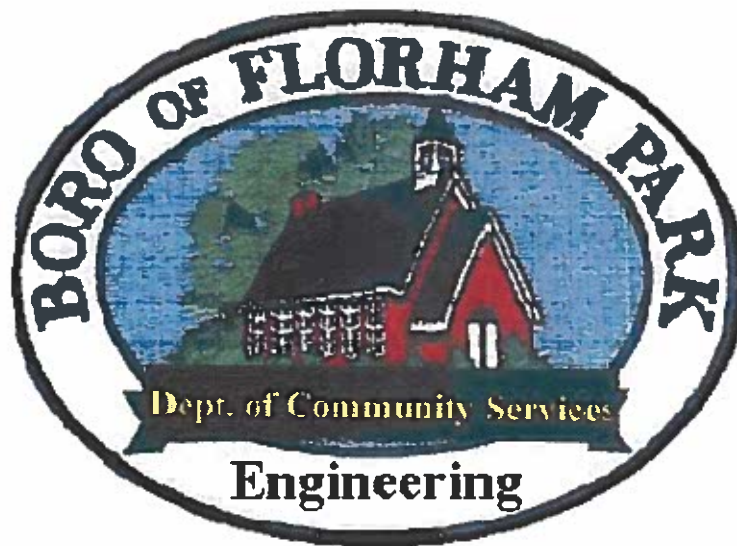


# MUNICIPAL STORMWATER MANAGEMENT PLAN

BOROUGH OF FLORHAM PARK, MORRIS COUNTY



Rev: July, 2008  
August, 2006  
BOROUGH OF FLORHAM PARK  
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## **INTRODUCTION**

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Florham Park (“the Borough”) to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides 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 not been included in this plan due to the fact that the Borough has a combined total of less than one square mile of vacant or agricultural lands.

The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

## **GOALS**

The goals of this MSWMP are to:

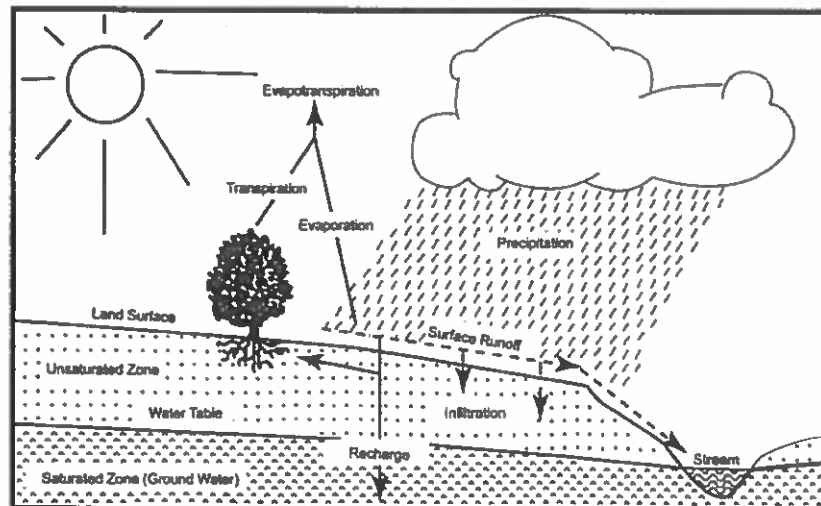
- Reduce flood damage, including damage to life and property;
- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges, and other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

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

## STORMWATER DISCUSSION

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

Figure 1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

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

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

## **BACKGROUND**

### *General*

The Borough of Florham Park is an older established community where land use is fairly stable. The Borough borders the Passaic River, which is severely impaired in some sections. There are flooding concerns for the flood prone areas in the Borough related to the Passaic River and its tributaries. This section addresses the Borough's location, history, population, waterways, lakes and ponds, water quality and stormwater quantity.

### *Location*

The Borough of Florham Park is located along the eastern boundary of Morris County. It is bounded on the north by East Hanover Township and Hanover Township. Morris Township borders the Borough on the west and Madison and Chatham Boroughs are adjacent to the southern boundary. The Passaic River marks the eastern municipal border, which separates the Borough from the Essex County communities of Livingston Township and Millburn.

The Route 24 freeway via the interchange with Columbia Turnpike provides access to Interstate 287 to the west, and Interstate 78 to the east. The County Roads of Columbia Turnpike (Route 510), Ridgedale Avenue (Routes 608 and 632), Hanover Avenue (Route 609), Park Avenue (Route 623) and Passaic Avenue (Route 607) link Florham Park with the surrounding communities and other regional roads such as State Routes 10 and 124.

### *History*

The English sometime between 1680 and 1700 first settled the land, which now constitutes the Borough. The community was long recognized as a prime farming area and has been a crossroads of well-traveled routes since colonial days. The area was known for the manufacture of quality brooms, which was the source of one of its names "Broomtown". Through its history, the area was known as Hoppingtown, Broomtown, Colombia, Afton and Florham Park. It was a

part of Hanover Township, then Chatham Township before being incorporated as Florham Park in 1899.

Residential development accelerated in the post World War II years, typical of many New Jersey suburban communities. Florham Park also had major corporate office and light industrial complexes within its borders. These included Exxon Corporation, Prudential Insurance Company and Automatic Switch Company. Retail and service businesses developed in shopping centers concentrated along Columbia Turnpike and Ridgedale Avenue at the community's center.

Until the 1970's, residential development within the Borough was limited to single-family detached housing. The first multi-family developments were constructed in the 1970's. With the Borough's settlement of Mount Laurel litigation, additional multi-family projects have been built and are currently under construction.

The Borough is also the home of The College of Saint Elizabeth, as well as a campus of Fairleigh Dickinson University. Pinch Brook Golf Course, a public course owned by Morris County, as well as the private Brooklake Country Club are located within the Borough.

The 7.6 square mile Borough provides a large municipal recreation area, a private golf course and a public golf course; one municipal swim club; numerous businesses; professional office buildings; light industry and residential development.

#### *Population.*

As listed in the 2000 U.S. Census the Borough's population was estimated to be 10,296, which shows a 20.8% increase from the 1990 Census. The population of Florham Park declined 9% to 8,521 from 9,359 in 1980. The reported decrease in population was accompanied by an increase in the number of dwelling units between 1980 and 1990.

The New Jersey Department of Labor has estimated that the population within the Borough has continued to grow since the 2000 Census. Their estimates show that Florham Park's population has increased every year to a high of 12,508 people in 2003. This population increase is likely due to the occupancy of the new multi-family developments of Avalon, Sun Valley and Riverbend, which have taken occupancy over the last few years.

The median age of residents of the Borough has increased. In 1990 the median age was 39.9 years and it was 43.8 years in 2000. This is higher than Morris County as a whole, which reported median ages of 35.2 years and 37.8 years respectively.

<u>Year</u>	<u>Population</u>
1980	9,359
1990	8,521
2000	10,296

Source: US Bureau of the Census: Censuses of Population and Housing

It is reasonable for the Borough to expect little increased development in the future due to its stabilized population and lack of land available for future development.

#### *Waterways/Lakes/Ponds.*

The Passaic River serves as the Borough's eastern boundary and flows in a southerly direction. The Black Cat Ditch, Black Cat Brook, Fish Brook, Spring Garden Brook and Spring Garden Lake all flow into the Passaic River in the Borough. There are floodplains and wetlands associated with these water bodies, including the Passaic River. The Hassock Brook and Pinch Brook flow into the Black Brook, which is tributary to the Whippany River north of the community.

#### *Water Quality.*

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Source (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. Sections of the Passaic River near the Borough are severely impaired based on AMNET data.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the State. These data show that the instream total phosphorous, arsenic and mercury concentrations of the Passaic River frequently exceed the State's criteria. This means that the river is an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for the 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, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

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

pollutants, for which one or more TMDLs are needed. There are no monitoring stations listed for the Passaic River in the Borough of Florham Park but there are several stations located in the adjacent Municipalities to the north, east and south. There are three (3) monitoring stations in the Township of East Hanover located to the north; Passaic River at Eagle Rock Ave (AN0231 & EQW0231) indicate impairments from benthic macroinvertebrates, phosphorus, dissolved solids and total suspended solids, and Passaic River at Old Mt. Pleasant Ave (AN0231B) indicates impairments from benthic macroinvertebrates. There are two monitoring stations in the Borough of Chatham located to the south; Passaic River at Watchung Ave (AN023A) indicates impairments from benthic macroinvertebrates and Passaic River near Chatham (01379500, 6-SITE-1, 6-PAS-2) indicates impairments from phosphorus, total suspended solids, arsenic, cadmium, copper, lead, mercury, silver, zinc and cyanide. In the Township of Millburn located to the southeast there is one monitoring station; Passaic River at Passaic Avenue in Millburn (AN0231A) indicates impairments from benthic macroinvertebrates.

Almost the entire Borough is connected to public potable water systems. The majority of the connections are serviced by the Florham Park Water Department. Other water purveyors that supply the Borough are the New Jersey American Water Company, the Southeast Morris County Municipal Utilities Authority (SMCMUA) and the Madison Water Department. There are also some scattered well users in the community. The source of the water serving the Borough, with the exception of that supplied by the New Jersey American Water Company, is ground water. The Florham Park Water Department operates three (3) wells located near Elm Street, south of Columbia Turnpike. New Jersey American Water Company had a well located east of Park Avenue and south of Columbia Turnpike, which was retired and sealed in 1992. The Madison and SMCMUA water supply sources are located outside of the Borough. There is also a well on the Exxon property and storage tanks located on the campus of Fairleigh Dickinson University. There is no known groundwater contamination in the Borough, according to the Borough's water department. The Water Department has two (2) storage facilities. One is a cylinder water tower with a capacity of 1,000,00 gallons, located off Tower Lane. The second is a 250,000-gallon spheroid water tower located north of Driftway Drive.

#### *Stormwater Quantity.*

The Borough improved its stormwater collection system during the 70's and 80's, such that much of the flooding that was occurring (mostly in "backyard" areas) was reduced. There are currently no chronic flood prone spots in the Borough with few exceptions. One of these is at Columbia Turnpike east of Elm Street. The existing culvert draining Hassock Brook toward the Black Brook is undersized. Another area of flooding is on Columbia Turnpike west of Elm Street at the Black Brook crossing. The bridge at Black Brook is under design to upgrade the safe capacity of this crossing. Another location where there is an undersized culvert is at Columbia Turnpike and Fish's Brook. This culvert has been studied by the County, but no action to improve its capacity has been taken. Upstream of the Columbia Turnpike restriction, an "unnatural" flood hazard area has been created.

Localized flooding along the Passaic River continues to occur. This is more of a function of the lack of maintenance of the river channel than any other factor.



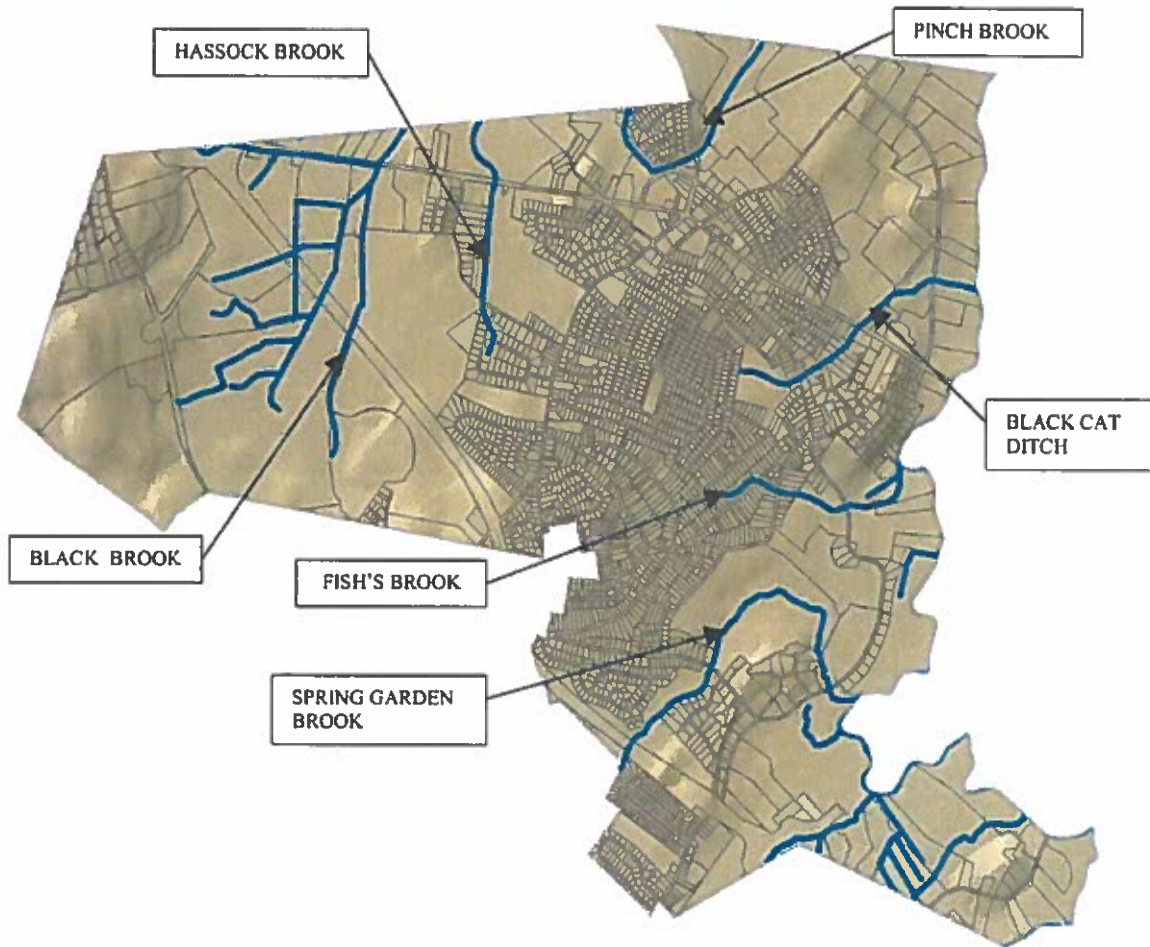
A map of the groundwater recharge areas is shown in Figure 4. The Borough is located in Metropolitan Planning Area (PA1) as delineated on the State Plan Policy Map (SPPM). The Borough requires that the groundwater recharge requirements of the Stormwater Management Regulations be applicable for all development and re-development as per N.J.A.C. 7:8-5.4(a)2ii, specifically as stated in the Borough's Stormwater Management Ordinance.

Wellhead protection areas, also required as part of the MSWMP, are shown in Figure 5.

Figure 2: Borough Boundary on USGS Quadrangle



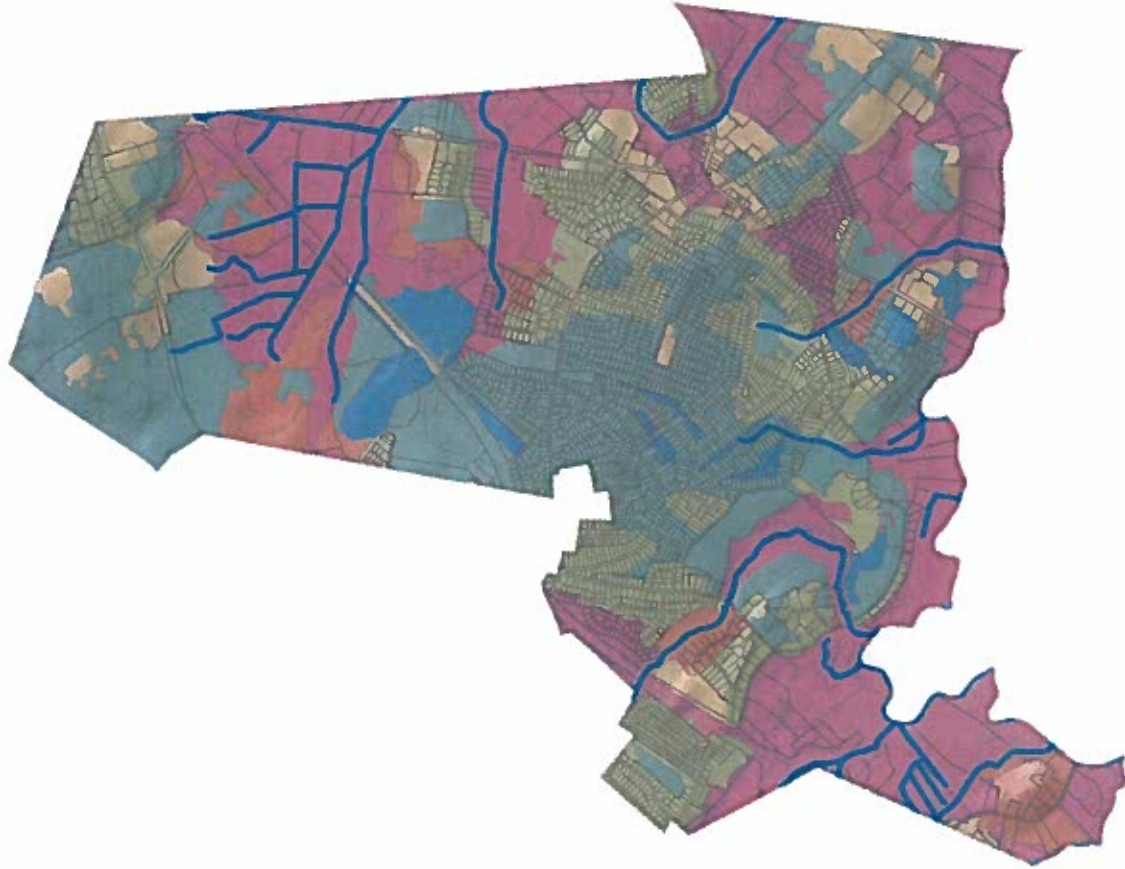
Figure 3: Borough/Waterways



### Waters

-  Highlands Preservation Area
-  Municipal Boundary
-  Highlands Open Water
-  C1 Streams
-  Streams

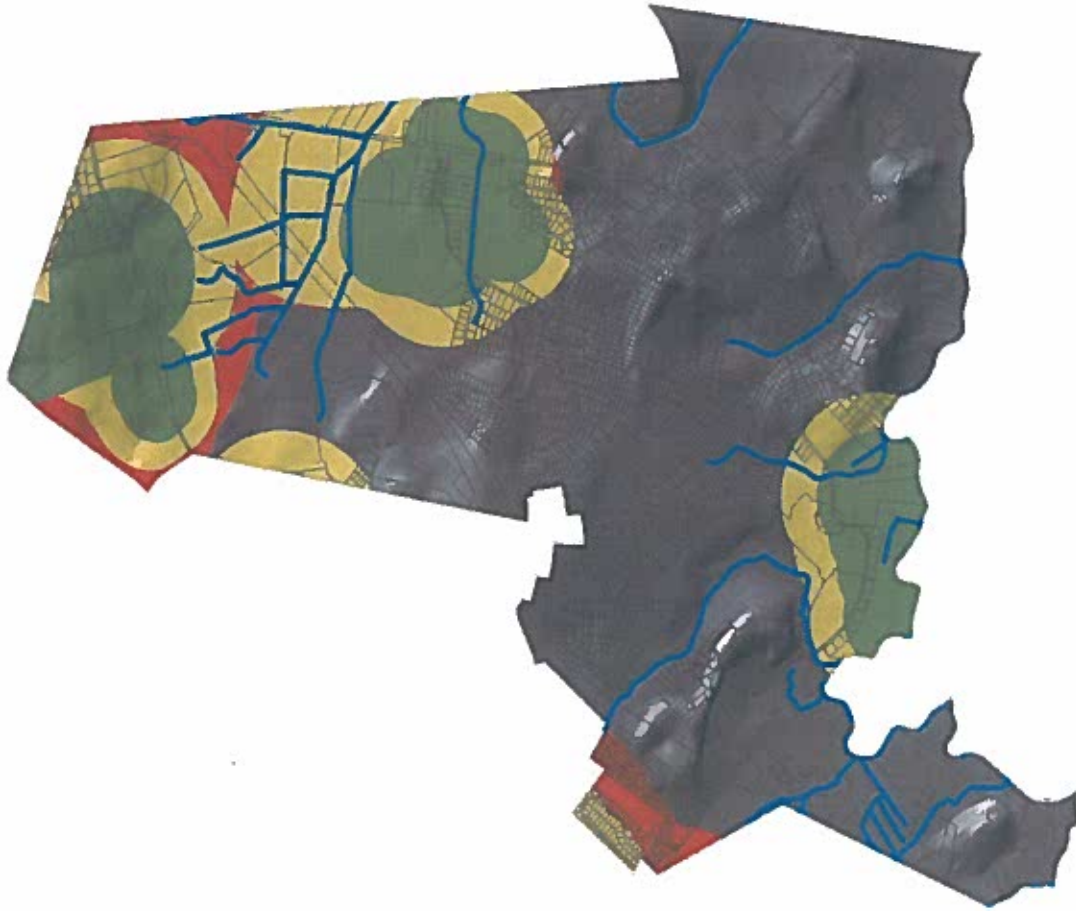
Figure 4: Groundwater Recharge Areas in the Borough



### Groundwater Recharge

- 17+ in/yr
- 13 to 16 in/yr
- 10 to 12 in/yr
- 1 to 9 in/yr
- 0 in/yr
- Hydric Soils
- Highlands Preservation Area
- Municipal Boundary
- Streams

Figure 5: Wellhead Protection Areas in the Borough



### Wellhead Protection Areas

#### TIER

0

1

2

3

Highlands Preservation Area

Municipal Boundary

Streams

## DESIGN AND PERFORMANCE STANDARDS

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

During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

## PLAN CONSISTENCY

### *Regional Stormwater Management Plan*

The Borough is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Borough; therefore this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

### *Residential Site Improvement Standards*

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

### *Soil Erosion and Sediment Control Standards*

The Borough's *Land Development Ordinance* requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Morris County Soil Conservation District.

### *Highlands Water Protection and Planning Act*

The Borough of Florham Park is not located within the Highlands Preservation Area.

## *Morris County Cross-Acceptance Report*

Cross-Acceptance is a process mandated by the State Planning Act for soliciting public comment on the State Development and Redevelopment Plan (State Plan). Counties across New Jersey coordinate the Cross-Acceptance process for their respective municipalities. The Morris County Cross-Acceptance Report includes an overview of the State Plan and the Cross-Acceptance process, presents key findings, issues and recommendations concerning the relative consistency between local, county and State Plans. It also includes a survey of municipal and county planning documents, information on redevelopment sites and other supporting documentation.

The Borough of Florham Park has actively participated with the Morris County Planning Board in coordinating the Borough's Master Plan with the State Plan. The Borough's main concern is with the designation of Planning Area I (PA-1) and the desire to create a better classification that will better describe the nature of the Borough. The first phase of Cross-Acceptance concludes with the submission of a Cross-Acceptance report submitted by the counties to the State Planning Commission. The Morris County Cross-Acceptance Report has been submitted to the State Planning Commission and they are currently waiting to start the negotiation phase of planning.

### **NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES**

The Borough has reviewed the master plan and ordinances, and has provided a list of the sections in the Borough's 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. A copy will be sent to the Department of Environmental Protection at the time of submission.

The *Land Development Ordinance* of the Borough was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes are recommended to incorporate these strategies:

- Article VI, Section 212-38: Utility Easements; Stormwater Easements; Natural Features
- Article VI, Section 212-35: Streets
- Chapter V, Section 215-20: Standards for Flood Hazard Reduction

**Article VI, Section 212-38: Utility Easements; Stormwater Easements; Natural Features** requires that natural features, such as trees, open waters, hilltops, and views be preserved to the maximum extent possible. It is encouraged that care be taken to preserve existing vegetation and trees to enhance natural scenic qualities of the Borough. It is recommended that this section be 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. It is also recommended that this section be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. Additionally, it is recommended that language be included to allow

buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

**Article VI, Section 212-35: Streets** describes the requirements for streets in the Borough. It is recommended that this section be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas. It is also recommended that language be added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces, or use permeable paving materials where appropriate. Also, it is recommended that this section be amended to allow the use of previous paving materials to minimize stormwater runoff and promote groundwater recharge.

**Chapter V, Section 215-20: Standards for Flood Hazard Reduction** addresses stormwater runoff and control measures. It is recommended that cited stormwater management provisions be updated to include all requirements outlined in N.J.A.C. 7:8-5.

## LAND USE/BUILD-OUT ANALYSIS

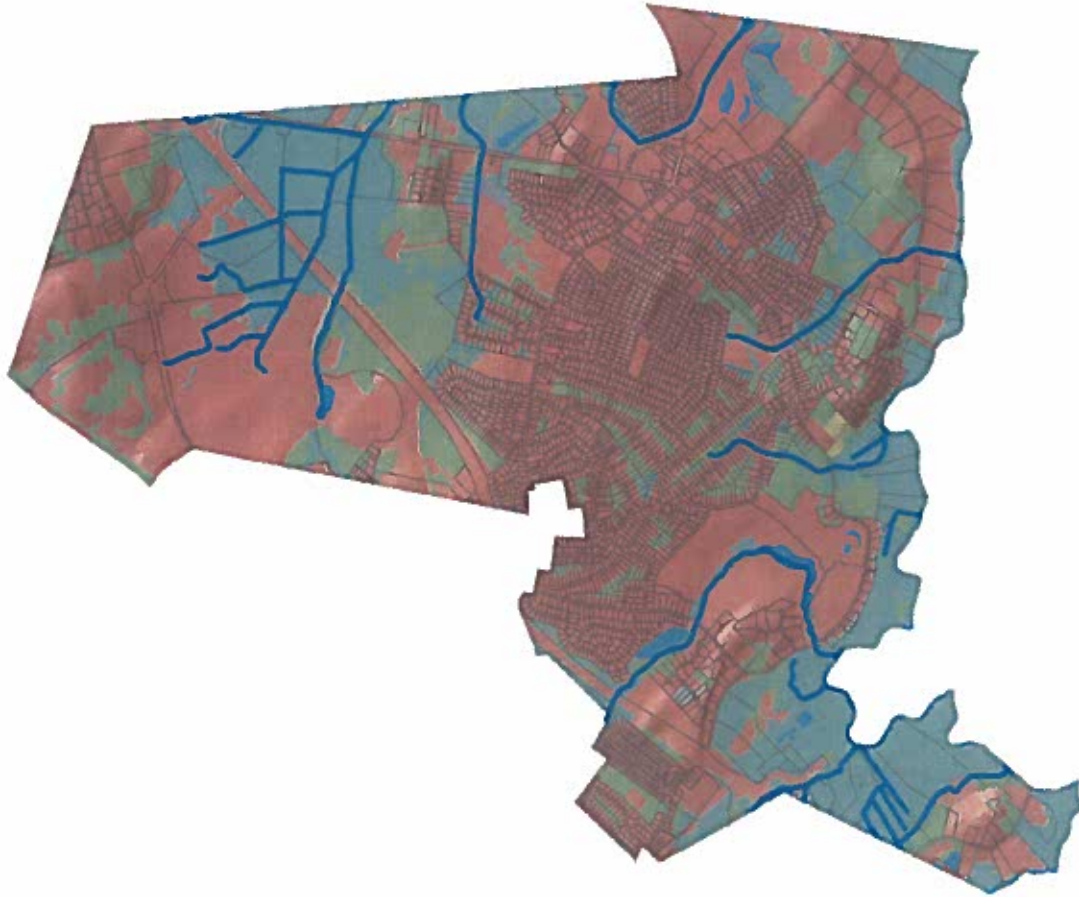
### *General*

Florham Park has a combined total of less than one square mile of vacant or agricultural lands and, therefore, is not required to complete the build-out analysis. The Borough is a primarily developed community.

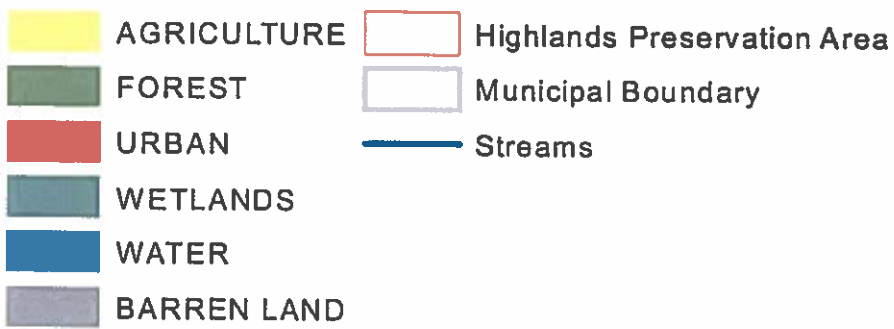
Figure 6 illustrates the existing land cover in the Borough based on 2002 GIS information from NJDEP.



Figure 6: Land Use/Land Cover



### Land Use/Land Cover



## *Land Cover*

Land use and land cover are not synonymous terms. Land cover indicates a type or class of land surface condition, while land use generally refers to specific activities taking place within the land cover category. Land cover mapping is highly useful in quickly identifying patterns of developed and undeveloped land. In more highly developed municipalities like Florham Park, the undeveloped areas usually remain undeveloped due to some type of environmental constraint. The easily seen remaining open space areas often indicate patterns of wetlands, forests and other critical natural features that constrain development.

Land cover classifications are:

Urban	Lands altered by traditional development.
Agriculture	Lands primarily used for food production.
Forest	Lands covered by wooded vegetation.
Water	Open water bodies and areas periodically water covered.
Wetlands	Areas of saturated soil condition that support vegetation.
Barren Land	Landfills, active construction sites and surface mines.

Figure 6 illustrates the existing land cover in the Borough based on 2002 GIS information from NJDEP.

*Urban Land.* This land is the most dominant land use in the Borough. It is heavily concentrated throughout the Borough. Most residential, commercial and industrial areas and some public areas of the Borough are included in this category.

*Agricultural Land.* The Fish Farm is the only assessed farmland located within the Borough. It consists of approximately 50 acres of assessed farmland at the eastern end of the Borough off of Brooklake Road.

*Forests.* Forest areas are few and scattered around the Borough. The forested lands are located primarily within the commercial zones and in small pockets of the residential zones. These areas comprise a very small portion of the total land area.

*Open Water.* The major water areas in the Borough are the Passaic River and its tributaries. Spring Garden Lake is the only existing lake or pond located in the southeast section of the Borough.

*Wetlands.* Wetlands are the second largest land use/land cover category present in the Borough. According to mappings, wetlands are immediately present along the Passaic River and its tributaries and along the Black brook and its tributaries.

*Barren Land.* No land in this classification is shown within the Borough.

## *Zoning.*

The Borough of Florham Park is divided into the following zones:

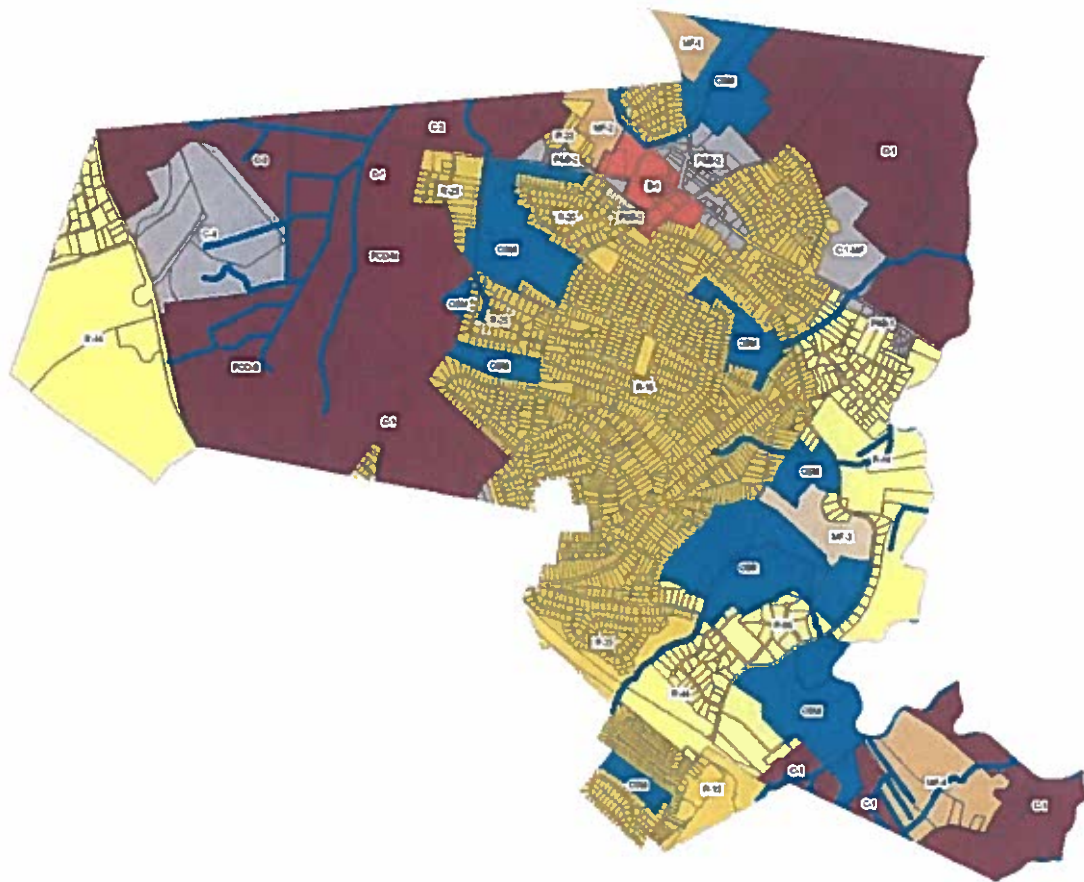
R-88	One-Family Residence Residential Zone
R-44	One-Family Residence Residential Zone
R-25	One-Family Residence Residential Zone
R-15	One-Family Residence Residential Zone
B-1	Business Zone
C-1-MF	Multi-family Residential Housing
C-1	Office and Manufacturing Zone
C-2	Office and Manufacturing Zone
C-3	Office and Manufacturing Zone
C-4	Mixed Office, Research, Laboratory and Multi-Family Residential Zone
P & B-1	Professional and Business Office Zone
P & B-2	Professional and Business Office Zone Residential Appearance Required
MF-1	Multi-Family Residential Zone
MF-2	Multi-Family Residential Zone
MF-3	Multi-Family Residential Zone
MF-4	Multi-Family Residential Zone
OSR	Open Space and Recreation Zone
OSM	Open Space and Municipal Use

The Borough Zoning Map is shown in Figure 7.

### *Build-Out Analysis*

The Borough of Florham Park contains a combined total of less than one (1 sq. mi.) square mile of vacant or agricultural lands. Consequently, a build-out analysis to determine non-point source pollutant loads is not required to be prepared.

Figure 7. Zoning Districts Within the Borough

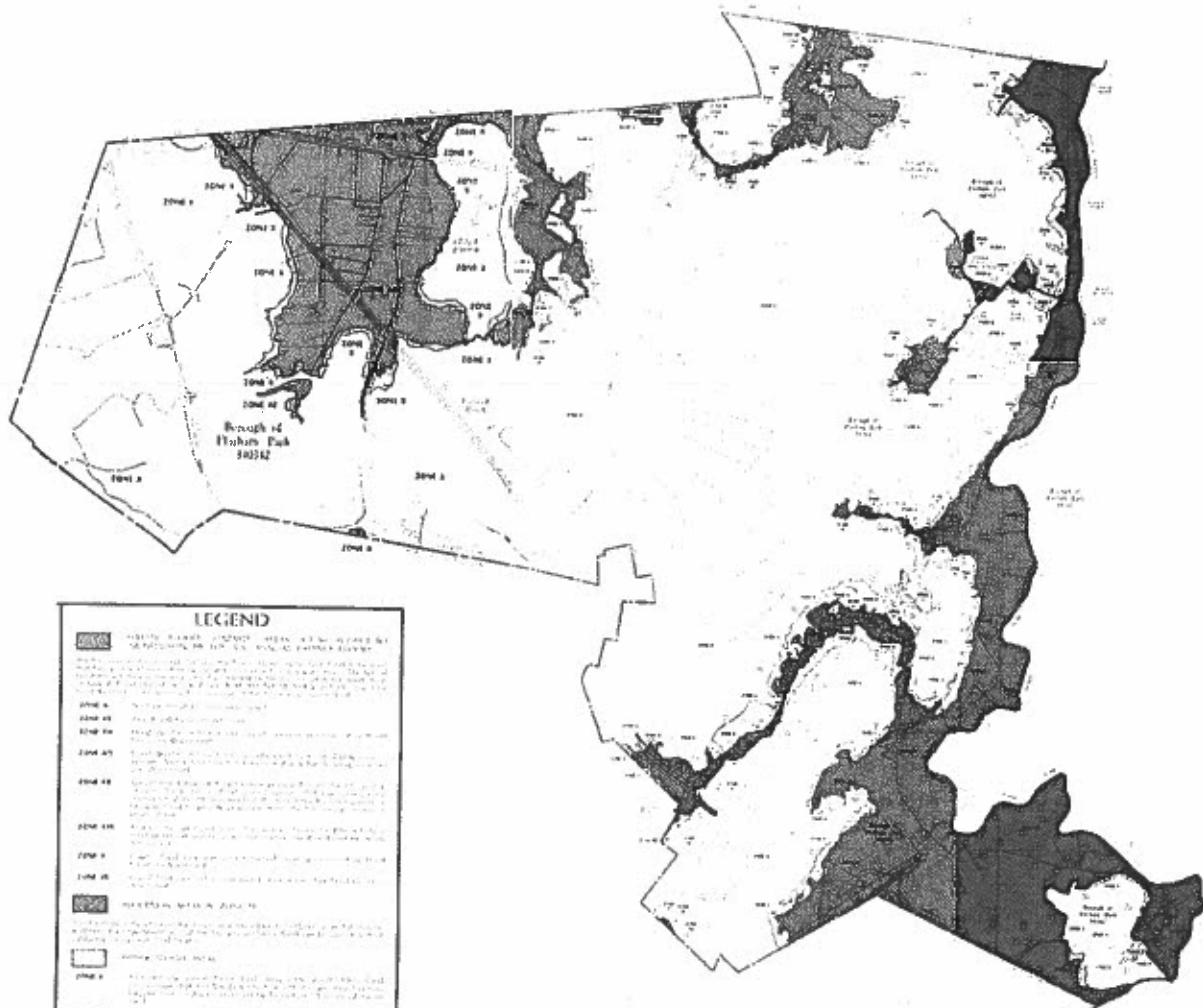


**Categorized Zoning**

- Large Lot Single Family
- Medium Lot Single Family
- Small Lot Single Family
- Low Density Multi-Family
- Medium Density Multi-Family
- High Density Multi-Family
- Retail/Service
- Commercial/Private Recreation
- Commercial/Industrial
- Public/Institutional
- Mixed Use

- Highlands Preservation Area
- Municipal Boundary
- Streams

Figure 8: Flood-Map



**LEGEND**

**Zone A** (Solid black) - Special Flood Hazard Area (SFHA) subject to inundation by 1% annual chance flooding. This zone is subject to the highest flood insurance rates.

**Zone B** (Diagonal lines) - Special Flood Hazard Area (SFHA) subject to inundation by 1% annual chance flooding. This zone is subject to the highest flood insurance rates.

**Zone C** (Horizontal lines) - Special Flood Hazard Area (SFHA) subject to inundation by 1% annual chance flooding. This zone is subject to the highest flood insurance rates.

**Zone D** (Vertical lines) - Special Flood Hazard Area (SFHA) subject to inundation by 1% annual chance flooding. This zone is subject to the highest flood insurance rates.

**Zone E** (Cross-hatch) - Special Flood Hazard Area (SFHA) subject to inundation by 1% annual chance flooding. This zone is subject to the highest flood insurance rates.

**Zone F** (Stippled) - Special Flood Hazard Area (SFHA) subject to inundation by 1% annual chance flooding. This zone is subject to the highest flood insurance rates.

**Zone G** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone H** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone I** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone J** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone K** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone L** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone M** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone N** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone O** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone P** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone Q** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone R** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone S** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone T** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone U** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Zone V** (White) - Areas not in a Special Flood Hazard Area. These areas are subject to the lowest flood insurance rates.

**Other Symbols:**

- City of Plainfield
- County of Essex
- County of Hudson
- County of Mercer
- County of Middlesex
- County of Monmouth
- County of Ocean
- County of Somerset
- County of Union
- County of Warren
- County of York
- County of Chester
- County of Delaware
- County of Kent
- County of Lancaster
- County of Lehigh
- County of Luzerne
- County of Northampton
- County of Northumberland
- County of Schuylkill
- County of York
- County of Adams
- County of Armstrong
- County of Berks
- County of Carbon
- County of Columbia
- County of Dauphin
- County of Franklin
- County of Fulton
- County of Hamilton
- County of Harford
- County of Howard
- County of Kent
- County of Lancaster
- County of Lehigh
- County of Luzerne
- County of Northampton
- County of Northumberland
- County of Schuylkill
- County of York
- County of Adams
- County of Armstrong
- County of Berks
- County of Carbon
- County of Columbia
- County of Dauphin
- County of Franklin
- County of Fulton
- County of Hamilton
- County of Harford
- County of Howard

**Scale:** 1 inch = 1 mile

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 BOROUGH OF PLAINFIELD, NEW JERSEY  
 MORRIS COUNTY  
 PANEL OF 30  
 MAP NUMBER 34281001C  
 MAP REVISED DECEMBER 20, 2007

**NATIONAL FLOOD INSURANCE PROGRAM**

**MAP NUMBER 34281001C**  
**MAP REVISED DECEMBER 20, 2007**

Federal Emergency Management Agency

## MITIGATION PLANS

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

### *Mitigation Project Criteria*

- 1) The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.
  - a) The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Borough Engineer. Listed below are specific projects that can be used to address the mitigation requirement.
    - i) Groundwater Recharge.
      - (1) Contribute to an escrow fund created to finance a specific drainage area study to determine the potential location for any meaningful recharge projects.
      - (2) In drainage area previously established as a potential recharge area, fund the purchase of all or part of such area in an amount consistent with existing laws; such as the Municipal Land Use Act.
      - (3) In a drainage area previously established as a potential recharge area, but is already developed, fund the purchase of and/or the installation of retrofitted recharge devices for an amount consistent with existing laws; such as the Municipal Land Use Act.
    - ii) Water Quality.
      - (1) Install stormwater management measures at the Borough's Recycling Center to provide an acceptable level of runoff water quality by removing 80% of total suspended solids from the site runoff.
      - (2) Install a new Salt Storage Bin in compliance with NJDEP criteria and recommendations at the DPW yard in order to eliminate discharge and improve water quality of the stormwater runoff from the site.
      - (3) Install stormwater management measures at inlets and at outlet structures discharging into Spring Garden Lake to provide removal of 80% of total suspended solids from the associated roadway runoff.
      - (4) Install channel stabilization improvements along the stormwater ditches from Ridgedale Avenue at the Ridgedale Middle School to the Farr Lane culvert, and

from the culvert along the Municipal Complex driveway at the south end of the Municipal Complex to Hassock Brook in order to eliminate sedimentation and improve water quality discharging to Hassock Brook.

- (5) Contribute to an escrow fund created to finance a specific drainage area study to determine potential locations for any additional meaningful water quality projects.

*iii) Water Quantity.*

- (1) Install channel stabilization improvements along the stormwater ditches from Ridgedale Avenue at the Ridgedale Middle School to the Farr Lane culvert, and from the culvert along the Municipal Complex driveway at the south end of the Municipal Complex to Hassock Brook in order to provide adequate capacity of the channels discharging into Hassock Brook. Provide stormwater management measures to reduce the peak flow from the 2, 10, and 100 year storms respectively.
  - (2) Install stormwater management measures at Briarwood School property to reduce the peak flow from the site runoff from the 2, 10, and 100 year storms respectively.
  - (3) Contribute to an escrow fund created to finance a specific drainage area study to determine the potential locations for any water quantity management measures.
  - (4) In drainage area previously established as a potential water quantity management area, fund the purchase of all or part of such area in an amount consistent with existing law; such as the Municipal Land Use Act.
- b) If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.
- i) Inflow/infiltration remediation in any area served by the Borough of Florham Park sanitary sewer system.
  - ii) Stormwater improvement to any existing municipal parking lots including those on any of the school properties.
  - iii) Stormwater improvement to any commercial or residential parking lot areas within the Borough.

The Borough 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.

## REFERENCES

*Municipal Stormwater Management Plan*, New Jersey Stormwater Best Management Practices Manual, February 2004.

*Stormwater Discussion and Groundwater Recharge in the Hydrologic Cycle*, New Jersey Geological Survey Report GSR-32.

*Borough of Florham Park Master Plan, 2000 & 2005 Master Reexamination and Master Plan Update*; Borough of Florham Park Official Website, 2005 and US Bureau of the Census: Census of Population and Housing, 1950-2000.

*Water Quality and Integrated List of Waterbodies, Ambient Biomonitoring Network (AMNET)*, NJDEP Division Of Watershed Management, June 2004.

*Groundwater Recharge Areas*, New Jersey Department of Environmental Protection (NJDEP), New Jersey Geological Survey, March 2004.

*Wellhead Protection Areas*, NJDEP, New Jersey Geological Survey, March 2004.

*Morris County Cross-Acceptance Report*, Morris County Planning Board 2005.

*Tier A Municipal Stormwater Guidance Document*, NJDEP April 2004.

*Wetlands*, NJDEP 1995/97 Land Use/Land Cover

*Map - Figure 1*, NJ Geological Survey Report GSR-32

*Map - Figure 2*, US Dept. of the Interior Geological Survey, USGS Morristown & Caldwell, NJ Quadrangle Maps

*Maps - Figures 3, 4, 5, 6, 7* NJDEP GIS Data, i-Map NJ, February 2005

*Map - Figure 8*, FEMA Flood Insurance Rate Map Panel 3403420017E, 3403420019E, 3403420020E, 3403420036E & 3403420038E revised December 20, 2002.