-year	7.6
100-year	8.9

10. The applicant must identify:

- a. The peak rate of runoff making adjustments as required for percent of impervious cover, alterations to hydraulic length and percentage of watershed and wetland as described in TR-55 and supplemented by notes provided by the Soil Conservation Service. The tabular method described in TR-55 shall be used for calculating runoff rates.
- b. The total quantity of runoff utilizing the tabular hydrographic data contained in TR-55. Total quantities of runoff shall be estimated prior to and after development by calculating the total area under the hydrograph utilizing the hydrographic coefficients contained in TR-55.

- c. The relative timing of the peak rate of discharge following the onset of a storm shall be identified within the stormwater calculations.
11. Retention basins, detention basins and partial detention basins shall be sized by routing each of the required design storms using either reservoir routing or graphical methods.
12. For storm sewer design, the rational method ($Q=CIA$) may be utilized for calculating runoff quantities subject to the following criteria. The minimum design requirements for storm sewers shall be the ten-year storm. Runoff generated by storms of greater intensity, up to and including the fifty-year storm, shall be directed towards detention basins or alternative stormwater facilities on the site:
- The rainfall intensity (I) shall be computed as a function of the time of concentration by generally accepted procedures found in Seeyles, algebraic equations, Soil Conservation Service Engineering Field Manual, etc.
 - The area (A) shall include all off-site acreage draining onto or through the site.
 - The coefficient of runoff (C) shall not be less than the values stated below unless well documented and approved by the Engineer:

Surface	Minimum "C"
Structures, pavements	0.90
Cultivated dense or clay soils	0.30
Cultivated sand or loam soils	0.25
Meadows, rural areas	0.20
Heavily wooded areas	0.15

Overall drainage runoff factors will not, in general, be less than the following:

Proposed Development - Site Plans	Minimum "C"
(to the limits of improvements)	0.70
1/4 acre residential	0.50
1/2 acre residential	0.40
1 acre residential	0.30

NOTE: The above tables are intended as minimum design standards. They are not mandated design criteria.

- d. Velocities will be computed using Manning's equation or generally accepted nomographs for pipe flow. Pipes shall be designed flowing full without head conditions for the ten-year storm (minimum).
- e. Acceptable friction factors "n" are listed below:
- | | |
|---|--------|
| [1] Circular cross section concrete pipe 18 inches or less: | 0.013. |
| [2] Circular cross section concrete pipe 18 inches or larger: | 0.015. |
| [3] Concrete lined ditches: | 0.015. |

- [4] Clear unlined ditches: 0.25.
- [5] Natural stream and watercourses: 0.3.
- f. Other cross sections or pipe materials shall have commensurate friction factors as may be approved by the Township Engineer or consultant.
- 13. Stone recharge systems shall use a maximum void ratio of 30%.

B. Methods of Calculating Stormwater Runoff Quality

1. In complying with the Stormwater Runoff Quality Standards in Section 4.I.4, 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 ¹			
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		

4. Total Suspended Solids (TSS) reduction calculations.

- a. 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.

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 9 or

¹ Source: N.J.A.C. 7:8-5.5(a).

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 the Township. Any alternative stormwater management measure, removal rate or method of calculating the removal rate shall be subject to approval by the 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 ²			
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

² Source: 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 herein.

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

1. In complying with the groundwater recharge requirements in Section 4, the design engineer shall 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 9 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 4, 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 6: Standards for Non-Structural Stormwater Management Measures

- A. To the maximum extent practicable, the performance standards in Section 4 for major development 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) into the design. The applicant shall identify within the Land Use Planning and Source Control Plan required by this chapter of the ordinance how each of the nine (9) nonstructural measures will be incorporated into the design of the project to the maximum extent practicable.

Nonstructural stormwater management strategies incorporated into site design shall:

1. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
2. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
3. Maximize the protection of natural drainage features and vegetation;
4. Minimize the decrease in the "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;
5. Minimize land disturbance including clearing and grading;
6. Minimize soil compaction;
7. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
8. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
9. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:
 - a. Site design features that help to prevent accumulation of trash and debris in drainage systems;
 - b. Site design features that help to prevent discharge of trash and debris from drainage systems;
 - c. Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
 - d. 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.
10. Blocks and lots shall be graded to secure proper drainage away from all buildings and to prevent the collection of stormwater in pools and to avoid concentration of stormwater from each lot to adjacent lots.

- B. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Section 4 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 the Township of Galloway that ensures that that measure, or equivalent stormwater management measure is maintained in perpetuity, as detailed in Section 4 of this ordinance.
- C. 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 11 to the Township of Galloway. A determination by the Township of Galloway that this rationale is inadequate or without merit shall result in a denial of the application unless one of the following conditions are met:
1. The Land Use Planning and Source Control Plan is amended to include a description of how all nine (9) nonstructural measures will be implemented on the development site, and the amended Plan is approved the Township of Galloway;
 2. The Land Use Planning and Source Control Plan is amended to provide an alternative nonstructural strategy or measure that is not included in the list of nine (9) nonstructural measures, but still meets the performance standards in Section 4, and the amended Plan is approved by the Township of Galloway; or
 3. The Land Use Planning and Source Control Plan is amended to provide an adequate rationale for the contention that use of the particular strategy is not practical on the site, and the amended Plan is approved by the Township of Galloway.
- D. Site design features identified under Section 6.A 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.
1. 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:
 - a. 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
 - b. 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.

2. 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. Curb-opening inlet grates to be consistent with standardized casting specifications as approved by the municipal engineer.
3. This standard does not apply:
 - a. 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;
 - b. Where flows from the water quality design storm 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:
 - i. 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
 - ii. A bar screen having a bar spacing of 0.5 inches.
 - c. 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 defined in Section 5; or
 - d. 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.
- E. Exception for major development sites creating less than one (1) acre of disturbance. The use of nonstructural strategies to meet the performance standards in Section 4 of this ordinance is not required for major development creating less than one (1) acre of disturbance. However, the following requirements shall be met:
 1. Within the Pinelands Area each application for major development and any other application where the Township of Galloway 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));
 2. Each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Township of Galloway Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval; and
 3. Existing trees and vegetation 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.

Section 7: 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, 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:

Bioretention systems are designed to aid in the removal of suspended solids, nutrients, metals, hydrocarbons and bacteria from stormwater runoff.

- i. The use of bioretention systems should be used as a secondary stormwater management structure. Bioretention systems should be located as close to the area of runoff as possible with runoff entering the system through overland flow. Bioretention systems may be placed in lawns, median strips, parking lot islands, unused lots and certain easements.
- ii. Bioretention systems must not be placed in operation until the site has been completely stabilized.
- iii. Bioretention systems should only be used in areas of well draining soils.

b. Constructed stormwater wetlands:

Constructed stormwater wetlands are designed to remove suspended solids, nutrients and bacteria from stormwater runoff and provide wildlife habitat.

- i. Constructed stormwater wetlands require a minimum drainage area of 10 to 25 acres depending on the type of wetlands.
- ii. Soils must be poorly draining as to provide permanent pools.
- iii. Care must be taken to ensure that mosquito breeding does not become a problem.

c. Dry Wells:

Drywells and porous pipes are designed to infiltrate the runoff from small drainage areas, such as roof structures. These structures supply a means to remove pollutants and provide infiltration when space is limited.

- i. Such devices should be used in areas of well draining soils and in cases where there is sufficient separation between the seasonal high water table and the bottom of the infiltration device.

d. Extended Detention Basins:

Extended Detention basins provide a means to control stormwater quantity and quality concerns. The lower stages of the basin provide measures to control the stormwater quality storm, while higher stages in the basin can attenuate the peak rates of runoff from larger storms.

- i. Such devices are most suitable in cases where there is a significant increase in the amount of runoff. Extended detention basins require a significant amount of room and depth to provide proper performance.

e. Vegetated filters:

Vegetated filter strips are designed to remove various pollutants such as suspended solids by providing runoff a flow path over a vegetated area. Such areas can be developed in grassed lined waterways or swales and be primarily grass or larger areas may be primarily composed of woods and brush.

- i. Grassed lined waterways are a viable option for stormwater conveyance, especially to secondary devices such as infiltration/detention basins. Such areas help promote the life span of basins by removing suspended solids before runoff reaches and settles on basin bottoms.
- ii. Large vegetated filters such as areas of woods and dense grass may be used alone in small areas of development or in areas where the amount of impervious cover will not be drastically increased.

f. Infiltration basins and trenches:

Infiltration basins are designed to remove certain pollutants and to infiltrate stormwater. Infiltration basins provide a means to reduce both the peak rate and total volume of runoff caused by land development.

- i. Infiltration basins may be used in areas requiring enhanced infiltration of stormwater to meet recharge, quantity and quality requirements set forth by this code.
- ii. Such devices should be designed with emergency outfall structures as stated in this code.

g. Wet ponds with suitable liners:

Wet ponds should be used as landscape devices providing minimal stormwater quantity control. Some quality control can be expected however this type of facility should not be the only form of onsite stormwater management control.

h. Pervious paving systems:

Pervious pavements act as infiltration systems providing infiltration either through a pervious paving surface course or through void spaces between individual paving blocks or pavers. Such systems offer enhanced infiltration performance and some pollutant removal.

- i. Such devices should not be used in industrial and commercial areas where solvents and/or petroleum products are loaded, unloaded, stored or applied or pesticides are loaded, unloaded, or stored.
 - ii. The use of such devices should be limited around building structures where enhances infiltration could cause basement seepage or flooding.
 - iii. Due to reduced shear strength of the surface course, pervious paving surface should be limited to areas of low traffic volumes and weight such as: secondary aisles in parking lots, single family driveways, sidewalk and walkways, golf cart paths, and overflow parking areas.
- 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 12 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. 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.
 9. In many instances, the provisions of separate detention facilities for a number of single sites may be more expensive and more difficult to maintain than provisions of joint facilities for a number of sites. In such cases, the Township will be willing to consider provisions of joint detention facilities which will fulfill the requirements of this regulation. In such cases, a properly planned staged program of detention facilities may be approved by the Township.
 10. The location of a retention system that is approved in lieu of detention facilities shall be in areas with seasonal high water a minimum of two feet below the lowest elevation of the facility. Where the bottom of any proposed retention basin is less than two feet above impervious soil formations, the use of vertical drains or other methods subject to the approval of the Engineer may be employed, provided that the water quality is addressed.
 11. In establishing the location and constructing basins, every effort shall be made to utilize existing contours and depressions.
 12. 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.
 13. 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. In lieu of review by the municipal engineer, the Township of Galloway reserves the right to engage a Professional Engineer to review the as-built plans. The applicant shall pay all costs associated with such review.
- B. Standards for stormwater management basins are as follows:
1. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of three inches in diameter.

2. 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).
3. All detention/retention and infiltration basins shall provide one foot (1') of freeboard between the design high water level and the top of the basin.
4. Outlet waters, including that from a design storm with a recurrence interval of 100 years, shall be discharged from the development at such locations and velocities as to not cause additional erosion or cause additional channels beyond the development from those natural or other drainage ways available before development.
5. All detention basins must have length to width ratios of at least two to one and maximize to the extent practicable the distance between basin inflow and outflow. A slope of 1% shall be provided from inlet to outlet.
6. Water-tolerant species of vegetative cover for detention basin usage must be employed. Suggested varieties of cover include reed, canary grass, fescue, perennial rye, orchard grass and Bermuda grass.
7. A minimum separation between the bottom of the basin and seasonal high water table of 2 feet must be maintained.
8. Stabilized access 15 feet wide is to be provided to the stormwater management basins to provide access capable of supporting maintenance vehicles. Basin accessway must be designed with a slope not to exceed 5 horizontal to 1 vertical, 5H:1V.
9. During construction, all basins shall be lined with filter fabric to prevent the siltation of subsurface soils. After completion of the proposed development, the fabric shall be inspected on a regular basis and removed or replaced, if necessary.
10. At inflow points to detention basins, energy dissipators, designed in accordance with the current Soil Conservation Service standards for soil erosion and sediment control, must be incorporated to reduce the velocity of inflowing waters.
11. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 10.

C. Design and Construction Standards for Stormwater Infiltration BMP's

1. Stormwater infiltration BMP's, 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 is 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 8 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 8 of this ordinance;
 - d. If the results of the post-development field permeability tests fail to achieve the minimum required design permeability rates in 4 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. For all major development, the design engineer shall conduct a mounding analysis of all stormwater infiltration BMPs. 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 4.

- b. To avoid compaction of subgrade soils of BMP's 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. 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 Sections 3 and 4 of this ordinance.
- D. Drainage Structures and stormwater conveyance systems are required to meet the following standards:
1. All drainage structures, including manholes, inlets, headwalls and sections and box culverts shall conform to the current details of the New Jersey Department of Transportation. Unless approved otherwise by the Engineer, all curb inlets shall be standard Type B with curb piece heights equal to the exposed curb face of the adjacent curb plus two inches. All lawn inlets shall be standard Type E. When the pipe size is such as to require a larger structure, standard Type B1 or B2, E1 and E2 shall be used. If still larger sizes are required, they shall be specifically detailed using standard frames and grates.
 2. Dished gutters on local streets shall be permitted only at T intersections involving local streets. Dished gutters shall not be permitted on arterial or collector streets.
 3. Storm drain pipes running longitudinally along streets shall not be located under curbing.
 4. Storm drainage pipe shall be concrete unless an alternate is approved. If an alternate is considered, it may be corrugated round, arch or helical. All pipe shall be of the size specified and laid to the exact lines and grades approved. Reinforced concrete pipe shall conform to ASTM Specification C76. All pipe shall be Class 111 strength, except where stronger pipe is required. Joints shall have O-ring rubber gaskets, where necessary. Steel, aluminum or other pipe shall meet the latest American Association of State Highway and Transportation Officials standard.

- a. All stormsewer systems shall have a design capacity equal to or greater than the volume of runoff generated by the 10-year 24 hour Type III storm event. The minimum pipe diameter shall be 15 inches. The maximum distances between manholes or inlets shall be 500 feet.
- b. Pipe crown elevations shall be matched in all manholes and inlets. In general, a cover of one diameter shall be maintained over the drainage pipe. If this is not possible, a higher class pipe must be specified or trench conditions must be designed and detailed to ensure at least 85% relative compaction.
- c. Inlets shall be specified with cast curb piece inlets attached. Inlets shall be depressed one or two inches to increase capacities on steep grades (6% or more).
- d. The minimum design velocity when flowing 1/4 full shall be at least two feet per second, but no more than 10 feet per second. Pipes shall be considered flowing full at maximum capacity.
- e. Single Type B inlets shall not be designed to catch more than 5 1/2 cubic feet per second, regardless of head.
- f. Concrete pipe shall be utilized beneath roadways and parking areas.
- g. A minimum of two feet of cover shall be provided over all pipe. For Class IV or V pipe, the cover may be reduced to one foot.

Section 8: Soils Investigation Requirements

A. 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:

1. 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 the Township of Galloway.
2. 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.
3. 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.
4. 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.
5. 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 redoximorphic 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.

6. 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.
7. 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.
8. 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.

B. Percolation/Permeability tests.

1. 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.

2. 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.
3. 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.

C. Fill material.

Fill material used for stormwater facilities shall have a percolation/permeability rate equal to or greater than the existing soils. All fill material shall meet or exceed the quality of the existing soil. Fill shall be free of clay soils as possible.

Section 9: 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 10: 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 shall have parallel bars, with no greater than six inch spacing between the bars.
 - 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 10.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

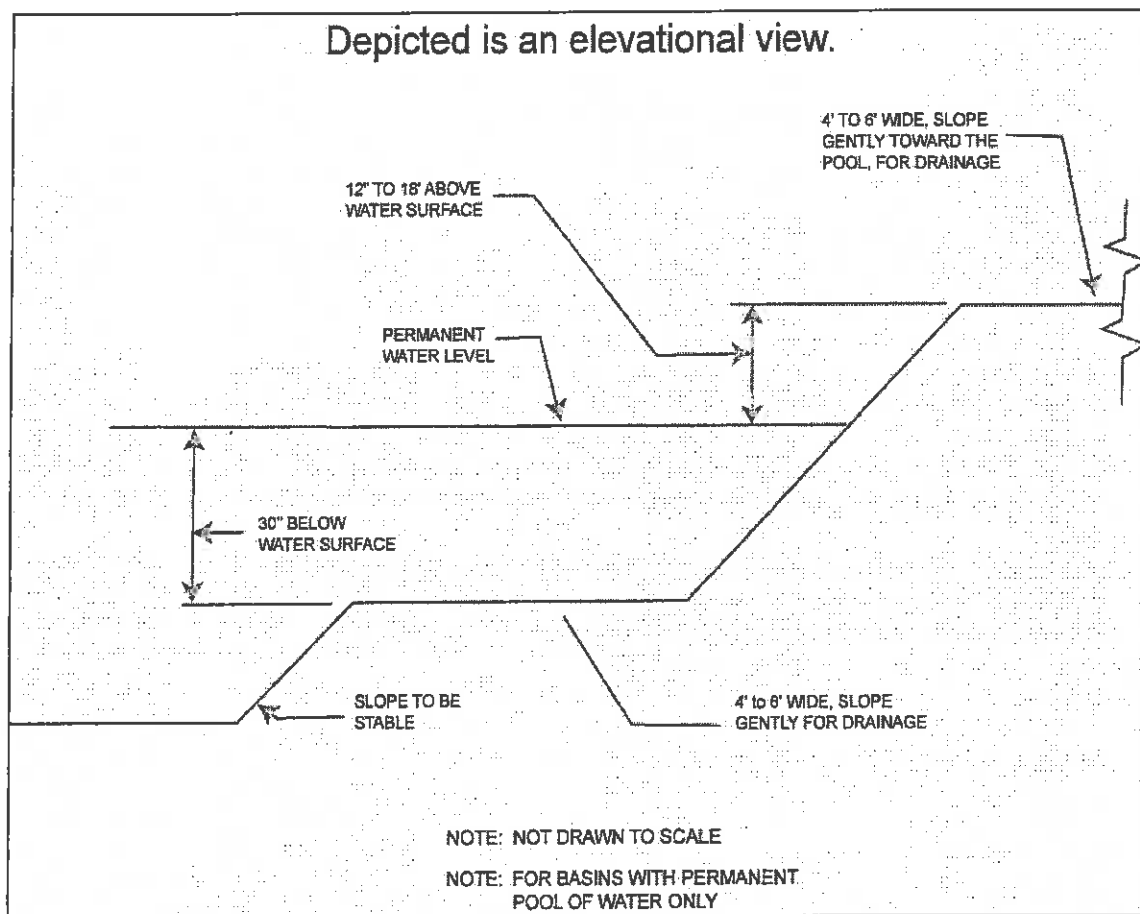
width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See Section 8.D for an illustration of safety ledges in a stormwater management basin.

- 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 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 11: Requirements for a Site Development Stormwater Management Plan

A. Submission of Site Development Stormwater Management Plan

1. Whenever an applicant seeks municipal approval of a major development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Management Plan at Section 11.C below as part of the submission of the applicant's application for subdivision or site plan approval. These required components are in addition to any other information required under any provisions of the Township of Galloway'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 project meets the standards set forth in this ordinance.
3. The applicant shall submit three copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 11.C of this ordinance.

B. Site Development Stormwater Management Plan Approval

1. The applicant's Site Development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from 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 at least the following information. All required engineering plans shall be submitted in CAD Format 15 or higher, registered and rectified to NJ State Plane Feet NAD 83.

The following information shall be required:

1. Topographic Base Map

The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of three hundred (300) feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 1-foot contour intervals. The map as appropriate shall indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the 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. A written and graphic description of the natural and man-made features of the site and its environment. 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 for development.

- 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)

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

4. Land Use Planning and Source Control Plan

- a. The applicant shall submit a detailed Land Use Planning and Source Control Plan which provides a description of how the site will be developed to meet the erosion control, groundwater recharge and stormwater runoff quantity and quality standards at Section 3 and 4 through use of nonstructural or low impact development techniques and source controls to the maximum extent practicable before relying on structural BMPs. The Land Use Planning and Source Control Plan shall include a detailed narrative and associated illustrative maps and/or plans that specifically address how each of the following nine (9) nonstructural strategies identified in Subchapter 5 of the NJDEP Stormwater Management Rules (N.J.A.C. 7:8-5) and set forth below (4.a. i. through ix.) will be implemented to the maximum extent practicable to meet the standards at Section 4 of this ordinance on the site. If one or more of the nine (9) nonstructural strategies will not be implemented on the site, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practicable on the site.
- 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 2 of this ordinance, the applicant shall also demonstrate in the Land Use Planning and Source Control Plan that the requirements of Section 3 and 4 have been met.
- c. The use of nonstructural strategies to meet the performance standards in Section 4 of this ordinance is not required for development sites creating less than one (1)

acre of disturbance. Within the Pinelands Area, each application for major development and any other application where the Township of Galloway 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). In addition, the applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Township of Galloway Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval.

5. Pre and Post Development Drainage Area Plans

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

- a. Total area to be 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 control and dispose of stormwater;
- b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway;
- c. Drainage area boundaries including upstream areas impacting the project site;
- d. Pre and post development flow path and times of concentration;
- e. Runoff coefficient calculations with areas of coverage indicated;
- f. Pre and post development design storm volumes;
- g. Post development routing summaries;
- h. Pre and post development pathway of positive outflow;
- i. Soil boring locations;
- j. A table demonstrating compliance with water quantity, water quality and recharge requirements;
- k. A separate plan showing the drainage sub-areas contributing to inlets of any storm sewer system including values for runoff coefficient (C), area (A), travel time (tc); rainfall intensity (I) and contributing sub-area flow (Q).

6. Calculations

- a. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 5 of this ordinance and a spreadsheet hydraulic pipe calculations.
- b. Hydraulic pipe calculations shall demonstrate free flow pipe capacity without head conditions and shall include a table showing calculations of successive downstream pipe sections. The pipe calculations shall provide the following:
 - i. Upstream and downstream inlet number;

- ii. Incremental drainage area to the upstream inlet;
 - iii. Total drainage area flowing through the pipe;
 - iv. Incremental and weighted runoff coefficients, C
 - v. Travel time to inlet, time in channel and total time of concentration;
 - vi. Rainfall intensity, I;
 - vii. Design flow, Q;
 - viii. Pipe diameter and wall thickness;
 - ix. Pipe slope;
 - x. Mannings Roughness Coefficient, n;
 - xi. Pipe capacity, calculated in accordance with the Manning Equation;
 - xii. Pipe velocity;
 - xiii. Length of pipe;
 - xiv. Pipe hall;
 - xv. Upper and lower invert and grate elevations;
 - xvi. Minimum pipe cover; and
 - xvii. Pipe material and class.
- c. 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 applicant shall submit a detailed plan describing how the proposed stormwater management measure(s) shall meet the maintenance and repair requirements of Section 12 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. Soil Investigation Report

Soils report must contain the results from subsurface investigations including test pits and borings along with the results for percolation and permeability. The locations of the test should be clearly labeled on plans.

9. Waiver from Submission Requirements

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 12: Maintenance and Repair

A. Applicability

1. Projects subject to review as defined in Section 1 of this ordinance shall comply with the requirements of Sections 12.B and 12.C.

B. General Inspection, Maintenance and Repair Plan

1. Responsibility for operation and maintenance of all facilities, include periodic removal and disposal of accumulated particulate material and debris, shall remain with the owner or owners of the property, with permanent arrangements that it shall pass to any successive owner, unless assumed by a government agency. If portions of the land are to be sold, legally binding arrangements shall be made to pass the basic responsibility to successors in title. These arrangements shall designate for each project the property owner, governmental agency or other legally established entity to be permanently responsible for maintenance.
 - a. The design engineer shall prepare an Inspection, maintenance and Repair Plan for the stormwater management measures incorporated into the design of a major development. The Inspection, Maintenance and Repair Plan shall contain the following:
 - i. Accurate and comprehensive drawings of the site's stormwater management measures;
 - ii. Specific locations of each stormwater management measure identified by means of longitude and latitude as well as block and lot number;
 - iii. Specific preventative and corrective maintenance tasks and schedules for such tasks for each stormwater BMP;
 - iv. Cost estimates, including estimated cost of sediment, debris or trash removal; and
 - v. 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.
 - b. The person responsible for inspection, maintenance and repair identified 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.
 - c. 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.

- d. If the person responsible for maintenance identified under Section 12.B.b above is not a public agency, the maintenance plan and any future revisions based on Section 12.B.g below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
- e. 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 non-vegetated linings.
- f. The person responsible for maintenance identified under Section 12.B.b 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.
- g. The person responsible for maintenance identified under Section 12.B.b 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 12.B.d and 12.B.f above.
- h. The requirements of Sections 12.B.c and 12.B.d do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.
- i. In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to affect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in 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, the municipality may immediately proceed to do so and shall bill the cost thereof to the responsible person.
- j. Prior to the granting of any site development approval, the applicant shall enter into an agreement (declaration of covenants and restrictions for drainage structures) with the municipality to insure the continued operation and maintenance of the stormwater facility unless the municipality has consented to accept the facility as municipal. This agreement shall be in a form satisfactory to the Municipal Attorney and may include, but may not necessarily be limited to, personal guarantees, deed restrictions, covenants and bonds. In cases where the property is subdivided and sold separately, a homeowners association or similar permanent entity shall be established as the responsible entity, absent an agreement by a governmental agency to assume responsibility. The agreement shall also provide for regular inspection at the expense of the applicant, or the applicant's successors in interest, and for the undertaking by the applicant and successors of such corrective

measures as are shown by such inspection to be required for the proper functioning of the facilities. The agreement shall provide, among other things that the applicant shall provide up to a four-year maintenance guaranty for the entire stormwater management system which shall commence at the conclusion of the period required for such performance guaranty as required by the Board. In addition, the applicant shall fund or otherwise guarantee an inspection and maintenance program for a period of no less than 10 years. The program shall identify the entity charged with responsibility for annual inspections and the completion of any necessary maintenance, and the method to finance said program.

- k. The applicant must obtain approval from the Engineer for all arrangements and values described in Subsection 12.B.k.
 - l. The applicant must deliver an easement for a clear accessway of 15 feet to all stormwater facilities for the purpose of assuring vehicular access for maintenance activities.
 - m. The applicant must submit escrows and guaranties as required in Article IX, § 233-65A(2), of the Galloway Land Management Code.
2. Requirements for Inspection, Maintenance and Repair of Stormwater BMP's 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:

- a. Once per month (if needed): Mow side slopes, remove litter and debris, stabilize eroded banks, repair erosion at inflow structure(s);
- b. After every storm exceeding one (1) inch of rainfall: Ensure that infiltration BMPs drain completely within seventy-two (72) hours after the storm event. If stored water fails to infiltrate seventy-two (72) hours after the end of the storm, corrective measures shall be taken. Raking or tilling by light equipment can assist in maintaining infiltration capacity and break up clogged surfaces;
- c. 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;
- d. Two times per year: Inspect for signs of damage to structures, repair eroded areas, check for signs of petroleum contamination and remediate;
- e. 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
- f. After every storm exceeding one (1) inch of rainfall, inspect and, if necessary, remove and replace K5 sand layer and accumulated sediment, to restore original infiltration rate.

- g. Additional guidance for the inspection, maintenance and repair of stormwater infiltration BMPs can be found in the New Jersey BMP Manual.
- 3. Financing of Inspection, Maintenance and Repair of Stormwater BMPs.

An adequate means of ensuring permanent financing of the inspection, maintenance and repair of stormwater BMPs shall be implemented and detailed in the Inspection, Maintenance and Repair Plan. Permanent financing of the inspection, maintenance and repair of stormwater BMPs shall be accomplished by:

 - a. The assumption of the inspection and maintenance program by a municipality, county, public utility or homeowner's association.
 - b. The required payment of fees to a municipal stormwater fund in an amount equivalent to the cost of both ongoing maintenance activities and necessary structural replacements. The fee schedule is attached.
 - c. Other suitable method approved by the municipality.
- 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.

Section 13: As-built Certification

- A. When excavated and completed, the design engineer shall certify in writing to the Township that the stormwater facility will operate as intended in the design phase taking into consideration all soil and water conditions encountered during construction. As-built percolation test results shall also be provided if the basin has been used as a place for sediment accumulation during the construction process.

Section 14: Penalties

- A. Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the penalties as stated in Section 233-64.

Section 15: Effective Date

- A. This ordinance shall take effect immediately upon the approval by the Pinelands Commission.

Section 16: Severability

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