



Roberts
ENGINEERING GROUP LLC
Women Business Enterprise Certified

1670 Whitehorse-Hamilton Square Rd.
Hamilton, New Jersey 08690
609-586-1141 fax 609-586-1143
www.RobertsEngineeringGroup.com

Borough of Roosevelt

Monmouth County, New Jersey

Stormwater Management Plan

REVISED
January 2006

Roberts Engineering Group
1670 Whitehorse – Hamilton Square Road
Hamilton, NJ 08690

Carmela Roberts, P.E.
NJPE License #NJ24GE034419000

Table of Contents

| | |
|--|----|
| Introduction..... | 3 |
| Goals..... | 3 |
| Stormwater Discussion..... | 4 |
| Background..... | 5 |
| Design and Performance Standards..... | 10 |
| Plan Consistency..... | 11 |
| Nonstructural Stormwater Management Strategies | 12 |
| Land Use/Build-Out Analysis..... | 13 |
| Mitigation Plan..... | 14 |

List of Tables

| | |
|--|----|
| Table 1: Build-Out Calculations for HUC14s | 20 |
|--|----|

List of Figures

| | |
|--|----|
| Figure 1: Groundwater Recharge in the Hydrologic Cycle..... | 21 |
| Figure 2: Borough Boundary on USGS Quadrangles..... | 22 |
| Figure 3: Groundwater Recharge Areas in the Borough..... | 23 |
| Figure 4: Borough's Existing Land Use..... | 24 |
| Figure 5: Hydrologic Features (HUC14s) Within the Borough..... | 25 |
| Figure 6: Zoning Map within the Borough | 26 |
| Figure 7: Mitigation Projects..... | 27 |

Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Roosevelt (“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 acres of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan recognizes the need for long-term operation and maintenance measures future stormwater facilities, by the adoption of a Stormwater Control Ordinance in accordance with N.J.A.C. 7:8-5.

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 and the Borough Master Plan to allow for project designs that include low impact development techniques. The plan includes 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 (of particular concern is Empty Box Brook);

- minimize pollutants in stormwater runoff from new 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;
- protect public safety through the proper design and operation of stormwater basins;
- recognize that the Borough is within the Assunpink Creek Watershed and the conservation and protection of our streams is essential; and
- adopt a stormwater control ordinance in accordance with N.J.A.C. 7: 8-4 and complying with New Jersey Soil Erosion and Sediment Control Standards.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. The plan proposes stormwater management controls to address impacts from new development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of new 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 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. Erosion and sedimentation can destroy habitat from which some species cannot adapt. Erosion and sediment can smother aquatic habitat and carry pollutants. The Borough of Roosevelt's Master Plan identifies several threatened species within the Borough's wetlands areas. These include the wood turtle (*Clemmys insculpta*), cooper's hawk (*Accipiter cooperi*), barred owl (*Strix varia*) and blunt-lobed grape fern (*Botrychium oneidense*).

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

Demographics

The Borough encompasses a 1.93 square mile area in Monmouth County, New Jersey. The population of the Borough increased from 835 in 1980, to 844 in 1990, to 933 in 2000 according to the U.S. Census. Development within the Borough prior to 1990 resulted in changes in the landscape and increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure 5 illustrates the waterways in the Borough. The New Jersey Department of Labor Building Permit Records for the period 1990 - 1995 and New Jersey Department of Community Affairs Construction Code Administrative Records System recorded only five new houses and one demolition. Figure 2 depicts the Borough boundary on the USGS quadrangle maps. Figure 4 depicts the Existing Land Use and Figure 5 is the Borough Zoning Map. Recognizing that the Borough is small, less than 2 square miles, it is important that new development and any redevelopment will not negatively impact stormwater management.

Physical Characteristics

Wetlands and Rare Wildlife

Wetlands within Roosevelt primarily follow the stream corridors and are contained within public lands held for open space uses. Documentation exists, through the New Jersey Office of Natural Heritage and through local accounts, of threatened species within the wetland areas of Roosevelt. These are the wood turtle (*Clemmys insculpta*) Cooper's hawk (*Accipiter cooperi*), barred owl (*Strix varia*) and blunt-lobed grape fern (*Boltrichium oneidense*). Habitat supportive of these species is located within most of the wetland areas within the Borough. NJDEP considers wetlands supporting threatened/endangered species to have a high resource value, thereby necessitating a transition area of 150 feet adjacent to the wetlands.

Threats to wetlands also exist, without the potential for development, through the behavior and practices of existing residents and businesses. Removal of vegetation, soil disturbance, dumping of household yard waste and the use encroachment can all act deleteriously upon existing wetland areas. The Natural Resources Inventory (NRI) indicated evidence of dumping within the wetland areas.

Streams and Surface Water Quality

Threats to Streams

Nonpoint source pollution is the primary source of surface water and groundwater contamination. Nonpoint source pollution may be defined as pollution originating from...

A diffuse, unconfined discharge of water from the land to a receiving body of water.

Nonpoint pollution results when rain or snow melt flows over land that has been modified through use or activities, such as excavation, dumping of chemicals, fuels or lubricants and application of fertilizers or pesticides. Existing conditions in Roosevelt may contribute to nonpoint pollution of surface water. Agriculture, urban runoff, construction activities and illegal dumping can lead to discharges of sediment, phosphorus, nitrogen, metals, pesticides, herbicides and salts. These contaminants can result in deleterious impacts to fish populations, water supply, wetlands and recreational resources.

Public education may include newsletters, brochures, information hotlines, workshops and signage.

Local regulatory controls may include impervious surface limitations, overlay zoning districts and stream buffers.

Facility management may include reduced road salting, proper storage of bulk materials, street cleaning, filter swales and urban forestry.

Vegetation

The Natural Resource Inventory (NRI) identifies several classifications of vegetation cover within Roosevelt. These include forests, meadows, agricultural fields, lawns, and scrub.

The forests and agricultural fields of Roosevelt are significant, principally, in two ways: they provide large contiguous expanses of wildlife habitat and they form the green infrastructure of the Borough, known as greenbelts, which were designed into the historic original town plan.

Maintenance of greenbelts is critical to maintaining the historic character of Roosevelt. Most of the forested greenbelts within the Borough are under public ownership (either the Borough or the State of New Jersey) and are protected from disturbances under the freshwater wetlands regulations.

Wildlife

Habitat within Roosevelt supports a wide range of native wildlife species. Roosevelt Borough's NRI indicates that threatened species, and their habitat, have been documented within Roosevelt. These species are the wood turtle (*Clemmys insculpta*), Cooper's hawk (*Accipiter cooperi*), barred owl (*Strix varia*) and blunt-lobed grape fern (*Boltrychium oneidense*). Wood turtle habitat consists of streams, forests and fields that are near streams. Areas identified as wood turtle habitat include the Empty Box Brook and the Assunpink Creek. Barred owl/Cooper's hawk habitat, consisting of forested wetland areas, includes those along the Empty Box Brook, the Assunpink Creek and in other forested areas along the borders of the Borough.

Much of the existing habitat within Roosevelt is located on Borough – owned or State – owned open space, contiguous or connected to the Assunpink Wildlife Refuge. This protected network of open spaces prevents fragmentation of habitat.

Open Space

Substantial benefits are derived from the preservation of the State's open space. These benefits are accorded to the ecological systems that are within, and connected to, open space lands and the organisms that depend on open space for habitat.

Forests, wetlands, grasslands and streams, each a distinct habitat within the Borough of Roosevelt, accommodate a great diversity of native and indigenous plant and animal species. Forests, wetlands and grasslands serve as pollutant filters, reducing the amount of contaminants in overland stormwater runoff prior to reaching streams and other bodies of water.

Wetlands are home to nearly 33% of the State's threatened and endangered species. Forests, in addition to reducing stormwater runoff and preventing soil erosion, also reduce the amount of pollutants in the air by absorbing carbon dioxide and releasing oxygen. These actions are beneficial to the health and well being of wildlife and humans.

In Roosevelt's case open space has a value beyond those attributes noted above: The greenbelts within and around Roosevelt are significant, integral components of the original community plan as recognized by it's listing of the National Register of Historic Places. The agricultural lands that form the outer boundary of Roosevelt are particularly important in keeping typical suburban development from intruding on the unique land use patterns and setting the stage for the interior character of the Borough.¹

Potential Impacts

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.

Roosevelt contains four stream bodies within its boundaries; the Assunpink Creek, an unnamed tributary of the Assunpink Creek, Empty Box Brook (also tributary to the Assunpink Creek) and the Rocky Brook. These stream bodies are manifested as distinct linear features which are largely responsible for the historical layout of the Borough. All of these water courses lie within wooded stream corridors and are largely bordered by associated wetlands.

None of the waterways are 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 Assunpink Creek and Rocky Brook in the area of the Borough are not impaired waterways and the NJDEP is not required to develop a Total Maximum Daily Load (TMDL) for any pollutant in the waterways.

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. No waterways within the Borough are included in Sublist 5 of the Integrated List.

The Borough has experienced both water quantity and quality problems generally associated with lack of stream maintenance. Of particular concern is the Empty Box Brook. The Environmental Commission has recently taken steps to improve the Empty Box Brook in the area of North Rochdale Avenue and South Valley Road. The Borough Environmental Commission has received a grant to study and remediate the Empty Box Brook area. The Empty Box Brook has experienced silting and degradation related to farming and runoff from the "Notterman Tract" east of North Valley Road. Runoff and erosion from the Notterman Tract has been directly responsible for silting of approximately 400 feet of the Empty Box Brook west of North Valley Road. In this 400 feet area, the stream has been silted in and degraded to such a degree that the stream has essentially disappeared. Deciduous vegetation have died, and wetlands have been silted in. Additionally, the volume of water able to pass through the culvert at North Valley Road has been reduced. . The Environmental Commission is working with an environmental consultant, Creative Habitats on a remediation effort to restore the stream and the wetlands.

There is one other Borough owned culvert on the Empty Box Brook at Tamara Lane. This culvert appears to be adequately passing flows at this time. All other culvert crossings in the Borough are under the jurisdiction of Monmouth County.

As imperviousness has increased in and around the Borough, the peak and volumes of stream flows also increased. The increased amount of water resulted in stream bank erosion, which resulted in unstable areas at roadway crossings, and degraded stream habitats. The increased imperviousness of the Borough has 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. A map of the groundwater recharge areas are shown in Figure 3.

Category One Waterways

The Assunpink Creek is classified as a Category One waterway east of South Rochdale Avenue. Special water resource protection areas shall be established along all waters designated Category One, in accordance with N.J.A.C. 7:9B, and perennial and intermittent streams that drain into or upstream of Category One waters as shown on the USGS Quadrangle Maps. A portion of both the Empty Box Brook and the tributaries to the Assunpink Creek in the Borough are upstream of the Assunpink and are included in the special water resource protection area. See Figure 5. The majority of the Borough tributaries are designated as special water resource protection areas.

The Category One areas are established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance and exceptional fisheries significance of the

established Category One waters. The Category One areas shall be designated and protected by a 300-foot special water resource protection area on each side of the waterway, consisting of existing vegetation or vegetation allowed to follow natural succession. [These waters require protection from measurable changes in their water quality characteristics, including clarity, color, scenic setting and other characteristics (N.J.A.C. 7:9B-1,4)]

Category One designations are a significant effort to safeguard high-quality drinking water supplies and will also help preserve water quality for streams and waterways that serve as critical habitat for many threatened and endangered species.

The Assunpink Creek above the Assunpink Lake is in a sub watershed identified by the U.S.G.S. with a 14 digit Hydrologic Unit Code (HUC14) that has less than 10% impervious cover. The Borough's water supply is provided by two deep wells, Well #3 on North Valley Road near the elevated water tower and Well #4 at the water treatment plant on Oscar Drive. Well #4 is 435 feet deep with a capacity of 410 gallons per minute (gpm). The static water level is 145 feet and the pump suction is set at 261 feet. The pump is a submersible pump set to operate at 200 gpm as the aerator is limited to this flow. The pump is capable of pumping at a rate of 250 gpm. Well #3 is 475 feet deep with a static water level of 160 feet. The pump is a vertical turbine pump and is set at 178 feet. The pump is capable of delivering 350 gpm however it is set to pump at 200 gpm.

Well #4, at the treatment plant, is located just outside the 300 foot special water resource protection area. Well #3 is outside the buffer area. With the exception of North Valley Road and Oscar Drive, the area around the wells is zoned for low density residential and low density agricultural. It is vital for the protection of the well heads and water quality that low density development be maintained and that industrial development be limited. While Well #3 is up gradient of the industrial area, Well #4 is within the industrial zone. Roosevelt must assure limited new impervious cover to assure continued recharge for its water supply wells.

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 12 months of adoption of the stormwater management plan.

During and after 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

The Borough is currently 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. 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's Stormwater Management Ordinance will require 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. Additionally, the Borough will copy the Freehold Soil Conservation District on key correspondence.

The Borough's Master Plan identifies the threats to wetlands that exist without the potential for development. Removal of vegetation, soil disturbance, dumping of household yard waste and wetland encroachment can all be deleterious. Public information campaigns are encouraged. All of the watercourses in the Borough lie within wooded wetland corridors. Non-point source pollution is the primary source of surface water and ground water contamination.

The Natural Resources Inventory (NRI) identifies several classifications of vegetative cover within Roosevelt. These include forest, meadows, agricultural fields, lawns, and shrubs. The forests and agricultural fields of Roosevelt are significant, in two ways: they provide large contiguous expanses of wildlife habitat; and they form green infrastructures which were designed into the historical original town plan. Proper stewardship of these resources is essential to the conservation of natural resources and the unique, historic character of Roosevelt. The Greenbelts throughout the Borough which adjoin the majority of residential lots in the Borough are under Borough ownership. The Borough is committed to maintaining these greenbelts in their current natural state. Much of the remaining undeveloped land in the Borough is under public ownership, by either the Borough or the State of New Jersey. These lands include the Notterman Tract and other areas in the southern portion of the Borough.

The Master Plan discusses the benefits of open space:

Forests, wetlands, grasslands and streams, each a distinct habitat, accommodate a great diversity of native and indigenous plant and animal species. Forests, wetlands and grasslands serve as pollutant filters, reducing the amount of contaminants in overland stormwater runoff prior to reaching streams and other bodies of water. Wetlands are home to nearly 33% of the State's threatened and endangered species. Forests, in addition to reducing stormwater runoff and preventing soil erosion, also reduce the amount of pollutants in the air by absorbing carbon dioxide and releasing oxygen. These actions are beneficial to the health and well being of wildlife and humans.

The benefit derived from open space by humans has been underscored by research that indicates peoples' exposure to verdant, natural landscapes reduces stress and anxiety. Research has also shown that people moving through a natural area, when compared to those who had walked through an urban area, exhibited a more positive emotional state. The residents of Roosevelt have confirmed the benefits of open space during a community survey that was conducted as part of the Natural Resources Inventory in 1993.

In Roosevelt's case, open space has a value beyond those attributes noted above: The greenbelts within and around Roosevelt are significant, integral components of the original community plan as recognized by its listing on the National Register of Historic Places. The agricultural lands that form the outer boundary of Roosevelt are particularly important in keeping typical suburban development from intruding on the unique land use patterns and setting the stage for the interior character of the Borough.²

Nonstructural Stormwater Management Strategies

The Borough has reviewed the master plan and ordinances, and has provided a list of the sections in the Borough 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 12 months of adoption of the stormwater management plan. A copy will be sent to the Department of Environmental Protection at the time of submission.

The Master Plan of the Borough of Roosevelt, updated in 2001, and amended in 2005 to incorporate a new Housing Plan, was reviewed in its entirety for consistency with non-structural stormwater management strategies. The Master Plan at this time is consistent and does not require modification.

The Zoning Ordinance of the Borough Code was reviewed with regard to consistency with nonstructural stormwater management strategies. Two changes are recommended for the “Zoning Ordinance” to incorporate these strategies.

Article VI Supplementary Regulations

Section 6.120.d – Site and Environmental Design Standards

This section requires that all surface water drainage from paved areas in excess of 15,000 square feet shall be carried away by “underground drainage”. This sentence should be amended to require the use of structural and nonstructural stormwater management measures as detailed in the N.J.D.E.P. Best Management Practices. These techniques include dry wells, vegetated swales, pervious pavement, bio-retention systems infiltration chambers as well as manufactured treatment devices.

Article VIII Performance Standards

Section 8.460 – Drainage

This section requires that all drainage be provided to an improved drainage way or structure and that concrete curbing and related street improvements shall be installed on abutting streets. This section should be amended to encourage the use of natural vegetated swales in lieu of inlets and pipes, and to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater

conveyance and to allow disconnection of impervious areas.

Land Use/Build-Out Analysis

A detailed land use build out analysis for the Borough was conducted. Figure 4 illustrates the existing land use in the Borough based on 1995/97 GIS information from NJDEP. Figure 5 illustrates the HUC14s within the Borough. The Borough zoning map is shown in Figure 6. Figure 3 illustrates the constrained lands within the Borough. The build-out calculations for impervious cover are shown in Table 1. The table indicates that there are 128.6 acres of developable land in the Borough, and confirms that the Borough has significantly less than one square mile of developable lands as one square mile is equivalent to 640 acres. Impervious area within the 128.6 acres of developable land could be as much as 21.8 acres under current ordinances. Since developable lands are less than one square mile no additional analysis has been performed to address pollutant loadings at full build-out.

Mitigation Plan

The Borough of Roosevelt is proposing a mitigation plan as an element of its Municipal Stormwater Management Plan which will allow the municipality to grant variances or exemptions to the design and performance standards for storm water runoff quality, storm water runoff quantity, and groundwater recharge, established under the Stormwater Management rules at N.J.A.C. 7:8-5. This mitigation plan does not preclude the requirement that an applicant must meet the design and performance standards for storm water runoff quality, storm water runoff quantity, and groundwater recharge on site to the maximum extent practicable. This plan will allow the Borough of Roosevelt to waive strict compliance of one or more of the performance standards, where full compliance cannot be reasonably accommodated on site, including through a reduction in the size or scale of the development.

Sensitive Receptors

Sensitive receptors are areas with specific sensitivity to impacts of storm water, whether through changes in storm water runoff quality, storm water runoff quantity, and groundwater recharge. Sensitive receptors within Borough of Roosevelt for which mitigation may be requested are listed below:

- **Storm Water Quality**
Category One Waters
Threatened and Endangered Species Habitats
- **Storm Water Quantity**
Inadequate Culvert
Property Subject to Flooding
Category One Waters
Freshwater Wetlands
- **Groundwater Recharge**
Freshwater Wetlands
Category One Waters
Aquifers

More than two thirds of the Borough lies within the HUC14, 02040105230010, Assunpink Creek sub watershed. This entire portion of the Borough is subject to the 300 foot special water resource protection area buffer. The Assunpink Creek, in the southwest corner of the Borough, is Category One water. Therefore, all tributaries within the HUC14 to the Category One water are also subject to the 300 foot buffer. All the tributaries in this area of the Borough are considered sensitive receptors. These Category One buffer areas are considered sensitive receptors for storm water quality, storm water quantity, and groundwater recharge.

There are large areas within this HUC14 sub watershed area that are classified as freshwater wetlands. For purposes of this Municipal Mitigation Plan the Borough is designating the wetlands in the area of the Empty Box Brook from North Rochdale Avenue to North Valley Road as a sensitive receptor. These wetlands are considered sensitive receptors for stormwater quantity, stormwater quality and groundwater recharge.

The Borough relies on two water supply wells to provide potable drinking water. Both of these wells are at a depth of approximately 400 feet. For purposes of this Municipal Mitigation Plan, recharge to the groundwater aquifer is considered a sensitive receptor. Groundwater recharge rates throughout the Borough are indicated on the Groundwater Recharge map. Groundwater recharge is proposed to be provided in areas with recharge rates of 11 to 13 inches per year.

- Contributory Drainage Areas

Because of the relatively small size of the Borough and the large area of the Borough covered by the HUC14, 02040105230010 sub watershed, the portion of the Borough within this HUC14 is considered to be the contributory drainage area to the above noted receptors.

Mitigation Projects

The Borough of Roosevelt has identified two specific mitigation projects that may be undertaken by a developer unable to meet the design and performance standards for storm water runoff quality, storm water runoff quantity and groundwater recharge as stated above. The Borough of Roosevelt has identified the remediation of the Empty Box Brook as a mitigation project for storm water quality, storm water quantity and groundwater recharge. The Borough of Roosevelt has additionally identified the vacation of the right-of-way and paved roadway on South Valley Road between County Route 571 and Lake Drive as a project for storm water quantity and groundwater recharge.

- Empty Box Brook Remediation

The area of the Empty Box Brook between North Rochdale Avenue and South Valley Road has been filling with sedimentation for approximately 10 years. In this area the stream has disappeared for 300 feet west of South Valley Road as a result of the sedimentation. The stream has flooded and has caused trees in the area to die. Two ditches in the same area connect to the stream, however this simply adds to the standing water, sedimentation and flooding that has been killing trees in this area. There was a time during the past 10 years when the 50 acres upstream of South Valley Road were being farmed and were connected to a new development in an adjacent municipality. This upstream area is locally known as the Notterman Tract. The Notterman Tract (Block 7, Lot 9) was acquired through the use of Green Acres funds and has become part of the Assunpink Wildlife Management Area in April 2001.

by the State of New Jersey and is overseen by the NJDEP Division of Fish and Wildlife. At this time the farm is no longer active and the construction in the adjacent municipality is completed. However, the Empty Box Brook remains impacted by sediment. The sedimentation has caused a reduced area for storm water and this has led to reduced ability to handle storm water runoff quantity; the sedimentation has also filled in areas that were wetlands that were providing storm water quality; this area is also part of the 300 foot Category One stream buffer and its ability to recharge groundwater has been diminished by the sedimentation.

The Borough of Roosevelt Environmental Commission has received a grant from the NJDEP to investigate the sedimentation of this area of the Empty Box Brook and to restore, to the financial ability that the grant will allow, the wetlands. The Borough made application to the NJDEP in 2005 for a permit to restore the wetlands in this area. It is anticipated that this permit will be received sometime in 2006. The amount of money remaining in the grant will not allow for full remediation of this area of wetlands. The Borough itself is committed to improving as much of this area as possible with volunteer efforts. However, it is clear that this will not be enough to restore the wetlands in this area.

A mitigation project for storm water runoff quality, storm water runoff quantity and storm water recharge for the Empty Box Brook between North Rochdale Avenue and South Valley Road may be undertaken by a developer unable to meet these requirements on a new development site.

- South Valley Road Park

In the area of South Valley Road between County Route 571, Clarksburg Road, and Lake Drive, is a Borough owned right-of-way. This one block stretch of roadway is approximately 30 feet wide. There is poor sight distance at the intersection of South Valley Drive and County Route 571 and there is little traffic that uses this area. The Borough of Roosevelt is proposing a project to vacate this area of right-of-way and to create a Borough owned lot as a park. It is anticipated that this project will incorporate the removal of existing pavement and curbs and will replace this impervious area with pervious ground covers and landscaping. This section of South Valley Road is located in an area of groundwater recharge of 11 to 13 inches per year. Within the Borough of Roosevelt this is the maximum amount of recharge that can be sustained. A portion of this area of South Valley Road drains to the Empty Box Brook. Conversion of this impervious area to a pervious area will decrease the volume of storm water runoff to the Empty Box Brook. Additionally conversion of the pavement to a pervious surface with best management practices to contain and treat the water will improve the storm water runoff quality. It is also desired that this area will be modified so that a measurable amount of groundwater recharge can be accomplished.

Refer to Figure 7 – Mitigation Projects.

- Developer Proposed Mitigation Projects

The Borough of Roosevelt will consider a developer initiated mitigation project. However, the following must be considered when making a proposal:

1. The location of the mitigation project must be located such that it will provide the most benefit.
2. Legal authorization must be obtained to construct the project at the selected location. This includes the maintenance and any access needs for the project in the future.
3. The project should be close to the location of the original project.
4. It is preferred that one location address all of the performance standards.
5. The project location must demonstrate no adverse impacts to other properties.
6. Projects addressing the groundwater recharge performance standard are preferred to be located upstream of the actual project site.
7. Projects that address storm water runoff quantity can choose to provide storage for proposed increases in runoff volume, as opposed to a direct peak flow reduction.

Requirements for Mitigation Projects

The following requirements for mitigation projects, whether those selected by the Borough of the Empty Box Brook remediation or South Valley Road Park, or proposed by a developer, must be included in the project submission. All mitigation projects, whether the Empty Box Brook remediation, the South Valley Road Park or a developer initiated project, must provide mitigation for storm water runoff quantity, storm water runoff quality and groundwater recharge at a one to one ratio. For example if the developer is unable to provide recharge at the development site due to a high groundwater condition or other reason, the developer must provide an exact amount of groundwater recharge at the mitigation site.

- Impact from Noncompliance

Provide a table to show the required values, and the values proposed in the project, and include an analysis demonstrating that on-site compliance was maximized.

- Narrative regarding Waiver

The waiver cannot be due to a condition created by the applicant.

Site specific conditions inhibiting the placement of a storm water management facility must be discussed and supporting information submitted. The Borough will consider whether an extraordinary hardship on the applicant has been brought about by circumstances peculiar to the property.

- Sensitive Receptor

The applicant is to identify the sensitive receptor related to the performance standard from which a waiver is sought. Sensitive receptors for the Empty Box Brook remediation and South Valley Park Road mitigation projects have been previously identified in this mitigation plan.

- Design of the Mitigation Project

The applicant is to provide the design details of the mitigation project including but not limited to drawings or calculations or other information necessary.

The Empty Box Brook remediation project has previously been designed by a consultant hired by the Borough of Roosevelt Environmental Commission. This plan is on file at the Borough Environmental Commission office. The design of the South Valley Road Park project will be dependent upon the amount of storm water runoff quantity, storm water runoff quality and groundwater recharge that may be necessary to mitigate a project. The developer is to prepare a plan of the area and the proposed mitigation improvements and submit to the Borough for review and approval.

- Responsible Party

The applicant is to provide the party or parties responsible for the construction and the maintenance of the mitigation project.

Regardless of whether the mitigation project is the Empty Box Brook remediation, the South Valley Road Park or another developer initiated project, the developer will be the constructing party and the party responsible for the maintenance of the mitigation project for a period of up to one year after construction is complete. After the one-year time period, the Borough of Roosevelt will maintain the improvements at the Empty Box Brook and at the South Valley Road Park. Depending upon the type of developer selected mitigation project the party responsible for maintenance may be an entity other than the Borough itself.

- Maintenance

Include a maintenance plan that addresses the criteria at N.J.A.C. 7:8- 5.8.

The Borough of Roosevelt will be the party responsible for maintenance for the Empty Box Brook improvement and the South Valley Road Park. The Borough is the owner of both parcels of land and is currently the entity responsible for maintenance. Should the developer select a mitigation project and desire to have the project be maintained by the municipality, the Borough may consider the transfer of

maintenance responsibility if the applicant provides for the cost of maintenance in perpetuity. This decision will be made on a project by project basis. The developer is not guaranteed that the Borough will become the party responsible for maintenance of any mitigation project other than the Empty Box Brook remediation and South Valley Road Park.

- Permits

The Borough of Roosevelt has obtained the permits necessary for remediation of the Empty Box Brook.

The South Valley Road Park mitigation project will require a permit from the Freehold Soil Conservation District. The applicant will be responsible for preparing the permit, paying the fee and obtaining the permit. The Borough of Roosevelt will be responsible for the vacation of the right-of-way, the transfer of the right-of-way ownership to the Borough and approval from the NJDOT for the roadway vacation.

For any developer initiated mitigation project, all permits and fees are to be obtained and paid for directly by the developer.

Permits for any mitigation project will be considered a condition of approval from the municipality and must be obtained prior to final approval.

- Construction

Construction of the mitigation project must coincide with the construction of the proposed project. In no case shall the proposed project be completed prior to the mitigation project. A Certificate of Occupancy or other final approval by the municipality will not be issued until the mitigation project receives final acceptance.

¹ 2001 Master Plan, Borough of Roosevelt, Clarke, Caton, Hintz.

² 2001 Master Plan, Borough of Roosevelt, Clarke, Caton, Hintz.

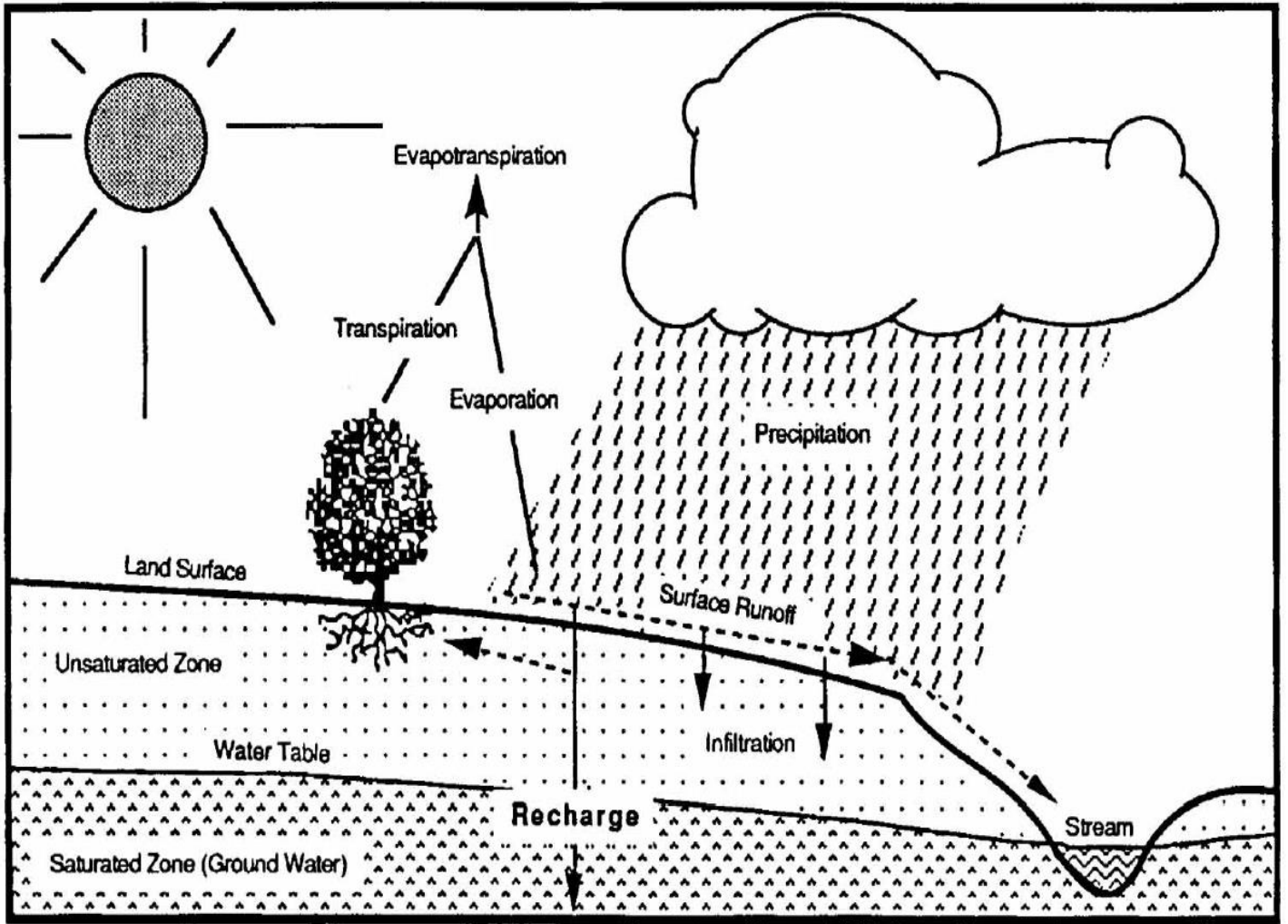


Figure 1: Groundwater Recharge in the Hydrologic Cycle
Page 21

USGS MAP - ROOSEVELT, N.J. QUADRANGLE
U.S DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY
1957 AND PHOTOREVISED 1981

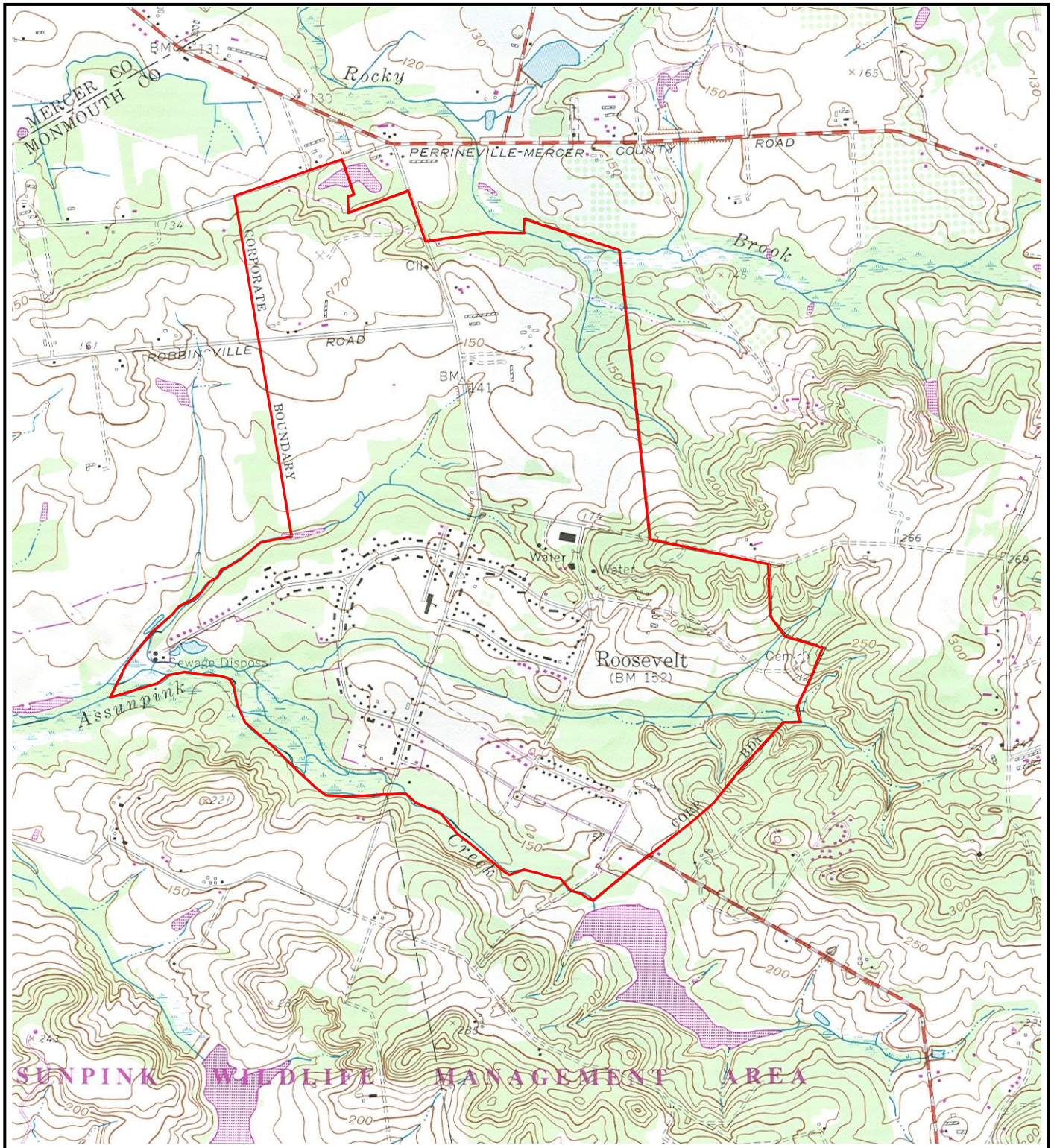
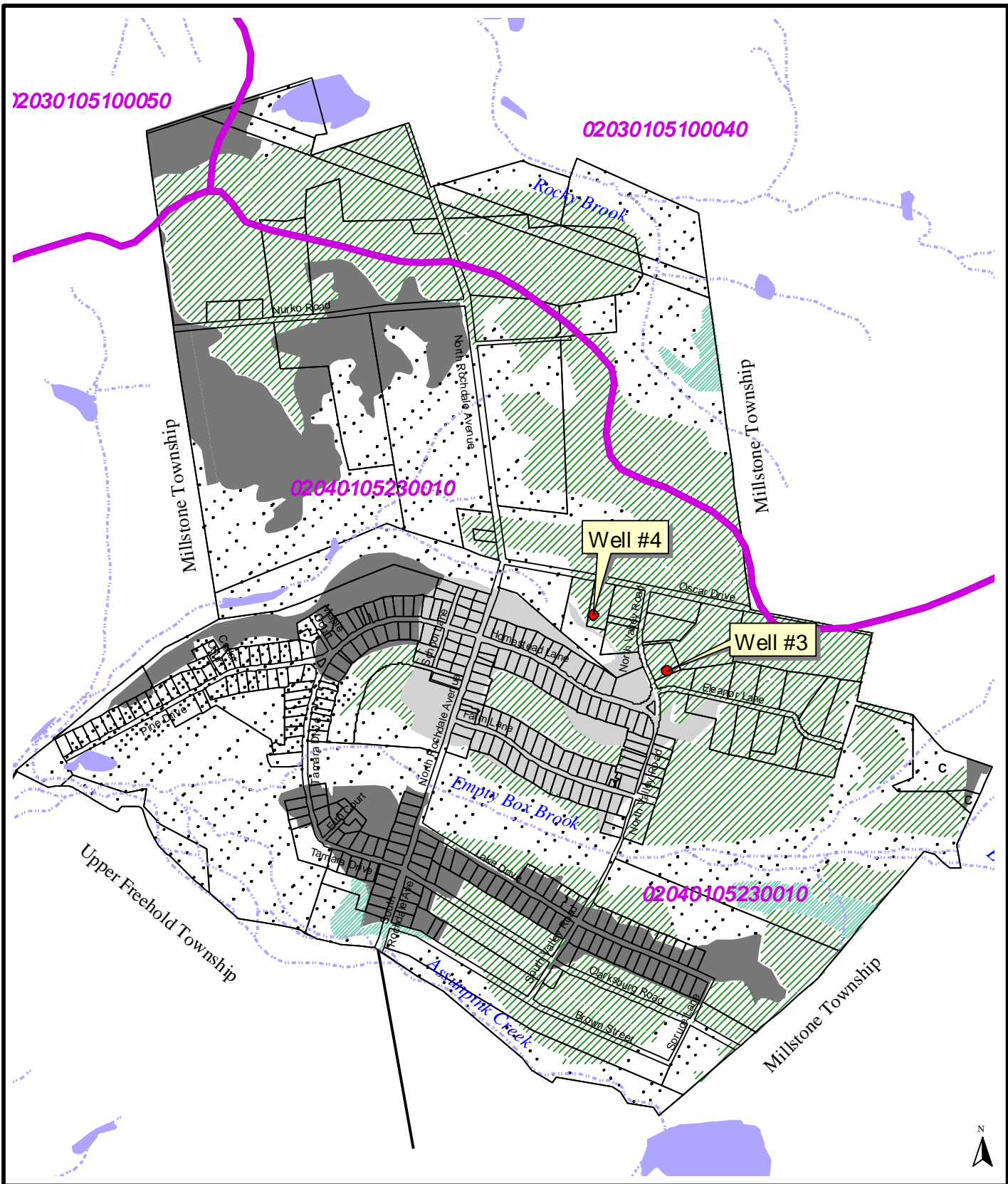


Figure 2: Borough Boundary on USGS Quadrangles
Page 22



| | | | | |
|---|---|-------------------------------------|--|---|
| GROUNDWATER RECHARGE BOROUGH OF ROOSEVELT Monmouth County, N.J. | Groundwater Recharge 14 to 15 in/yr 11 to 13 in/yr 8 to 10 in/yr Hydric Soils Wetlands & Open Water | 1 to 7 in/yr 0 in/yr Wellhead | Sources: Borough of Roosevelt G.I.S. Base Map; NJDEP Groundwater Recharge G.I.S. Prepared: January 25, 2006 500 0 500 1000 Feet | THOMAS PLANNING ASSOCIATES DR. BELLE 975, Box 545 Bldg. 2, NJ 08730-0545 Phone: 732.253.5225 OCEAN TWP. 141 Ocean View North Ocean, NJ 07712 Phone: 732.867.1114 |
| | GROUNDWATER RECHARGE BOROUGH OF ROOSEVELT Monmouth County, N.J. | | | Sources: Borough of Roosevelt G.I.S. Base Map; NJDEP Groundwater Recharge G.I.S. Prepared: January 25, 2006 500 0 500 1000 Feet |

Figure 3: Groundwater Recharge Areas in the Borough
Page 23

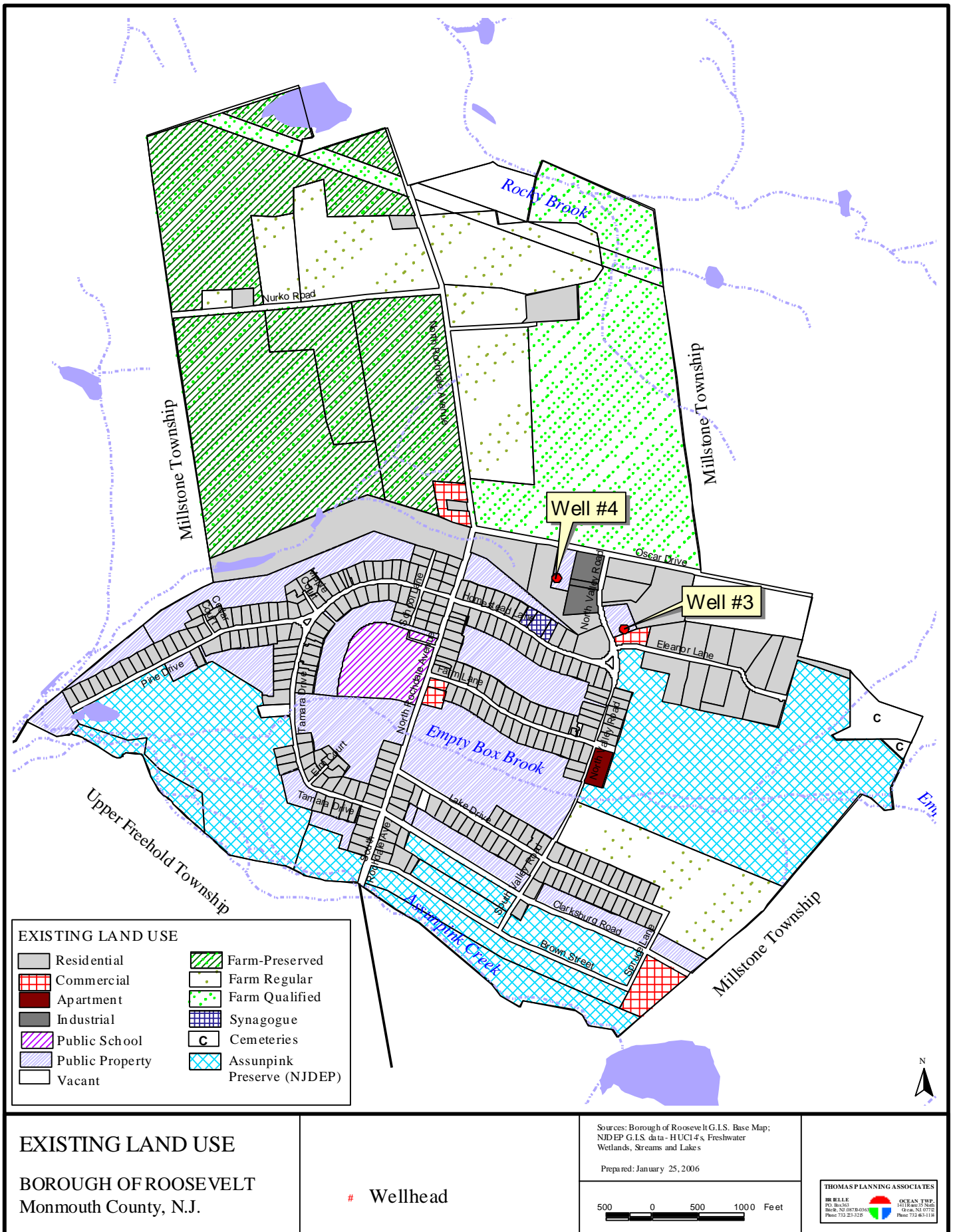


Figure 4: Borough's Existing Land Use
Page 24

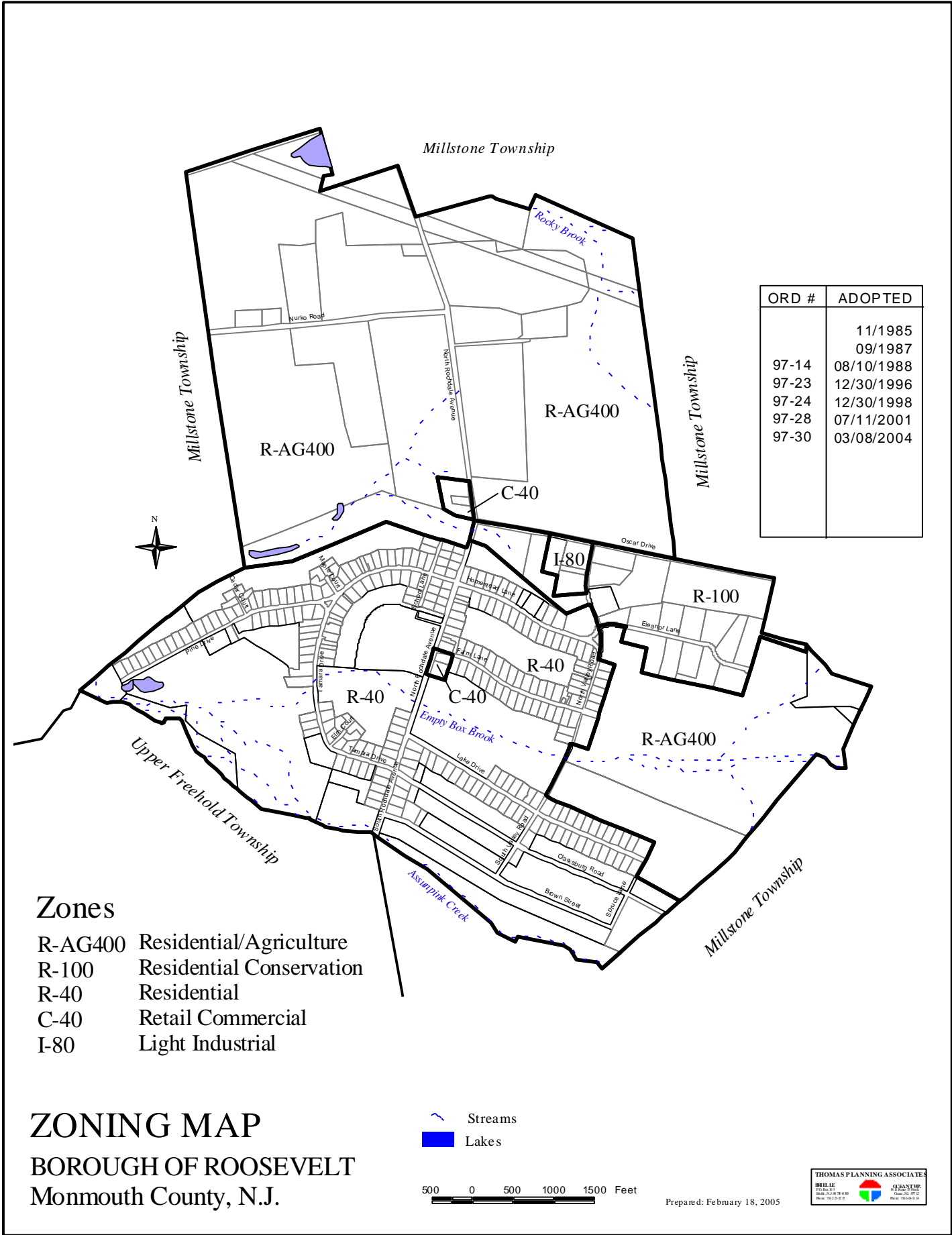
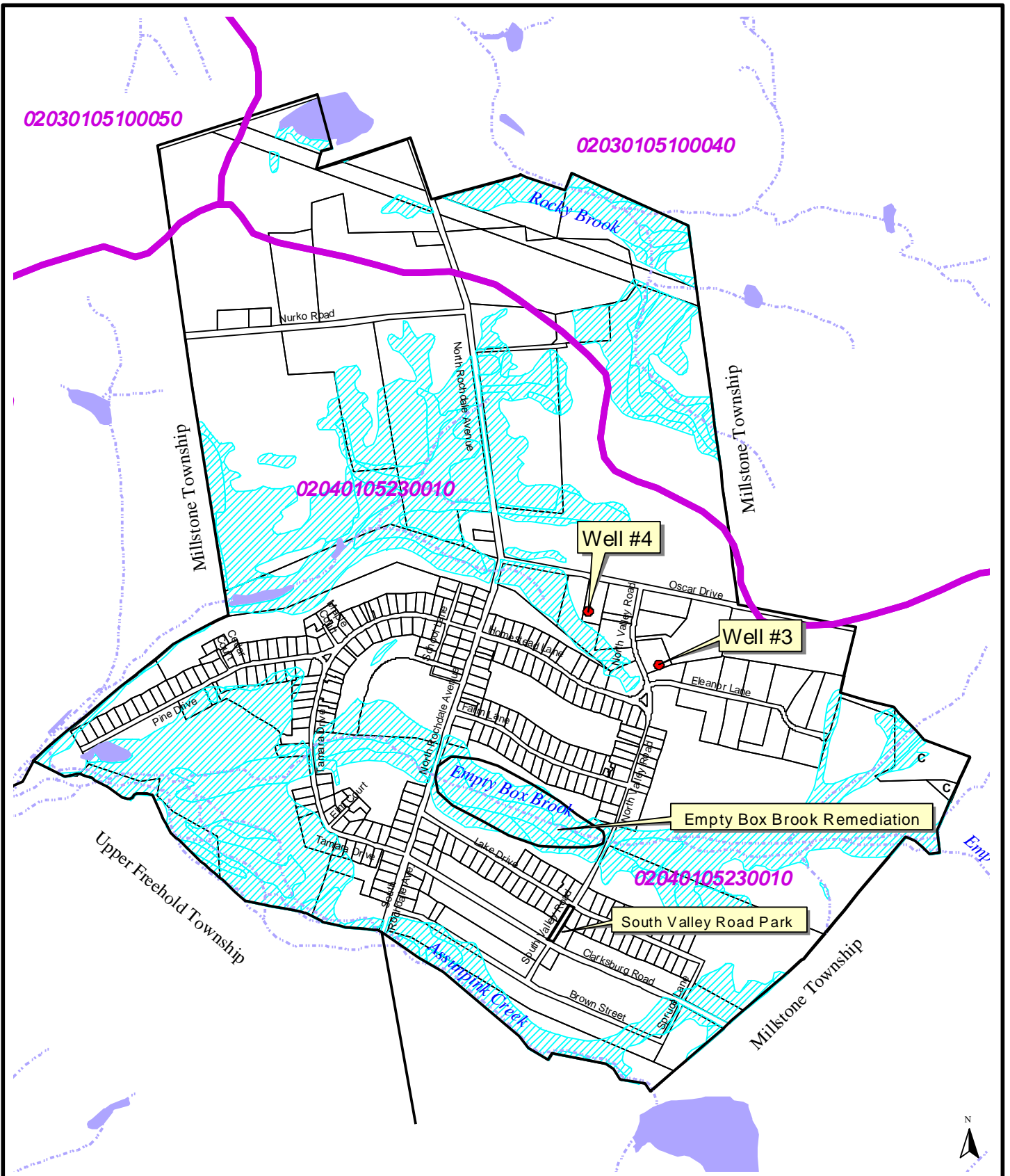


Figure 6: Zoning Map within the Borough
 Page 26



| | | | |
|---|---|---|--|
| <p>MITIGATION PROJECTS</p> <p>BOROUGH OF ROOSEVELT Monmouth County, N.J.</p> | <ul style="list-style-type: none"> Freshwater Wetlands 50 Ft. Wetlands Buffer Hydrologic Units (HUC 14s) - 02040105230010 Streams Lakes Wellheads Mitigation Projects | <p>Sources: Borough of Roosevelt G.I.S. Base Map; NJDEP G.I.S. data - HUC14s, Freshwater Wetlands, Streams and Lakes</p> <p>Prepared: January 25, 2006</p> <p>500 0 500 1000 Feet</p> | <p>THOMAS PLANNING ASSOCIATES</p> <p>TRVILLE PO Box 363 Rte 261, Ocean Township Phone: 732.253.3288</p> <p>OCEAN TWP. 1411R, Route 37 North Ocean, NJ 07712 Phone: 732.663-1118</p> |
|---|---|---|--|

Figure 7: Mitigation Projects
Page 27