STORMWATER MANAGEMENT PLAN

Borough of Runnemede

Camden County, New Jersey

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BOROUGH OF RUNNEMEDE

Original Prepared by:

BACH Associates, PC
ENGINEERS • ARCHITECTS • PLANNERS

304 WHITE HORSE PIKE • HADDON HEIGHTS NJ, 08035

(856) 546-8611 • FAX (856) 546-8612

STORMWATER MANAGEMENT PLAN – Revision History

	Revision Date	SPC Initials	SPPP Form Changed	Reason for Revision
1.	2/20/2019	HW	ALL	Update all information
2.	4/5/2022	HW	NONE	REVIEW
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STORMWATER MANAGEMENT PLAN

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Runnemede Borough ("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 allows a municipality to project future development based on existing zoning and land use regulations. It develops a picture, projected visually on a map, of what will happen if land is developed to the maximum extent allowed by law. A build-out analysis is not only useful for communities with undeveloped land. Areas with significant redevelopment potential should be considered in developing a build-out analysis. Many urban and older suburban municipalities contain properties that are not developed to the full extent allowed under current zoning. For example, properties zoned for industrial use may contain residential developments. Or, a developer might assemble several small residential and retail properties for demolition and redevelopment as an office complex. A build-out analysis can identify those properties and project impacts of their potential redevelopment.

A build-out analysis has not been included in this plan since the Borough has less than one square mile of vacant or agricultural lands. Therefore, in accordance with the NJDEP regulations, a Land Use/Build-Out and analysis has not been performed.

The MSWMP 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 MSWMP is a mitigation strategy for when a variance or exemption of the design and performance standards is sought.

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 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.

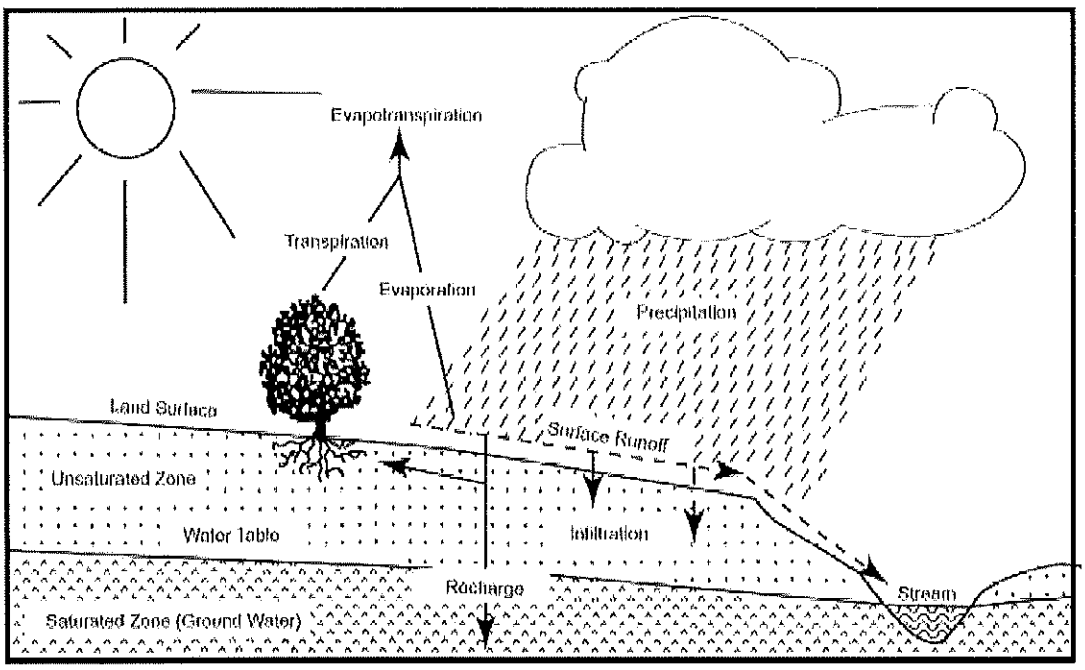

Figure C-1: Groundwater Recharge in the Hydrologic Cycle
Source: New Jersey Geological Survey Report GSR-32.

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

Runnemede is a borough located in Camden County, New Jersey. As of the 2010 census, the borough had a total population of 8468. Runnemede is located at 39°51'6" North, 75°4'34" West. According to the United States Census Bureau, the borough has a total area of 5.5 km² (2.1 mi²). 5.4 km² (2.1 mi²) of it is land and 0.1 km² (0.04 mi²) of it is water. The total area is 1.42% water.

Runnemede borders Barrington, Bellmawr, Gloucester Township, and Magnolia. Runnemede also borders Gloucester County.

Runnemede is located entirely within the Big Timber Creek Watershed (See Figure C-2). A description of this watershed obtained from "A Teacher's Guide to the Watersheds of Camden County" prepared by the Delaware Valley Regional Planning Commission is as follows:

Big Timber Creek Watershed

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

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

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

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

CAMDEN COUNTY : Watersheds

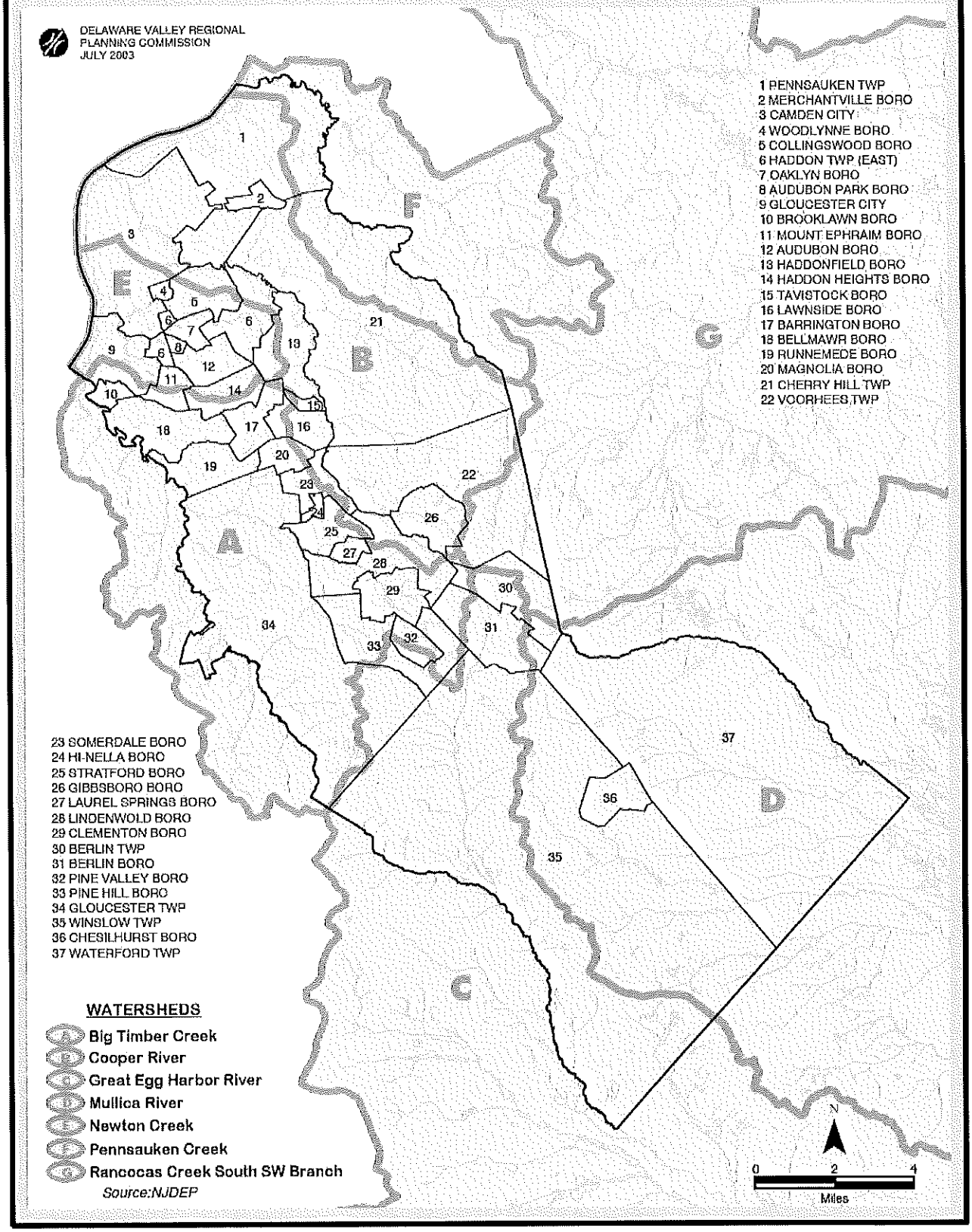

Figure C-2: Camden County Watersheds

Seventeen municipalities in Camden County and four in Gloucester County are included within the Big Timber (and Little Timber) watershed boundaries, in full or part. The largest in area in Camden County are Gloucester Township, Barrington, Bellmawr, Clementon, and Runnemede.

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

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

The 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.

Figure C-3 illustrates the water bodies located within the Borough and Figure C-4 depicts the Borough boundary on the USGS quadrangle maps. The waterbodies located within the Borough are not listed on Sublist 5 of the Integrated List. Therefore, it is assumed that the waterbodies located within the Borough are non- impaired.

In addition to water quality problems, the Borough has exhibited moderate water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. This can be attributed to a change in the hydrologic conditions (i.e., less impervious area) than presently exist in the Borough. As the imperviousness increased in the Borough, the peak and volumes of stream flows also increased. The increased amount of water resulted in stream bank erosion, which resulted in degraded stream habitats. The high imperviousness of the Borough has significantly decreased groundwater recharge, decreasing base flows in streams during dry weather periods. Lower base flows can have a negative impact on instream habitat during the summer months. Wellhead protection areas, also required as part of the MSWMP, are shown in Figure C-5. The Borough may consider an ordinance, in the future, if it is determined to be necessary to protect the wellheads to minimize the infiltration of pollutants into the aquifers.

Figure C-3: Borough and Its Waterways

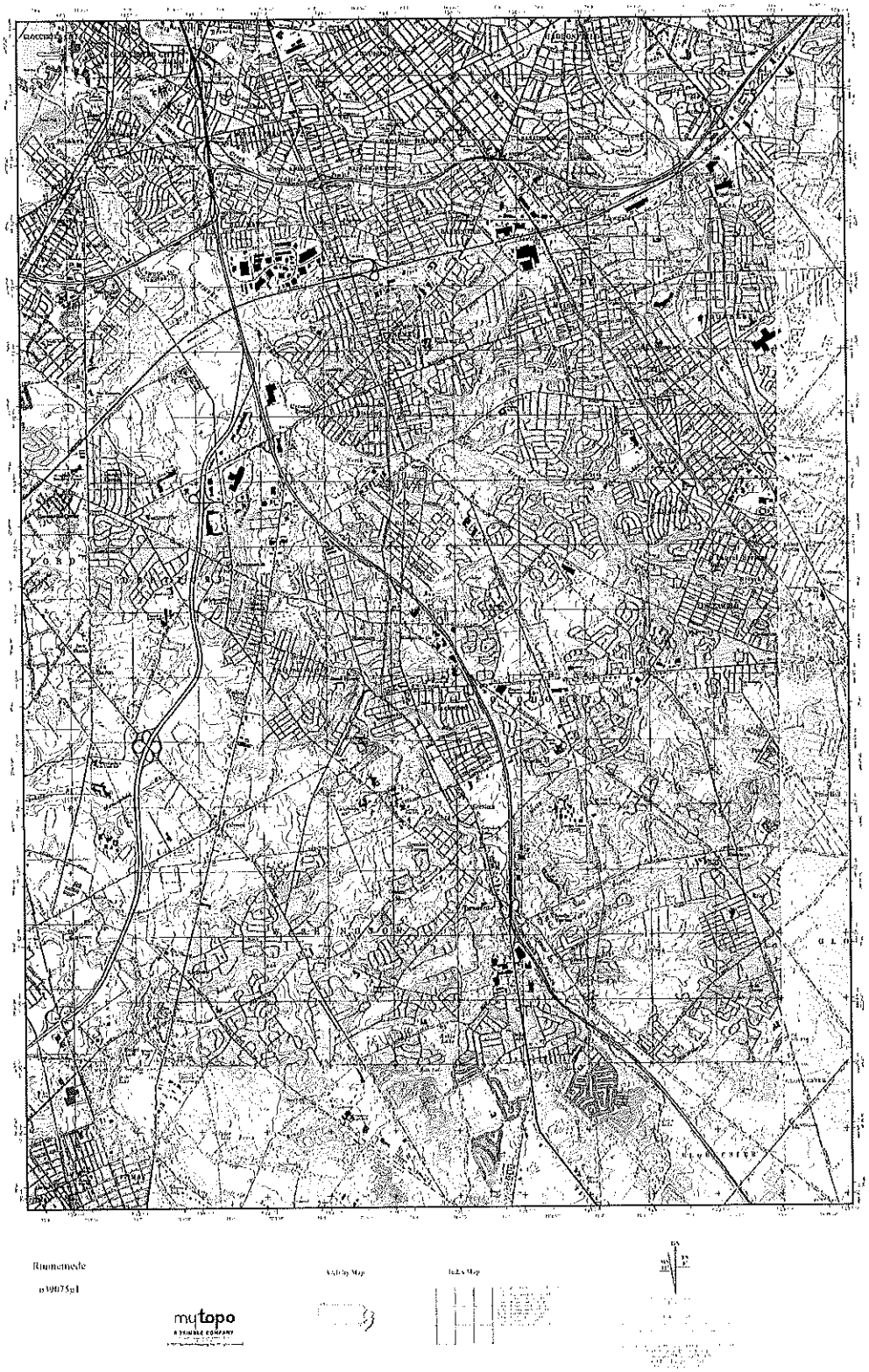

Figure C-4: Borough Boundary on USGS Quadrangles

Refer to Mapping under NJDEP Well Head Protection

www.nj.gov/dep

Figure C-5: Wellhead Protection Areas in the Borough

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 the county for review and approval within [24 months of the effective date of the Stormwater Management Rules.] During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Currently, the Planning Board and the Borough inspectors are enforcing the Residential Site Improvement Standards and requiring that developers satisfy the requirements of the NJDEP Best Management Practices.

Plan Consistency

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

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

The Borough 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 local Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Borough is currently reviewing the master plan and ordinances and is evaluating the land use and zoning ordinances that require modification to incorporate nonstructural stormwater management strategies. 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 (April 2006). A copy will be sent to the Department of Environmental Protection at the time of submission.

Land Use/Build-Out Analysis

As previously discussed, a build-out analysis has not been included in this plan since the Borough has less than one square mile of vacant or agricultural lands. Therefore, in accordance with the NJDEP regulations, a Land Use/Build-Out and analysis has not been performed.

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 Borough will evaluate a proposed mitigation plan from a developer that can be proven to clearly offset the effect on groundwater recharge, stormwater quantity control, and/or stormwater quality control that was created by granting the variance or exemption. The Planning Board will have the authority to accept or decline the proposed mitigation plan.

Mitigation Project Criteria

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.