



TOWNSHIP OF FAIRFIELD

Essex County, New Jersey

MUNICIPAL STORMWATER MANAGEMENT PLAN



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March 28, 2005

Revised April 14, 2025

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Fairfield to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules including all amendments. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acres of land since February 2, 2004.

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. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

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

Stormwater Management Plan Goals

The goals of this MSWMP are to:

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

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

Stormwater Discussion

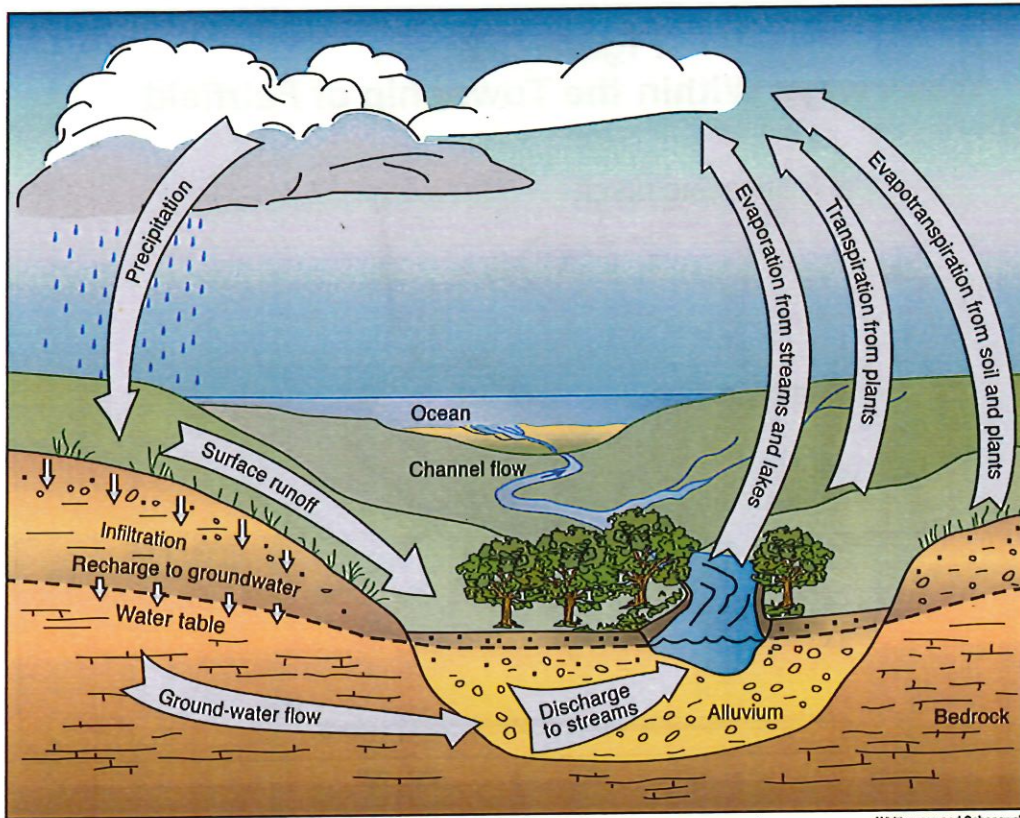
Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream.

Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

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.

Land development can also 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.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



THE HYDROLOGIC CYCLE

Whitemore and Schonevelds

Figure C-2
Waterways Within the Township of Fairfield

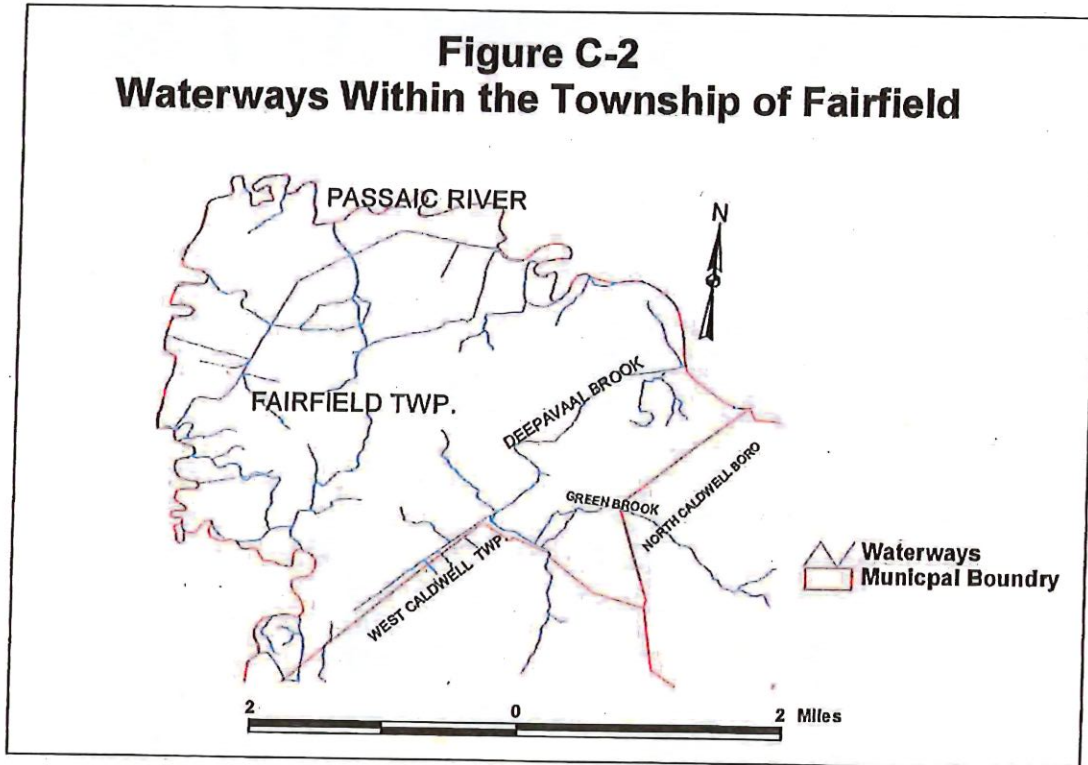
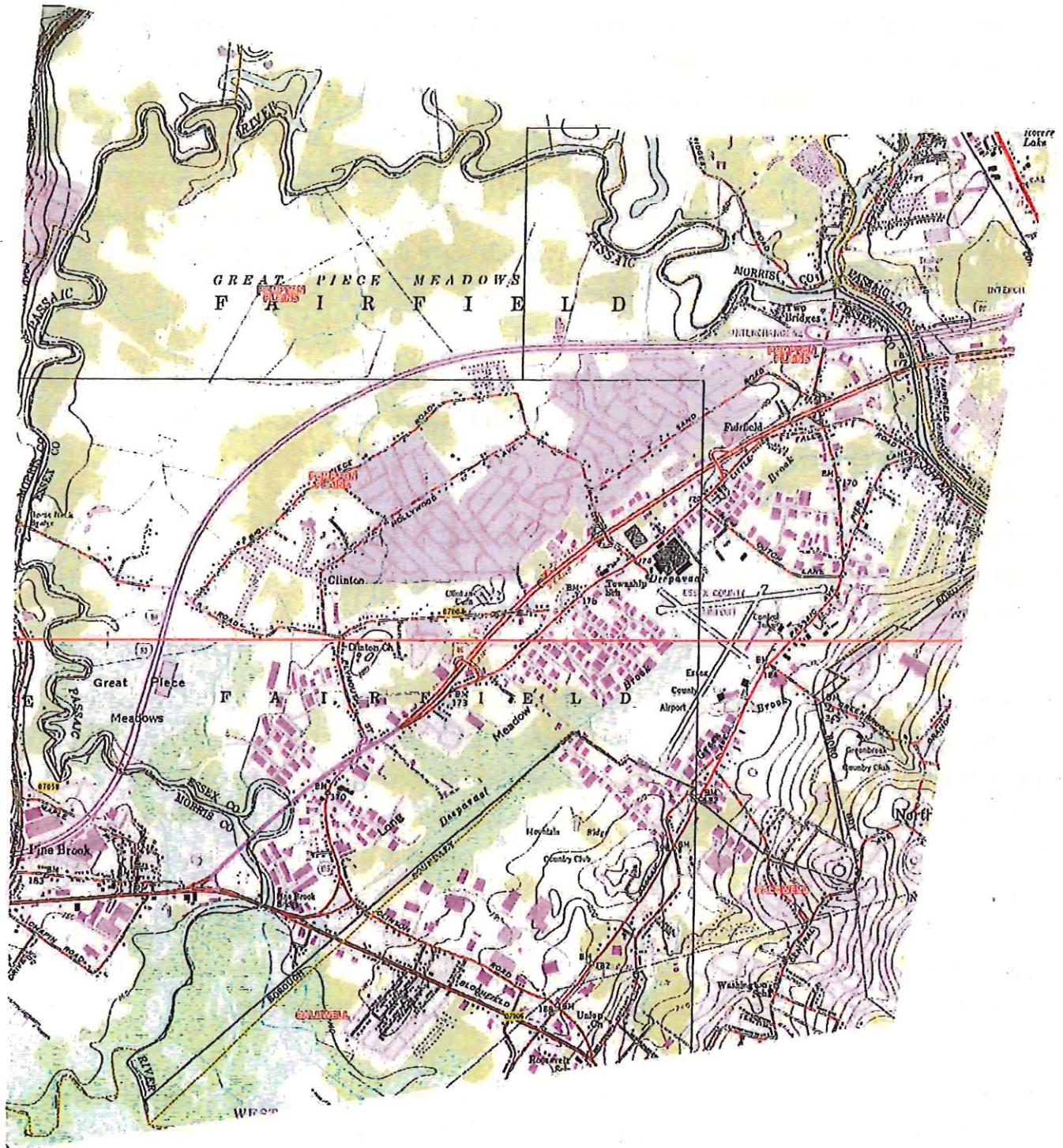


FIGURE C-3
TOWNSHIP BOUNDARY ON USGS
QUADRANGLES



Background

The Township of Fairfield has an area of 10.34 square miles in Essex County, New Jersey and lies within the flood plain of the Central Passaic River Basin. The Passaic River bounds the Township on the west, north and east. The Township has a stable land use of residential, commercial and industrial land uses. In the past 5 years the greatest increase in new development has been in the multifamily residential sector. The Township is also experiencing modest redevelopment in the commercial and industrial zones. The U.S. Census Bureau reports the population of the Township in 1980 as 7,987. Following a reduction to 7,306 in 2000, it has increased to 7,872 in 2020. The residential population is rebounding to the 1980 levels. This population increase has resulted in renewed demand for new development. Changes in the landscape have most likely increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. In an effort to deal with increased runoff as a result of new development the planning authorities have required that developers preserve the capacity of the Township's downstream drainage facilities by means of detention basins or other similar methods.

A significant portion of the Township lies within the floodplain of the Central Passaic River Basin. New development in these areas are regulated by FEMA, NJDEP and municipal floodplain regulations. The Township continues to actively monitor development for compliance with NJDEP regulations. Figure C-2 illustrates the waterways in the Township. Figure C-3 depicts the Township boundary on the USGS quadrangle maps. The Northern portion of the Township is located within NJDEP Watershed Management Area 6 and drains northerly to the Passaic River. The area which drains to the Deepavaal Brook is located within NJDEP Watershed Management Area 4.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Bio-monitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. Two major watercourses that are found within the Township are the Passaic River and the Deepavaal Brook both of which are impaired. Tributaries that flow through the Township to these waterways have not been evaluated and therefore no data is available on their condition.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the in-stream total mercury and phosphorus

concentrations in the Passaic River. Fecal coliform concentrations in the Passaic River and Deepavaal Brook frequently exceed the state's criteria. This means that these rivers are impaired waterways and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway.

A TMDL is the amount of a pollutant that can be accepted by a water body without causing an exceedance of water quality standards or interfering with the ability to use a water body 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. 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, and reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

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

The State of New Jersey's proposed 2004 Integrated List of Waterbodies was reviewed to identify any water bodies within and proximate to the Township of Fairfield where water quality information is available. The most current Ambient Bio-monitoring Network (AMNET) data for Watershed Management Areas 4 and 6, Passaic Region was also reviewed to identify any sites nearby to the Township of Fairfield. Sub-list 5 of the 2004 Intergraded List was also reviewed. Portions of that list can be found in appendix A. The March 28, 2003 amendment to the Northeast Water Quality Management Plan established TMDLs for Fecal Coliform for the Deepavaal Brook and the Passaic River. These TMDLs have not been adopted to date.

In addition to water quality problems, the Township has exhibited water quantity problems including flooding during extreme storm events. Due to the Township's location in the Passaic River and Deepavaal Brook floodplain the Township's drainage system backflows in many areas during extreme flooding events. The backwater effect results in low lying areas occurs whenever Upper Passaic River levels rise above elevation 168.26 NGVD29.

The areas of the Township most susceptible to this condition are those that have a ground surface elevation below 170 NGVD29. These area lie within the area bounded by Rt.46 to the south the Passaic River to the west and north and Two Bridges Road to the east. The steep grades along the Green Brook are also susceptible to flash flooding,

The Township's storm sewer system was designed for the greater but less intense storms. Recognizing that due to the flat terrain and the influence from Passaic River levels the storm sewers and culverts could not be constructed to pass the less frequent (more intense) storm events. Changes in hydrologic conditions have occurred (i.e., more impervious area) in the Township since much of the storm sewer system was constructed. As imperviousness increases in the Township, the peak rates and volumes of stream flows also increase. The increased amount of water results in degraded stream habitats.

The high imperviousness of the Township has decreased groundwater recharge, decreasing base flows in streams during dry weather periods. Lower base flows can have a negative impact on in stream habitat during the summer months. Currently there is no soil survey for Essex County therefore an overall map of the groundwater recharge areas has not been prepared. The loss of groundwater recharge must be evaluated on a site-by-site basis. A complete soils evaluation for the purpose of determining the existing recharge characteristics of a particular site will be required for all major developments.

There are no public community water supply wells in operation in the Township of Fairfield.

Design and Performance Standards

The Township has adopted the updated design and performance standards for stormwater management measures mandated by N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures and safety standard consistent with the stormwater management rules. The ordinances were submitted to the county for review and approval within 24 months of the effective date of the Stormwater Management Rules.

The amended Stormwater Control Ordinance includes safety standards for stormwater control basins. During construction, Township inspectors observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Unless the stormwater facilities are specifically dedicated to the Township, proper maintenance and record keeping is the responsibility of the owner. Failure to comply with these requirements may result in penalties.

Plan Consistency

The Township is not within a Regional Stormwater Management Planning Area(RSWMP). If any RSWMPs are developed in the future, this Municipal Stormwater Management Plan will also be updated. The Municipal Stormwater Management Plan is consistent with N.J.A.C. 5:21, the Residential Site Improvement Standards (RSIS). The municipality continue to update this plan with any changes to RSIS requirements and utilize them in the stormwater management review of residential areas.

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

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

Nonstructural Stormwater Management Strategies

The Township has reviewed it's master plan and ordinances, and has provided a list of the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater

management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within 24 months of the effective date of the Stormwater Management Rules. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapter 45 and Chapter 42 of the Township Code, entitled Zoning and Subdivision of Land and Site Plan Review respectively were reviewed. Definitions were added to both chapters to be consistent with the Stormwater Management Rules.

The following amendments were made to the zoning ordinance to incorporate to the greatest extent possible nonstructural stormwater management strategies:

Section 45-12.7h: Requirements for Planting in Buffer Area: The landscape requirements for these buffer areas do not recommend the use of native vegetation. The language of this section was amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. A landscape Architect shall certify that native vegetation species are being utilized.

Section 45-12.7G: Additionally, language was included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. This section also requires the preservation of natural wooded tracts and limits land disturbance for new construction. The width of buffers in the C-2 zone has been increased from 10' to 20'.

Section 45-19.2: Parking Stall Sizes: The required parking stall size has been reduced to 9'X18' for all parking spaces. A provision has been added for a percentage of compact car spaces and the reduction in length of a maximum of two feet for vehicle overhangs adjacent to landscaped areas. Landscape areas where overhangs are allowed may be increased in width an amount equal to the proposed overhang. Both of these provisions will further reduce impervious coverage.

Section 45-22 & 23: A cluster development option is being considered for the R-1 and R-2 zones to preserve land for public and agricultural purposes, to prevent development on environmentally sensitive areas, and to aid in reducing the cost of providing streets, utilities and services in residential developments. This cluster option is an excellent tool for reducing impervious roads and driveways. The option allows for smaller lots with smaller front and side yard setbacks than traditional development options. It also minimizes the disturbance of large tracts of land, which is a key nonstructural stormwater management strategy. The cluster option requires that 40% of the total tract be preserved as common open space for residential area. The cluster option does require that 20 percent of the green or common area be landscaped with trees and/or shrubs. Although the cluster option requires public concrete sidewalks to be installed along all streets, the option requires paths in open space to be mulched or stone to decrease the impervious area.

Section 45-19.5d2: Driveways-Residential Uses Only: This section was amended to allow the use of pervious paving materials such as concrete pavers to minimize stormwater runoff and promote groundwater recharge. Residential impervious coverage requirements have been established which limit the amount of impervious coverage in residential zones to 35%. A maximum driveway width of 18' within the required front yard set back is also specified with a minimum setback from the property line of four feet.

Section 45-19.6c Design Standards: requires that concrete curb and or Belgian block curb be installed for all new or expanded uses in non-residential zones. This section has been modified to permit flush curbs with curb stops to allow disconnection of impervious surfaces with vegetated swales or other non-structural strategies to be used for stormwater conveyance with overflow for larger storm events into storm sewers.

Section 45-18: Schedule of Area, Yard, and Building Regulations has been amended to require mitigation whenever a variance for maximum percent impervious coverage is granted. The property owner must mitigate the impact of the additional impervious surfaces unless the stormwater management plan for the development provided for these increases in impervious surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge as described in N.J.A.C.7: 8-5.

Section 45-19: Off-street Parking and Loading Requirements details off-street parking and loading requirements. This section also provides guidance on minimum parking space requirements. These requirements are based on the number of dwelling units and/or gross floor area. This section was amended to allow pervious paving to be used in areas to provide overflow parking, smaller parking stalls, and shared parking.

Section 45-19.4d: Allows shared parking with adjoining properties and a new section has been added to allow for areas to be set aside for future parking spaces if necessary.

Section 45-19.1a: Currently for mixed use development the total number of parking spaces is based upon the sum of the requirements of the individual uses. This section has been modified to permit less parking spaces than the minimum required by ordinance if it can be demonstrated through a parking generation analysis that the peak parking demand is less than the total number of spaces required by ordinance. Where re-development takes place on a site and a reduced number of parking spaces is approved excess impervious pavement shall be removed and replaced with green space which is to be utilized for stormwater management strategies.

Section 42-18: Design Standards for Subdivision Plats and Site Plans has been revised to conform to the latest revised version of the Residential Site Improvement Standards. References to street widths, cul-de-sac radii ect. Have been referenced to the latest RSIS Standards

Section 42-18Q: Drainage provides for the establishment of an easement and an undisturbed vegetative buffer 25 feet in width measured from the top of bank of any watercourse that traverses the property. Storm water inlets are now required to comply with the maximum opening sizes stipulated in the attachment C of the Township's Storm water permit.

Section 42-18Q subsection (1): This section was amended to require that for all major developments that the method for stormwater management be in conformance with N.J.A.C.7: 8-5. This section also requires that all drainage through a tract be provided with inlets and pipes where feasible or by lined ditch. The use of natural vegetated swales in lieu of inlets and pipes or lined ditches has been added. For all major developments and developments which add more than one-quarter acre of new impervious coverage it is required that the developer disconnect to the greatest extent possible impervious surfaces to promote pollutant removal and groundwater recharge.

Section 42-18Q subsection (2): Drainage Design Criteria was amended to be in conformance with the latest requirements of the Residential Site Improvement Standards and Section N.J.A.C. 7:8-5.

New Section 42-18T: A Natural Features section was added to this ordinance and requires that natural features, such as trees, brooks, swamps, hilltops, steep slopes, wetlands and views, be preserved whenever possible, and that care be taken to preserve selected trees to enhance soil stability and landscaped treatment of the area. This section was amended to expand trees to forested areas, to ensure that leaf litter and other beneficial aspects of the forest are maintained in addition to the trees. A limit of disturbance requirement is being added to all sub-division and site plan checklists as well as review by the environmental commission and planning board. All natural areas to be preserved shall be delineated in the field prior to the start of construction. **Section 42-18V: (New Section) Off-site and Off-tract Improvements** describes off-site and off-tract improvements. Any off-site and off-tract stormwater management and drainage improvements must conform to the "Design and Performance Standards" described in this plan and provided in 42-18 of the Township Code.

Sections 42-18W: Performance Standards provide pollution source control. It prohibits raw materials or wastes to be deposited upon a lot in such form or manner that natural forces such as precipitation, evaporation or wind can transfer them off the lot, directly or indirectly, It also requires that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers.

Section 42-18U: Design Standards requires a minimum of two shade trees per lot to be planted in the front yard for new residential construction. The Township has a Tree Preservation Ordinance (Sections 45-17)

that restricts and otherwise controls the removal of mature trees throughout the Township. This ordinance recognizes that the preservation of mature trees and forested areas is a key strategy in the management of environmental resources, particularly watershed management, air quality, and ambient heating and cooling. These sections set out a "critical footprint area" that extends 30 feet beyond the driveway and building footprint where clearing of trees cannot occur. This complies with minimizing land disturbance, which is a nonstructural stormwater management strategy. These sections were amended to require the identification of forested areas, and that a minimum of ten percent of forested areas be protected from disturbance.

Section 42-18X: Sidewalks describe sidewalk requirements for the Township. In new residential developments the requirement to construct sidewalks is controlled by the Residential Site Improvement Standards. Although sidewalks are not required along all streets, the Township can require them in areas where the probable volume of pedestrian traffic, the development's location in relation to other populated areas and high vehicular traffic, pedestrian access to bus stops, schools, parks, and other public places, and the general type of improvement intended indicate the advisability of providing a pedestrian way. Sidewalks are to be a minimum of four feet wide and constructed of concrete, or pavers. Developers are required to design sidewalks to discharge stormwater to lawns and disconnect these impervious surfaces.

Section 42-18Y: Soil Erosion and Sediment Control addresses soil erosion and sediment control by referencing Chapter 128, the Township's Soil Erosion and Sediment Control Ordinance. This ordinance requires developers to comply with the New Jersey Soil Erosion and Sediment Control Standards and outlines some general design principles, including: whenever possible, retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; and, install diversions, sediment basins, and similar required structures prior to any on-site grading or disturbance.

Section 42-18 D: Streets describes the requirements for streets in the Township and has been amended to conform to the latest requirements of the Residential Site Improvement Standards. Maximum nonresidential pavement widths have been reduced to 36 feet.

The Township has two street classifications, "Non-Residential," which has a minimum right-of-way of 60 feet, and "Residential," which has a minimum right-of-way of 50 feet. Street paving widths of 40 feet and 30 feet respectively were required. This section was amended to conform to the requirements of RSIS and encourage developers to limit on-street parking to allow for narrower paved widths. This section also required that cul-de-sacs have a minimum radius of 50 feet. Language was added to this section to reduce the minimum radius of cul-de-sac designs. Cul-de-sacs with landscaped islands have a minimum

radius of 35 feet, cul-de-sacs with flush curbs have a minimum radius of 25 feet, with a 5 foot reinforced shoulder to accommodate larger equipment and emergency vehicles.

Several changes are being considered to Article VII of the Township Code entitled "Zoning Districts and Standards." The Township has 6 types of residential districts. Each district has a maximum percent impervious surface allocation, ranging from 35 percent for the R-1 and R-2 Districts, which has a minimum lot size of 15,000 sf. And 18,000 sf. Respectively for detached single-family homes. The Township has 8 types of non-residential districts. Each of these districts has a maximum percent impervious surface allocation of 55 percent. The Township is evaluating the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. The Township is also evaluating a maximum percent of disturbance for each zone, for those areas identified as natural features in Section 42-18T. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must mitigate the impact of the additional impervious

Land Use/Build-Out Analysis

There are four steps to preparing a build-out analysis that satisfies the requirements for the municipal stormwater management plan:

1. Determine the total land area within each of the HUC14 of the municipality.
2. Determine the area of constrained lands within each HUC14 of the municipality.
3. Determine the land available for development by simply subtracting the constrained lands from the total land area for each HUC14. In essence, the land available for development is the agricultural, forest and/or barren lands available within each HUC14. Existing residential, commercial, and industrial areas are also eligible for redevelopment and should be considered as land available for development.
4. For each HUC14, complete a build-out analysis by using the municipal zoning map and applicable ordinances to determine the acreage of new development. Once the build-out acreage of each land use is determined for each HUC14, non-point source loadings can be determined for the build-out scenario.

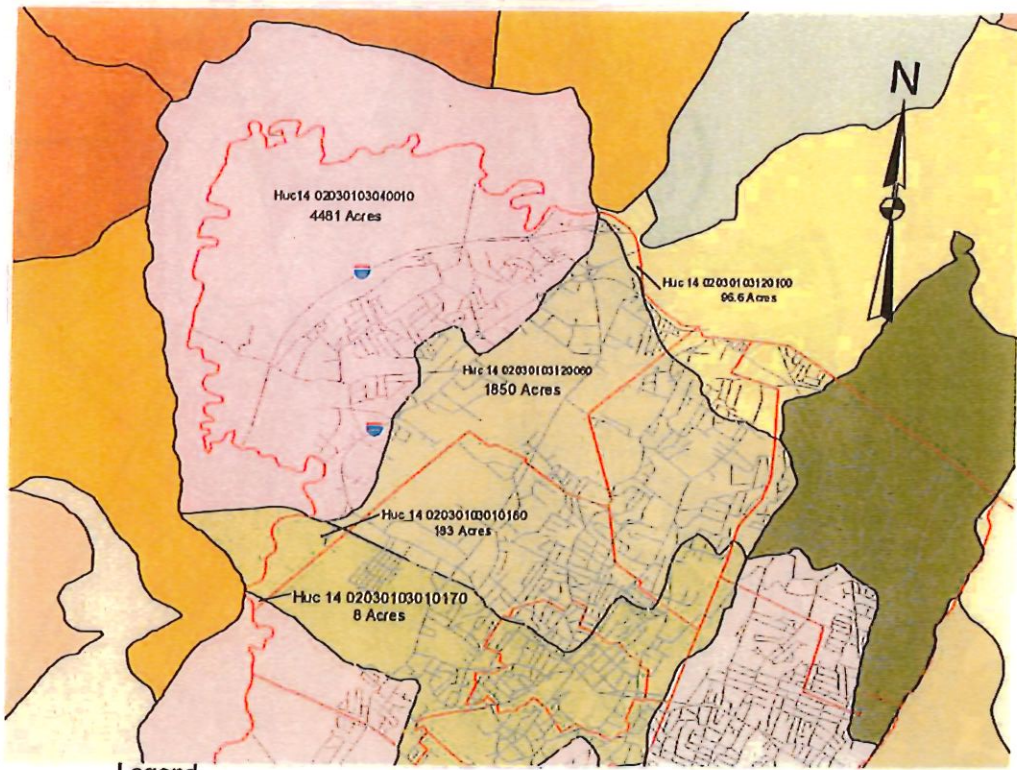
Figure C-4 illustrates the existing land use in the Township based on 1995/97 GIS information from NJDEP. Figure C-5 illustrates the HUC14s within the Township. The Township's zoning map is shown as Figure C-6. Figure C-7 illustrates the environmentally constrained lands within the Township.

Table C-1 is a tabulation of developable areas by zone. Table C-2 compares existing impervious coverage with build-out impervious coverage. Comparing the total impervious for build-out vs. existing indicates that a reduction in impervious surfaces will be realized in each of the HUC 14 drainage areas.

This can best be explained by noting that the current impervious coverage percentages are less than that which existed when the Township initially developed. The greatest reduction can be found in the non-residential zones where impervious coverage percentage ranged from unlimited to 70% to the present 55%. The pollutant loads at full build-out are presented in Table C-3.

The pollutant loads by land cover were obtained from the NJDEP 2004 Stormwater BMP Manual and are included in Appendix A It is important to note that, although the pollutant loads for agricultural lands are higher than those for low density residential for the parameters in Table C-2, converting agricultural lands to residential typically results in an increase in pollutant loads for metals and petroleum hydrocarbons. Also, total suspended solids loads due to stormwater runoff may decrease due to the conversion of agricultural lands to low density residential, but the percentage of impervious surfaces increases dramatically. If, due to the increase of impervious surfaces, increases in stormwater runoff flows are not managed properly, these high flows will increase stream bank erosion, thereby increasing sediment loads.

Figure C-5 Township of Fairfield Land Area within Huc 14's



Legend









- | | | |
|---|----------------------|--|
|  | Roads |  |
|  | Municipal Boundary | |
|  | Huc 14 2030103040010 | |
|  | Huc 14 2030103120060 | |
|  | Huc 14 2030103120100 | |
|  | Huc 14 2030103010180 | |
|  | Huc 14 2030103010170 | |

TABLE C-1

TOWNSHIP OF FAIRFIELD
MUNICIPAL STORMWATER MANAGEMENT PLAN
BUILD-OUT ANALYSIS

Huc 14 Code	Zone District	Area/Zone (acres)	Env. Constrained Area(acres)		Developable Area(acres)
2030103040010	R-1	964.0		132.6	831.4
	R-2	149.0		110.8	38.2
	L-1	171.4		10.9	160.5
	L-2	162.5		14.8	147.7
	C-1	5.2		0.0	5.2
	HD	225.6		12.0	213.6
	OP	22.3		1.3	21.0
	OS/Rec.	344.1		344.1	0.0
	AC	2185.0		2185.0	0.0
TOTAL FOR THIS HUC		4229.1		2811.4	1417.7

Huc 14 Code	Zone District	Area/Zone (acres)	Env. Constrained Area(acres)		Developable Area(acres)
2030103120060	R-1	421.4		26.0	395.4
	R-3	17.5			17.5
	R-4	8.7			8.7
	R-6	4.2			4.2
	L-1	735.4		73.6	661.8
	L-3	356.0		124.8	231.2
	C-1	29.0			29.0
	C-2	10.8		4.1	6.7
	HD	202.8		12.2	190.6
	OS/Rec	17.6		17.6	0.0
TOTAL FOR THIS HUC		1803.4		258.3	1545.1

Huc 14 Code	Zone District	Area/Zone (acres)	Env. Constrained Area(acres)		Developable Area(acres)
2030103120100	R-1	39.3		8.4	30.9
	R-5	13.0		10.3	2.7
	R-6	3.2		0.8	2.4
	C-1	3.5			3.5
	L-1	3.2		1.4	1.8
	HD	17.2		10.2	7.0
	OS/Rec	1.0		1.0	0.0
TOTAL FOR THIS HUC		80.4		32.1	48.3

Huc 14 Code	Zone District	Area/Zone (acres)	Env. Constrained Area(acres)		Developable Area(acres)
2030103010180	R-1	21.0		12.0	9.0
	C-2	10.7			10.7
	OS/Rec	161.0		161.0	0.0
TOTAL FOR THIS HUC		192.7		173.0	19.7

Huc 14 Code	Zone District	Area/Zone (acres)	Env. Constrained Area(acres)		Developable Area(acres)
2030103010170	OS/Rec	8.0		8.0	0.0
TOTAL FOR THIS HUC		8.0		8.0	0.0

Total Acres In All Zones 6313.6 3282.8 3030.8
(This total excludes area of Rt.80)

TABLE C-2

TOWNSHIP OF FAIRFIELD
STORMWATER MANAGEMENT PLAN
BUILD-OUT ANALYSIS
Impervious Coverage

Huc 14 Code & Zone	Total Area	Existing Impervious	Existing Impervious	Wetland Area	Developable Area	Allowable Impervious	Build-out Impervious
	(acres)	%	(acres)	(acres)	(acres)	(%)	(acres)
2030103040010							
R-1	964.0	30%	289.2	132.6	831.4	35%	291.0
R-2	149.0	30%	44.7	110.8	38.2	35%	13.4
L-1	171.4	80%	137.1	10.9	160.5	55%	88.3
L-2	162.5	80%	130.0	14.8	147.7	55%	81.2
C-1	5.2	72%	3.8	0.0	5.2	55%	2.9
HD	225.6	85%	191.8	12.0	213.6	55%	117.5
OP	22.3	85%	19.0	1.3	21.0	55%	11.6
OS/Rec.	344.1	25%	86.0	344.1	0.0	40%	0.0
AC	2185.0	0%	5.5	2185.0	0.0	15%	0.0
TOTAL FOR THIS HUC	4229.1		907.0	2811.4	1417.7		605.8

Huc 14 Code Zone	Total Area	Existing Impervious	Existing Impervious	Wetland Area	Developable Area	Allowable Impervious	Build-out Impervious
	(acres)	%	(acres)	(acres)	(acres)	(%)	(acres)
2030103120060							
R-1	421.4	30%	126.4	26.0	395.4	35%	138.4
R-3	17.5	30%	5.3		17.5	35%	6.1
R-4	8.7	30%	2.6		8.7	35%	3.0
R-6	4.2	30%	1.3		4.2	55%	2.3
L-1	735.4	80%	588.3	73.6	661.8	55%	364.0
L-3	356.0	80%	284.8	124.8	231.2	55%	127.2
C-1	29.0	72%	20.9		29.0	55%	16.0
C-2	10.8	72%	7.8	4.1	6.7	55%	3.7
HD	202.8	85%	172.4	12.2	190.6	55%	104.8
OS/Rec	17.6	25%	4.4	17.6	0.0	15%	0.0
TOTAL FOR THIS HUC	1803.4		1214.1	258.3	1545.1		765.5

Huc 14 Code Zone	Total Area	Existing Impervious	Existing Impervious	Wetland Area	Developable Area	Allowable Impervious	Build-out Impervious
	(acres)	%	(acres)	(acres)	(acres)	(%)	(acres)
2030103120100							
R-1	39.3	30%	11.8	8.4	30.9	35%	10.8
R-5	13.0	30%	3.9	10.3	2.7	35%	0.9
R-6	3.2	30%	1.0	0.8	2.4	35%	0.8
C-1	3.5	72%	2.5		3.5	55%	1.9
L-1	3.2	80%	2.6	1.4	1.8	55%	1.0
HD	17.2	85%	14.6	10.2	7.0	55%	3.9
OS/Rec	1.0	25%	0.3	1.0	0.0	15%	0.0
TOTAL FOR THIS HUC	80.4		36.6	32.1	48.3		19.4

Huc 14 Code Zone	Total Area	Existing Impervious	Existing Impervious	Wetland Area	Developable Area	Allowable Impervious	Build-out Impervious
	(acres)	%	(acres)	(acres)	(acres)	(%)	(acres)
2030103010180							
R-1	21.0	30%	6.3	12.0	9.0	35%	3.2
C-2	10.7	72%	7.7		10.7	55%	5.9
OS/Rec	161.0	25%	40.3	161.0	0.0	15%	0.0
TOTAL FOR THIS HUC	192.7		54.3	173.0	19.7		9.0

Huc 14 Code Zone	Total Area	Existing Impervious	Existing Impervious	Wetland Area	Developable Area	Allowable Impervious	Build-out Impervious
	(acres)	%	(acres)	(acres)	(acres)	(%)	(acres)
2030103010170							
OS/Rec	8.0	25%	2.0	8.0	0.0	15%	0.0
TOTAL FOR THIS HUC	8.0		2.0	8.0	0.0		0.0

Total Acres in All Zones 6313.6 2213.9 3282.8 3030.8 1399.7

(This total excludes area of Rt.80)

**TABLE C-3
TOWNSHIP OF FAIRFIELD
STORMWATER MANAGEMENT PLAN
NONPOINT SOURCE LOADS AT BUILD-OUT**

Huc 14 Code & Zone	Build-Out Zoning	Developable Area (acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
2030103040010								
R-1	Low Density Residential	831.4	0.6	498.8	5.0	4157.0	100.0	83140.0
R-2	Low Density Residential	38.2	0.6	22.9	5.0	191.2	100.0	3823.0
L-1	Industrial	160.5	1.5	240.8	16.0	2568.0	200.0	32100.0
L-2	Industrial	147.7	1.5	221.6	16.0	2363.2	200.0	29540.0
C-1	Comercial	5.2	2.1	11.0	22.0	115.3	200.0	1048.0
HD	Comercial	213.6	2.1	448.6	22.0	4699.2	200.0	42720.0
OP	Comercial	21.0	2.1	44.2	22.0	462.7	200.0	4206.0
OS/Rec.	Forest, Water, Wetlands	0.0	0.1	0.0	3.0	0.0	40.0	0.0
AC	Forest, Water, Wetlands	0.0	0.1	0.0	3.0	0.0	40.0	0.0
TOTAL FOR THIS HUC		1417.7		1487.8		14556.5		196577.0

Huc 14 Code Zone	Build-Out Zoning	Developable Area (acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
2030103120060								
R-1	Low Density Residential	395.4	0.6	237.2	5.0	1977.0	100.0	39540.0
R-3	Low Density Residential	17.5	0.6	10.5	5.0	87.5	100.0	1750.0
R-4	Low Density Residential	8.7	0.6	5.2	5.0	43.4	100.0	867.0
R-6	Low Density Residential	4.2	0.6	2.5	5.0	21.2	100.0	424.0
L-1	Industrial	661.8	1.5	992.7	16.0	10588.8	200.0	132360.0
L-3	Industrial	231.2	1.5	346.8	16.0	3699.2	200.0	46240.0
C-1	Comercial	29.0	2.1	60.9	22.0	638.0	200.0	5800.0
C-2	Comercial	6.7	2.1	14.1	22.0	147.4	200.0	1340.0
HD	Comercial	190.6	2.1	400.3	22.0	4193.2	200.0	38120.0
OS/Rec	Forest, Water, Wetlands	0.0	0.1	0.0	3.0	0.0	40.0	0.0
TOTAL FOR THIS HUC		1545.1		2070.2		21395.7		266441.0

Huc 14 Code Zone	Build-Out Zoning	Developable Area (acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
2030103120100								
R-1	Low Density Residential	30.9	0.6	18.5	5.0	154.5	100.0	3090.0
R-5	Low Density Residential	2.7	0.6	1.6	5.0	13.5	100.0	270.0
R-6	Low Density Residential	2.4	0.6	1.4	5.0	11.9	100.0	238.0
C-1	Comercial	3.5	2.1	7.4	22.0	77.0	200.0	700.0
L-1	Industrial	1.8	1.5	2.8	16.0	29.4	200.0	368.0
HD	Comercial	7.0	2.1	14.7	22.0	154.0	200.0	1400.0
OS/Rec	Forest, Water, Wetlands	0.0	0.1	0.0	3.0	0.0	40.0	0.0
TOTAL FOR THIS HUC		48.3		46.4		440.3		6066.0

Huc 14 Code Zone	Build-Out Zoning	Developable Area (acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
2030103010180								
R-1	Low Density Residential	9.0	0.6	5.4	5.0	45.0	100.0	900.0
C-2	Comercial	10.7	2.1	22.5	22.0	235.4	200.0	2140.0
OS/Rec	Forest, Water, Wetlands	0.0	0.1	0.0	3.0	0.0	40.0	0.0
TOTAL FOR THIS HUC		19.7		27.9		280.4		3040.0

Huc 14 Code Zone	Build-Out Zoning	Developable Area (acres)	TP (lbs/acre/yr)	TP (lbs/yr)	TN (lbs/acre/yr)	TN (lbs/yr)	TSS (lbs/acre/yr)	TSS (lbs/yr)
2030103010170								
OS/Rec	Forest, Water, Wetlands	0.0	0.1	0.0	3.0	0.0	40.0	0.0
TOTAL FOR THIS HUC		0.0		0.0		0.0		0.0

Totals for All Zones 3030.8 3632.3 36672.9 472124.0

(This total excludes area of Rt.80)

Mitigation Plans

A mitigation plan is required to grant a variance or exemption from the design and performance standards of a municipal stormwater management plan. The mitigation requirements should offer a hierarchy of options that clearly offset the effect on groundwater recharge, stormwater quantity control, and/or stormwater quality control that was created by granting the variance or exemption.

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

Mitigation Project Criteria

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

The following is the procedure for a developer to mitigate any deficit from the performance standards resulting from the proposed project:

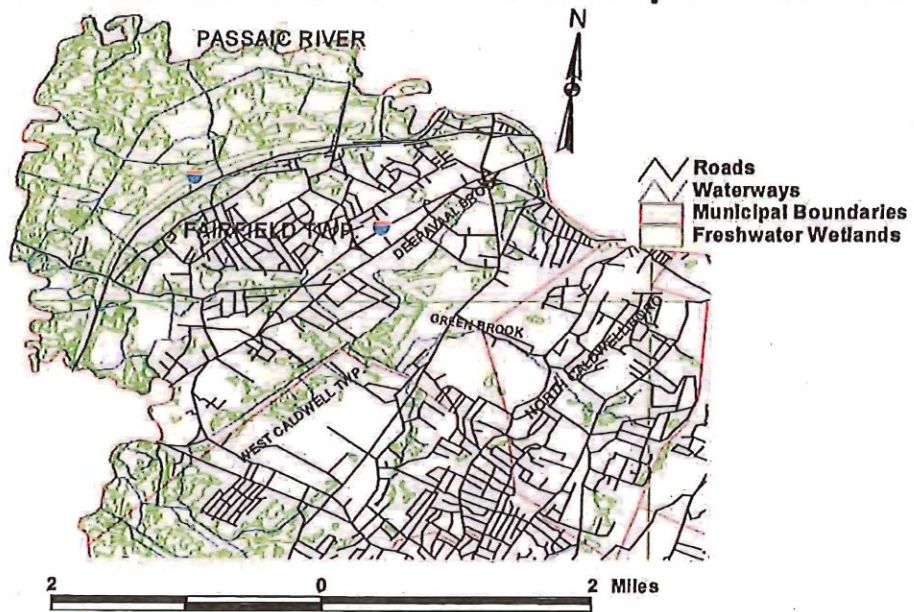
- a) At the time of submission of an application for major development clearly identify and quantify any deficit from the performance standards and provide a detailed justification as to why the standards cannot be met on site.
- b) The developer shall first consult with the Township to determine if there are any Municipal projects that can be constructed that will achieve the required mitigation.
- c) If no municipal projects can be identified for mitigation, the developer may construct an offsite project on private property that will fulfill the required mitigation.
- d) In the event that an offsite mitigation project is being proposed the developer shall submit at the time an application is made a property owner's consent and legal agreements granting permission to the developer to construct said mitigation project.
- e) Submit a detailed drainage analysis and plans signed and sealed by a professional engineer for the proposed project.
- f) Submit a detailed maintenance plan which identifies the person or persons responsible for preventative and corrective maintenance tasks, frequency of maintenance, annual cost estimate for maintenance, contact phone numbers, and a detailed description of the maintenance tasks to be performed on each and every component of the proposed stormwater management plan. Maintenance

measures shall be consistent with those described in the NJDEP's Best Management Practices Manual.

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

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

Figure C-7
Freshwater Wetlands Within the Township of Fairfield



Appendix A – Table of Pollutant Loads, Map of Impaired Waterways

Pollutant Loads By Land Cover

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

Source: NJDEP Stormwater BMP Manual 2004

Appendix I B
Sublist 5 of the 2004 Integrated List (By Waterbody/Parameter) With Priority Ranking

Region	WMA	Station Name/Waterbody	Site ID #	Impairment	Priority	Data Source
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Chromium	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Copper	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Cyanide	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Lead	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Mercury	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Phosphorus	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Silver	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Thallium	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	04	Passaic River at Little Falls	01389500, Passaic-11, Passaic-12, 4-SITE-6, 4-PAS-3	Zinc	High	NUDEP/USGS Data, PVSC, Metal Recon
Northwest	06	Passaic River at S Main Ave in Warren	AN0228	Benthic Macroinvertebrates	Low	NUDEP AMNET
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Benthic Macroinvertebrates	Low	NUDEP AMNET
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Arsenic	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Cadmium	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Chromium	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Copper	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Cyanide	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Lead	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Mercury	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Phosphorus	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Silver	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Thallium	High	NUDEP/USGS Data, Metal Recon
Northwest	04	Passaic River at Singac	01389130, 4-PAS-4	Zinc	High	NUDEP/USGS Data, Metal Recon
Northwest	06	Passaic River at Summit Ave in Summit	AN0229	Benthic Macroinvertebrates	Low	NUDEP AMNET
Northwest	06	Passaic River at Summit Ave in Summit	AN0230	Benthic Macroinvertebrates	Low	NUDEP AMNET
Northwest	06	Passaic River at Tempwick Rd near Mendham	01378660	Fecal Coliform	High	NUDEP/USGS Data
Northwest	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Arsenic	High	NUDEP/USGS Data, Metal Recon
Northwest	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Mercury	High	NUDEP/USGS Data, Metal Recon
Northwest	06	Passaic River at Two Bridges	01382000, 6-SITE-3	Phosphorus	High	NUDEP/USGS Data, Metal Recon
Northwest	06	Passaic River at Watchung Ave in Chatham	AN0230A	Benthic Macroinvertebrates	Low	NUDEP AMNET
Northwest	06	Passaic River at Willard St in Montville	AN0274A	Benthic Macroinvertebrates	Low	NUDEP AMNET
Northwest	04	Passaic River Below Pompton River at Two Bridges	01389005	Phosphorus	High	NUDEP/USGS Data

TMDL Stream Segments Within Essex County, New Jersey

WMA	County	Municipalities in Streamshed	Site ID	Stream Segment	TMDL	WQMP
4	Essex	Cedar Grove Township	01389600	Peckman River at West Paterson	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
6	Essex	Essex Fells Boro	01379530	Canoe Brook near Summit	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
4	Essex	Fairfield Township	01389138	Deepavaal Brook at Fairfield	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
4	Essex	Fairfield Township	01389005	Passaic R. below Pompton R. at Two Bridges	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
4	Essex	Fairfield Township	01389500	Passaic River at Little Falls	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
6	Essex	Fairfield Township	01382000	Passaic River at Two Bridges	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
7	Essex	Irvington Township	01393350	WB Elizabeth River Near Union	TMDL for fecal coliform to address 48 streams in the Raritan Water Region	Northeast WQMP
6	Essex	Livingston Township	01379530	Canoe Brook near Summit	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
6	Essex	Livingston Township	01379500	Passaic River near Chatham	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
7	Essex	Maplewood Township	01394500	Rahway River Near Springfield	TMDL for fecal coliform to address 48 streams in the Raritan Water Region	Northeast WQMP
7	Essex	Maplewood Township	01393350	WB Elizabeth River Near Union	TMDL for fecal coliform to address 48 streams in the Raritan Water Region	Northeast WQMP
6	Essex	Millburn Township	01379530	Canoe Brook near Summit	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
6	Essex	Millburn Township	01379500	Passaic River near Chatham	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
7	Essex	Millburn Township	01394500	Rahway River Near Springfield	TMDL for fecal coliform to address 48 streams in the Raritan Water Region	Northeast WQMP
4	Essex	North Caldwell Boro	01389138	Deepavaal Brook at Fairfield	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
7	Essex	Orange City	01394500	Rahway River Near Springfield	TMDL for fecal coliform to address 48 streams in the Raritan Water Region	Northeast WQMP
6	Essex	Roseland Boro	01379530	Canoe Brook near Summit	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
6	Essex	Roseland Boro	01379500	Passaic River near Chatham	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
7	Essex	South Orange Village	01394500	Rahway River Near Springfield	TMDL for fecal coliform to address 48 streams in the Raritan Water Region	Northeast WQMP
4	Essex	Verona Boro	01389600	Peckman River at West Paterson	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP
4	Essex	West Caldwell Township	01389138	Deepavaal Brook at Fairfield	TMDI for fecal coliform to address 34 streams in the Northeast Water Region	Northeast WQMP

Appendix B – SCO Ordinance #2021-01

TOWNSHIP OF FAIRFIELD ORDINANCE #2021-01

AN ORDINANCE AMENDING CHAPTER 42, SECTION 10 OF THE CODE OF THE TOWNSHIP OF FAIRFIELD ENTITLED STORM CONTROL

WHEREAS, the New Jersey Department of Environmental Protection adopted revised Stormwater Management rules, requiring all municipalities to adopt revised Ordinances reflecting the updated rules.

NOW, THEREFORE, BE IT ORDAINED by the Mayor and Township Council of the Township of Fairfield, County of Essex, State of New Jersey, as follows:

SECTION 1. Chapter 42, Section 10, of the Township Code of the Township of Fairfield, entitled "Stormwater Control" shall be deleted in its entirety.

SECTION 2. Chapter 42, Section 10, of the Township Code of the Township of Fairfield, entitled "Stormwater Control" shall be added to read in its entirety as follows:

42-10 STORMWATER CONTROL

42-10.1 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 ordinance is to establish minimum stormwater management requirements and controls for "major development," as defined below in Section 42-10.2.

c. Applicability

1. This ordinance 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 ordinance shall also be applicable to all major developments undertaken by the Township of Fairfield.

d. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued pursuant to this ordinance 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 ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare.

This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

42-10.2 Definitions:

For the purpose of this ordinance, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this Chapter 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" means 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" means 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" means 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 chapter.

"Compaction" means the increase in soil bulk density.

"Contributory drainage area" means the area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself.

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

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

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

"Department" means the Department of Environmental Protection.

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

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

"Development" means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or 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:IC-1 *et seq.*

"Disturbance" means 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" means a geographic area within which storm water, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

"Environmentally constrained area" means 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" means 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.

"Empowerment Neighborhoods" means 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.

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

"Green infrastructure" means a storm water management measure that manages storm water close to its source by:

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

"HUC 14" or "hydrologic unit code 14" means 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" means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

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

"Lead planning agency" means one or more public entities having storm water management planning authority designated by the regional storm water management planning committee pursuant to N.J.A.C. 7:8-3.2, that serves as the primary representative of the committee.

"Major development" means an individual "development," as well as multiple developments that individually or collectively result in the disturbance of one or more acres of land since February 2, 2004.

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 result in the disturbance of one or more acres of land since February 2, 2004. 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" means 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" means 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" means any city, borough, town, township, or village.

"New Jersey Stormwater Best Management Practices (BMP) Manual" or "BMP Manual" means 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 chapter. 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 chapter. Alternative stormwater management measures, removal rates, or calculation methods may be utilized, subject to any limitations specified in this chapter, provided the design engineer demonstrates to the municipality, in accordance with Section IV.F. of this ordinance 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 chapter.

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

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

"Person" means any individual, corporation, company, partnership, firm, association, political subdivision of this State and any state, interstate or Federal agency.

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

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

"Regulated impervious surface" means any of the following, alone or in combination:

1. A net increase of impervious surface;
2. 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);
3. The total area of impervious surface proposed to be newly collected by an existing stormwater conveyance system; and/or
4. 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" means any of the following, alone or in combination:

1. The total area of motor vehicle surface that is currently receiving water;
2. 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" means solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

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

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

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

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

Introduced: 01-25-2021
Adopted: 02-22-2021

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

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

"Stormwater management planning agency" means a public body authorized by legislation to prepare stormwater management plans.

"Stormwater management planning area" means 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.

"Tidal Flood Hazard Area" means a flood hazard area in which the flood elevation resulting from the two-, 10-, 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" means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

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

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

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

Introduced: 01-25-2021

Adopted: 02-22-2021

4. Designated as Urban Coordinating Council Empowerment Neighborhoods.

"Water control structure" means a structure within, or adjacent to, a water, which intentionally or coincidentally alters the hydraulic capacity, the flood elevation resulting from the two-, 10-, 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" means 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" means an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

42-10.3 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 Chapter 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.

42-10.4 Stormwater Management Requirements for Major Development:

- a. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section 42-10.10.
- 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 *He/onias bullata* (swamp pink) and/or *Clemmys muhlnebergi* (bog turtle).

Introduced: 01-25-2021

Adopted: 02-22-2021

- c. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of Section 42-10.4 (p), (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 42-10.4 (o), (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 42-10.4 (o), (p), (q) and (r) to the maximum extent practicable;
 3. The applicant demonstrates that, in order to meet the requirements of Section 42-10.4 (o), (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 Section 42-10.4(d)(3) above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Section 42-10.4 (o), (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 42-10.4 (o), (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.

Introduced: 01-25-2021

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- f. Where the BMP tables in the NJ Stormwater Management Rule are different due to updates or amendments with the tables in this ordinance 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) 11(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(t)	2(b) 1(i)
Small-Scale Bioretention Basin(a)	80 or 90	Yes	Yes(b) No(t)	2(b) 1(t)
Small-Scale Infiltration Basin(a)	80	Yes	Yes	2
Small-Scale Sand Filter	80	Yes	Yes	2
Vegetative Filter Strip	60-80	No	No	--

Introduced: 01-25-2021
 Adopted: 02-22-2021

Table 2 Green Infrastructure BMPs for Stormwater Runoff Quantity (or for Groundwater Recharge and/or Stormwater Runoff Quantity 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)} No ^{e)}	2 ^{b)} 1 ^{c)}
Infiltration Basin	80	Yes	Yes	2
Sand Filter ^{l)}	80	Yes	Yes	2
Standard Constructed Wetland	90	Yes	No	N/A
Wet Pond ^{d)}	50-90	Yes	No	N/A

Introduced: 01-25-2021

Adopted: 02-22-2021

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 ^l	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 42-10.4(0)(2);
- (b) designed to infiltrate into the subsoil;
- (c) designed with underdrains;
- (d) designed to maintain at least a 10-foot wide area of native vegetation along at least 50 percent 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 two percent;
- (f) designed with a slope of equal to or greater than two percent;
- (g) manufactured treatment devices that meet the definition of green infrastructure at Section 42-10.2;
- (h) manufactured treatment devices that do not meet the definition of green infrastructure at Section 42-10.2.

- g. An alternative storm water 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 storm water management measure and/or the validity of the alternative rate or method to the municipality. A copy of any approved alternative storm water management measure, alternative removal rate, and/or alternative method to calculate the removal rate shall be provided to the Department in accordance with Section 42-10.6(b). Alternative storm water management measures may be used to satisfy the requirements at Section 42-10.4(o) only if the measures meet the definition of green infrastructure at Section 42-10.2. Alternative storm water management measures that function in a similar manner to a BMP listed at Section 42-10.4(o)(2) are subject to the contributory drainage area limitation specified at Section 42-10.4(o)(2) for that similarly functioning BMP. Alternative storm water management measures approved in accordance with this subsection that do not function in a similar manner to any BMP listed at Section 42-10.4(o)(2) shall have a contributory drainage area less than or equal to 2.5 acres, except for alternative storm water 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 storm water 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 42-10.4(d) is granted from Section 42-10.4(o).
- h. Whenever the storm water management design includes one or more BMPs that will infiltrate storm water 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 storm water management measure itself.
1. Design standards for storm water management measures are as follows:
 1. Storm water 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. Storm water 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 one-third 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 42-10.8(c).

Introduced: 01-25-2021

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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 42-10.8; and
 5. The size of the orifice at the intake to the outlet from the stormwater management BMP shall be a minimum of two and one-half 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 II may be used only under the circumstances described at Section 42-10.4(0)(4).
- k. Any application for a new agricultural development that meets the definition of major development at Section II shall be submitted to the Soil Conservation District for review and approval in accordance with the requirements at Section 42-10.4 (o), (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 42-10.4 (p), (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 Essex County Register of Deeds and Mortgages. 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 42-10.4 (o), (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 42-10.10(b)(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 42-10.4 of this ordinance 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 Essex County Register of Deeds and Mortgages 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 42-10.4 (p) and (q), the design engineer shall utilize green infrastructure BMPs identified in Table 1 at Section 42-10.4(f) and/or an alternative stormwater management measure approved in accordance with Section 42-10.4(g). 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 three 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 42-10.4(r), 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 42-10.4(g).
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 42-10.4(d) 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 42-10.4(g) may be used

to meet the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at Section 42-10.4 (p), (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 42-10.4 (p), (q) and (r), unless the project is granted a waiver from strict compliance in accordance with Section 42-10.4(d).

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 42-10.5, either:
 - (a) Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or
 - (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.
3. This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (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 (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.

Table 4 - Water Quality Design Storm Distribution

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
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 percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

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

Where

R = total TSS Percent Load Removal from application of both BMPs, and
 A = the TSS Percent Removal Rate applicable to the first BMP
 B = the TSS Percent Removal Rate applicable to the second BMP.

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 42-10.4 (p), (q) and (r).
7. In accordance with the definition of FWI 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 FWI.
8. The Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-4.1(c)l 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. 7:13-11.20)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 percent 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 42-10.5, complete one of the following:
 - (a) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2-, 10-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
 - (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 2-, 10- and 100-year storm events and that the increased volume or change in timing of stormwater runoff will

not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

- (c) Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10- and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed; or
 - (d) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (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.

42-10.5 Calculation of Stormwater Runoff and Groundwater Recharge:

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

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

- (a) The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in 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/am/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 42-10.5(a)(1)(a) and the Rational and Modified Rational Methods at Section 42-10.5(a)(1)(b). A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).
 3. In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.
 4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS *Technical Release 55 - Urban Hydrology for Small Watersheds* 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.

42-10.6 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.

42-10.7 Solids and Floatable Materials Control Standards:

- a. Site design features identified under Section 42-10.4(f) above, or alternative designs in accordance with Section 42-10.4(g) 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 42-10.7(a)(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 (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater 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 (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.

2. The standard in (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 (9.0) 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 four and five-eighths (4.625) 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 0.5 inches.

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 (1 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.

42-10.8 Safety Standards for Stormwater Management Basins:

- a. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management 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 42-10.8(c)(1), 42-10.8(c)(2), and 42-10.8(c)(3) for trash racks, overflow grates, and escape provisions at outlet structures.

c. Requirements for Trash Racks, Overflow Grates and Escape Provisions

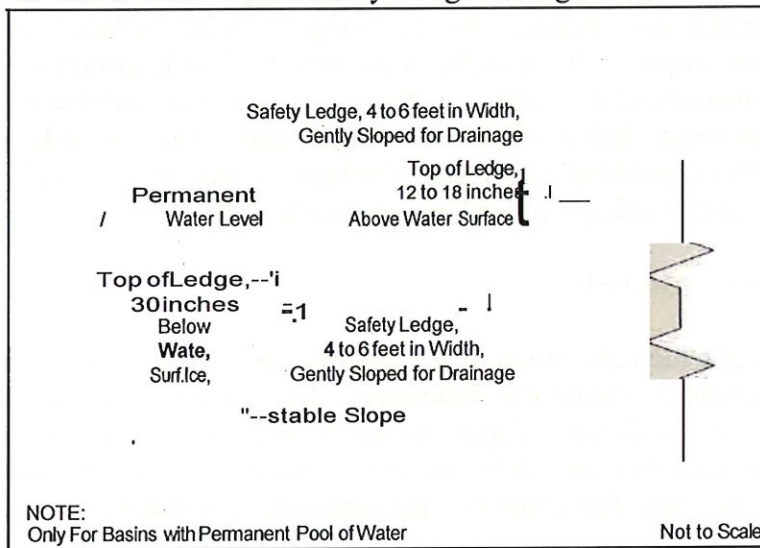
1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the Stormwater management BMP to ensure proper functioning of the BMP outlets in accordance with the following:
 - (a) The trash 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 Section 42-10.8(c), a free-standing outlet structure may be exempted from this requirement;
 - (b) Safety ledges shall be constructed on the slopes of all new stormwater management BMPs having a permanent pool of water deeper than two and one-half 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 two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See Section 42-10.8(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



42-10.9 Requirements for a Site Development Stormwater Plan:

a. Submission of Site Development Stormwater Plan.

1. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 42-10.9(c) 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 Chapter.
3. The applicant shall submit sixteen (16) copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 42-10.9(c) of this ordinance.

b. Site Development Stormwater Plan Approval

The applicant's Site Development project shall be reviewed as a part of the review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the municipality's review engineer to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance

c. Submission of Site Development Stormwater Plan

The following information shall be required:

I. 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 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, 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 42-10.3 through 42-10.5 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 pre-development and post-development conditions for the design storms specified in Section 42-10.4 of this ordinance.
- (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 42-10.10.

8. Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation with the municipality's review engineer, waive submission of any of the requirements in Section 42-10.9(c)(1) through 42-10.9(c)(6) of this Chapter 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.

2-10.10 Maintenance and Repair:

a. Applicability

Projects subject to review as in Section 42-10.1(c) of this Chapter shall comply with the requirements of Section 42-10.10(b) and 42-10.10(c).

b. General Maintenance

1. The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
2. The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). 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 42-10.10(b)(3) above is not a public agency, the maintenance plan and any future revisions based on Section 42-10.10(b)(7) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
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 42-10.10(b)(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

Introduced: 01-25-2021
Adopted: 02-22-2021

- 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 42-10.10(b)(6) and 42-10.10(b)(7) above.
8. The requirements of Section 42-10.10(b)(3) and 42-10.10(b)(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.
- c. The party responsible for maintenance identified under Section 42-10.10(b)(3) shall post a maintenance guarantee in accordance with N.J.S.A. 40:55D-53 in an amount to be reviewed and approved by the Township Engineer. The Township Engineer may waive this requirement in the event he or she determines a maintenance bond is unnecessary.

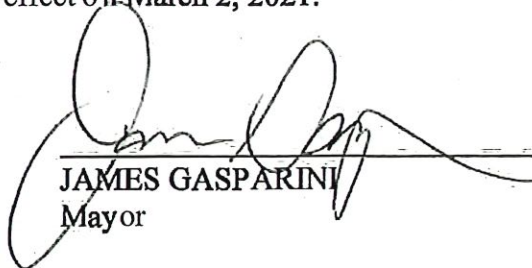
42-10.11 Penalties:

Any person(s) who erects, constructs, alters, repairs; converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the General Penalty provisions set forth in Chapter 1-5 of the Township Code.

SECTION 3. All ordinances and parts of ordinances inconsistent herewith are hereby repealed.

SECTION 4. If any section, paragraph, subdivision, clause of provision of this ordinance shall be adjudged invalid, such adjudication shall apply only to that section, paragraph, subdivision, clause or provision so adjudged, and the remainder of this ordinance shall be deemed to be valid and effective.

SECTION 5. This ordinance shall take effect on ~~March 2, 2021~~.


JAMES GASPARINI
Mayor

ATTEST:

DENISE D. CAFONE
Municipal Clerk

