

STORMWATER MANAGEMENT PLAN

FOR

TOWNSHIP OF WINSLOW

CAMDEN COUNTY, NEW JERSEY

CES: 3943-03

Date: October 25, 2006

Revised: May 12, 2022 – Final Draft

NJPDES Permit # NJG0154601



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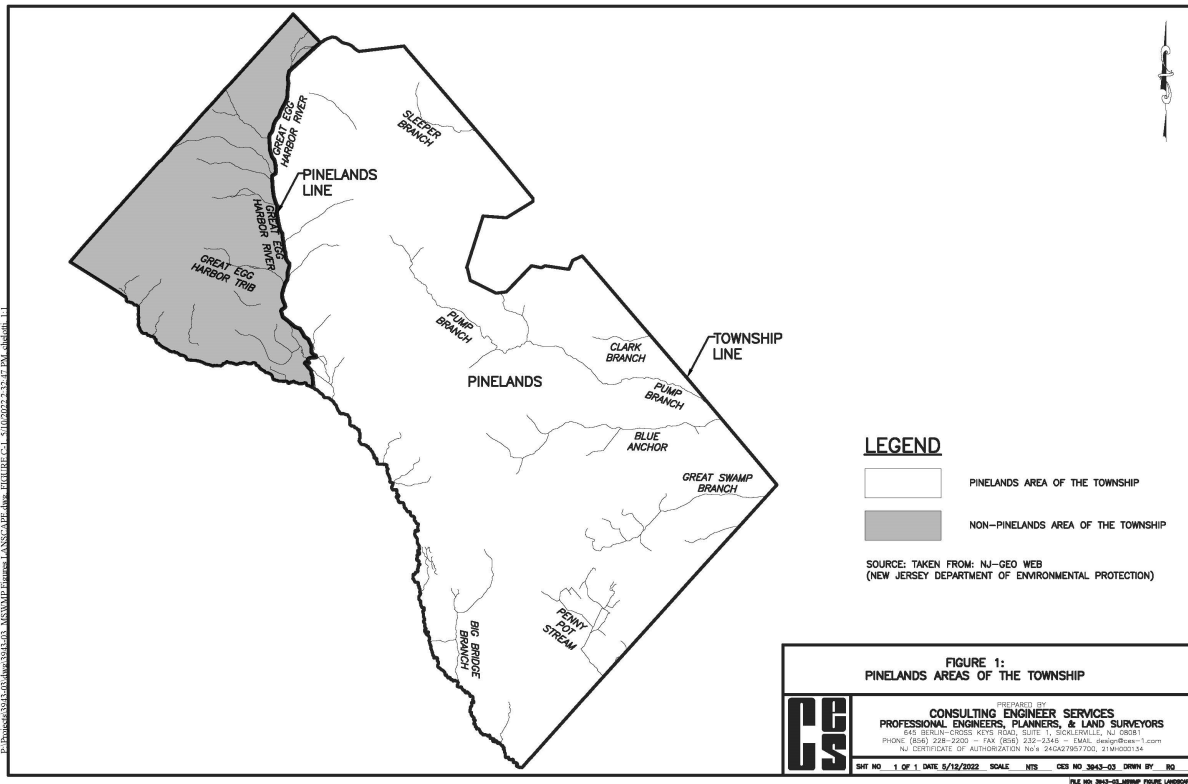
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Introduction

This Municipal Stormwater Management Plan documents the strategy for the Township of Winslow (“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 the plan contains all the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. As shown on Figure 1, a majority of Winslow Township is a Pinelands Community regulated in part by the Pinelands Comprehensive Management Plan (CMP). This plan has been developed in coordination with the current relevant sections of the Winslow Township Code, which in accordance with the CMP, has been reviewed and approved by the Pinelands Commission. Specifically, this plan incorporates Chapter 297, Stormwater Control, which details stormwater management design requirements within Pinelands and Non-Pinelands areas of the municipality and Chapter 296, Zoning within Pinelands Area, which includes additional stormwater management requirements for projects located within areas of the Township regulated by the CMP.

Figure 1 – Pinelands Areas of the Township



This plan also addresses green infrastructure, groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new “major development”. Major development is defined by the State Stormwater Management Rules as an individual “development,” as well as multiple developments that individually or collectively result in:

1. The disturbance of one or more acres of land since February 2, 2004;
2. The creation of one-quarter acre or more of “regulated impervious surface” since February 2, 2004;
3. The creation of one-quarter acre or more of “regulated motor vehicle surface” since March 2, 2021; or

4. A combination of 2 and 3 above that totals an area of one-quarter acre or more. The same surface shall not be counted twice when determining if the combination area equals one-quarter acre or more.

Major development also includes all developments that are part of a common plan of development or sale (for example, phased residential development) that collectively or individually meet any one or more of items 1, 2, 3, or 4 above. Projects undertaken by any government agency that otherwise meet the definition of “major development”, but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered “major development.”

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 base flow in receiving water bodies. This plan describes long-term operation and maintenance measures for existing and future stormwater facilities in the Township and includes the need for Major Developments to use Green Infrastructure. “Green Infrastructure” as defined by the State Stormwater Management Rules, means a stormwater management measure that manages stormwater close to its source by:

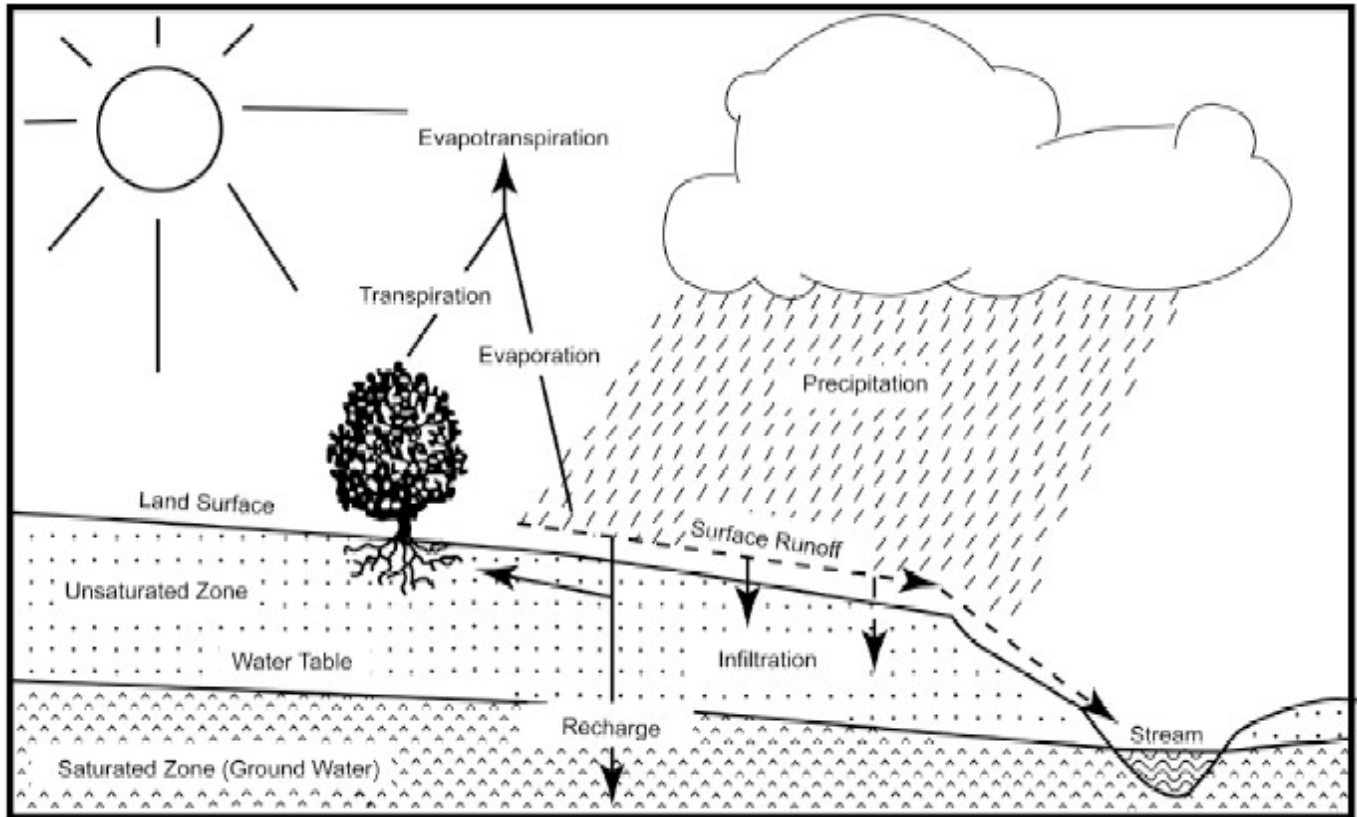
1. Treating stormwater runoff through infiltration into subsoil;
2. Treating stormwater runoff through filtration by vegetation or soil; or
3. Storing stormwater runoff for reuse.

Finally, this 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 and green infrastructure. The final component of the 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 Plan, specific stormwater management measures are identified to lessen the impact of existing development.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure 2) of a site and, ultimately, an entire watershed.

Figure 2 – Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities

that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

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

Winslow Township is Camden County's largest municipality with 58.2 square miles of land, of which approximately 80% is contained within the Pinelands National Reserve (see Figure 1). Winslow Township is a rural municipality with a population of 39,499 according to the 2010 U.S. Census. The United States Census Bureau in 2020 estimated the population to be 39,907, showing no substantial change over the last few years.

Township Waterways

As shown on the following page (See Figure 3), Winslow Township is located within three (3) distinct Watershed Management Areas (WMAs). 55.5% (32.3 square miles) of the Township is in the Great Egg Harbor River management area (WMA 15). The areas of the Township in WMA-15 are above Hospitality Branch, which is in Hydrologic Unit Code (HUC) HUC-11 drainage basin (02040302030). 44.2% (25.7 square miles) of the Township is in the Mullica River management area (WMA 14) and the areas of the Township in WMA 14 are above the Batsto River, which is the HUC-11 drainage basin (02040301160).

The remaining 0.3% (0.2 square miles) of the Township falls within the Lower Delaware management area (WMA 18) and is part of the Big Timber Creek HUC-11 drainage basin (02040202120).

Figure 3 – Township WMA's and Waterways

A description of these watersheds obtained from “A Teacher’s Guide to the Watersheds of Camden County” prepared by the Delaware Valley Regional Planning Commission and the NJDEP Watershed Restoration Program is as follows:

Great Egg Harbor River WMA 15 - HUC-11: 02040302030 (Above Hospitality Branch)

The Great Egg Harbor River drains an area of 304 square miles in Camden, Atlantic, and Gloucester Counties. The Great Egg Harbor River is one of the longest rivers in New Jersey and is 49 miles in length. It originates in southeastern Camden County and is joined by tributaries from Gloucester County before flowing southeast through the Pinelands region to the Great Egg Harbor Bay and into the Atlantic Ocean. The river is tidal downstream of the dam at Mays Landing in Atlantic County and major tributaries are the Hospitality Branch, which forms HUC-11 drainage basin 02040302030 that is located in the Township, Watering Race, Babcock Creek, Deep Run, South River and Stephens Creek. Waters in WMA-15 are classified by the NJDEP as FW-2 Non-Trout, Pinelands Waters, FW-1 (not subject to any regulated discharges) , an SE-1 (Saline Estuarine). In the Township the Great Harbor River is classified as FW-2 Non-Trout and Pinelands Waters.

The Great Egg Harbor River’s main channel begins behind the Berlin Plaza Shopping Center, which is the site of a former wetlands area that was sacrificed to create the shopping center and its parking lot. Because of the natural springs on the site, water had to be routed around the shopping center and diverted to underground pipes, where it travels below the NJ Transit railroad tracks and the White Horse Pike. It emerges from a pipe at Camden County’s Berlin Park in Berlin Borough to continue toward Great Egg Harbor Bay.

One tributary of the Great Egg Harbor River, Four Mile Branch, starts in Winslow Township and forms a portion of the boundary between Camden and Gloucester Counties. It joins the main channel east of the New Brooklyn section of Winslow Township, at the start of the Winslow Wildlife Management Area. Other large tributaries are Sharp’s Branch and Big Bridge Branch. Penny Pot Creek, a large tributary that joins the Great Egg farther downstream in Atlantic County, also originates in Winslow Township. New Brooklyn Lake in New Brooklyn Park is the principal lake along the Great Egg Harbor River in Camden County. The name “Egg Harbor” comes from the Dutch “Eyer Haven.” This name was applied by early navigators to the Great Egg Harbor Bay because of the immense colonies of nesting birds and their eggs that were found along the seashore. The “Great” in the name of the river was a means of distinguishing it from the Little Egg Harbor River, which is now called the Mullica River. The Little Egg Harbor was smaller in size and extent than the Great Egg. Another early name for the section of the main branch originating within Berlin was “Longacoming Branch,” which was also the name of the area that is now Berlin Borough and part of Berlin Township. There are several legends about the origins of “Longacoming” but it actually derives from “Lonaconing...a Delaware (Lenape) Indian word meaning ‘where many waters meet.’”

Mullica River Watershed WMA 14 - (HUC-11: 02040301160)

The Mullica River watershed drains 561 square miles in Camden, Atlantic and Burlington Counties, of which 64.5 square miles are within Camden County. Nearly all of the watershed lies within the Pinelands Preservation Area and is characterized by extensive wetlands.

The Mullica River forms part of the boundary between Burlington and Camden Counties in the area of Waterford Township. The main channel originates in Camden County just east of Route 73 in Berlin Township and flows eastward through the Wharton State Forest toward Burlington County, passing through Atsion Lake before turning southward to form the boundary between Burlington and Atlantic Counties. The total length of the Mullica River main channel is 45 miles and the river, which

is tidal up to Sweetwater in Atlantic County, empties into Great Bay on the Atlantic Ocean, just south of Little Egg Harbor.

There are several headwater streams flowing across Waterford and Winslow Townships and Chesilhurst Borough in Camden County. Hayes Mill Creek meets the Cooper Branch and together they join Wildcat Branch to form the Mechescatuxin Branch. Price Branch joins Clark Branch, which meets the Mechescatuxin Branch at the Camden-Atlantic boundary, where it becomes Sleepy Branch (often printed on maps as “Sleeper Branch”). The long Pump Branch in Camden County combines with the Blue Anchor Branch to form Albertsons Branch. All of these streams, as well as the Great Swamp Branch in Winslow Township, flow eastward into Atlantic County where they are part of a huge wetland area called the “Great Swamp.” There they join the main channel of the Mullica River at Pleasant Mills near Batsto, just above where the Batsto River comes in from the north. From there the Mullica flows southeast before emptying into Great Bay on the Atlantic Ocean, east of Port Republic. Lakes along the Mullica River in Camden County include Atco Lake, Beaver Dam Lake, Hobb Lake, and Goshen Pond. The Mullica River is named for Eric Mullica, a pioneer who established settlements along the river in the late 1600s.

Big Timber Creek Watershed WMA 18 - (HUC-11: 02040202120)

The Big Timber Creek Watershed drains an area of 63 square miles in Camden and Gloucester Counties. There are two branches of the Big Timber Creek: the North Branch and the South Branch. The North Branch begins in Berlin Borough in the area of Lake Worth and Sharps Corner and flows northwest toward Gloucester Township. The South Branch begins in lower Gloucester Township in Camden County and in Washington Township in Gloucester County and flows northward toward Brooklawn.

The North and South Branches of the Big Timber Creek are 10 and 11 miles long respectively and join together just east of Clements Bridge Road in Gloucester Township. From there, the main channel travels less than four miles before it empties into the Delaware River between Brooklawn Borough on the north and Westville Borough on the south. The main channel and the South Branch of the Big Timber Creek form a major portion of the border between Camden and Gloucester Counties. The creek is tidal up to Blackwood Lake in Gloucester Township.

Major tributaries of the Big Timber Creek include Otter Brook, Mason Run, Trout Run, Pines Run, Holly Run, the unnamed tributary that flows through the Lakeland complex, Almonesson Creek and Bells Lake Creek on the Gloucester County side. Major lakes are Blackwood Lake, Grenloch Lake, Nash’s Lake, Jones Lake, Almonesson Lake, and Bells Lake on the South Branch and Laurel Lake, Clementon Lake, Bottom Lake, Pillings Lake, Silver Lake (in Clementon) and Lake Worth along the North Branch.

Originally named Timmer Kil by the Dutch (“Timmer” meaning “timber” and “kil” meaning “river”), the stream name later became “Great Timber Creek” and eventually “Big Timber Creek” to distinguish it from “Little Timber Creek.” The Little Timber Creek is a separate stream within the Big Timber Creek watershed that starts in Tavistock, runs partly underground in pipes, emerges to become the boundary between Haddon Heights and Barrington and between Bellmawr and Mt. Ephraim, before joining the Big Timber Creek and emptying into the Delaware River between Gloucester City and Brooklawn.

Township Water Quality – Ambient Biomonitoring Network

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

850 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates, which according to the United States Environmental Protection Agency are small, bottom-dwelling, animals and insects such as dragonfly larvae, snails, worms and beetles, by the NJDEP on a five-year cycle. To date, 4 cycles have been completed since the program's inception. Previously, a single statewide index, The New Jersey Impairment Score (NJIS), was used in assigning one of three assessment ratings to streams – non-impaired, moderately impaired, and severely impaired. The NJIS was limited in that it used family level taxonomic identification for calculating scores and did not account for geographical differences in macroinvertebrate community structures. To resolve these limitations, the following indices are now used for assessments: High Gradient Macroinvertebrate Index (HGMI), Coastal Plain Macroinvertebrate Index (CPMI), and Pinelands Macroinvertebrate Index (PMI). Each index is further categorized as being Excellent, Good, Fair, or Poor.

AMNET data is readily available through the NJDEP GIS system (GeoWeb) and the most recently published AMNET data for the Township was accessed in December 2021. Based on NJDEP GeoWeb for the Great Egg Harbor Watershed (WMA 15), there are three (3) sampling locations located within or directly adjacent to the Township. As shown on Table 1, the identified AMNET sample locations, are summarized as follows:

Table 1 - AMNET Data for Great Egg Harbor Watershed in Winslow Township

Sample Site	Index	Round 1 Rating (Samples)	Round 2 Rating (Samples)	Round 3 Rating (Samples)	Round 4 Rating (Samples)	Round 5 Rating (Samples)	Round 6 Rating (Samples)
AN0620 - Watsonstown- New Freedom Rd (Berlin Boro)	PMI	Moderate (12)	Poor (26)	Fair (43)	Fair (44)	N/A	N/A
AN0621 - Great Egg Harbor River Williamstown- New Freedom Rd.	PMI	N/A	Good (57)	Good (61)	Fair (56)	Good (59)	N/A
AN0621A - Great Egg Harbor River Causeway Rd.	PMI	N/A	N/A	N/A	N/A	Fair (38)	N/A

Based on the information provided by the NJDEP, the impairment ratings for the Great Egg Harbor River in the Township range from Poor to Good, with approximately 11.1 percent of the samples rating as Poor, 44.4 percent of the samples rating as Fair, 11.1 percent rating as Moderate, and 33.3 percent rating as Good. It should be noted that Sample Site AN0620, is apparently located in the adjacent municipality of the Borough of Berlin; however, since that area is at the Township line, the sample point was included in the analysis.

The most recently published AMNET data for the Mullica River (WMA 14) was also accessed from NJDEP GeoWeb in December 2021 and the data is summarized in Table 2.

Table 2 - AMNET Data for Mullica River Watershed in Winslow Township

Sample Site	Index	Round 1 Rating (Samples)	Round 2 Rating (Samples)	Round 3 Rating (Samples)	Round 4 Rating (Samples)	Round 5 Rating (Samples)	Round 6 Rating (Samples)
AN0569A – Pump Branch Barrett Ave.	PMI	N/A	N/A	N/A	N/A	Fair (40)	N/A
AN0569 – Pump Branch Old WHP	PMI	Moderate (12)	Fair (47)	Poor (33)	Fair (46)	Poor (20)	N/A
AN0570 – Blue Anchor Branch Rt. 30	PMI	Moderate (15)	Fair (38)	Poor (29)	Fair (35)	N/A	N/A
AN0573 – Great Swamp Branch Rt. 30	PMI	Severe (3)	Fair (52)	Fair (39)	Fair (49)	N/A	N/A

Based on the information provided by the NJDEP, the impairment ratings for the Mullica River in the Township range from Severe to Fair, with approximately 7.1 percent of the samples rating as Severe, 21.4 percent of the samples rating as Poor, 14.3 percent rating as Moderate, and 57.1 percent rating as Fair.

Summary of AMNET Data for Big Timber Creek Watershed in Winslow Township

There is no applicable AMNET data for the Big Timber Creek Watershed (WMA 18) located in the Township.

Township Water Quality – Total Maximum Daily Loads

According to the NJDEP, a Total Maximum Daily Load (TMDL) is the amount of a specific pollutant that can be discharged into a waterway without causing an exceedance of water quality standards or interfering with the ability to use a waterway for recreation or other specific purpose. The allowable TMDL is distributed among the various sources of the pollutant classified into either “point” source or “non-point” source categories. Point sources require a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. Examples of point source discharges are wastewater treatment and/or other industrial plant discharges, including site specific stormwater runoff discharge permits. Nonpoint sources typically include stormwater runoff from non-industrial and residential areas and do not require a NJPDES permit. The following Total Maximum Daily Loads (TMDLs) have been identified for water bodies within the Township using the United States Environmental Protection Agency’s (USEPA) How’s My Waterway program:

Table 3 – Township TMDL Data for Great Egg Harbor Watershed

Waterbody Segment	Evaluated Use	Impairment	Date
Piney Hollow Rd. to Broad Lane Rd.	Drinking Water = Impaired Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Good	Acidity Metals	2016
Hospitality Br. To Piney Hollow Rd.	Drinking Water = Good Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Good	Acidity Metals	2016
Squankum Branch	Drinking Water = Impaired Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Impaired	Acidity Bacteria and Other Microbes Degraded Aquatic Life Mercury, Metals	2016

Table 4 – Township TMDL Data for Mullica River in Winslow Township

Waterbody	Evaluated Use	Impairment	Date
Great Swamp Branch (above Rt.206)	Drinking Water = Impaired Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Good	Acidity Degraded Aquatic Life Low Oxygen Metals Nitrogen and/or Phosphorus Temperature	2016
Great Swamp Branch (above Rt.206)	Drinking Water = Impaired Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Impaired	Acidity Bacteria and Other Microbes Degraded Aquatic Life Metals Nitrogen and/or Phosphorus	2016
Blue Anchor Brook	Drinking Water = Good Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Good	Acidity Degraded Aquatic Life	2016
Pump Branch	Drinking Water = Good Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Good	Acidity Degraded Aquatic Life	2016
Hammonton Creek	Drinking Water = Impaired Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Impaired	Acidity Bacteria and Other Microbes Degraded Aquatic Life Mercury Metals Murky Water Nitrogen and/or Phosphorus	2016
Mullica River (Pleasant Mills)	Drinking Water = Good Aquatic Life= Impaired Fish and Shellfish= Impaired Recreation= Condition Unknown	Acidity Mercury PCBs Pesticides	2016
Albertson Brook/Gun Branch	Drinking Water = Good Aquatic Life= Impaired Fish and Shellfish= Condition Unknown Recreation= Condition Unknown	Acidity Degraded Aquatic Life	2016

Table 5 – Township TMDL Data for Big Timber Creek

Waterbody	Evaluated Use	Impairment	Date
Big Timber Creek NB (above Laurel Rd.)	Drinking Water = Impaired Aquatic Life= Impaired Fish and Shellfish= Impaired Consumption= Impaired Recreation= Impaired	Bacteria and Other Microbes Mercury Metals Nitrogen and/or Phosphorus	2016

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

The 2016 New Jersey Integrated Water Quality Assessment Report's final issuance was dated December 2019. This report 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 Report indicates pollutants which threaten a waterbody's recognized use and therefore requires the development of a TMDL by NJDEP. Due to their size, only applicable portions of the water quality source documents are included as Appendix A.

Township Water Quality Information - Miscellaneous

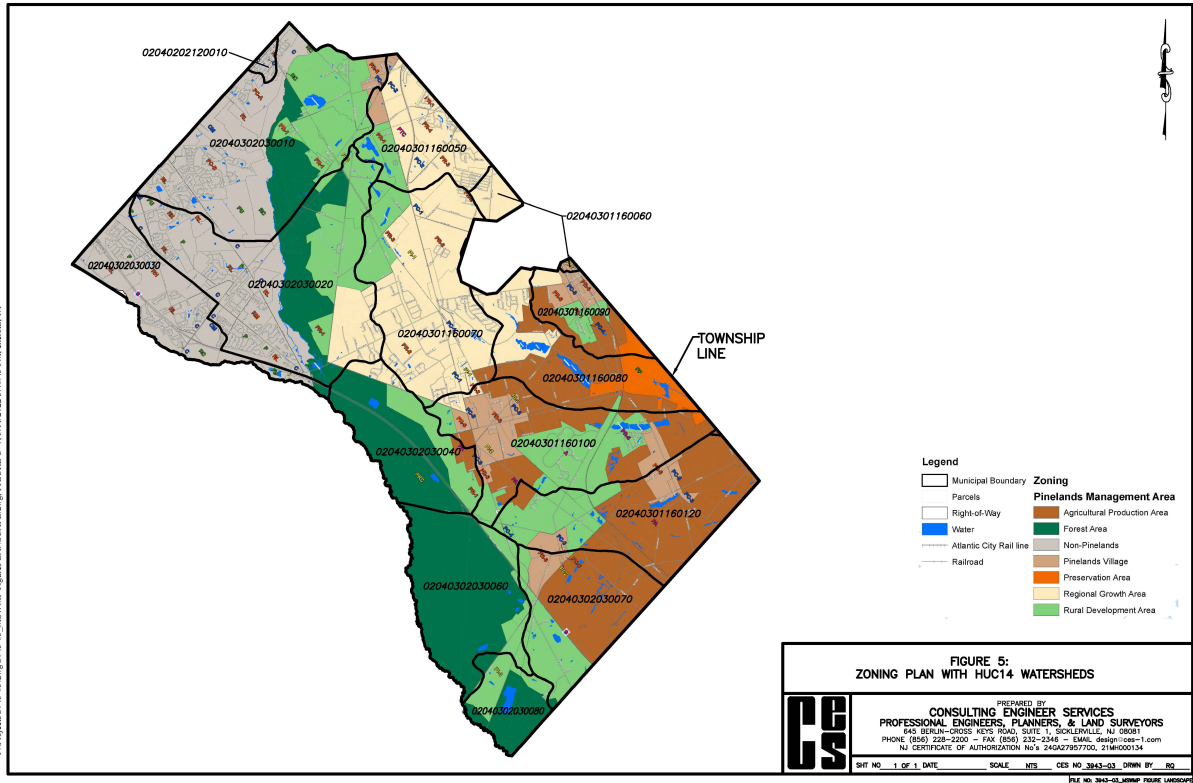
In addition to the water quality problems identified by the AMNET Network and the TMDL lists, the Township has exhibited other moderate water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. This can be attributed to a change in the hydrologic conditions (i.e., more impervious area) than previously existed in the Township. It should be noted; however, that this moderate impacts are mitigated since approximately 80% of the Township is regulated under the Pinelands Commission CMP.

Even moderate increases in impervious coverage, especially in the non-Pinelands regulated areas of the Township, have the peak and volumes of stream flows to the Township waterways. The increased amount of water has resulted in minor stream bank changes and/or erosion, which may have resulted in some degradation to stream habitats. The increase in impervious coverage also decreased groundwater recharge thereby decreasing base flows in streams during dry weather periods. These lower base flows can have a negative impact on instream habitat during the summer months; however, this has been mitigated to some degree by the Township's enforcement of the stormwater infiltration requirements for all major development that has occurred in both Pinelands and non-Pinelands areas since 2007.

Township Mapping Information

As required by the NJDEP, we have included the following Figure 4 (Wellhead Protection Areas) and Figure 5 (Township Zoning Plan with HUC14 Watersheds),

Figure 4 – Township Wellhead Protection Areas
Figure 5 – Township Zoning Plan with HUC14 Watersheds



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Goals

The Township will implement the following detailed goals of this plan to the greatest extent feasible: 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.

The minimum goals and specific Township action items to accomplish these goals are outlined as follows:

Reduce Flood Damage to Life and Property

- Maintain surface drainage to reduce the threat of flooding, through proper maintenance of the stormwater drainage system infrastructure, with practices that are protective of water quality.
- Preserve open stormwater drainage infrastructure where feasible, to best accommodate peak storm flows, maintain flood storage capacity, and promote water quality.
- Adhere to standards, policies, and practices which comply with Federal Emergency Management Agency (FEMA) Flood Management Program requirements to ensure that the Township maintain flood insurance coverage under this program.
- Continue evaluation of maintenance practices and implement appropriate BMPs to assure that the Township adequately maintains the stormwater drainage system capacity in an environmentally responsible manner.
- Evaluate and refine programs including educational outreach, inspection, and enforcement components to reduce the negative stormwater impacts from land alteration, erosion, sedimentation, and excessive runoff.
- Review and amend the Municipal Code as needed to comply with FEMA requirements for floodplain development.

Minimize Increases in Stormwater Runoff From Non-Major Development

- Through the development review process, the Township will ensure that development is protective of significant open waterways, wetlands, and riparian areas.
- The Township shall ensure that all development does not exceed maximum impervious coverages permitted in Section 294 – Zoning and Section 296 – Zoning Within Pinelands Area of the Township Code.
- The Township will review development proposals for impacts on open drainage ways, wetlands, and riparian areas, and protect the functions and benefits of these areas as provided for in the Township Code and other planning documents.

- The Township will work cooperatively with residents, businesses, and agencies to protect and improve surface waterways, seek opportunities for stewardship partnerships, further enhance educational opportunities, and continue participation in intergovernmental work groups.

Reduce Soil Erosion From Development Or Construction Project

- The Township will implement permitting programs, educational outreach, compliance inspections and enforcement activities as needed to reduce erosion, sedimentation, illicit discharges, and other pollution impacts to waterways.
- Enhance erosion and illicit discharge detection and compliance efforts, including permitting and Code enforcement for all construction projects that result in more than 5,000 square feet of land disturbance as defined by the Camden County Soil Conservation District.

Assure The Adequacy Of Existing And Proposed Culverts And Bridges, And Other Instream Structures

- The Township will seek funding and partnership opportunities for restoration efforts.
- The Township will Implement inspection procedures to ensure structures are operating as designed.
- Provide adequate funding for public maintenance of the stormwater drainage system and ensure ongoing maintenance of private stormwater features through development agreements.
- Provide operation and maintenance manual which will outline preventative and corrective measures.

Prevent, To The Greatest Extent Feasible, An Increase In Nonpoint Pollution

- The Township will educate the general public and provide technical assistance to businesses, industries, and agencies regarding practices and obligations for keeping pollutants out of the stormwater drainage system.
- The Township will enforce relevant Codes prohibiting the discharge of any deleterious material to the stormwater drainage system.
- The Township will continue to maintain cooperative partnerships with local water providers to address local stormwater quality issues.
- The Township will seek to form partnerships with neighborhoods or groups interested in providing stewardship of local waterways.
- The Township will develop, implement, and enforce appropriate building, design, and Codes to address water quality compliance issues, including pollution, habitat, and aesthetic issues, to encourage the development of urban waterways that are positive amenities in the community.

- The Township will review development proposals for impacts on open drainageways, wetlands, and riparian areas, and protect the functions and benefits of these areas as provided for in Section 294 – Zoning and Section 296 – Zoning Within Pinelands Area of the Township Code.
- The Township will work cooperatively with citizens, businesses, and agencies to protect and improve surface waterways, seek opportunities for stewardship partnerships, further enhance educational opportunities, and continue participation in intergovernmental work groups.
- The Township will implement and continue to refine/improve BMPs for all Township activities with potential to impact water quality and/or the functions of waterways, wetlands, and riparian areas.
- The Township will continue to support outreach and education efforts regarding water quality, riparian and wetland areas, including business, contractor, and developer outreach programs to educate these parties about their impacts on stormwater quality.
- Continue to maintain enforcement and compliance activities, including inspections, technical assistance, and Code enforcement.

Maintain The Integrity Of Waterways For Their Biologic Functions, As Well As For Drainage

- The Township will maintain its open channels and waterways in a manner that is protective of their natural stormwater management and habitat functions for the benefit of the citizens of the Township, local wildlife, including threatened or endangered species, and future generations.
- The Township will, through the Township Code and other Planning Documents, protect existing significant open waterways and encourage site planning and landscaping that enhances the attractiveness and natural functions of the water features.

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

- The Township will develop targeted education and outreach and technical assistance programs regarding practices and obligations for keeping debris and pollutants out of the stormwater drainage system and train stakeholder groups in appropriate erosion control and sediment prevention practices, as well as stormwater management BMPs.
- The Township will develop, implement, and enforce appropriate building, design, and Municipal Codes to address water quality compliance issues, including pollution, habitat, and aesthetic issues, to encourage the development of urban waterways that are positive amenities in the community.

- Increase educational outreach to schools to increase awareness of children regarding the need to keep litter and pollutants out of urban drainageways.
- Continue to maintain enforcement and compliance activities, including inspections, technical assistance, and Code enforcement.
- The Township will work cooperatively with citizens, businesses, and agencies to protect and improve surface waterways, seek opportunities for stewardship partnerships, further enhance educational opportunities, and continue participation In intergovernmental work groups.
- The Township will implement and continue to refine/improve BMPs for all Township activities with potential to impact water quality and/or the functions of waterways, wetlands, and riparian areas.
- Continue to support spill response training for Township staff, including training and coordination with other jurisdictions for area or regional major event response.
- Consider support for limiting extremely hazardous chemical use in wellhead protection zones.
- Support public hazardous waste disposal events.

Maintain Groundwater Recharge

- The Township shall ensure compliance with the Stormwater Control Ordinance and NJDEP's N.J.A.C. 7:8 regulations requiring developments to meet the groundwater recharge requirements.
- The Township shall review development applications classified as "Major Development" to ensure compliance with groundwater recharge requirement requiring applicants to 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 demonstrate through hydrologic and hydraulic analysis that the increase of stormwater volume from predevelopment to post construction for the two year storm event is infiltrated

To Protect Public Safety Through Proper Design and Operation of Stormwater Management Basins

- The Township shall ensure compliance to protect the public safety through the proper design and operations of Stormwater Management Basins. Implementation Actions:
- The Township will review stormwater management designs which include basins *for* compliance with Chapter 9.4 Extended Detention Basins and Chapter 9.5 Infiltration Basins within the NJDEP Best Practices Manual.
- The Township will ensure that municipal inspectors observe the construction and ongoing operation of the stormwater management basins for public safety.

Design and Performance Standards

The Township adopted the following design and performance standards that comply with both the NJDEP Stormwater Regulations and the Pinelands Commission CMP. Chapter 297 of the Township Code entitled “Stormwater Control” includes the design and performance standards for stormwater management measures as required by NJAC 7:8-5 and the Pinelands CMP to minimize the adverse impact of stormwater runoff on water quality and quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards included in Chapter 297 include language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5,8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. Sections 1 through 41 are standards for Pinelands areas of the Township, while Sections 42 through 54 apply to non-Pinelands areas of the town. A copy of the adopted Chapter 297 is included as Appendix B.

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 implemented rules at N.J.A.C. 2:90 and 16:25A.

The minimum design and performance standards for groundwater recharge, stormwater runoff quality and stormwater runoff quantity at N.J.A.C. 7:8-5.4, 5.5 and 5.6 shall be met by incorporating green infrastructure in accordance with N.J.A.C. 7:8-5.3.

The general standards for stormwater management measures are specified in N.J.A.C. 7:8 Stormwater Management Rules and have been incorporated into the Township's Ordinance. These measures shall be incorporated as needed to meet the soil erosion standards included in the Township's Stormwater Control Ordinance. The design standards for the specific structural and green infrastructure stormwater management measures are those included in the New Jersey Stormwater Best Management Practices Manual (BMP Manual). Alternate designs or practices may be used if they are approved by the Township and comply with N.J.A.C.7:8-4.6. The design and construction of such facilities must comply with the Soil Erosion and Sediment Control Standards as well as any other applicable state regulation, including the Freshwater Wetland Protection Act rules, the Flood Hazard control rules, the Surface Water Quality Standards, the Coastal Area Facilities Review Act, Waterfront Development and Harbor Facilities Act, and the Dam Safety rules. The requirement to be consistent with all other applicable rules will be included in the Township's Stormwater Control Ordinance. Stormwater runoff quality controls for total suspended solids and nutrient loads shall meet the design and performance standards as specified in the Stormwater Management rules.

During construction, Township Inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. Should it be determined that stormwater management measures are not being constructed, maintained or operating as designed, after construction, enforcement will be required. The Township will reserve the right to implement a fine schedule in the event of repeated non-compliance warnings being issued, with all monies being utilized to address the standard being violated.

Where the Township assumes maintenance responsibility, preventive maintenance shall be performed on a regular basis and will be appropriate for the particular structural management measure being implemented. These maintenance measures shall be in accordance with N.J.A.C. 7:8-5.8 and may include: periodic inspections, vegetation management, sediment, debris and trash removal and mosquito control. Corrective maintenance shall be performed on an as needed basis

for structural repairs or replacements, removal of outlet and pipe blockages, erosion restoration, snow and ice removal, etc. The person or persons responsible for maintenance shall keep a detailed log of all preventative and corrective maintenance for the structural management measures incorporated into the design of the development, including a record of all inspections and work orders.

In order to ensure adequate long term operation as well as preventative and corrective maintenance of both structural and green infrastructure stormwater management facilities, the designers of such facilities should submit to the Township a maintenance plan indicating specific maintenance tasks and schedules as indicated in N.J.A.C. 7:8-5.8 "Maintenance Requirements". This maintenance plan will require the ultimate user of said BMP's to provide an annual certification that the stormwater management measure approved are functioning as designed and that the proper maintenance and inspection of said measures have been performed. Random spot inspections by the Township will be conducted to ensure compliance along with appropriate enforcement actions such as fines to be levied should non-compliance result.

Plan Consistency

The Township is not within a Regional Stormwater Management Planning Area (RSMPA). TMDLs have been identified for waters within the Township with reduction percentages indicated. If any RSMPAs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

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

Chapter 297 of the Township Code 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 Conservation office.

This Plan and Chapter 297 are consistent with the previous Pinelands CMP requirements; however, based on CMP revisions that were effective on January 19, 2022, it will be necessary to update both this plan and Chapter 297 upon issuance guidance documentation from the Pinelands Commission.

Land Use/Build-Out Analysis

Since the Township contains 58.2 square miles of land area, a Land Use/Build-Out Analysis is required. It should be noted that the Pinelands Commission is currently in the process of conducting updated Build-Out Analysis for the Township and this Plan will be Amended upon receipt of the Pinelands Commission work.

Mitigation Project Criteria

Mitigation is defined as an action by an applicant providing compensation or offset actions for onsite stormwater management requirements where the applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in NJAC 7:8, in an adopted regional stormwater management plan, or in this local ordinance, and has received a waiver from strict compliance from the municipality. Mitigation, for the purposes of this ordinance, includes both the mitigation plan detailing how the project's failure to strictly comply will be compensated, and the implementation of the approved mitigation plan within the same HUC-14 within which the subject project is proposed. The mitigation project should be implemented in the same drainage area as the proposed development, preferably on the same site. 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 of the NJDEP Stormwater BMP Manual. If a suitable site cannot be located on the site or in the same drainage area as the proposed development after extensive research, as discussed above, 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.

A mitigation option is provided below, but this shall not be considered all-inclusive. If a developer can provide any different options for mitigation, they shall be presented to the Township Engineer for his approval.

- Install a manufactured treatment device approved by the State for removal TSS rates to provide water quality at the Township's outfalls. Units installed shall be approved by the NJDEP and a maintenance schedule shall be provided.

The issuance of a waiver under a Land Use Permit by the NJDEP does not automatically waive the requirement for mitigation to be performed under the municipal review. It shall also be noted that the applicant is required to obtain all the required permits for any mitigation project which will be performed under the municipal review. Any approved variance shall be submitted by the Township to the county review agency and NJDEP, by way of a written report describing the variance, as well as the required mitigation, within 30 days of approval. Any variance from the design and performance standards issued by the Township shall be conditioned upon the applicant providing a written report describing the variance and required mitigation to the Board's engineer for approval.

APPENDIX A

Chapter 297

Chapter 297
STORMWATER CONTROL

ARTICLE I
Scope and Purpose

§ 297-1. Purpose.

It is hereby determined that:

- A. Land development projects and associated disturbance of vegetation and soil and changes in land cover, including increases in impervious cover, alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes. If inadequately or improperly managed, this stormwater runoff can deplete groundwater resources and increase flooding, stream channel erosion, and sediment transport and deposition.
- B. This stormwater runoff contributes to increased quantities of waterborne pollutants.
- C. Increases of stormwater runoff, soil erosion and nonpoint source pollutants have occurred in the past as a result of land development, and contribute to the degradation of the water resources of Winslow Township.
- D. Certain lands of Winslow Township lie within the Pinelands Area, and therefore, development in this portion of Winslow Township is subject to the requirements of the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.) and the implementing regulations and minimum standards contained in the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.) (CMP). The purpose and intent of these regulations and standards is to promote orderly development of the Pinelands so as to preserve and protect the significant and unique natural, ecological, agricultural, archaeological, historical, scenic, cultural and recreational resources of the Pinelands.
- E. Pinelands Area resources are to be protected in accordance with Pinelands Comprehensive Management Plan at N.J.A.C. 7:50 et seq., New Jersey's Stormwater Management Rules at N.J.A.C. 7:8-1.1 et seq. and New Jersey's surface water quality antidegradation policies contained in the New Jersey Surface Water Quality Standards at N.J.A.C. 7:9B-1.1 et seq. Permitted uses shall maintain the ecological character and quality of the Pinelands, including good water quality and natural rates and volumes of flow.
- F. Increased stormwater rates and volumes and the sediments and pollutants associated with stormwater runoff from future development projects within the Pinelands Area have the potential to adversely affect Winslow Township's streams and water resources and the streams and water resources of downstream municipalities.
- G. Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites.
- H. It is in the public interest to regulate the discharge of stormwater runoff from "major development" projects, as defined in Article VII of this chapter, conducted within the Pinelands Area, as provided in this chapter, in order to control and minimize increases in stormwater runoff rates and volumes, to maintain groundwater recharge, and to control and minimize soil erosion, stream channel erosion and

nonpoint source pollution associated with stormwater runoff.

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

§ 297-2. Goals and techniques.

A. Through this chapter, Winslow Township has established the following goals for stormwater control:

- (1) To reduce flood damage, including damage to life and property;
- (2) To minimize any increase in stormwater runoff from new development;
- (3) To reduce soil erosion from any development or construction project;
- (4) To assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- (5) To maintain groundwater recharge;
- (6) To minimize any increase in nonpoint pollution;
- (7) To maintain the integrity of stream channels for their biological functions, as well as for drainage;
- (8) To restore, protect, maintain and enhance the quality of the streams and water resources of Winslow Township and the ecological character and quality of the Pinelands Area;
- (9) 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 Winslow Township, to protect public health and to enhance the domestic, municipal, recreational, industrial and other uses of water; and
- (10) To protect public safety through the proper design and operation of stormwater management basins.

B. In order to achieve the goals for stormwater control set forth in this chapter, Winslow Township has identified the following management techniques:

- (1) 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 chapter.
- (2) 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 chapter, 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.

- (3) 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.
- (4) Source control plans shall be developed based upon physical site conditions and the origin, nature and the anticipated quantity or amount of potential pollutants.
- (5) Structural BMPs, where necessary shall be integrated with nonstructural stormwater management strategies and proper maintenance plans.
- (6) 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 chapter before relying on a single, larger stormwater management measure to achieve these performance standards.

§ 297-3. Applicability.¹

A. This chapter shall apply to:

- (1) All site plans and subdivisions for major developments occurring within the Pinelands Area that require preliminary or final site plan or subdivision review; and
- (2) All major development projects undertaken by Winslow Township shall comply with this chapter.²

§ 297-4. Procedures.

In addition to other development review procedures set forth in the Code of Winslow Township, major developments located within the Pinelands Area shall comply with the stormwater management requirements and specifications set forth in this chapter. New agricultural development that meets the definition of major development in Article VII of this chapter shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of N.J.A.C. 5.4(b)7:8.

§ 297-5. Compatibility with other permit and ordinance requirements.

A. Development approvals issued for subdivisions and site plans pursuant to this chapter are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable ordinance, code, rule, regulation, statute, act or other provision of

1. Editor's Note: See also Article XIII.

2. This clause is intended to provide consistency with DEP's stormwater management requirements. As per normal practice, all development within the Pinelands Area which is undertaken by a Pinelands Area Municipality shall comply with all of the requirements of the CMP.

law.

- B. In their interpretation and application, the provisions of this chapter shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This chapter 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 chapter imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive or stringent provisions or higher standards shall control.
- C. 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 Winslow Township is a part, the stormwater provisions of such a plan(s) shall be adopted by Winslow Township within one (1) year of the adoption of a Regional Stormwater Management Plan (RSWMP) as an amendment to an Areawide Water Quality Management Plan. Local ordinances proposed to implement the RSWMP shall be submitted to the Commission for certification within six (6) months of the adoption of the RSWMP per N.J.A.C. 7:8 and the Pinelands CMP (N.J.A.C. 7:50.)

ARTICLE II
Requirements for a Site Development Stormwater Plan

§ 297-6. Submission of site development stormwater plan.

- A. Whenever an applicant seeks municipal approval of a site development that is subject to this chapter, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 297-8 below as part of the applicant's application for subdivision or site plan approval. These required components are in addition to any other information required under any provisions of Winslow Township's Land Use Ordinance or by the Pinelands Commission pursuant to N.J.A.C. 7:50-1.1 et seq.
- B. The applicant shall demonstrate that the site development project meets the standards set forth in this chapter.
- C. The applicant shall submit three (3) copies of the materials listed in the checklist for site development stormwater plans in accordance with Article III, Section 297-11 of this chapter.

§ 297-7. Site development stormwater plan approval.

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

§ 297-8. Checklist requirements.

Any application for approval of a major development shall include at least the following information. All required engineering plans shall be submitted to Winslow Township and the Pinelands Commission in CAD Format 15 or higher, registered and rectified to NJ State Plan Feet NAD 83 or Shape Format NJ State Plan Feet NAD 83, and all other documents shall be submitted in both paper and commonly used electronic file formats such as pdf., word processing, database or spreadsheet files. Three (3) copies of each item shall be submitted.

- A. Topographic base map. The applicant shall submit a topographic base map of the site which extends a minimum of three hundred (300) feet beyond the limits of the proposed development, at a scale of one (1) inch = two hundred (200) feet or greater, showing one (1) foot contour intervals. The map shall indicate the following: existing surface water drainage, shorelines, steep slopes, soils, highly erodible soils, perennial or intermittent streams that drain into or upstream of any Category One or Pinelands waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing surface and subsurface human-made structures, roads, bearing and distances of property lines, and significant natural and man-made features not otherwise shown. Winslow Township or the Pinelands Commission may require upstream tributary drainage system information as necessary.

- B. Environmental site analysis. The applicant shall submit a written description along with the drawings of the natural and human-made features of the site and its environs. This description should include:
- (1) A discussion of environmentally critical areas, soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual or environmentally sensitive features and to those that provide particular opportunities for or constraints on development; and
 - (2) 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 on-site 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.
- C. Project description and site plan(s). The applicant shall submit a map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations will occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification for proposed changes in natural conditions shall also be provided.
- D. Land use planning and source control plan.
- (1) 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 Article IV through use of nonstructural or low impact development techniques and source controls to the maximum extent practicable before relying on structural BMPs. The land use planning and source control plan shall include a detailed narrative and associated illustrative maps and/or plans that specifically address how each of the following nine (9) nonstructural strategies identified in Subchapter 5 of the NJDEP Stormwater Management Rules (N.J.A.C. 7:8-5) and set forth below (Subsection D(1)(a) through (i)) will be implemented to the maximum extent practicable to meet the standards at Article IV of this chapter on the site. If one (1) 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.
 - (a) Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

- (b) Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
 - (c) Maximize the protection of natural drainage features and vegetation;
 - (d) Minimize the decrease in the predevelopment "time of concentration;"
 - (e) Minimize land disturbance including clearing and grading;
 - (f) Minimize soil compaction and all other soil disturbance;
 - (g) Provide low-maintenance landscaping that provides for the retention and planting of native plants and minimizes the use of lawns, fertilizers and pesticides, in accordance with N.J.A.C. 7:50-6.24;
 - (h) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and
 - (i) Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. 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.
- (2) For sites where stormwater will be generated from "high pollutant loading areas" or where stormwater will be exposed to "source material," as defined in Article VII of this chapter, the applicant shall also demonstrate in the land use planning and source control plan that the requirements of Article IV have been met.
- (3) The use of nonstructural strategies to meet the performance standards in Article IV of this chapter is not required for development sites creating less than one (1) acre of disturbance. However, each application for major development and any other application where Winslow Township otherwise requires a landscaping plan shall contain a landscaping or revegetation plan in accordance with the CMP standards at N.J.A.C. 7:50-6.24(c). 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 Winslow Township Land Use

Ordinance, Zoning Ordinance or by conditions of zoning or variance approval.

- E. Stormwater management facilities map. The applicant shall submit a map, at the same scale as the topographic base map, depicting the following information:
- (1) The total area to be disturbed, paved and/or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to manage and dispose of stormwater; and
 - (2) Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention (if applicable) and emergency spillway provisions with maximum discharge capacity of each spillway.
- F. Calculations (groundwater recharge and stormwater runoff rate, volume and quality). The applicant shall submit comprehensive hydrologic and hydraulic design calculations for the predevelopment and post-development conditions for the design storms specified in Article III. The standards for groundwater recharge and stormwater runoff rate, volume and quality required by Article IV shall be met using the methods, calculations and assumptions provided in Article III.
- G. 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 Article VI of this chapter. Said plan shall include, at a minimum, the following elements:
- (1) The frequency with which inspections will be made;
 - (2) The specific maintenance tasks and requirements for each proposed structural and nonstructural BMP;
 - (3) The name, address and telephone number for the entity responsible for implementation of the maintenance plan;
 - (4) The reporting requirements; and
 - (5) Copies of the inspection and maintenance reporting sheets.
- H. Exception from submission requirements. An exception may be granted from submission of any of these required components (except Subsection G. 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.

ARTICLE III

**Methodologies for the Calculation of Stormwater Runoff Rate and Volume,
Stormwater Runoff Quality, and Groundwater Recharge****§ 297-9. Method of calculating stormwater runoff rate and volume.**

- A. In complying with the stormwater runoff quantity and rate standards in Article IV, Section 297-13, 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. In calculating stormwater runoff using the NRCS methodology, the design engineer shall separately calculate and then combine the runoff volumes from pervious and directly connected impervious surfaces within each drainage area within the parcel.
- C. Calculation of stormwater runoff from unconnected impervious surfaces shall be based, as applicable, upon the Two-Step method described in the current New Jersey Stormwater Best Management Practices Manual or the NRCS methodology.
- D. In calculating stormwater runoff using the NRCS methodology, the design engineer shall use appropriate 24-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at <http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.
- E. When calculating stormwater runoff for predeveloped site conditions, the design engineer shall use the following criteria:
 - (1) When selecting or calculating Runoff Curve Numbers (CNs) for predeveloped project site conditions, the project site's land cover shall be assumed to be woods in good condition. However, another land cover may be used to calculate runoff coefficients if:
 - (a) 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
 - (b) 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.
 - (2) If more than one (1) land cover has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations.
 - (3) All predeveloped land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

- (4) In calculating predeveloped site stormwater runoff, the design engineer shall include the effects of all land features and structures, such as ponds, wetlands, depressions, hedgerows, and culverts, that affect predeveloped site stormwater runoff rates and/or volumes.
- (5) Where tailwater will affect the hydraulic performance of a stormwater management measure, the design engineer shall include such effects in the measure's design.

§ 297-10. Method of calculating stormwater runoff quality.

- A. In complying with the stormwater runoff quality standards in Article IV, Section 297-17A, 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.
- B. 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.
- C. Calculation of runoff volumes, peak rates, and hydro-graphs 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 Distribution³			
Time	Cumulative Rainfall	Time	Cumulative Rainfall
(minutes)	(inches)	(minutes)	(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

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

Table 1			
Water Quality Design Storm Distribution			
Time	Cumulative Rainfall	Time	Cumulative Rainfall
(minutes)	(inches)	(minutes)	(inches)
55	0.3583	120	1.2500
60	0.6250		

D. Total Suspended Solids (TSS) reduction calculations.

- (1) If more than one (1) 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:

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

- (2) If there is more than one (1) on-site drainage area, the eighty percent (80%) TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site, in which case the removal rate can be demonstrated through a calculation using a weighted average.

E. TSS removal rates for stormwater BMPs.

- (1) 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 Article XII, Section 297-40 or found on the NJDEP's website at www.njstormwater.org. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2.

- (2) 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 Winslow Township. Any alternative stormwater management measure, removal rate or method of calculating the removal rate shall be subject to approval by Winslow Township and a copy shall be provided to the following:

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

- (b) The New Jersey Pinelands Commission, PO Box 7, New Lisbon, NJ, 08064.

Table 2			
Pollutant Removal Rates for BMPs⁴			
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 Article III.	Pollutant removal rates as certified by NJDEP; see Article III.	Pollutant removal rates as certified by NJDEP; see Article 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

F. Nutrient removal rates for stormwater BMPs. For purposes of post-development

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

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 Article IV, Section 297-17.

§ 297-11. Methods of calculating groundwater recharge.

- A. If complying with the groundwater recharge standards contained in Article IV, Section 297-14A(1), the design engineer may calculate groundwater recharge in accordance with the New Jersey Groundwater Recharge Spreadsheet (NJGRS) computer program incorporated herein by reference as amended and supplemented. Information regarding the methodology is available in Article XI, Section 297-35 or from the New Jersey BMP Manual.
- B. Alternative groundwater recharge calculation methods to meet these requirements may be used upon approval by the Municipal Engineer.
- C. If complying with the groundwater recharge standards contained in Article IV, Section 297-14A(2), the design, engineer shall:
 - (1) 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
 - (2) 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>.
- D. When calculating groundwater recharge or stormwater runoff for predeveloped site conditions, the design engineer shall use the following criteria:
 - (1) When selecting land covers or calculating Runoff Curve Numbers (CNs) for predeveloped 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:
 - (a) 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
 - (b) 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.
 - (2) If more than one (1) 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.

- (3) All predeveloped land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

ARTICLE IV

Stormwater Management Performance Standards for Major Development**§ 297-12. Nonstructural stormwater management strategies.**

- A. To the maximum extent practicable, the performance standards in Article IV 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), and set forth in Article II, Section 297-8D(1), into the design. The applicant shall identify within the land use planning and source control plan required by Article II, Section 297-8 of this chapter how each of the nine (9) nonstructural measures will be incorporated into the design of the project to the maximum extent practicable.
- B. 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 Article II to Winslow Township. A determination by Winslow Township that this rationale is inadequate or without merit shall result in a denial of the application unless one (1) 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 by Winslow Township;
 - (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 Article IV, and the amended plan is approved by Winslow Township; 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 Winslow Township.
- C. In addition to all other requirements of this Article, 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 Winslow 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.
- D. In addition to all other requirements of this Article, each application for major development, and any other application where Winslow Township otherwise requires a landscaping plan, shall contain a landscaping or revegetation plan in accordance with the Pinelands CMP standards at N.J.A.C. 7:50-6.24(c).

- E. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Article IV shall be dedicated to a government entity; shall be subjected to a conservation easement filed with the appropriate County Clerk's office; or shall be subjected to an equivalent form of restriction approved by Winslow Township that ensures that measure, or equivalent stormwater management measure is maintained in perpetuity, as detailed in Article VI of this chapter.
- F. Guidance for nonstructural stormwater management strategies is available in the New Jersey BMP Manual, which may be obtained from the address identified in Article XII, Section 297-40 or found on the NJDEP's website at www.njstormwater.org.
- G. Exception for major development sites creating less than one (1) acre of disturbance. The use of nonstructural strategies to meet the performance standards in Article IV of this chapter is not required for major development creating less than one (1) acre of disturbance. However, the following requirements shall be met:
 - (1) Each application for major development and any other application where Winslow Township otherwise requires a landscaping plan shall contain a landscaping or revegetation plan prepared in accordance with the Pinelands CMP standards (N.J.A.C. 7:50-6.24(c));
 - (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 Winslow Township 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.

§ 297-13. Stormwater runoff quantity and rate standards.

- A. For all developments proposed in the Pinelands portion of the municipality only, there shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetland, wetlands transition area or surface waterbody. In addition, stormwater runoff shall not be directed in such a way as to increase the volume and/or rate of discharge into any surface waterbody from that which existed prior to development of the site.
- 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. For all major developments, the total runoff volume generated from the net increase in impervious surfaces by a 10-year, 24-hour storm shall be retained and infiltrated on site.

- D. In addition, the design engineer, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Article III, shall either:
- (1) Demonstrate through hydrologic and hydraulic analysis that the post-developed stormwater runoff hydrographs from the project site for the 2-, 10-, and 100-year storms do not exceed, at any point in time, the site's predeveloped runoff hydrographs for the same storms;
 - (2) Demonstrate through hydrologic and hydraulic analysis that under post-developed site conditions:
 - (a) There is no increase in predeveloped stormwater runoff rates from the project site for the 2-, 10-, and 100-year storms; and
 - (b) Any increased stormwater runoff volume or change in stormwater runoff timing for the 2-, 10-, and 100-year storms will not increase flood damage at or downstream of the project site. When performing this analysis for pre-developed site conditions, all off-site development levels shall reflect existing conditions. When performing this analysis for post-developed site conditions, all off-site development levels shall reflect full development in accordance with current zoning and land use ordinances; or
 - (3) Demonstrate that the peak post-developed stormwater runoff rates from the project site for the 2-, 10- and 100-year storms are fifty, seventy-five and eighty percent (50%, 75% and 80%), respectively, of the site's peak predeveloped stormwater runoff rates for the same storms. Peak outflow rates from on-site stormwater measures for these storms shall be adjusted where necessary to account for the discharge of increased stormwater runoff rates and/or volumes from project site areas not controlled by the on-site measures. These percentages do not have to be applied to those portions of the project site that are not proposed for development at the time of application, provided that such areas are:
 - (a) Protected from future development by imposition of a conservation easement, deed restriction, or other acceptable legal measures; or
 - (b) Would be subject to review under these standards if they are proposed for any degree of development in the future.
- E. In tidal flood hazard areas, a stormwater runoff quantity analysis in accordance with Subsection D(1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.
- F. The standards for stormwater runoff quantity and rate required by this Article shall be met using the methods, calculations and assumptions provided in Article III.

§ 297-14. Groundwater recharge standards.

- A. For all major developments, with the exception of those described in Article IV, Section 297-14D, below, the design engineer, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Article III,

shall either:

- (1) Demonstrate through hydrologic and hydraulic analysis that the post-developed project site maintains one hundred percent (100%) of the site's predeveloped average annual groundwater recharge volume; or
 - (2) Demonstrate through hydrologic and hydraulic analysis that any increase in the project site's stormwater runoff volume for the 2-year, 24-hour storm from predeveloped to post-developed conditions is infiltrated on site.
- B. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all site groundwater recharge measures so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface facilities in the vicinity of the groundwater recharge measure.
- C. The standards for groundwater recharge required by this section shall be met using the methods, calculations and assumptions provided in Article III.
- D. Exceptions.
- (1) The preceding groundwater recharge standards shall not apply to sites that create less than one (1) acre of disturbance.
 - (2) The following types of stormwater shall not be recharged:
 - (a) Stormwater from areas of high pollutant loading. High pollutant loading areas in industrial and commercial developments where solvents and/or petroleum products are loaded/ unloaded, stored or applied; 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 recharge would be inconsistent with department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and
 - (b) Industrial stormwater exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to raw materials; intermediate products; final products; waste materials; by-products; industrial machinery, fuels, and lubricants; solvents and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

§ 297-15. Erosion control standards.

The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and its implementing regulations, N.J.A.C. 2:90-1.1 through 1.4.

§ 297-16. Stormwater runoff quality standards.

- A. There shall be no direct discharge of stormwater runoff from any point or nonpoint source to any wetland, wetland transition area or surface waterbody.
- B. Stormwater management measures shall be designed to reduce the total suspended solids (TSS) load in the stormwater runoff from the post-developed site by eighty percent (80%) expressed as an annual average.
- C. Stormwater management measures shall also be designed to reduce the nutrient load in the stormwater runoff from the post-developed site by the maximum extent practicable. In achieving this reduction, the design of the development site shall include nonstructural and structural stormwater management measures that optimize nutrient removal while still achieving the groundwater recharge, runoff quantity and rate, and TSS removal standards in this Article.
- D. The standards for stormwater runoff quality required by this Article shall be met using the methods, calculations, assumptions and pollutant removal rates provided in Article III.
- E. Exceptions.
 - (1) 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.
 - (2) The TSS reduction requirement in Article IV, Section 297-17B 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.
 - (3) The stormwater runoff quantity and rate standards in Article IV, Section 297-13 shall still be met for all major development sites.

§ 297-17. Additional stormwater quality standards for high pollutant loading areas and areas where stormwater runoff is exposed to source material.

- A. This section applies to the following areas of a major development as defined in Article VII of this chapter, proposed in the Pinelands portion of the municipality only:
 - (1) High pollutant loading areas (HPLAs); and

(2) Areas where stormwater is exposed to "source material."

B. For a major development in areas described in Subsection A(1) or (2) above, in addition to the infiltration requirements specified in Article IV, Section 297-13B and the groundwater recharge requirements specified in Article IV, Section 297-14, the applicant shall demonstrate in the land use planning and source control plan required in Article II, Section 297-8D that the following requirements have been met:

- (1) The extent of the areas described in Subsection A(1) and (2) above have been minimized on the development site to the maximum extent practicable;
- (2) The stormwater runoff from the areas described in Subsection A(1) and (2) 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 Subsection A(1) and (2) above and the remainder of the site will be minimized;
- (3) The amount of precipitation falling directly on the areas described in Subsection A(1) and (2) 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
- (4) The stormwater runoff from or co-mingled with the areas described in Subsection A(1) and (2) above for the Water Quality Design Storm, defined in Article III, Section 297-10, Table 1 shall be subject to pretreatment by one (1) or more of the following stormwater BMPs, designed in accordance with the New Jersey BMP Manual to provide ninety percent (90%) TSS removal:
 - (a) Bioretention system;
 - (b) Sand filter;
 - (c) Wet ponds which shall be hydraulically disconnected by a minimum of two (2) feet of vertical separation from the seasonal high water table and shall be designed to achieve a minimum eighty percent (80%) TSS removal rate;
 - (d) Constructed stormwater wetlands; and/or
 - (e) Media filtration system manufactured treatment device with a minimum eighty percent (80%) TSS removal as verified by the New Jersey Corporation for Advanced Technology and as certified by NJDEP.
- (5) If the potential for contamination of stormwater runoff by petroleum products exists on site, prior to being conveyed to the pretreatment BMP required in Article IV, Section 297-17B(4) above, the stormwater runoff from the areas described in Subsection A(1) and (2) 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.

§ 297-18. Threatened and endangered species and associated habitat standards.

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

§ 297-19. Exceptions and mitigation requirements.

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

- (1) The exception is consistent with that allowed by Winslow Township;
- (2) Winslow Township has an adopted and effective municipal stormwater management plan in accordance with N.J.A.C. 7:8-4.4, which includes a mitigation plan in accordance with N.J.A.C. 7:8-4.2(c)11, and is also certified by the Pinelands Commission. The mitigation plan shall identify what measures are necessary to offset the deficit created by granting the exception and the municipality shall submit a written report to the county review agency and the NJDEP describing the exception and the required mitigation. Guidance for developing municipal stormwater management plans, including mitigation plans, is available from the NJDEP, Division of Watershed Management and the New Jersey BMP Manual.
- (3) The applicant demonstrates that mitigation, in addition to the requirements of mitigation plan discussed in paragraph (2) above, will be provided consistent with one (1) of the following options:
 - (a) Mitigation may be provided off site, but within the Pinelands Area and within the same drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standard which is lacking on the development site due to the exception; or
 - (b) In lieu of the required mitigation, a monetary "in lieu contribution" may be provided by the applicant to Winslow Township in accordance with the following:
 - [1] The amount of the in lieu contribution shall be determined by Winslow Township, but the maximum in lieu contribution required shall be equivalent to the cost of implementing and maintaining the storm-water management measure(s) for which the exception is granted;
 - [2] 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 Winslow Township in

Winslow Township's adopted municipal stormwater management plan. The stormwater control project to which the monetary contribution will be applied shall be identified by Winslow Township at the time the exception is granted. The applicant shall amend the project description and site plan required in Article II, Section 297-8C 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.

- [3] Winslow Township shall expend the in lieu contribution to implement the selected off-site mitigation project within five (5) years from the date that payment is received. Should Winslow Township fail to expend the in lieu contribution within the required timeframe, the mitigation option provided in Article IV, Section 297-19A(3)(b) of this chapter shall be void and Winslow Township shall be prohibited from collecting in lieu contributions.
- B. An exception from strict compliance granted in accordance with Section 297-19A 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.

ARTICLE V
**Design, Construction, and Safety Standards for Structural Stormwater
Management Measures**

§ 297-20. General design and construction standards.

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

Where directed by Winslow Township, the applicant shall be required to retrofit any existing substandard basin directly impacted by the proposed development in order to comply with the standards outlined in this Article.

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

- (1) Bioretention systems;
- (2) Constructed stormwater wetlands;
- (3) Extended detention basins;
- (4) Infiltration basins;
- (5) Vegetated filter strips;
- (6) Infiltration basins and trenches;
- (7) Wet ponds with suitable liners;
- (8) Pervious paving systems; and
- (9) Manufactured treatment devices, provided their pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the NJDEP.

- C. 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.

- D. 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.

- E. 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 Article V of this chapter.
- F. To the maximum extent practical, the design engineer shall design structural stormwater management measures on the development site in a manner that:
- (1) Limits site disturbance, maximizes stormwater management efficiencies, and maintains or improves aesthetic conditions;
 - (2) 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;
 - (3) 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.
- G. 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:
- (1) Use of natural, non-wetland wooded depressions for stormwater runoff storage; and
 - (2) 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.
- H. Stormwater management basins shall be designed with gently sloping slides. For all basins which are to be dedicated to and owned by the Township of Winslow, and all basins servicing commercial or industrial properties, the maximum allowable basin side slope shall be five (5) horizontal to one (1) vertical, (5:1). The Township of Winslow requires this basin slope in order to protect the health, safety and welfare of its employees in safely operating the equipment necessary for maintenance of the basins. The maximum allowable basin slope for all other basins shall be three (3) horizontal to one (1) vertical (3:1), however, the Township prefers a maximum 5:1 side slope in all basins. **[Amended 9-23-08 by Ord. No. 0-33-08; 7-23-09 by Ord. No. O-2009-017]**
- H.1. It is the intent of the subsection to promote a desirable visual environment within the Township of Winslow through the implementation of specific design standards for stormwater management basins which address visual impacts in addition to the stormwater management functions of these facilities. In enforcing these standards, the township shall consider such factors as visibility of the basin from existing and proposed roadways, location of the basin on the property in question and visual impacts of the basin on surrounding land uses. In considering the potential visual impact of the proposed stormwater management basin under this subsection, screening of the basin area with landscape plantings shall not be considered an acceptable alternative to implementation of the general stormwater basin

requirements outlined below. **[Added 9-23-08 by Ord. No. 0-33-08; amended 7-23-09 by Ord. No. O-2009-017]**

- (1) General stormwater basin design requirements:
 - (a) Basins shall be designed with curvilinear, naturalistic boundaries generally following the natural contours of the surrounding land. Geometric basin configurations should be avoided.
 - (b) Basin side slopes should not exceed 5:1 providing a variation in side slopes between 5:1 and 10:1 to create the appearance of a more natural land form, except where 3:1 side slopes are permitted.
 - (c) The maximum overall depth of the basin shall not exceed six (6) feet from the top of the berm.
 - (d) In residential developments, the basin shall be located on a separate, conforming lot whenever possible.
 - (e) Basins with average side slopes of less than 5:1 may not require perimeter fencing at the discretion of the Board, however safety measures shall be installed at all headwall and pipe openings.
 - (f) If the basin is designed to the Board Engineer's satisfaction in accordance with the general stormwater basin design requirements, the basin planting requirement shall be reduced (see Stormwater Basin Planting Requirements, Planting Requirements).
 - (g) Outflow structures and headwalls should be embedded into the slope as much as possible and the outlet structure must be accessible during a 100-year storm.
- (2) Stormwater basin planting requirements: **[Amended 6-23-09 by Ord. No. O-2009-017]**
 - (a) General requirements:
 - [1] Basin perimeters shall be planted with a combination of shade trees, evergreen trees and shrubs.
 - [2] A maximum of fifty percent (50%) of the shrubs may be replaced with ornamental grasses at a rate of two (2) ornamental grasses per shrub.
 - [3] A maximum of fifty percent (50%) of the shade trees may be replaced with ornamental trees at a rate of two (2) ornamental trees per shade tree.
 - [4] For each one hundred (100) feet of basin perimeter, the following plant quantities shall be provided:
 - [a] Three (3) shade trees
 - [b] Five (5) evergreen trees

- [c] A minimum of twenty (20) shrubs located within a minimum of two (2) shrub clusters
 - [5] If the basin design requirements outlined in the general stormwater basin design requirements are implemented to the satisfaction of the reviewing engineer, planting quantities per one hundred (100) feet of basin perimeter may be reduced at the discretion of the Board in accordance with the following recommendations:
 - [a] One (1) shade tree
 - [b] A minimum of fifteen (15) shrubs
 - [6] Establishment of attractive landscaping in and around the basin that mimics the existing vegetation and incorporates native Pinelands plants, including, but not limited to, species listed in N.J.A.C. 7:50-6.25 and 6.26.
- (b) Planting sizes:
- [1] Plant material for stormwater basins shall be the following minimum sizes at time of planting:
 - [a] Shade trees Minimum 2.5" caliper
 - [b] Evergreen trees Minimum 6'-8' height
 - [c] Ornamental trees Minimum 1.5" caliper
 - [d] Shrubs Minimum 18" to 24" for small shrubs
 Minimum 30" to 36" for large shrubs
 - [e] Ornamental grasses Minimum 12" to 18"
- (c) Planting design:
- [1] Basin shrub plantings shall be planted in groups containing a minimum of three (3) to twelve (12) shrubs within the same planting bed.
 - [2] No planting shall be located within twenty (20) feet of low-flow channels.
 - [3] Basin plantings shall be located on the tops and side slopes of proposed berms.
 - [4] When fences are required, shade trees shall be planted both outside of and inside of the proposed fence. Trees planted within a basin shall be wet-tolerant species.
 - [5] 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. The 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 reassured from the bottom of the K5 sand layer.

- [6] Basins need not be completely screened from view; however, basin headwalls and other structures shall be screened using evergreen species.
- [7] To calculate the amount of plant material required, the length of the perimeter of a basin shall be measured along the top of the berm surrounding the basin.
- [8] Where fencing is required, planting beds shall be placed along the fence to reduce maintenance of grass at the base of the fence.

(d) Fencing requirements:

- [1] Where fences are required, they shall be installed to follow the general configuration of the basin. Rectilinear fence alignments shall be avoided.
 - [2] Fences shall be vinyl post and rail with black or brown wire mesh. The color shall be tan or cedar (wood-grain look). Three rail wood fences may be substituted for vinyl fences at the discretion of the Board.
 - [3] Fences shall be four (4) feet in height.
 - [4] When at the discretion of the Township, considerations for public safety dictate special design features, a 6-foot chain link fence may be required.
- I. 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.
 - J. 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 chapter and/or any reasons of public health or safety, shall be completed by the applicant. In lieu of review by the Municipal Engineer, Winslow Township reserves the right to engage a professional engineer to review the as-built plans. The applicant shall pay all costs associated with such review.

§ 297-21. Design and construction standards for stormwater infiltration BMPs.

- A. Stormwater infiltration BMPs, such as bioretention systems with infiltration, dry wells, infiltration basins, pervious paving systems with storage beds, and sand filters with infiltration, shall be designed, constructed and maintained to completely drain the total runoff volume generated by the basin's maximum design storm

within seventy-two (72) hours after a storm event. Runoff storage for greater times can render the BMP ineffective and may result in anaerobic conditions, odor and both water quality and mosquito breeding problems.

- B. 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.
- C. For all developments proposed in the Pinelands portion of the municipality only, 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 (1) of the following conditions:
 - (1) 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
 - (2) 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.
 - (3) In the event groundwater is experienced prior to reaching the greater of eight (8) feet below the bottom of the proposed infiltration BMP, or a depth which is two (2) times the maximum potential water depth in the proposed infiltration BMP, the Applicant has the option of redesigning or relocating the basin. Any redesign or relocation of a basin will require continuing compliance with the soil test pit requirements. **[Added 6-23-09 by Ord. No. O-2009-017]**
- D. 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 Subsection A. above. The maximum design permeability shall be ten (10) inches per hour.
- E. A soil's field-tested permeability rate shall be determined in accordance with the following:
 - (1) The predevelopment field test permeability rate shall be determined according to the methodologies provided in Article XI, Section 297-37C of this chapter;

- (2) The results of the required field permeability tests shall demonstrate a minimum tested infiltration rate of one (1) inch per hour;
 - (3) 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 Article XI, Section 297-37C of this chapter;
 - (4) If the results of the post-development field permeability tests fail to achieve the minimum required design permeability rates in Subsection E. above utilizing a factor of safety of two (2), the stormwater infiltration BMP shall be renovated and retested until such minimum required design permeability rates are achieved; and
 - (5) The results of all field permeability tests shall be certified by a professional engineer and transmitted to the Municipal Engineer.
- F. 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.
- G. 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.
- H. The design engineer shall conduct a mounding analysis, as defined in Article VII, of all stormwater infiltration BMPs. The mounding analysis shall be conducted in accordance with the requirements in Article XI, Section 297-37C(12). Where the mounding analysis identifies adverse impacts, the stormwater infiltration BMP shall be redesigned or relocated, as appropriate.
- I. Stormwater infiltration BMPs shall be constructed in accordance with the following:
- (1) 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:
 - (a) Unless the conditions in paragraph (b) below are met, a stormwater BMP shall not be placed into operation until its drainage area is completely stabilized. Instead, upstream runoff shall be diverted around the BMP 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.

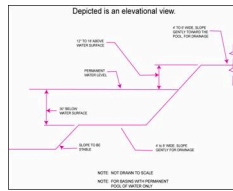
- (b) If the design engineer determines that, for engineering, environmental or safety reasons, temporary stormwater management facilities and sediment basins cannot be constructed on the site, the stormwater infiltration basin may be placed into operation prior to the complete stabilization of its drainage 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 Article 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 Article and the performance standards in Article IV.
- (2) To avoid compaction of subgrade soils of BMPs that rely on infiltration, no heavy equipment such as backhoes, dump trucks or bulldozers shall be permitted to operate within the footprint of the BMP. All excavation required to construct a storm-water 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 Section 297-21E of this Article.
- (3) 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.

§ 297-22. Safety standards for structural stormwater management measures.

- A. If a structural stormwater management measure has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide readily accessible means of ingress and egress from the outlet structure.
- B. A trash rack is a device intended to intercept runoff-borne trash and debris that might otherwise block the hydraulic openings in an outlet structure of a structural stormwater management measure. Trash racks shall be installed upstream of such outlet structure openings as necessary to ensure proper functioning of the structural stormwater management measure in accordance with the following:
 - (1) The trash rack should be constructed primarily of bars aligned in the direction of flow with one (1) inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the bars shall be spaced no greater than one-third (1/3) the width of the hydraulic opening it is protecting or six (6) inches, whichever is less. Transverse bars aligned perpendicular to flow should be sized and spaced as

necessary for rack stability and strength.

- (2) The trash rack shall not adversely affect the hydraulic performance of either the outlet structure opening it is protecting or the overall outlet structure.
 - (3) The trash rack shall have sufficient net open area under clean conditions to limit the peak design storm velocity through it to a maximum of two and one-half (2.5) feet per second.
 - (4) 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 three hundred (300) pounds per square foot.
- C. An overflow grate is a device intended to protect the opening in the top of a stormwater management measure outlet structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:
- (1) The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance;
 - (2) The overflow grate spacing shall be no more than two (2) inches across the smallest dimension; and
 - (3) The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of three hundred (300) pounds per square foot.
- D. The maximum side slope for an earthen dam, embankment, or berm shall not be steeper than three (3) horizontal to one (1) vertical (3:1).
- E. Safety ledges shall be constructed on the slopes of all new structural stormwater management measures having a permanent pool of water deeper than two and one-half (2 1/2) feet. Such safety ledges shall be comprised of two (2) steps. Each step shall be four (4) to six (6) feet in width. One (1) step shall be located approximately two and one-half (2 1/2) feet below the permanent water surface, and the second step shall be located one (1) to one and one-half (1 1/2) feet above the permanent water surface. See paragraph (1) below, for an illustration of safety ledges in a stormwater management basin.
- (1) Illustration of safety ledges.



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

ARTICLE VI

Inspection, Maintenance and Repair of Stormwater Management Measures**§ 297-23. Applicability.**

Projects subject to review pursuant to Article I, Section 297-3 of this chapter shall comply with the requirements of Article VI, Sections 297-24 and 297-25 below.

§ 297-24. General inspection, maintenance and repair plan.

- A. The design engineer shall prepare an inspection, maintenance and repair plan for the stormwater management measures, including both structural and nonstructural measures incorporated into the design of a major development. This plan shall be submitted as part of the checklist requirements established in Article II, Section 297-8. Inspection and maintenance guidelines for stormwater management measures are available in the New Jersey BMP Manual.
- B. The inspection, maintenance and repair plan shall contain the following:
- (1) Accurate and comprehensive drawings of the site's stormwater management measures;
 - (2) Specific locations of each stormwater management measure identified by means of longitude and latitude as well as block and lot number;
 - (3) Specific preventative and corrective maintenance tasks and schedules for such tasks for each stormwater BMP;
 - (4) Cost estimates, including estimated cost of sediment, debris or trash removal; and
 - (5) 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.
- C. The person responsible for inspection, maintenance and repair identified under Article VI, Section 297-24B 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.
- D. If the inspection, maintenance and repair plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for inspection and maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management measure to such person under an applicable ordinance or regulation.
- E. If the person responsible for inspection, maintenance and repair identified under

Article VI, Section 297-24B above is not a public agency, the maintenance plan and any future revisions based on Article VI, Section 297-24F below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan shall be undertaken.

- F. The person responsible for inspection, maintenance and repair identified under Article VI, Section 297-24B above shall evaluate the effectiveness of the inspection, maintenance and repair plan at least once per year and update the plan and the deed as needed.
- G. The person responsible for inspection, maintenance and repair identified under Article VI, Section 297-24B above shall submit the updated inspection, maintenance and repair plan and the documentation required by Articles VI, Sections 297-24B and 297-24C above to Winslow Township once per year.
- H. The person responsible for inspection, maintenance and repair identified under Article VI, Section 297-24B above shall retain and make available, upon request by any public entity with administrative, health, environmental or safety authority over the site the inspection, maintenance and repair plan and the documentation required by Article VI, Sections 297-24B and 297-24C above.

§ 297-25. Responsibility for inspection, repair and maintenance.

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

§ 297-26. Preventative and corrective maintenance.

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

§ 297-27. Stormwater management measure easements.

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

§ 297-28. Public health nuisance or danger to public safety or public health.

In the event that the stormwater management measure becomes a public health nuisance or danger to public safety or public health, or if it is in need of maintenance or repair, Winslow Township shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or the Municipal Engineer's designee. Winslow Township, at its discretion, may extend

the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair within the allowable time, Winslow Township may immediately proceed to do so with its own forces and equipment and/or through contractors. The costs and expenses of such maintenance and repair by Winslow Township shall be entered on the tax roll as a special charge against the property and collected with any other taxes levied thereon for the year in which the maintenance and repair was performed.

§ 297-29. Requirements for inspection, maintenance and repair of stormwater BMPs that rely on infiltration.

If a stormwater infiltration BMP is incorporated into the design of a major development, the applicant shall include the following requirements in its inspection, maintenance and repair plan:

- 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 (4) 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 (2) 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.

§ 297-30. Maintenance guarantee.

- A. The applicant shall provide a maintenance guarantee in accordance with Chapter 232 and/or Chapter 246 as applicable, to ensure that all required stormwater management measures will be maintained in accordance with the specifications established herein. **[Amended 6-26-18 by Ord. No. O.2018-015]**
- B. Additionally, for those stormwater management measures that are to be inspected, maintained and repaired by a public agency, Winslow Township shall collect a prepaid fee from the applicant in the amount the township determines is needed to

provide long-term inspection, maintenance and repair of all stormwater management measures.

This prepaid fee shall be placed in a dedicated cash management account and expended by Winslow Township for the sole purpose of conducting inspection, maintenance and repair activities for all stormwater management measures required under the applicant's major development application approval. The calculation of the fee shall be based upon the inspection, maintenance and repair plan (plan) required to be prepared by the applicant and approved by Winslow Township.

The plan shall include an estimate of the present value of the cost to inspect, maintain and repair the stormwater management measure(s) in accordance with the plan for the useful life of those measure(s). Winslow Township shall furnish the applicant their published hourly rates as prescribed by their salary ordinance for public works and other personnel having responsibilities associated with stormwater management.

Added to this fee shall be an amount mutually determined by Winslow Township and the applicant to account for the reconstructing/reconditioning of stormwater management measures that are based on the reasonable life expectancies of those facilities. After an agreed number of years, depending on the type of measure(s), the measure(s) will need to be reconstructed/ reconditioned. The amount shall be based on the future value of the measure(s) being reconstructed/ reconditioned.

Both inflation rates and bank interest rates shall be based on the ten (10) year average published in the Wall Street Journal or other approved publication. Interest accruing in the account must also be accounted for at an agreed upon interest rate, to arrive at an amount. The costs for reconstruction/reconditioning the measure(s) shall be taken from the engineer's probable cost estimate that is utilized to determine the amount of the required performance guarantee. It is acceptable to attach a percentage of failure to certain line items in the estimate.

- C. Additionally, for those stormwater management measures that are to be inspected, maintained and repaired by a homeowners' association, condominium association or some other form of nonpublic ownership, no fee shall be collected by Winslow Township. Instead, the ownership entity shall establish and maintain a fund for the annual inspection and testing program, annual maintenance and repair program and annual contribution to a contingency fund for long-term reconstruction/reconditioning.

The initial costs agreed to for the annual inspection and testing program and annual maintenance and repair program shall be based upon actual itemized proposals offered to the applicant by prospective vendors. The annual cost expended on inspection, testing and maintenance shall be reported to Winslow Township to verify that maintenance is not being deferred and to inform the township on the magnitude of those services.

The contingency fund shall require sufficient funds to be committed for long-term reconstruction/reconditioning of the stormwater management measure(s). Major reconstruction/reconditioning activities will necessitate proper financial planning. After an agreed number of years, depending on the type of measure(s), the measure(s) will need to be reconstructed/reconditioned. The contingency fund in

the financial schedule shall be based on the future value of the measure being reconstructed/reconditioned.

Both inflation rates and bank interest rates shall be based on the ten (10) year average published in the Wall Street Journal or other approved publication. Interest accruing in the account must also be accounted for at an agreed upon interest rate, to arrive at an annual contribution amount.

ARTICLE VII
Definitions

§ 297-31. Words defined.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application. When used in this chapter, the following terms shall have the meanings herein ascribed to them.

WINSLOW TOWNSHIP — The Planning Board, Zoning Board of Adjustment or other board, agency or official of Winslow Township with authority to approve or disapprove subdivisions, site plans, construction permits, building permits or other applications for development approval. For the purposes of reviewing development applications and ensuring compliance with the requirements of this chapter, Winslow Township may designate the Municipal Engineer or other qualified designee to act on behalf of Winslow Township.

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

CERTIFICATION — 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 used, the terms "certify" and "certified" shall be construed accordingly.

COMPACTION — The increase in soil bulk density caused by subjecting soil to greater-than-normal loading. Compaction can also decrease soil infiltration and permeability rates.

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

COUNTY REVIEW AGENCY — An agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

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

DESIGN ENGINEER — 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 — The tested permeability rate with a factor of safety of two (2) applied to it (e.g., if the tested permeability rate of the soil is four (4) inches per hour, the design rate would be two (2) inches per hour).

DEVELOPMENT — 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 (2) or more parcels, and the creation or termination of rights of access or riparian rights including, but not limited to:

- A. A change in type of use of a structure or land;
- B. A reconstruction, alteration of the size, or material change in the external appearance of a structure or land;
- C. 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;
- D. Commencement of resource extraction or drilling or excavation on a parcel of land;
- E. Demolition of a structure or removal of trees;
- F. Commencement of forestry activities;
- G. Deposit of refuse, solid or liquid waste or fill on a parcel of land;
- H. In connection with the use of land, the making of any material change in noise levels, thermal conditions, or emissions of waste material; and
- I. Alteration, either physically or chemically, of a shore, bank, or flood plain, seacoast, river, stream, lake, pond, wetlands or artificial body of water.

In the case of development on agricultural land, i.e. lands used for an agricultural use or purpose as defined at N.J.A.C. 7:50-2.11, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Boards (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A. 4:1C-1 et seq.

DEVELOPMENT, MAJOR — Any division of land into five (5) or more lots; any construction or expansion of any housing development of five (5) or more dwelling units; any construction or expansion of any commercial or industrial use or structure on a site of more than three (3) acres; or any "development," grading, clearing or disturbance of an area in excess of five thousand (5,000) square feet. Disturbance for the purpose of this chapter is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting or removing of vegetation.

DEVELOPMENT, MINOR — All development other than major development.

DRAINAGE AREA — A geographic area within which stormwater, sediments, or dissolved materials drain to a BMP, a stormwater management system, a particular receiving waterbody or a particular point along a receiving waterbody.

ENVIRONMENTALLY CRITICAL AREA — An area or feature which is of significant environmental value, including but not limited to: stream corridors; natural

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

EXCEPTION — 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 chapter. 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 — 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 — The elevation of the surface of the ground after completion of final grading, either via cutting, filling or a combination thereof.

GRADING — 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 — Water below the land surface in a zone of saturation.

GROUNDWATER MOUNDING ANALYSIS — 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 — Equipment, machinery, or vehicles that exert ground pressure in excess of eight (8) pounds per square inch.

HIGH POLLUTANT LOADING AREA — 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 — A surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

INFILTRATION — The process by which precipitation enters the soil through its surface.

IN LIEU CONTRIBUTION — A monetary fee collected by Winslow Township in lieu of requiring strict on-site compliance with the groundwater recharge, stormwater runoff quantity and/or stormwater runoff quality standards established in this chapter.

INSTALL — To assemble, construct, put in place or connect components of a stormwater management system.

MITIGATION — 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 Winslow Township and the Pinelands Commission.

NEW JERSEY STORMWATER BEST MANAGEMENT PRACTICES MANUAL — 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 — The New Jersey Department of Environmental Protection.

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

NONPOINT SOURCE —

- A. Any human-made or human-induced activity, factor, or condition, other than a point source, from which pollutants are or may be discharged;
- B. 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
- C. 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 — 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 — A chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

PERMEABILITY — The rate at which water moves through a saturated unit area of soil or rock material at hydraulic gradient of one (1), 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 chapter.

PERMEABLE — 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 — 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 CMP — The New Jersey Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-1.1 et seq.).

PINELANDS COMMISSION OR COMMISSION — The Commission created pursuant Section 5 of the Pinelands Protection Act, N.J.S.A. 13:18A-5.

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

PROFESSIONAL ENGINEER — 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 — The amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

REPLICATE — One (1) of two (2) or more soil samples or tests taken at the same location (within five (5) 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 — 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 eighty-five percent (85%) or more of sand and a content of silt and clay such that the percentage of silt plus one and one-half (1.5) times the percentage of clay does not exceed fifteen (15), as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

SEASONALLY HIGH WATER TABLE — 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 — 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 — The lot or lots upon which a major development is to occur or has occurred.

SOIL — All unconsolidated mineral and organic material of any origin which is not a rock substratum, including sediments below the biologically active and/or weathered zones.

SOURCE MATERIAL — 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.

STORMWATER — Water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.

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

STORMWATER MANAGEMENT MEASURE — 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 nonstormwater discharges into stormwater conveyances. This includes, but is not limited

to, structural and nonstructural stormwater Best Management Practices described in the New Jersey BMP Manual and designed to meet the standards for stormwater control contained within this chapter. The terms "stormwater Best Management Practice" and "stormwater BMP" shall have the same meaning as "stormwater management measure."

STORMWATER RUNOFF — Water flow on the surface of the ground or in storm sewers, resulting from precipitation.

SUITABLE SOIL — 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 — Any waters of the State which are not groundwater.

TIDAL FLOOD HAZARD AREA — 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 — 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 — 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."

WATERS OF THE STATE — The ocean and its estuaries, all springs, streams and bodies of surface and groundwater, whether natural or artificial, within the boundaries of New Jersey or subject to its jurisdiction.

WATER TABLE — The upper surface of a zone of saturation.

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

WET POND — 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."

ARTICLE VIII
Penalties

§ 297-32. Fines and penalties.

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this chapter shall be subject to a fine of not less than one hundred dollars (\$100.) but not more than one thousand dollars (\$1,000.) and/or sentencing to a period of not more than ninety (90) days in jail. Every continuous day that a violation takes place shall be considered a separate occurrence.

ARTICLE IX
Effective Date

§ 297-33. Date effective.

This chapter shall take effect immediately upon the following:

- A. Certification by the Pinelands Commission in accordance with N.J.A.C. 7:50 Subchapter 3; and
- B. Approval by the county review agency in accordance with N.J.S.A. 40:55D-97.

ARTICLE X
Severability

§ 297-34. Severability.

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

ARTICLE XI
Appendices

§ 297-35. Methods for calculating groundwater recharge.

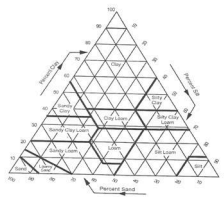
- A. The New Jersey Geological Survey Report GSR-32: A Method for Evaluating Groundwater Recharge Areas in New Jersey. Available at <http://www.njgeology.org/geodata/dgs99-2.htm>.
- B. The New Jersey Groundwater Recharge Spreadsheet (NJGRS). Available in the New Jersey BMP Manual, Chapter 6, at <http://www.njstormwater.org/bmp-manual2.htm>.

§ 297-36. NJDEP Nonstructural Strategies Point System.

The New Jersey Stormwater Management Rules at N.J.A.C. 7:8-5.2(a), and Article IV, Section 297-12 of this chapter, require nonstructural stormwater management strategies to be incorporated into the site design of a major development. A total of nine (9) strategies are to be used to the maximum extent practical to meet the groundwater recharge, stormwater quality and stormwater quantity requirements of the rules prior to utilizing structural stormwater management measures. The New Jersey Nonstructural Stormwater Management Strategies Point System (NSPS) provides a tool to assist planners, designers and regulators in determining that the strategies have been used to the "maximum extent practical" at a major development as required by the rules. Refer online to <http://www.njstormwater.org> for information on the NSPS.

§ 297-37. Soils.

- A. USDA Soil Textural Triangle.



Source: US Department of Agriculture.

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

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

ARTESIAN ZONE OF SATURATION — A zone of saturation which exists immediately below a hydraulically restrictive horizon, and which has an upper surface which is at a pressure greater than atmospheric, either seasonally or throughout the year.

CHROMA — The relative purity or strength of a color, a quantity which decreases with increasing grayness. Chroma is one (1) of the three (3) variables of soil color as defined in the Munsell system of classification.

CLAY — A particle size category consisting of mineral particles which are smaller] than 0.002 millimeter in equivalent spherical diameter. Also, a soil textural class having more than forty percent (40%) clay, less than forty-five percent (45%) sand, and less than forty percent (40%) silt, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

CLAY LOAM — A soil textural class having twenty-seven to forty percent (27%—40%) clay and twenty to forty-five percent (20%—45%) sand, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

COARSE FRAGMENT — A rock fragment contained within the soil which is greater than two (2) millimeters in equivalent spherical diameter or which is retained on a two (2) millimeter sieve.

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

DIRECT SUPERVISION — Control over and direction of work carried out by others with full knowledge of and responsibility for such work.

EQUIVALENT SPHERICAL DIAMETER OF A PARTICLE — The diameter of a sphere which has a volume equal to the volume of the particle.

EXCESSIVELY COARSE HORIZON — A horizon of limited thickness within the soil profile which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

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

EXTREMELY FIRM CONSISTENCE — A type of soil material whose moist aggregated mass crushes only under very strong pressure; cannot be crushed between the thumb and forefinger and shall be broken apart bit by bit.

FIRM CONSISTENCE — A type of soil material whose moist aggregated mass crushes under moderate pressure between the thumb and forefinger but resistance is distinctly noticeable.

HARD CONSISTENCE — A type of soil material whose dry aggregated mass is moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between the thumb and forefinger.

HUE — The dominant spectral color, one (1) of the three (3) variables of soil color defined within the Munsell system of classification.

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

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

LOAMY SAND — A soil textural class, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle), that has a maximum of eighty-five to ninety percent (85%-90%) sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of fifteen (15); or a minimum of seventy to eighty-five percent (70%-85%) sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of thirty (30).

LOWER PLASTIC LIMIT — The moisture content corresponding to the transition between the plastic and semi-solid states of soil consistency. This corresponds to the lowest soil moisture content at which the soil can be molded in the fingers to form a rod or wire, one-eighth (1/8) inch in thickness, without crumbling.

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

MUNSELL SYSTEM — A system of classifying soil color consisting of an alphanumeric designation for hue, value and chroma, such as "7.5 YR 6/2," together with a descriptive color name, such as "strong brown."

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

PERCHED ZONE OF SATURATION — A zone of saturation which occurs immediately above a hydraulically restrictive horizon and which is underlain by permeable horizons or substrata which are not permanently or seasonally saturated.

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

PLATY STRUCTURE — Characterized by a soil aggregate which has one (1) axis distinctly shorter than the other two (2) and are oriented with the short axis vertical.

REGIONAL ZONE OF SATURATION — A zone of saturation which extends vertically without interruption below the depth of soil borings and profile pits.

SANDY CLAY — A soil textural class having thirty-five percent (35%) or more of clay and forty-five percent (45%) or more of sand, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

SANDY LOAM — A soil textural class, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle), that has a maximum of twenty percent (20%) clay, and the percentage of silt plus twice the percentage of clay exceeds thirty (30), and contains fifty-two percent (52%) or more sand; or less than seven percent (7%) clay, less than fifty percent (50%) silt, and between forty-three and fifty-two percent (43%-52%) sand.

SILT — A particle size category consisting of mineral particles which are between 0.002 and 0.05 millimeters in equivalent spherical diameter. It also means a soil textural class having eighty percent (80%) or more of silt and twelve percent (12%) or less of clay, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

SILT LOAM — A soil textural class having fifty percent (50%) or more of silt and twelve to twenty-seven percent (12%-27%) of clay; or fifty to eighty percent (50%-80%) of silt and less than twelve percent (12%) of clay, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

SILTY CLAY — A soil textural class having forty percent (40%) or more of clay and forty percent (40%) or more of silt, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

SILTY CLAY LOAM — A soil textural class having twenty-seven to forty percent (27%-40%) of clay and less than twenty percent (20%) of sand, as shown in Article XI, Section 297-37A (USDA Soil Textural Triangle).

SOIL AGGREGATE — A naturally occurring unit of soil structure consisting of particles of sand, silt, clay, organic matter, and coarse fragments held together by the natural cohesion of the soil.

SOIL COLOR — The soil color name and Munsell color designation determined by comparison of the moist soil with color chips contained in a Munsell soil color book.

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

SOIL HORIZON — A layer within a soil profile differing from layers of soil above and below it in one (1) or more of the soil morphological characteristics including color, texture, coarse fragment content, structure, consistence and mottling.

SOIL LOG — A description of the soil profile which includes the depth, thickness, color, texture, coarse fragment content, mottling, structure and consistence of each soil horizon or substratum.

SOIL MAPPING UNIT — An area outlined on a map in a County Soil Survey Report and marked with a letter symbol designating a soil phase, a complex of two (2) or more soil phases, or some other descriptive term where no soil type has been identified.

SOIL PHASE — A specific type of soil which is mapped by the Natural Resources

Conservation Service and which belongs to a soil series described within the County Soil Survey Report.

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

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

SOIL STRUCTURAL CLASS — One (1) of the shape classes of soil structure described in N.J.A.C. 7:9A-5.3(g).

SOIL STRUCTURE — The naturally occurring arrangement, within a soil horizon, of sand, silt and clay particles, coarse fragments and organic matter, which are held together in clusters or aggregates of similar shape and size.

SOIL TEST PIT — An excavation made for the purpose of exposing a soil profile which is to be described.

SOIL TEXTURAL CLASS — One (1) of the classes of soil texture defined within the USDA system of classification. (Soil Survey Manual, Agricultural Handbook No. 18, USDA Soil Conservation Service 1962.)

SOIL TEXTURE — The relative proportions of sand, silt and clay in that portion of the soil which passes through a sieve with two (2) millimeter openings.

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

SUBSTRATUM — A layer of soil or rock material present below the soil profile and extending beyond the depth of soil borings or profile pits.

UNSUITABLE SOIL — All soil other than suitable soil.

USDA SYSTEM OF CLASSIFICATION — The system of classifying soil texture used by the United States Department of Agriculture which defines twelve (12) soil textural classes based upon the weight percentages of sand, silt and clay in that portion of the soil which passes through a sieve with two (2) millimeter openings. The soil textural classes are shown graphically on the USDA Soil Textural Triangle, as shown in Article XI, Section 297-37A.

VALUE — The relative lightness or intensity of a color, one (1) of the three (3) variables of soil color defined within the Munsell system of classification.

VERY FIRM CONSISTENCE — Characterized by a moist soil which crushes under strong pressure; barely crushable between thumb and forefinger.

VERY HARD CONSISTENCE — Characterized by a dry soil which is resistant to pressure, can be broken in the hands only with difficulty; not breakable between the thumb and forefinger.

ZONE OF SATURATION — A layer within or below the soil profile which is saturated with groundwater either seasonally or throughout the year. This includes both regional and perched zones.

C. 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: **[Amended 11-20-07 by Ord. No. 0-40-07]**

- (1) All soil test pits and soil permeability results shall be performed under the direct supervision of the applicant's professional engineer and in addition be witnessed by the Municipal Engineer. All soil logs and permeability test data shall be accompanied by a certification by the applicant's 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 Winslow Township.
- (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.

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.

In the event groundwater is experienced prior to reaching the minimum depth of eight (8) feet, the test shall terminate. At that point, the Township Engineer shall determine if the proposed depth of the basin is at least two (2) feet above ground water. For example, a basin with a five (5) foot depth which experiences ground water at seven (7) feet. In such a case, the Township Engineer has the discretion to approve the test pit. In all other cases where the ground water is experienced prior to the minimum required eight (8) feet, the applicant has the option of redesigning the basin, relocating the basin or proposing to convert it to wet basin. Any redesign or relocation of a basin will require continuing compliance with the test pit requirements. **[Amended 9-23-08 by Ord. No. 0-33-08]**

- (4) 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.
- (5) 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.
- (6) 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 (1) foot thick zone of unsaturated soil, free of mottling or other redoximorphic features and possessing a chroma of four (4) or higher, exists immediately below the unsuitable soil.
- (7) 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 (2) 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 chapter.

- (8) 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 one hundred percent (100%) safety factor to the tested rate.
- (9) 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.
- (10) 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 (1) 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.
- (11) A groundwater mounding analysis shall be provided for each stormwater infiltration BMP. The groundwater mounding analysis shall calculate the maximum height of the groundwater mound based upon the volume of the maximum design storm. The applicant's professional engineer conducting the analysis shall provide the Municipal Engineer with the methodology and supporting documentation for the mounding analysis used and shall certify to Winslow Township, based upon the analysis, that the groundwater mound will not cause stormwater or groundwater to break out to the land surface or cause

adverse impact to adjacent surface water bodies, wetlands or subsurface structures including but not limited to basements and septic systems. If there is more than one (1) infiltration BMP proposed, the model shall indicate if and how the mounds will interact. The mounding analysis shall be calculated using the most restrictive soil horizon that will remain in place within the explored aquifer thickness unless alternative analyses is authorized by the Municipal Engineer. The mounding analysis shall be accompanied by a cross section of the infiltration BMP and surrounding topography and the mound analysis shall extend out to the point(s) at which the mound intersects with the preexisting maximum water table elevation.

- (12) The applicant shall demonstrate that stormwater infiltration BMPs meet the seventy-two (72) hour drain time requirement established in Article V, Section 297-21A of this chapter.
 - (13) Except as expressly noted within this document, all required soil tests shall be submitted with the applicant's land development application to the township. Such tests shall not be deferred until time of construction as this information is considered to be essential to evaluating the design of the stormwater management facility(s).
 - (14) In addition to any other development review escrow that may be required, the applicant shall pay an escrow fee of two thousand five hundred dollars (\$2,500.) in connection with its application for the purposes of the Municipal Engineer's review and approval of the soil testing under this section.
- D. Prior to the performance of any soil testing, and at the time of the payment of the soil test application fee, the applicant's professional engineer shall submit a letter identifying the type of design and type of test pit to be done and the depth of the test pit in accordance with the township's requirements, together with a concept plan with height elevations. **[Added 9-23-08 by Ord. No. 0-33-08]**

§ 297-38. Pretreatment measures for infiltration BMPs.

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

- A. Vegetative filter strips;
- B. Bioretention systems. Used in conjunction with a bioretention system, the infiltration basin takes the place of the standard underdrain;
- C. Sand filters;
- D. Grassed swales; and
- E. Detention basins.

§ 297-39. Collection and conveyance.

- A. Bicycle-safe inlet grates. Site development plans that incorporate site design features that help to prevent discharge of trash and debris from drainage systems shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids.
- (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) square inches, or is no greater than one-half (0.5) inch across the smallest dimension. Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
 - (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 (2) or more clear spaces) shall have an area of no more than seven (7) square inches, or be no greater than two (2) inches across the smallest dimension.
 - (3) This standard does not apply:
 - (a) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practically be overcome by using additional or larger storm drain inlets that meet these standards;
 - (b) Where flows from the water quality design storm as specified in Article III are conveyed through any device (e.g., end-of-pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one (1) of the following:
 - [1] A rectangular space four and five-eighths (4 5/8) inches long and one and one-half (1.5) inches wide (this option does not apply for outfall netting facilities); or
 - [2] A bar screen having a bar spacing of one-half (0.5) inch.
 - (c) Where flows are conveyed through a trash rack that has parallel bars with one (1) inch spacing between the bars, to the elevation of the water quality design storm as specified in Article III of this chapter; or

- (d) Where the NJDEP determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.
- B. Catch basins. Catch basins are storm drain inlets with or without sumps. Catch basins may provide pretreatment for other stormwater BMPs by capturing large sediments. The sediment and pollutant removal efficiency of catch basins depends on the size of the sump and the performance of routine maintenance to retain the available sediment storage space in the sump. Where catch basins with sumps are proposed, the minimum two (2) feet separation between the bottom of the sump and seasonally high water table shall be provided.
- C. Open or perforated conveyance piping. Where adequate separation to the seasonal high water table exists, stormwater from the development site may be conveyed to a stormwater basin via a system of perforated pipes. These pipes may be made of PVC or corrugated metal and are available with perforations of varying size and spacing. Perforated pipe specifications shall be certified by a professional engineer. A professional engineer shall certify that perforated conveyance piping will not act to intercept the seasonal high water table and convey groundwater to the stormwater basin. All open or perforated stormwater conveyance systems shall be installed with a minimum separation of two (2) feet from the seasonal high water table.

ARTICLE XII
Additional Sources for Technical Guidance

§ 297-40. NJDEP Technical Guidance Sources.

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

§ 297-41. Additional Guidance Sources.

- A. New Jersey Pinelands Commission, PO Box 7, 15 Springfield Road, New Lisbon, New Jersey, 08064; Phone: 609-894-7300; Website: <http://www.state.nj.us/pinelands>.
- B. State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey. Available from all State Soil Conservation Districts [including Camden County Soil Conservation District, 423 Commerce Lane, Suite 1, West Berlin, NJ, 08091; Phone: 856-767-6299; Fax: 856-767-1676; Website: <http://www.camdenscd.org>.]
- C. Camden County Soil Conservation District.
- D. New Jersey Department of Transportation, PO Box 600, Trenton, NJ 08625-0600; Phone: 609-530-3536; Website: <http://www.state.nj.us/transportation>.

ARTICLE XIII
Stormwater Management⁵
[Added 3-9-2021 by Ord. No. O-2021-007]

§ 297-42. Scope and purpose.

- A. Policy statement. Flood control, groundwater recharge, and pollutant reduction shall be achieved through the use of stormwater management measures, including green infrastructure Best Management Practices (GI BMPs) and nonstructural stormwater management strategies. GI BMPs and low impact development (LID) should be utilized to meet the goal of maintaining natural hydrology to reduce stormwater runoff volume, reduce erosion, encourage infiltration and groundwater recharge, and reduce pollution. GI BMPs and LID 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. The purpose of this article is to establish minimum stormwater management requirements and controls for "major development," as defined below in Section 297-43.
- C. Applicability.
- (1) This article shall be applicable to the following major developments:
 - (a) Non-residential major developments; and
 - (b) Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.
 - (2) This article shall also be applicable to all major developments undertaken by Township of Winslow.
 - (3) The provisions of this article shall supersede any contradictory provisions of Chapter 297, Articles I through XII.
 - (4) This article shall not apply to any portion(s) of the Township of Winslow which are located within the New Jersey Pinelands Area.
- D. Compatibility with other permit and ordinance requirements. Development approvals issued pursuant to this article are to be considered an integral part of development approvals 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 article shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This article 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 article imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other

5. Editor's Note: See also Articles I through XII.

provision of law, the more restrictive provisions or higher standards shall control.

§ 297-43. Definitions.

For the purpose of this article, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this article clearly demonstrates a different meaning. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

CAFRA CENTERS, CORES OR NODES — Those areas with boundaries incorporated by reference or revised by the Department in accordance with N.J.A.C. 7:7-13.16.

CAFRA PLANNING MAP — The map used by the Department to identify the location of Coastal Planning Areas, CAFRA centers, CAFRA cores, and CAFRA nodes. The CAFRA Planning Map is available on the Department's Geographic Information System (GIS).

COMMUNITY BASIN — An infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond, established in accordance with N.J.A.C. 7:8-4.2(c)14, that is designed and constructed in accordance with the New Jersey Stormwater Best Management Practices Manual, or an alternate design, approved in accordance with N.J.A.C. 7:8-5.2(g), for an infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond and that complies with the requirements of this article.

COMPACTION — The increase in soil bulk density.

CONTRIBUTORY DRAINAGE AREA — The area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself.

CORE — A pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

COUNTY REVIEW AGENCY — An agency designated by the County Commissioners to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

- A. A county planning agency; or
- B. 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 — The Department of Environmental Protection.

DESIGN ENGINEER — 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.

DESIGNATED CENTER — A State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

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

DISTURBANCE — The placement or reconstruction of impervious surface or motor vehicle surface, or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation. Milling and repaving is not considered disturbance for the purposes of this definition.

DRAINAGE AREA — 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.

EMPOWERMENT NEIGHBORHOODS — Neighborhoods 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.

ENVIRONMENTALLY CONSTRAINED AREA — The following areas where the physical alteration of the land is in some way restricted, either through regulation, easement, deed restriction or ownership such as: wetlands, floodplains, threatened and endangered species sites or designated habitats, and parks and preserves. 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.

ENVIRONMENTALLY CRITICAL AREA — An area or feature which is of significant environmental value, including but not limited to: stream corridors, natural heritage priority sites, habitats 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.

EROSION — The detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

GREEN INFRASTRUCTURE — A stormwater management measure that manages stormwater close to its source by:

- A. Treating stormwater runoff through infiltration into subsoil;
- B. Treating stormwater runoff through filtration by vegetation or soil; or
- C. Storing stormwater runoff for reuse.

HUC 14 or HYDROLOGIC UNIT CODE 14 — An area within which water drains

to a particular receiving surface water body, also known as a subwatershed, which is identified by a 14-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey.

IMPERVIOUS SURFACE — A surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

INFILTRATION — The process by which water seeps into the soil from precipitation.

LEAD PLANNING AGENCY — One or more public entities having stormwater management planning authority designated by the regional stormwater management planning committee pursuant to N.J.A.C. 7:8-3.2, that serves as the primary representative of the committee.

MAJOR DEVELOPMENT — An individual "development," as well as multiple developments that individually or collectively result in:

- A. The disturbance of one or more acres of land since February 2, 2004;
- B. The creation of one-quarter acre or more of "regulated impervious surface" since February 2, 2004;
- C. The creation of one-quarter acre or more of "regulated motor vehicle surface" since March 2, 2021;
- D. A combination of Subsection B and C above that totals an area of one-quarter acre or more. The same surface shall not be counted twice when determining if the combination area equals one-quarter acre or more.

Major development includes all developments that are part of a common plan of development or sale (for example, phased residential development) that collectively or individually meet any one or more of Subsection A, B, C, or D above. Projects undertaken by any government agency that otherwise meet the definition of "major development" but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered "major development."

MOTOR VEHICLE — Land vehicles propelled other than by muscular power, such as automobiles, motorcycles, autocycles, and low speed vehicles. For the purposes of this definition, motor vehicle does not include farm equipment, snowmobiles, all-terrain vehicles, motorized wheelchairs, go-carts, gas buggies, golf carts, ski-slope grooming machines, or vehicles that run only on rails or tracks.

MOTOR VEHICLE SURFACE — Any pervious or impervious surface that is intended to be used by "motor vehicles" and/or aircraft, and is directly exposed to precipitation including, but not limited to, driveways, parking areas, parking garages, roads, racetracks, and runways.

MUNICIPALITY — Any city, borough, town, township, or village.

NEW JERSEY STORMWATER BEST MANAGEMENT PRACTICES (BMP) MANUAL or BMP MANUAL — The manual maintained by the Department providing, in part, design specifications, removal rates, calculation methods, and soil testing procedures approved by the Department as being capable of contributing to the achievement of the stormwater management standards specified in this article. The BMP

Manual is periodically amended by the Department as necessary to provide design specifications on additional best management practices and new information on already included practices reflecting the best available current information regarding the particular practice and the Department's determination as to the ability of that best management practice to contribute to compliance with the standards contained in this article. Alternative stormwater management measures, removal rates, or calculation methods may be utilized, subject to any limitations specified in this article, provided the design engineer demonstrates to the municipality, in accordance with Section 297-45F of this article and N.J.A.C. 7:8-5.2(g), that the proposed measure and its design will contribute to achievement of the design and performance standards established by this article.

NODE — An area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

NUTRIENT — A chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

PERSON — Any individual, corporation, company, partnership, firm, association, political subdivision of this State and any state, interstate or federal agency.

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

RECHARGE — The amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

REGULATED IMPERVIOUS SURFACE — Any of the following, alone or in combination:

- A. A net increase of impervious surface;
- B. The total area of impervious surface collected by a new stormwater conveyance system (for the purpose of this definition, a "new stormwater conveyance system" is a stormwater conveyance system that is constructed where one did not exist immediately prior to its construction or an existing system for which a new discharge location is created);
- C. The total area of impervious surface proposed to be newly collected by an existing stormwater conveyance system; and/or
- D. The total area of impervious surface collected by an existing stormwater conveyance system where the capacity of that conveyance system is increased.

REGULATED MOTOR VEHICLE SURFACE — Any of the following, alone or in combination:

- A. The total area of motor vehicle surface that is currently receiving water;

- B. A net increase in motor vehicle surface; and/or quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant, where the water quality treatment will be modified or removed.

SEDIMENT — 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 — The lot or lots upon which a major development is to occur or has occurred.

SOIL — All unconsolidated mineral and organic material of any origin.

STATE DEVELOPMENT AND REDEVELOPMENT PLAN METROPOLITAN PLANNING AREA (PA1) — 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 — 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 — 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 MANAGEMENT BMP — An excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management BMP may either be normally dry (that is, a detention basin or infiltration system), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

STORMWATER MANAGEMENT MEASURE — Any 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 MANAGEMENT PLANNING AGENCY — A public body authorized by legislation to prepare stormwater management plans.

STORMWATER MANAGEMENT PLANNING AREA — The geographic area for which a stormwater management planning agency is authorized to prepare stormwater management plans, or a specific portion of that area identified in a stormwater management plan prepared by that agency.

STORMWATER RUNOFF — Water flow on the surface of the ground or in storm sewers, resulting from precipitation.

TIDAL FLOOD HAZARD AREA — A flood hazard area in which the flood elevation resulting from the two-, ten-, or 100-year storm, as applicable, is governed by tidal flooding from the Atlantic Ocean. Flooding in a tidal flood hazard area may be contributed to, or influenced by, stormwater runoff from inland areas, but the depth of flooding generated by the tidal rise and fall of the Atlantic Ocean is greater than flooding from any fluvial sources. In some situations, depending upon the extent of the storm surge from a particular storm event, a flood hazard area may be tidal in the 100-year

storm, but fluvial in more frequent storm events.

URBAN COORDINATING COUNCIL EMPOWERMENT NEIGHBORHOOD — A neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

URBAN ENTERPRISE ZONES — 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 — Previously developed portions of areas:

- A. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
- B. Designated as CAFRA Centers, Cores or Nodes;
- C. Designated as Urban Enterprise Zones; and
- D. Designated as Urban Coordinating Council Empowerment Neighborhoods.

WATER CONTROL STRUCTURE — A structure within, or adjacent to, a water, which intentionally or coincidentally alters the hydraulic capacity, the flood elevation resulting from the two-, ten-, or 100-year storm, flood hazard area limit, and/or floodway limit of the water. Examples of a water control structure may include a bridge, culvert, dam, embankment, ford (if above grade), retaining wall, and weir.

WATERS OF THE STATE — The ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or groundwater, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

WETLANDS or WETLAND — 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.

§ 297-44. Design and performance standards for stormwater management measures.

- A. Stormwater management measures for major development shall be designed to provide erosion control, groundwater recharge, stormwater runoff quantity control, and stormwater runoff quality treatment as follows:
 - (1) The minimum standards for erosion control are those established under the Soil and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules at N.J.A.C. 2:90.
 - (2) The minimum standards for groundwater recharge, stormwater quality, and stormwater runoff quantity shall be met by incorporating green infrastructure.
- B. The standards in this article apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management

plan or Water Quality Management Plan adopted in accordance with Department rules.

§ 297-45. Stormwater management requirements for major development.

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 297-51.
- 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 muhlenbergii* (bog turtle).
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of Section 297-45P, Q and R:
 - (1) The construction of an underground utility line, provided that the disturbed areas are revegetated upon completion;
 - (2) The construction of an aboveground utility line, provided that the existing conditions are maintained to the maximum extent practicable; and
 - (3) The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance from the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of Section 297-45O, P, Q and R may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
 - (1) The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
 - (2) The applicant demonstrates through an alternatives analysis, that through the use of stormwater management measures, the option selected complies with the requirements of Section 297-45O, P, Q and R to the maximum extent practicable;
 - (3) The applicant demonstrates that, in order to meet the requirements of Section 297-45O, P, Q and R, 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 297-45D(3) above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Section 297-45O, P, Q and R that were not achievable onsite.

- E. Tables 1 through 3 below summarize the ability of stormwater best management practices identified and described in the New Jersey Stormwater Best Management Practices Manual to satisfy the green infrastructure, groundwater recharge, stormwater runoff quality and stormwater runoff quantity standards specified in Section 297-45O, P, Q and R. When designed in accordance with the most current version of the New Jersey Stormwater Best Management Practices Manual, the stormwater management measures found at N.J.A.C. 7:8-5.2(f) Tables 5-1, 5-2 and 5-3 and listed below in Tables 1, 2 and 3 are presumed to be capable of providing stormwater controls for the design and performance standards as outlined in the tables below. Upon amendments of the New Jersey Stormwater Best Management Practices to reflect additions or deletions of BMPs meeting these standards, or changes in the presumed performance of BMPs designed in accordance with the New Jersey Stormwater BMP Manual, the Department shall publish in the New Jersey Registers a notice of administrative change revising the applicable table. The most current version of the BMP Manual can be found on the Department's website at: https://njstormwater.org/bmp_manual2.htm.
- F. Where the BMP tables in the NJ Stormwater Management Rule are different due to updates or amendments with the tables in this article the BMP Tables in the Stormwater Management rule at N.J.A.C. 7:8-5.2(f) shall take precedence.

Table 1				
Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity				
Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Cistern	0	Yes	No	—
Dry well ^(a)	0	No	Yes	2
Grass swale	50 or less	No	No	2 ^(e) 1 ^(f)
Green roof	0	Yes	No	—
Manufactured treatment device ^{(a)(g)}	50 or 80	No	No	Dependent upon the device
Pervious paving system ^(a)	80	Yes	Yes ^(b) No ^(c)	2 ^(b) 1 ^(c)

Table 1
Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity

Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Small-scale bioretention basin ^(a)	80 or 90	Yes	Yes ^(b)	2 ^(b)
			No ^(c)	1 ^(c)
Small-scale infiltration basin ^(a)	80	Yes	Yes	2
Small-scale sand filter	80	Yes	Yes	2
Vegetative filter strip	60-80	No	No	—

(Notes corresponding to annotations ^(a) through ^(e) are after Table 3.)

Table 2
Green Infrastructure BMPs for Stormwater Runoff Quantity
(or for Groundwater Recharge and/or Stormwater Runoff Quality with a Waiver or Variance from N.J.A.C. 7:8-5.3)

Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Bioretention system	80 or 90	Yes	Yes ^(b)	2 ^(b)
			No ^(c)	1 ^(c)
Infiltration basin	80	Yes	Yes	2
Sand filter ^(b)	80	Yes	Yes	2

Table 2				
Green Infrastructure BMPs for Stormwater Runoff Quantity				
(or for Groundwater Recharge and/or Stormwater Runoff Quality with a Waiver or Variance from N.J.A.C. 7:8-5.3)				
Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Standard constructed wetland	90	Yes	No	N/A
Wet pond ^(d)	50-90	Yes	No	N/A

(Notes corresponding to annotations^(b) through ^(d) are found after Table 3.)

Table 3				
BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity				
only with a Waiver or Variance from N.J.A.C. 7:8-5.3				
Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Blue roof	0	Yes	No	N/A
Extended detention basin	40-60	Yes	No	1
Manufactured treatment device ^(h)	50 or 80	No	No	Dependent upon the device
Sand filter ^(c)	80	Yes	No	1
Subsurface gravel wetland	90	No	No	1
Wet pond	50-90	Yes	No	N/A

Notes to Tables 1, 2, and 3:

- (a) Subject to the applicable contributory drainage area limitation specified at Section 297-45O(2);
 - (b) Designed to infiltrate into the subsoil;
 - (c) Designed with underdrains;
 - (d) Designed to maintain at least a ten-foot wide area of native vegetation along at least 50% of the shoreline and to include a stormwater runoff retention component designed to capture stormwater runoff for beneficial reuse, such as irrigation;
 - (e) Designed with a slope of less than 2%;
 - (f) Designed with a slope of equal to or greater than 2%;
 - (g) Manufactured treatment devices that meet the definition of green infrastructure at Section 297-43;
 - (h) Manufactured treatment devices that do not meet the definition of green infrastructure at Section 297-43.
- G. An alternative stormwater management measure, alternative removal rate, and/or alternative method to calculate the removal rate may be used if the design engineer demonstrates the capability of the proposed alternative stormwater management measure and/or the validity of the alternative rate or method to the municipality. A copy of any approved alternative stormwater management measure, alternative removal rate, and/or alternative method to calculate the removal rate shall be provided to the Department in accordance with Section 297-47B. Alternative stormwater management measures may be used to satisfy the requirements at Section 297-45O only if the measures meet the definition of green infrastructure at Section 297-43. Alternative stormwater management measures that function in a similar manner to a BMP listed at Section 297-45O(2) are subject to the contributory drainage area limitation specified at Section 297-45O(2) for that similarly functioning BMP. Alternative stormwater management measures approved in accordance with this subsection that do not function in a similar manner to any BMP listed at Section 297-45O(2) shall have a contributory drainage area less than or equal to 2.5 acres, except for alternative stormwater management measures that function similarly to cisterns, grass swales, green roofs, standard constructed wetlands, vegetative filter strips, and wet ponds, which are not subject to a contributory drainage area limitation. Alternative measures that function similarly to standard constructed wetlands or wet ponds shall not be used for compliance with the stormwater runoff quality standard unless a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with Section 297-45D is granted from Section 297-45O.
- H. Whenever the stormwater management design includes one or more BMPs that will infiltrate stormwater into subsoil, the design engineer shall assess the hydraulic impact on the groundwater table and design the site, so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table, so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems or other subsurface structures within the zone

of influence of the groundwater mound, or interference with the proper functioning of the stormwater management measure itself.

- I. Design standards for stormwater management measures are as follows:
 - (1) Stormwater management measures shall be designed to take into account the existing site conditions, including, but not limited to, environmentally critical areas; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability, and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone);
 - (2) 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 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 the width of the diameter of the orifice or 1/3 the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 297-49C;
 - (3) Stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement;
 - (4) Stormwater management BMPs shall be designed to meet the minimum safety standards for stormwater management BMPs at Section 297-49; and
 - (5) The size of the orifice at the intake to the outlet from the stormwater management BMP shall be a minimum of 2 1/2 inches in diameter.
- J. Manufactured treatment devices may be used to meet the requirements of this subchapter, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department. Manufactured treatment devices that do not meet the definition of green infrastructure at Section 297-43 may be used only under the circumstances described at Section 297-45O(4).
- K. Any application for a new agricultural development that meets the definition of major development at Section 297-43 shall be submitted to the Soil Conservation District for review and approval in accordance with the requirements at Section 297-45O, P, Q and R and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For purposes of this subsection, "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 manufacture of agriculturally related products.
- L. If there is more than one drainage area, the groundwater recharge, stormwater

runoff quality, and stormwater runoff quantity standards at Section 297-45P, Q and R shall be met in each drainage area, unless the runoff from the drainage areas converge onsite and no adverse environmental impact would occur as a result of compliance with any one or more of the individual standards being determined utilizing a weighted average of the results achieved for that individual standard across the affected drainage areas.

- M. Any stormwater management measure authorized under the municipal stormwater management plan or ordinance shall be reflected in a deed notice recorded in the Office of the County Clerk. A form of deed notice shall be submitted to the municipality for approval prior to filing. The deed notice shall contain a description of the stormwater management measure(s) used to meet the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at Section 297-45O, P, Q and R and shall identify the location of the stormwater management measure(s) in NAD 1983 State Plane New Jersey FIPS 2900 US Feet or Latitude and Longitude in decimal degrees. The deed notice shall also reference the maintenance plan required to be recorded upon the deed pursuant to Section 297-46B(5). Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the municipality. Proof that the required information has been recorded on the deed shall be in the form of either a copy of the complete recorded document or a receipt from the clerk or other proof of recordation provided by the recording office. However, if the initial proof provided to the municipality is not a copy of the complete recorded document, a copy of the complete recorded document shall be provided to the municipality within 180 calendar days of the authorization granted by the municipality.
- N. A stormwater management measure approved under the municipal stormwater management plan or ordinance may be altered or replaced with the approval of the municipality, if the municipality determines that the proposed alteration or replacement meets the design and performance standards pursuant to Section 297-45 of this article and provides the same level of stormwater management as the previously approved stormwater management measure that is being altered or replaced. If an alteration or replacement is approved, a revised deed notice shall be submitted to the municipality for approval and subsequently recorded with the Office of the County Clerk and shall contain a description and location of the stormwater management measure, as well as reference to the maintenance plan, in accordance with Subsection M above. Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the municipality in accordance with Subsection M above.
- O. Green infrastructure standards.
- (1) This subsection specifies the types of green infrastructure BMPs that may be used to satisfy the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards.
 - (2) To satisfy the groundwater recharge and stormwater runoff quality standards at Section 297-45P and Q, the design engineer shall utilize green infrastructure BMPs identified in Table 1 at Section 297-45F and/or an alternative stormwater management measure approved in accordance with Section

297-45G. The following green infrastructure BMPs are subject to the following maximum contributory drainage area limitations:

Best Management Practice	Maximum Contributory Drainage Area
Dry well	1 acre
Manufactured treatment device	2.5 acres
Pervious pavement systems	Area of additional inflow cannot exceed 3 times the area occupied by the BMP
Small-scale bioretention systems	2.5 acres
Small-scale infiltration basin	2.5 acres
Small-scale sand filter	2.5 acres

- (3) To satisfy the stormwater runoff quantity standards at Section 297-45R, the design engineer shall utilize BMPs from Table 1 or from Table 2 and/or an alternative stormwater management measure approved in accordance with Section 297-45G.
- (4) If a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with Section 297-45D is granted from the requirements of this subsection, then BMPs from Table 1, 2, or 3, and/or an alternative stormwater management measure approved in accordance with Section 297-45G may be used to meet the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at Section 297-45P, Q and R.
- (5) For separate or combined storm sewer improvement projects, such as sewer separation, undertaken by a government agency or public utility (for example, a sewerage company), the requirements of this subsection shall only apply to areas owned in fee simple by the government agency or utility, and areas within a right-of-way or easement held or controlled by the government agency or utility; the entity shall not be required to obtain additional property or property rights to fully satisfy the requirements of this subsection. Regardless of the amount of area of a separate or combined storm sewer improvement project subject to the green infrastructure requirements of this subsection, each project shall fully comply with the applicable groundwater recharge, stormwater runoff quality control, and stormwater runoff quantity standards at Section 297-45P, Q and R, unless the project is granted a waiver from strict compliance in accordance with Section 297-45D.

P. Groundwater recharge standards.

- (1) This subsection contains the minimum design and performance standards for groundwater recharge as follows:
- (2) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 297-46 either:

- (a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100% of the average annual pre-construction groundwater recharge volume for the site; or
 - (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.
- (3) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to Subsection P(4) below.
 - (4) The following types of stormwater shall not be recharged:
 - (a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with Department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and
 - (b) Industrial stormwater exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

Q. Stormwater runoff quality standards.

- (1) This subsection contains the minimum design and performance standards to control stormwater runoff quality impacts of major development. Stormwater runoff quality standards are applicable when the major development results in an increase of one-quarter acre or more of regulated motor vehicle surface.
- (2) Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm as follows:
 - (a) Eighty percent TSS removal of the anticipated load, expressed as an annual average shall be achieved for the stormwater runoff from the net increase of motor vehicle surface.
 - (b) If the surface is considered regulated motor vehicle surface because the water quality treatment for an area of motor vehicle surface that is

currently receiving water quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant is to be modified or removed, the project shall maintain or increase the existing TSS removal of the anticipated load expressed as an annual average.

- (3) 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 Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. Every major development, including any that discharge into a combined sewer system, shall comply with Subsection Q(2) above, unless the major development is itself subject to a NJPDES permit with a numeric effluent limitation for TSS or the NJPDES permit to which the major development is subject exempts the development from a numeric effluent limitation for TSS.
- (4) The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 4, below. The calculation of the volume of runoff may take into account the implementation of stormwater management measures.

Time (minutes)	Cumulative Rainfall (inches)	Time (minutes)	Cumulative Rainfall (inches)	Time (minutes)	Cumulative Rainfall (inches)
1	0.00166	41	0.1728	81	1.0906
2	0.00332	42	0.1796	82	1.0972
3	0.00498	43	0.1864	83	1.1038
4	0.00664	44	0.1932	84	1.1104
5	0.00830	45	0.2000	85	1.1170
6	0.00996	46	0.2117	86	1.1236
7	0.01162	47	0.2233	87	1.1302
8	0.01328	48	0.2350	88	1.1368
9	0.01494	49	0.2466	89	1.1434
10	0.01660	50	0.2583	90	1.1500
11	0.01828	51	0.2783	91	1.1550
12	0.01996	52	0.2983	92	1.1600
13	0.02164	53	0.3183	93	1.1650
14	0.02332	54	0.3383	94	1.1700
15	0.02500	55	0.3583	95	1.1750

Table 4 - Water Quality Design Storm Distribution

Time (minutes)	Cumulative Rainfall (inches)	Time (minutes)	Cumulative Rainfall (inches)	Time (minutes)	Cumulative Rainfall (inches)
16	0.03000	56	0.4116	96	1.1800
17	0.03500	57	0.4650	97	1.1850
18	0.04000	58	0.5183	98	1.1900
19	0.04500	59	0.5717	99	1.1950
20	0.05000	60	0.6250	100	1.2000
21	0.05500	61	0.6783	101	1.2050
22	0.06000	62	0.7317	102	1.2100
23	0.06500	63	0.7850	103	1.2150
24	0.07000	64	0.8384	104	1.2200
25	0.07500	65	0.8917	105	1.2250
26	0.08000	66	0.9117	106	1.2267
27	0.08500	67	0.9317	107	1.2284
28	0.09000	68	0.9517	108	1.2300
29	0.09500	69	0.9717	109	1.2317
30	0.10000	70	0.9917	110	1.2334
31	0.10660	71	1.0034	111	1.2351
32	0.11320	72	1.0150	112	1.2367
33	0.11980	73	1.0267	113	1.2384
34	0.12640	74	1.0383	114	1.2400
35	0.13300	75	1.0500	115	1.2417
36	0.13960	76	1.0568	116	1.2434
37	0.14620	77	1.0636	117	1.2450
38	0.15280	78	1.0704	118	1.2467
39	0.15940	79	1.0772	119	1.2483
40	0.16600	80	1.0840	120	1.2500

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

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

Where:

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

- (6) 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 green infrastructure BMPs that optimize nutrient removal while still achieving the performance standards in Section 297-45P, Q and R.
- (7) In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.
- (8) The Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-4.1(c)1 establish 300-foot riparian zones along Category One waters, as designated in the Surface Water Quality Standards at N.J.A.C. 7:9B, and certain upstream tributaries to Category One waters. A person shall not undertake a major development that is located within or discharges into a 300-foot riparian zone without prior authorization from the Department under N.J.A.C. 7:13.
- (9) Pursuant to the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-11.2(j)3.i, runoff from the water quality design storm that is discharged within a 300-foot riparian zone shall be treated in accordance with this subsection to reduce the post-construction load of total suspended solids by 95% of the anticipated load from the developed site, expressed as an annual average.
- (10) This stormwater runoff quality standards do not apply to the construction of one individual single-family dwelling, provided that it is not part of a larger development or subdivision that has received preliminary or final site plan approval prior to December 3, 2018, and that the motor vehicle surfaces are made of permeable material(s) such as gravel, dirt, and/or shells.

R. Stormwater runoff quantity standards.

- (1) This subsection contains the minimum design and performance standards to control stormwater runoff quantity impacts of major development.
- (2) In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 297-46, complete one of the following:

- (a) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two-, ten-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
 - (b) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two-, ten-, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;
 - (c) Design stormwater management measures so that the post-construction peak runoff rates for the two-, ten- and 100-year storm events are 50%, 75% and 80%, 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; or
 - (d) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with Subsection R(2)(a), (b) and (c) above is required unless the design engineer demonstrates through hydrologic and hydraulic analysis that the increased volume, change in timing, or increased rate of the stormwater runoff, or any combination of the three will not result in additional flood damage below the point of discharge of the major development. No analysis is required if the stormwater is discharged directly into any ocean, bay, inlet, or the reach of any watercourse between its confluence with an ocean, bay, or inlet and downstream of the first water control structure.
- (3) The stormwater runoff quantity standards shall be applied at the site's boundary to each abutting lot, roadway, watercourse, or receiving storm sewer system.

§ 297-46. Calculation of stormwater runoff and groundwater recharge.

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

- (1) The design engineer shall calculate runoff using one of the following methods:
 - (a) The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in Chapters 7, 9, 10, 15 and 16 Part 630, Hydrology National Engineering Handbook, incorporated herein by reference as amended and supplemented. This methodology is additionally described in Technical Release 55 - Urban Hydrology for Small Watersheds (TR-55), dated June 1986, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the Natural Resources Conservation

Service website at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf or at United States Department of Agriculture Natural Resources Conservation Service, 220 Davison Avenue, Somerset, New Jersey 08873; or

- (b) The Rational Method for peak flow and the Modified Rational Method for hydrograph computations. The rational and modified rational methods are described in "Appendix A-9 Modified Rational Method" in the Standards for Soil Erosion and Sediment Control in New Jersey, January 2014. This document is available from the State Soil Conservation Committee or any of the Soil Conservation Districts listed at N.J.A.C. 2:90-1.3(a)3. The location, address, and telephone number for each Soil Conservation District is available from the State Soil Conservation Committee, PO Box 330, Trenton, New Jersey 08625. The document is also available at: <http://www.nj.gov/agriculture/divisions/anr/pdf/2014NJSoilErosionControlStandardsComplete.pdf>.
- (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 above at Section 297-46A(1)(a) and the Rational and Modified Rational Methods at Section 297-46A(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 or other methods may be employed.
- (5) If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

- B. Groundwater recharge may be calculated in accordance with the following: The New Jersey Geological Survey Report GSR-32, A Method for Evaluating Groundwater-Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at the New Jersey Geological Survey website at: <https://www.nj.gov/dep/njgs/pricelst/greport/gsr32.pdf> or at New Jersey Geological and Water Survey, 29 Arctic Parkway, PO Box 420 Mail Code 29-01, Trenton, New Jersey 08625-0420.

§ 297-47. Sources for technical guidance.

- A. Technical guidance for stormwater management measures can be found in the documents listed below, which are available to download from the Department's website at: http://www.nj.gov/dep/stormwater/bmp_manual2.htm.
- (1) Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended and supplemented. Information is provided on stormwater management measures such as, but not limited to, those listed in Tables 1, 2, and 3.
 - (2) Additional maintenance guidance is available on the Department's website at: https://www.njstormwater.org/maintenance_guidance.htm.
- B. Submissions required for review by the Department should be mailed to: The Division of Water Quality, New Jersey Department of Environmental Protection, Mail Code 401-02B, PO Box 420, Trenton, New Jersey 08625-0420.

§ 297-48. Solids and floatable materials control standards.

- A. Site design features identified under Section 297-45F above, or alternative designs in accordance with Section 297-45G above, to prevent discharge of trash and debris from drainage systems shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 297-48A(2) below.
- (1) Design engineers shall use one 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; or
 - (b) A different grate, if each individual clear space in that grate has an area of no more than seven square inches, or is no greater than 0.5 inch across the smallest dimension.

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

- (c) For curb-opening inlets, including curb-opening inlets in combination inlets, 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 square inches, or be no greater than two inches across the smallest dimension.
- (2) The standard in Subsection A(1) above does not apply:
- (a) Where each individual clear space in the curb opening in existing curb-opening inlet does not have an area of more than nine square inches;
 - (b) Where the municipality agrees that the standards would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets;
 - (c) Where flows from the water quality design storm as specified in N.J.A.C. 7:8 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:
 - [1] A rectangular space 4.625 inches long and 1.5 inches wide (this option does not apply for outfall netting facilities); or
 - [2] A bar screen having a bar spacing of 0.5 inch.

Note that these exemptions do not authorize any infringement of requirements in the Residential Site Improvement Standards for bicycle safe grates in new residential development [N.J.A.C. 5:21-4.18(b)2 and 7.4(b)1].

- (d) Where flows are conveyed through a trash rack that has parallel bars with one-inch spacing between the bars, to the elevation of the Water Quality Design Storm as specified in N.J.A.C. 7:8; or
- (e) 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.

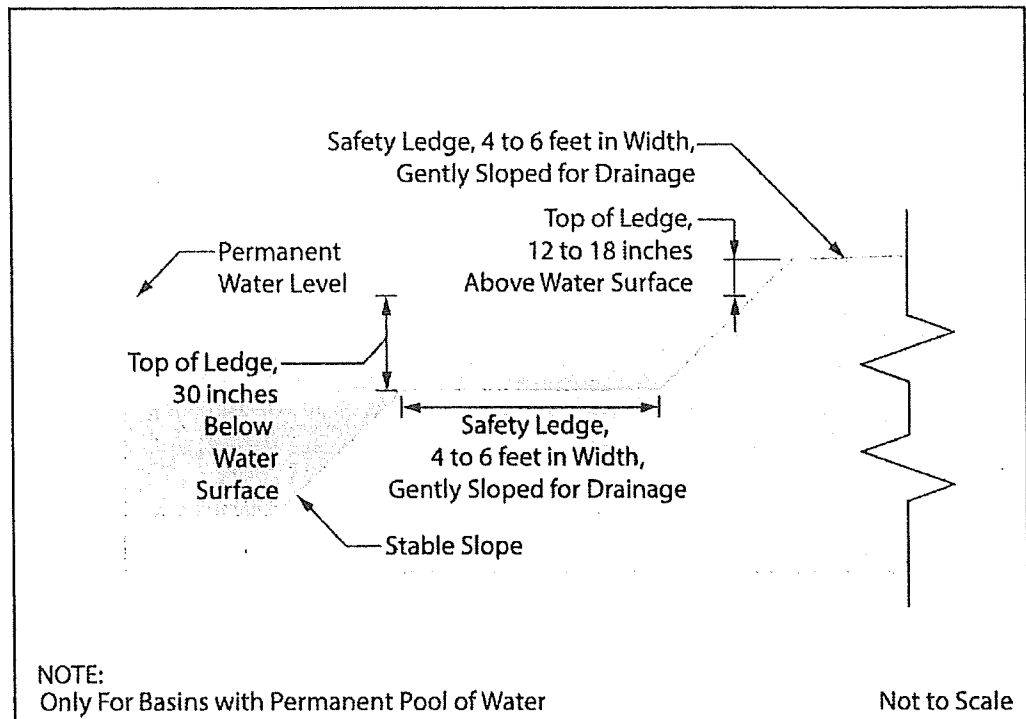
§ 297-49. Safety standards for stormwater management basins.

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management BMPs. This section applies to any new stormwater management BMP.
- B. The provisions of this section are not intended to preempt more stringent municipal or county safety requirements for new or existing stormwater management BMPs. Municipal and county stormwater management plans and ordinances may, pursuant to their authority, require existing stormwater management BMPs to be retrofitted to meet one or more of the safety standards in Section 297-49C(1), (2), and (3) for trash racks, overflow grates, and escape provisions at outlet structures.
- C. 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 BMP to ensure proper functioning of the BMP 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; and
 - (d) The trash rack shall be constructed of rigid, durable, and corrosion resistant material and designed to withstand a perpendicular live loading of 300 pounds per square foot.
 - (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 pounds per square foot.
 - (3) Stormwater management BMPs shall include escape provisions as follows:
 - (a) If a stormwater management BMP has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions include the installation of permanent ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater

management BMPs. With the prior approval of the municipality pursuant to Subsection 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 BMPs having a permanent pool of water deeper than 2 1/2 feet. Safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately 2 1/2 feet below the permanent water surface, and the second step shall be located one to 1 1/2 feet above the permanent water surface. See Subsection E for an illustration of safety ledges in a stormwater management BMP; and
 - (c) In new stormwater management BMPs, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than three horizontal to one vertical.
- D. Variance or exemption from safety standard. A variance or exemption from the safety standards for stormwater management BMPs may be granted only upon a written finding by the municipality that the variance or exemption will not constitute a threat to public safety.
- E. Safety ledge illustration.

Elevation View - Basin Safety Ledge Configuration



§ 297-50. Requirements for a site development stormwater plan.

- A. Submission of site development stormwater plan.
- (1) Whenever an applicant seeks municipal approval of a development subject to this article, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 297-50C below as part of the submission of the application for approval.
 - (2) The applicant shall demonstrate that the project meets the standards set forth in this article.
 - (3) The applicant shall submit 12 copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 297-50C of this article.
- B. Site development stormwater plan approval. The applicant's Site Development project shall be reviewed as a part of the review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this article.
- C. Checklist requirements. The following information shall be required:
- (1) Topographic base map. The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of one inch equals 200 feet or greater, showing two-foot contour intervals. The map as appropriate may 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 written and graphic description of the natural and man-made features of the site and its surroundings should be submitted. 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.
 - (3) Project description and site plans. A map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations will occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification

for proposed changes in natural conditions shall also be provided.

- (4) Land use planning and source control plan. This plan shall provide a demonstration of how the goals and standards of Sections 297-44 through 297-46 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.
- (5) Stormwater management facilities map. The following information, illustrated on a map of the same scale as the topographic base map, shall be included:
 - (a) Total area to be disturbed, paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.
 - (b) Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.
- (6) Calculations.
 - (a) Comprehensive hydrologic and hydraulic design calculations for the predevelopment and post-development conditions for the design storms specified in Section 297-45 of this article.
 - (b) When the proposed stormwater management control measures depend on the hydrologic properties of soils or require certain separation from the seasonal high water table, 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) Maintenance and repair plan. The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 297-51.
- (8) Waiver from submission requirements. The municipal official or board reviewing an application under this article may, in consultation with the municipality's review engineer, waive submission of any of the requirements in Section 297-50C(1) through (6) of this article when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

§ 297-51. Maintenance and repair.

- A. Applicability. Projects subject to review as in Section 297-42C of this article shall comply with the requirements of Section 297-51B and C.

B. General maintenance.

- (1) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
- (2) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). The plan shall contain information on BMP location, design, ownership, maintenance tasks and frequencies, and other details as specified in Chapter 8 of the NJ BMP Manual, as well as the tasks specific to the type of BMP, as described in the applicable chapter containing design specifics.
- (3) If the maintenance plan identifies a person other than the property owner (for example, a developer, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's or entity's agreement to assume this responsibility, or of the owner's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.
- (4) 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. The individual property owner may be assigned incidental tasks, such as weeding of a green infrastructure BMP, provided the individual agrees to assume these tasks; however, the individual cannot be legally responsible for all of the maintenance required.
- (5) If the party responsible for maintenance identified under Section 297-51B(3) above is not a public agency, the maintenance plan and any future revisions based on Section 297-51B(7) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
- (6) Preventative and corrective maintenance shall be performed to maintain the functional parameters (storage volume, infiltration rates, inflow/outflow capacity, etc.) of the stormwater management measure, including, but not limited to, 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.
- (7) The party responsible for maintenance identified under Section 297-51B(3) above shall perform all of the following requirements:
 - (a) 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;
 - (b) Evaluate the effectiveness of the maintenance plan at least once per year

and adjust the plan and the deed as needed; and

- (c) 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 Section 297-51B(6) and (7) above.
 - (8) The requirements of Section 297-51B(3) and (4) do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency, subject to all applicable municipal stormwater general permit conditions, as issued by the Department.
 - (9) 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 14 days to effect 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 or County may immediately proceed to do so and shall bill the cost thereof to the responsible person. Nonpayment of such bill may result in a lien on the property.
- C. Nothing in this subsection 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.

§ 297-52. Penalties.

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this article shall be subject to a fine of not less than \$100 but not more than \$1,000 and/or sentencing to a period of not more than 90 days in jail. Every continuous day that a violation takes place shall be considered a separate occurrence.

§ 297-53. Severability.

Each section, subsection, sentence, clause and phrase of this article is declared to be an independent section, subsection, sentence, clause and phrase, and the finding or holding of any such portion of this article to be unconstitutional, void, or ineffective for any cause, or reason, shall not affect any other portion of this article.

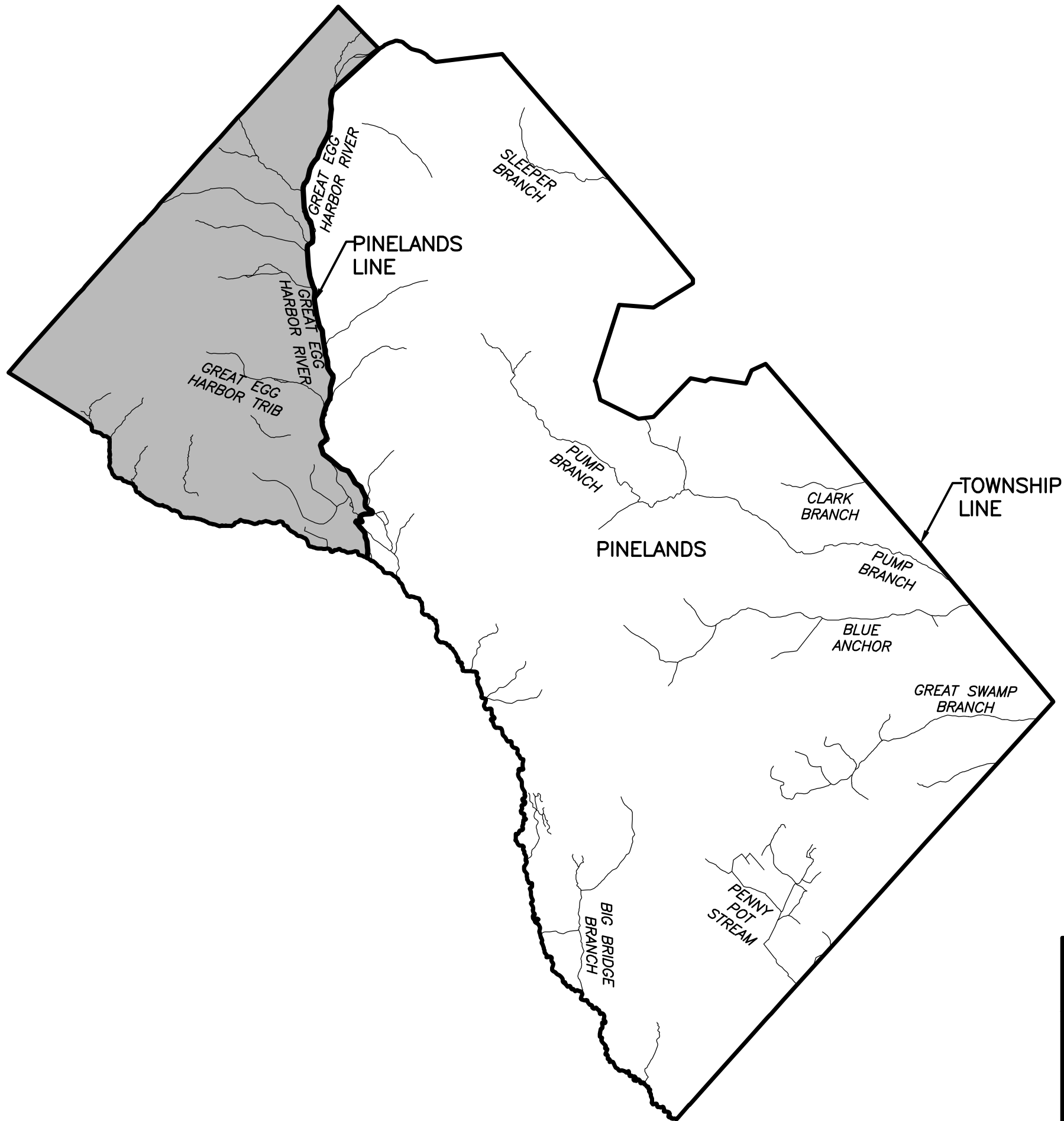
§ 297-54. Effective date.

This article shall take effect immediately upon the approval by the county review agency or 60 days from the receipt of this article by the county review agency if the county review agency should fail to act.

APPENDIX B

Figures

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LEGEND

- PINELANDS AREA OF THE TOWNSHIP
- NON-PINELANDS AREA OF THE TOWNSHIP

SOURCE: TAKEN FROM: NJ-GEO WEB
(NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)

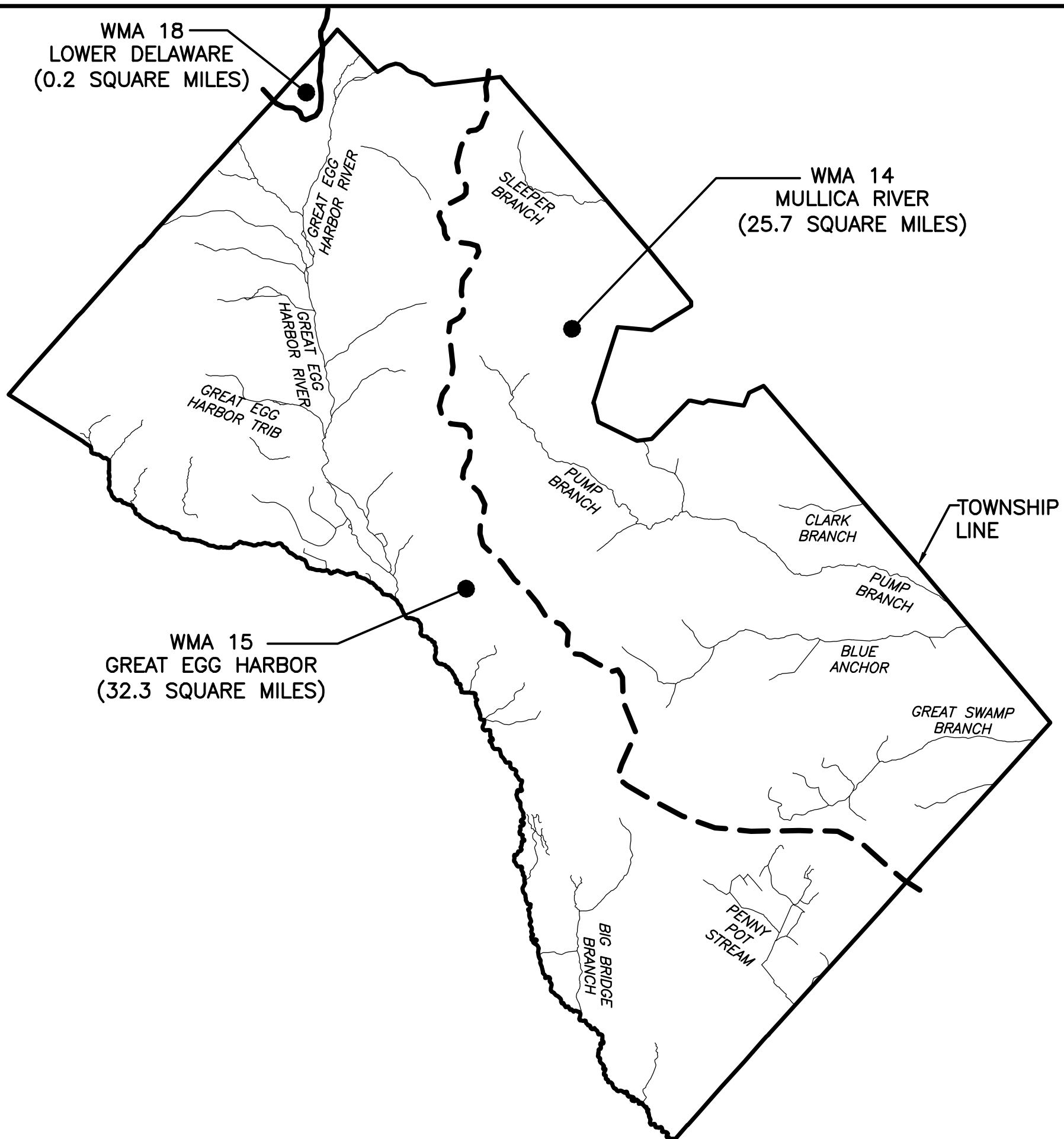
**FIGURE 1:
PINELANDS AREAS OF THE TOWNSHIP**



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CONSULTING ENGINEER SERVICES
PROFESSIONAL ENGINEERS, PLANNERS, & LAND SURVEYORS
645 BERLIN-CROSS KEYS ROAD, SUITE 1, SICKLERVILLE, NJ 08081
PHONE (856) 228-2200 - FAX (856) 232-2346 - EMAIL design@ces-1.com
NJ CERTIFICATE OF AUTHORIZATION No's 24GA27957700, 21MH000134

SHT NO 1 OF 1 DATE 5/12/2022 SCALE NTS CES NO 3943-03 DRWN BY RQ

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----- WATERSHED MANAGEMENT AREA (WMA)

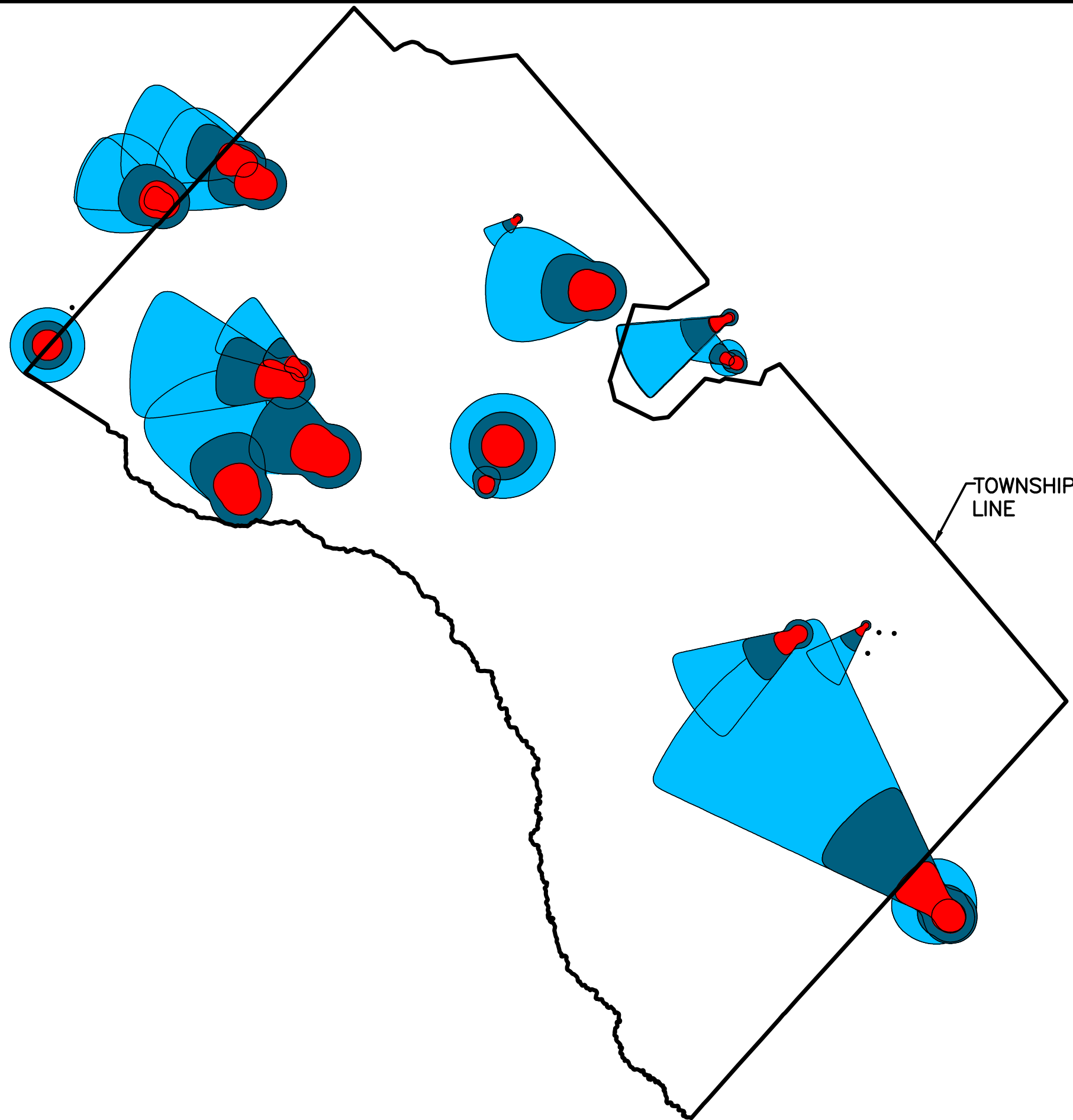
SOURCE: TAKEN FROM: NJ-GEO WEB
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**FIGURE 3:
TOWNSHIP WATERSHED MANAGEMENT AREAS
AND WATERWAYS**



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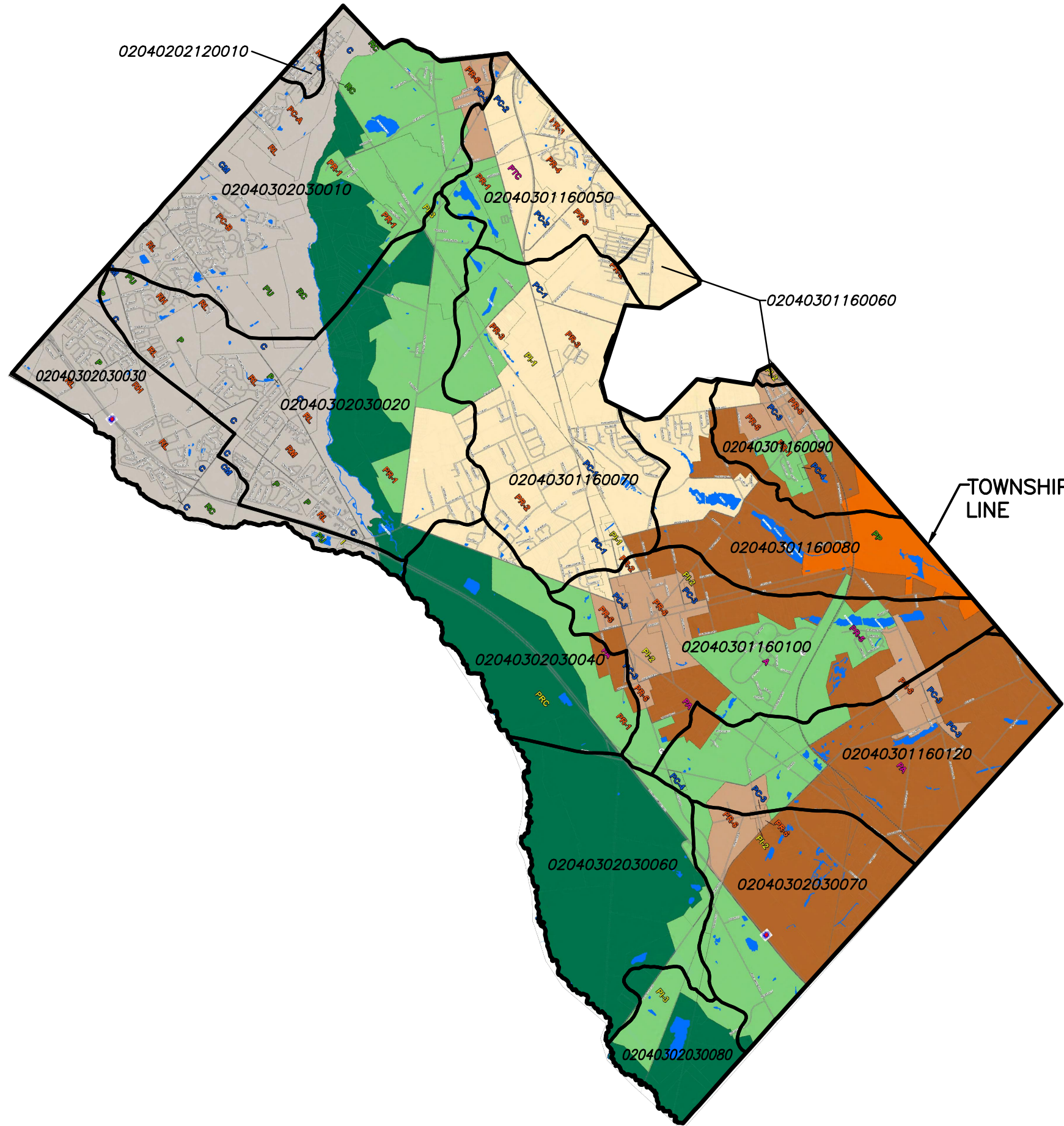
FIGURE 4:
WELLHEAD PROTECTION AREAS IN THE TOWNSHIP



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Legend

- | | |
|-------------------------|----------------------------------|
| Municipal Boundary | Zoning |
| Parcels | Pinelands Management Area |
| Right-of-Way | Agricultural Production Area |
| Water | Forest Area |
| Atlantic City Rail line | Non-Pinelands |
| Railroad | Pinelands Village |
| | Preservation Area |
| | Regional Growth Area |
| | Rural Development Area |

**FIGURE 5:
ZONING PLAN WITH HUC14 WATERSHEDS**



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