MUNICIPAL STORMWATER MANAGEMENT PLAN

FOR THE

BOROUGH OF NORTHVALE

BERGEN COUNTY, NEW JERSEY

JANUARY, 2005

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I. INTRODUCTION

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Northvale 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 base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The Borough Master Plan re-examination was completed in May, 1999. The report indicates that based upon existing zoning and land available for development, the Borough contains approximately 21 acres for new development. Therefore, an analysis fo4r developed condition, "build-out" is not required and has not been included. The Borough is fully serviced by the Bergen County Utilities Authority (B.C.U.A.), providing sewage disposal, solid waste services and treatment works. United Water Company supplies water to the entire Borough.

The plan 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 less the impact of existing development.

II. GOALS

The goals of this MSWMP are as follows:

- 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, any 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 developments to restore, enhance, and maintain the chemical, physical and biological integrity of the waters of the state, 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

To achieve these nine goals, this plan outlines specific stormwater design and performance standards for new development and redevelopment. Each plan for development and redevelopment is thoroughly evaluated by the Land Use Boards and the Borough Engineer's office to insure that the development does not create any new adverse impacts on adjoining, downhill residences as a result of stormwater runoff. Furthermore, the development will be reviewed to determine the ability to address and reduce the intensity of any pre-existing stormwater related problem to adjoining property owners. All development is currently required to provide erosion control devices as a condition of the issuance of building permits. These devices are required to be installed in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, and must be installed prior to any soil moving activity.

New culverts, bridges, and in-stream structures are required to be submitted to NJDEP for review and permits and, as such, are within the jurisdiction of the Department. The adequacy of existing culverts, bridges, and in-stream structures will need to be evaluated on a case-by-case basis. Through observations during intense storm conditions, capacity-related problems will be reported to the Borough Engineer's office for evaluation. Maintenance of identified problem areas is performed by Borough personnel and erosion-prone stream embankment areas will be protected to the extent permitted by the Department.

New development applications, that fall within the jurisdiction of NJAC 5:21 or NJAC 7:8, will be required to submit Stormwater Management reports, outlining the groundwater recharge requirements of the site in question. The plans shall incorporate those measures identified in the approved report. Groundwater recharge requirements will be required for all projects that are deemed to be "major developments", as defined

by the Department (disturbance of more than one acre of land area or creation of more than ¼ acre of impervious area).

Nonpoint pollution will be controlled and, to the extent feasible, diminished with each new development and redevelopment project within the Borough. The on-site stormwater management requirements will mandate the reduction in the peak rate and/or volume of stormwater runoff as well as instituting water quality and groundwater recharge measures where applicable. Water quality and groundwater recharge for all sites shall be required to comply with the requirements of NJAC 5:21-7 and NJAC 7:8, which ever is applicable to that particular development. In addition, this Plan recommends that certain recommendations and goals offered in the most recent Master Plan (2003) should be revisited by the Governing Body. These recommendations are detailed later in this Plan. The creation of impervious areas is controlled under the current zoning ordinance of the Borough. Stormwater runoff from these areas is, and will continue to be, the priority when reviewing plans for new development and redevelopment, to insure compliance with the above noted NJAC stormwater control requirements.

Any new development and, in particular, new development in close proximity to a watercourse will be evaluated to ensure adequate protection of the watercourse and its overbank areas. Specifically, developments within the Westbrook and Norwood Brook basins which are part of the Dorotockey's Run HUC 14 drainage area will be evaluated to insure compliance with the sensitive Category One designation (discussed in detail later in this Plan). These watercourses and their affected tributaries have been mapped and identified for reference purposes. These developments will be reviewed to insure compliance with the requirements of NJAC 7:9B. Finally, at such time that TMDL's are established for the affected water course, the Borough will evaluate what, if anything, will need to be done to satisfy the established TMDL limits.

The Borough will minimize pollutants in stormwater runoff from new development and redevelopment by strictly adhering to the requirements of the above noted NJAC regulations. Adherence will be reviewed and evaluated through the land use approval process and further evaluated to verify compliance through on-site inspections during construction. This Plan also proposes stormwater management controls to minimize pollutants from existing developments. These controls are identified in the "Mitigation Plan" section of this Plan. The mitigation projects are all situated in areas of the Borough that were initially developed prior to the start of any stormwater management of water quantity, water quality, or groundwater recharge as a design feature. Furthermore, most of these areas are situated in the vicinity of the designated Category One watercourses. Redevelopment of these sites will be closely monitored to insure that each site that is redeveloped will contribute its small portion to reversing prior trends by addressing the quantity, quality, and recharge issues. The Borough has already begun retrofitting existing street catch basins with acceptable style grates and, where required, curb pieces to minimize solids and floatables from entering the watercourses.

Public safety will continue to be addressed through proper design of stormwater facilities. Stormwater management facilities are required to provide a safe means of entry in order to visually inspect and, when necessary, maintain the facilities. Security fencing shall be required along the perimeter of detention basins to prevent entry to anyone except authorized personnel performing normal or remedial maintenance at the facility. Control structures fitted with trash racks or choke pipes (orifices) will be monitored and cleaned after all intense rainfall events, to prevent clogging and/or abnormal build-up of stormwater.

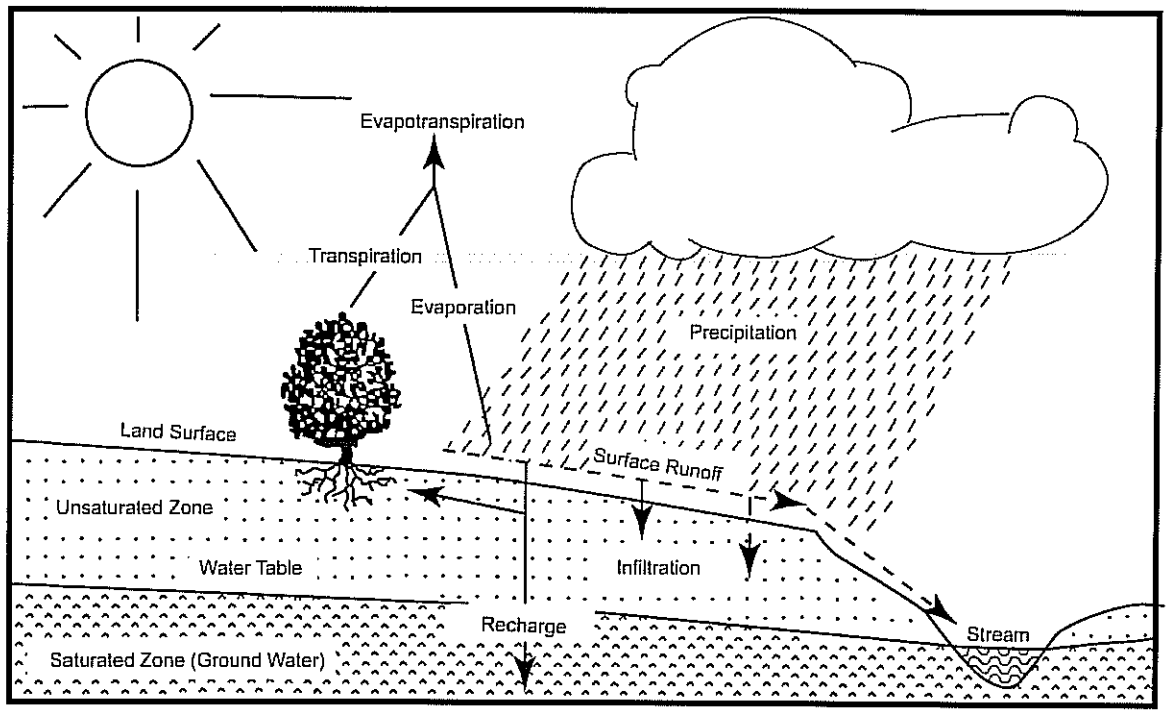
III. STORMWATER DISCUSSION

Following is a brief description of the hydrologic cycle and how development affects the cycle.

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 evaportranspiration 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 areas, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new downstream flooding and aggravate existing overflowing 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 areas can also decrease opportunities for infiltration, which, in turn, reduce 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 to a degree that some species cannot adapt to it and result in the elimination of those species.

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.

Figure 1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota (flora and fauna) 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.

IV. BACKGROUND

The Borough of Northvale encompasses 1.26 square miles (806 acres) in northeastern Bergen County, New Jersey. It borders the State of New York to its north. The Borough has been experiencing a slight decrease in its population. The population of the Borough has varied from 5,046 in 1980 to 4,563 in 1990 and to 4,460 in 2000. The number of households has increased from 1,506 in 1980 to 1,509 in 1990 and to 1,575 in 2000.

Recent development within the Borough include mainly residential developments. NJDEP has prepared maps showing the growth in developed use areas for all municipalities. The map showing the Borough's growth from 1986 to 1995/97 can be accessed at http://www.state.nj.us/dep/gis/images/m4m/berco/northvale_b.html. A copy of this map in included under Appendix A of this plan. Based on this map, the Borough's impervious area increased by approximately one (1) acre between 1986 and 1997. The growth locations are scattered within the Borough. The Borough follows the RSIS regulations regarding Stormwater Management. Therefore, due to the small increase in impervious area and the Borough's adherence to the RSIS regulations, there has been minimal increase in stormwater runoff rates and volumes to the waterways of the municipality.

West Brook in the west side of the Borough, Norwood Brook in the southeast, Cooper Pond at the northeast, a small section of the Sparkill Creek at the center north, and an uncoded tributary to the Sparkill Brook in the east side of the Borough, constitute Northvale's waterbodies. West Brook originates in the Borough and runs southerly discharging into Tappan Run in the Borough of Norwood, Tappan Run continues southerly for approximately 2300 feet, where it turns and resumes running westerly, discharging into Dorotockey's Run in the Borough of Harrington Park. Dorotockeys Run ultimately discharges into Oradell Reservoir. Norwood Brook runs southerly and feeds Dwars Kill, which adjoins Oradell Reservoir. A general map of the Borough is shown in Figure 2. Figure 3 illustrates the waterways in the Borough. Figure 4 depicts the Borough boundary on the USGS quadrangle maps. West Brook and Norwood Brook are part of the Hackensack River Watershed, and Sparkill Creek and Brook are part of the Hudson River Watershed, which are further part of Hackensack and Pascack Watershed Management Area (WMA) 5. New Jersey has been divided into 20 Watershed Management Areas. WMA 5 includes part of Bergen and Hudson Counties and has a drainage area of 165 square miles and contains the Hudson River Watershed, the Pascack Brook Watershed and the Hackensack River Watershed. West Brook and Norwood Brook are listed under FW2-NTC1 (Freshwater 2 Non Trout Category One Waters). The Sparkill Creek and the Un-coded Tributary are listed under FW2-NT and are not included under category one waters. It is noted that NJDEP website identifies West Brook and Tappan Run also as Dorotockeys Run.

The Category One antidegradation designations are based on "exceptional water supply significance". The Oradell Reservoir provides a potable water supply for 700,000 residents of New Jersey. Under the stormwater management rules, the Category One watercourses will be protected by buffer areas, identified as Special Water Resource Protection Areas (SWRPA). These buffers will extend out 300 feet from the top of bank on each side of the watercourse. Development within these buffer areas will be severely restricted and are to be maintained in their natural states. Certain exceptions would be permitted, such as redevelopment of previously disturbed areas (only) and certain time-restricted developments for single family housing. These exceptions would be based on the date of the previous subdivision approvals as well as the areas of permitted disturbance and impervious area created.

The 300 feet buffer zone in the Special Water Resource Protection Area(s) is required to be established around Category One Waters and perennial or intermittent streams that drain into or upstream of the Category One Waters to the Hydrologic Unit Code (HUC) 14 boundary. Sub-watersheds designated as HUC 14 are the smallest watersheds mapped by the NJDEP and the USGS, with each covering only approximately 3,000 acres. The USGS calls the watersheds Hydrologic Units. Each basic unit is a unique feature and is given a unique Hydrologic Unit Code (HUC), which is 14 digits long. The HUC is hierarchical. Larger and larger watersheds can be defined using different portions of the 14 digit code to define the watershed boundaries.

On May 19, 2003, the Department adopted amendments to upgrade the antidegradation designations for fifteen waterbodies under Amendment N.J.A.C. 7:9B-1.15 (R1-C1 Adoption). Of the fifteen, six waterbodies were upgraded to Category 1 based on an integrated ecological assessment conducted by the Department to determine "exceptional ecological significance," while nine water supply reservoirs were designated as Category 1 based on their "exceptional water supply significance." Oradell Reservoir is included among these water supply reservoirs. The USEPA approved these amendments on October 1, 2003. On August 2, 2004, the Department adopted amendments N.J.A.C. 7:9B-1.15 (R3-C1 Adoption) to upgrade the antidegradation designation for seven streams, including both named and unnamed tributaries based upon "exceptional ecological significance." These streams include Hackensack River and all its tributaries, including Dorotockeys Run and all its branches and Norwood Brook. It is noted that West Brook is identified as Dorotockeys Run by NJDEP and, therefore, is included under Category One Waters. The adopted amendments and maps can be accessed at the following Department websites: http://www.state.nj.us/dep/wmm/sgwqt/amendsummary.html and http://www.state.nj.us/dep/wmm/sgwqt/hackpasc.pdf.

The New Jersey Department of Environmental Protection 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 the number of biometrics related to benthic macroinvertebrate community dynamics. West Brook and Tappan Run are both tributary to Dorotockeys Run upstream of site ID ANO210 located in the Borough of Harrington Park. The data collected at this site rated Dorotockeys Run as modified impaired.

In addition to the AMNET data, the NJDEP and other regulatory agencies, such as US Environmental Protection Agency (USEPA) and the United States Geological Survey (USGS) collect water quality chemical data on the streams in the state. The data for Norwood Brook, collected at Site ID "5 DWA-1," at Dwars Kill on Blanche Avenue, downstream of Northvale in the Borough of Norwood, indicate that the instream

mercury concentrations of this brook exceed the state's criteria. This means that Norwood Brook is an impaired stream and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for this pollutant for this waterway.

A TMDL is the amount of a pollutant that can be accepted by a water body without exceeding the 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 or wastewater discharge, which requires a NJPDES permit to discharge, and non-point 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 of stream corridors, retrofitting stormwater systems, and other Best Management Practices (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.

The New Jersey Proposed 2004 Integrated List of Waterbodies lists the following watercourse under Sublist 5:

a) The Dwars Kill Brook, as monitored in Norwood, identifies one impairment: mercury, as monitored by NJDEP/USGS, Metal Recon, and benthic macroinvertebrates, as monitored by NJDEP AMNET.

While this monitoring point is not located in the Borough, the headwaters of this watercourse are situated in the Borough and, therefore, may be subject to TMDLs, if and when established by the State.

In addition to water quality problems, the Borough has exhibited water quantity problems. One source of flooding is the Sparkill Brook. Another source of flooding is the Sparkill Creek. The Sparkill Creek flows into the Borough of Northvale from a source in Rockland County, New York and then flows back into Rockland County, New York. Heavy rain events often cause extensive flooding within the Borough. A preliminary reconnaissance study is being conducted by US Army Corps of Engineers in coordination with NJDEP on Sparkill Creek and Brook. The study was authorized under Section 205 of the Flood Control Act of 1948, as amended (33 U.S.C. 701s). It will investigate potential solutions to reduce flood damages in future storm events. The document will determine the potential for Federal interest and summarize project goals

and potential solutions. The limits of these extensive floodings are shown on Flood Insurance Rate Maps (FIRM) 34003C114F and 34003C202F. These maps show the flood hazard areas inundated by a 100-year storm at Sparkill Creek and Norwood Brook. The 100-year Flood Hazard Area covers an average width of 500 feet adjacent to Sparkill Creek in the northeast side of the Borough. From the Borough's northerly border with New York and up to a length of approximately 4,300 feet, the 100-year Flood Hazard Area at the east side of the Borough extends for an average of 1,200 feet into the Borough. From this point to the southerly boundary of Northvale with the Borough of Norwood, the flood zone is much larger and covers an approximate width of 1,800 feet. This large flood hazard area contains Norwood Brook within it. It is noted that Sparkill Brook runs within the Borough of Rockleigh, adjacent to its westerly limit with the Borough of Northvale.

The FIRM maps do not show the 100-year flood hazard area for West Brook. However, adjacent areas to this brook are subject to flooding and experience inundation during major storm events. Furthermore, these maps do not identify the unnamed brook at the southeast portion of the Borough, but show this location being flooded by the 100-year storm at Sparkill Brook. It is noted that Firm maps delineation of Norwood Brook is more extensive. Panel 202 shows Norwood Brook as originating in the Borough of Norwood, running northward, making a turn at just south of Legrand Avenue, continuing to run easterly for approximately750 feet, and making a turn at this point to run southerly. Both Bergen County and NJDEP web sites show only the section of Norwood Brook running southerly from a point adjacent to Legrand Avenue.

Since the adoption of NJAC 5:21-7 (Residential Site Improvement Standards, commonly referred to as RSIS), new residential developments have been required to address the more stringent stormwater management standards of the regulations. These requirements have primarily focused on the peak rate of runoff reduction requirements.

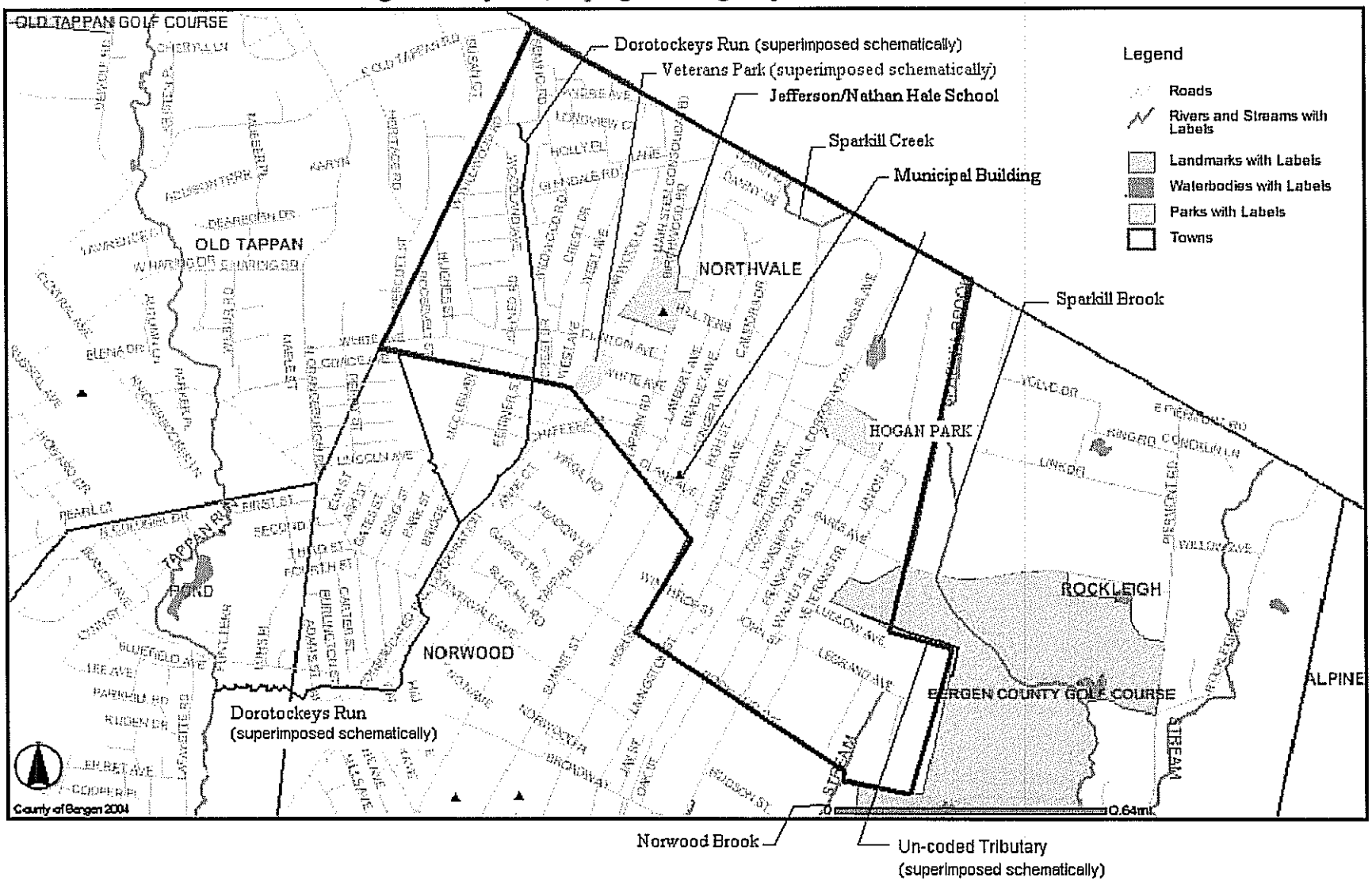
The New Jersey Municipal Land Use Law empowers and requires that local planning boards periodically re-examine and update their municipal Master Plan and that they do so on a cycle not to exceed six years. Northvale's last Master Plan re-examination was completed in May, 1999. The plan indicates that it supports the efforts of the Borough and other governmental bodies to protect environmental features and laws that regulate development in constrained areas, including stormwater management and steep slope ordinances. Accordingly, the Borough has initiated a master plan update that will include a review of the laws that regulate development and stormwater management, said update to be prepared and adopted by the Planning Board during 2005.

The Borough of Northvale has not conducted any groundwater assessments during dry weather periods. Lower base flows can have a negative impact on instream habitat during the summer months. Groundwater recharge is estimated using the NJGS methodology from NJ Geological Survey Report GSR-32 "A Method for Evaluation of Ground-Water-Recharge Areas in New Jersey." Land-use/land-cover, soil and municipality-based climatic data were combined and used to produce an estimate of

groundwater recharge in inches/year. A map of the groundwater recharge areas is shown in Figure 5. As stated, there are no existing groundwater assessments for the Borough.

A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) within New Jersey that delineates the horizontal extent of groundwater captured by a well pumping at a specific rate over a two-, five-, and twelve-year period of time. The area of capture over two, five, and twelve years is defined using line boundaries and polygon areas generated with Geographic Information System (GIS). WHPA delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Protection Program (SWPP). Wellhead protection areas are shown in Figure 6. Private wellhead location information is not available.

Figure 2: Borough of Northvale General Map
Source: Bergen County GIS, http://gis.co.bergen.nj.us/website/viewer1/viewer.htm



Note: Veterans Park, Dorotockeys Run and the Un-coded Tributary are not shown on Bergen County GIS site, and were superimposed schematically on this map.

Figure 3: Waterways in Borough of Northvale
Source: Bergen SWAN, Bergen County GIS, http://gis.co.bergen.nj.us/website/viewer1/viewer.htm

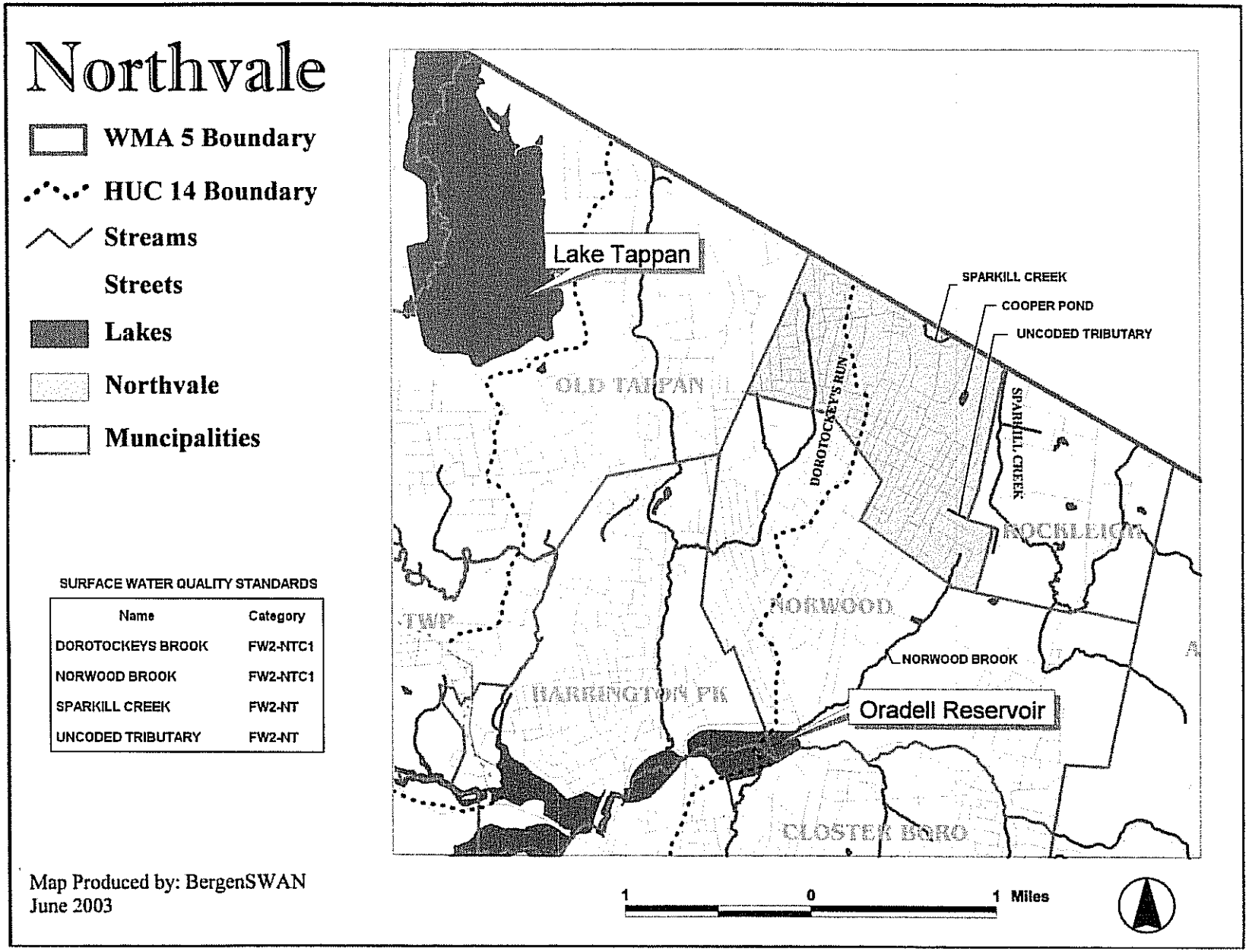


Figure 4: Borough of Northvale Boundary on USGS

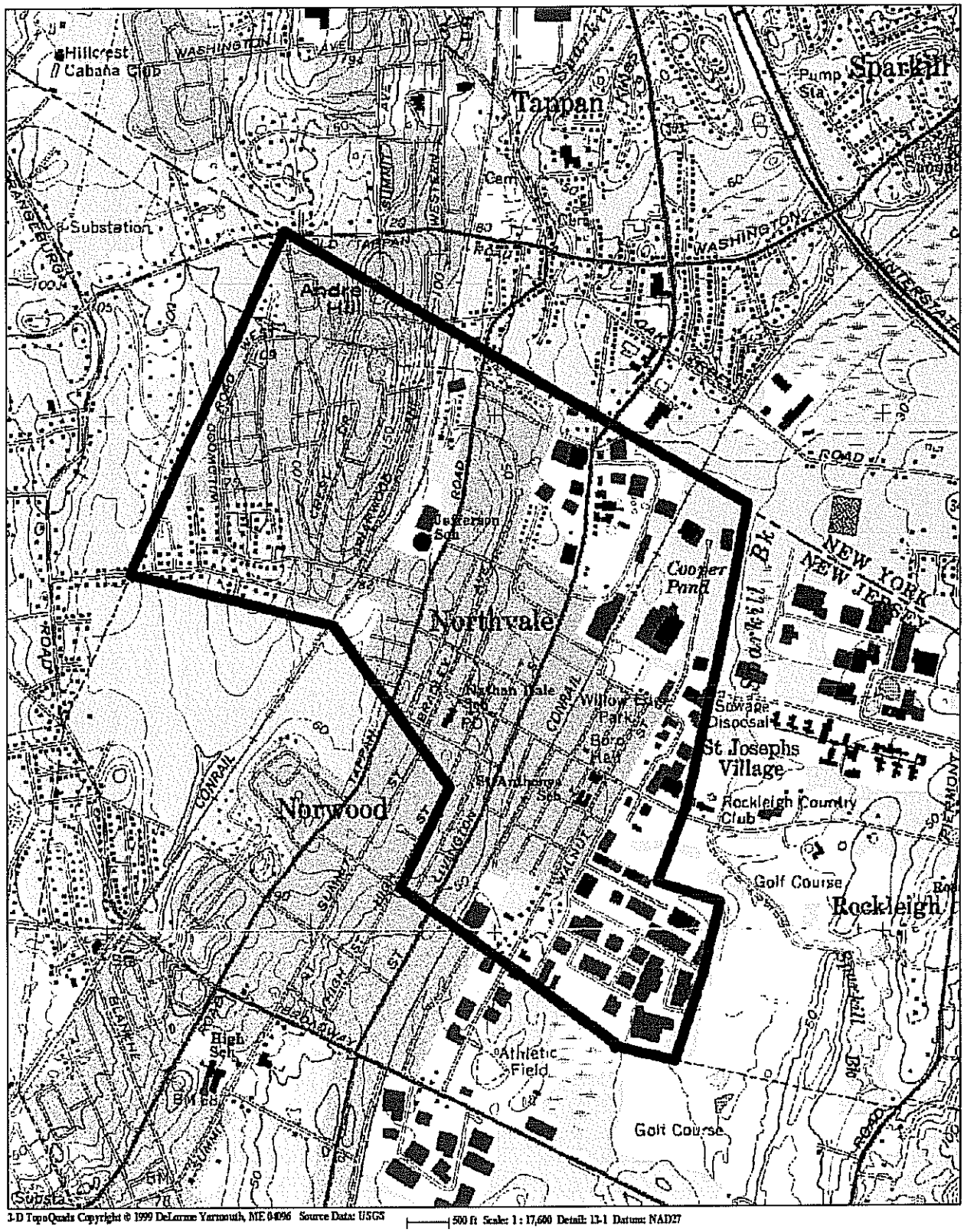


Figure 5: Groundwater Recharge Areas in Borough of Northvale
Source: http://www.state.nj.us/dep/gis/newmapping.htm

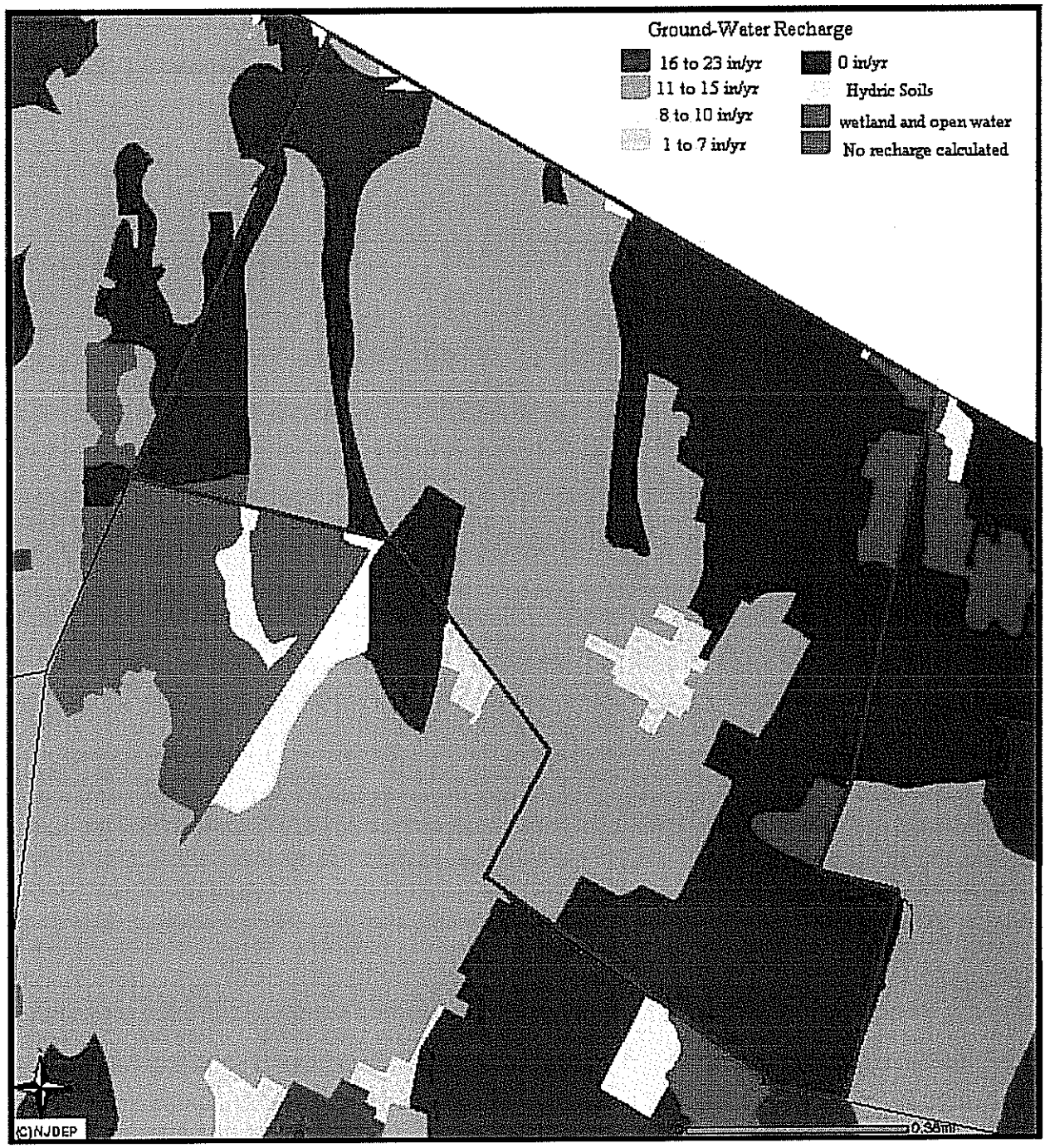
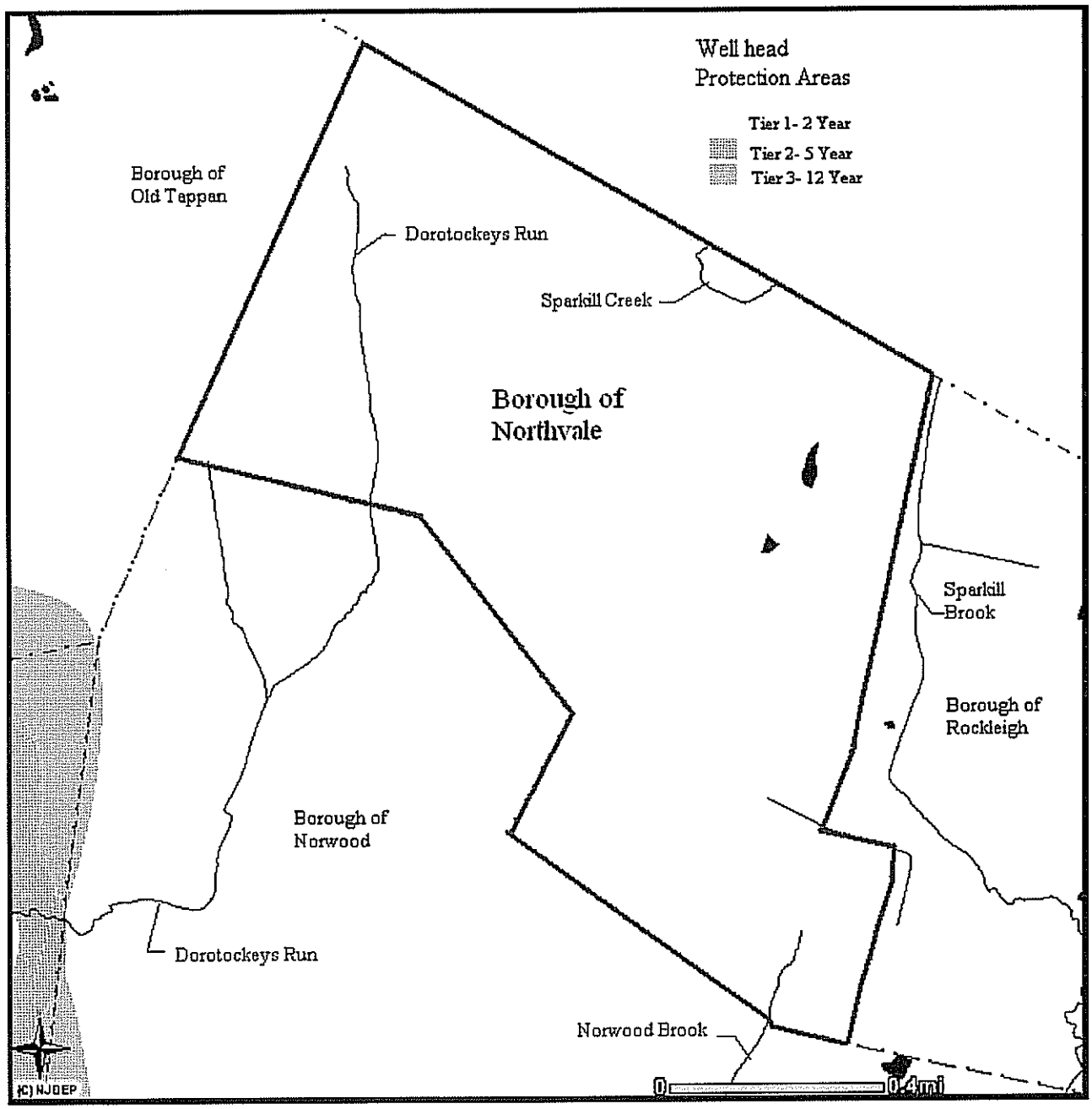


Figure 6: Wellhead Protection Areas in Borough of Northvale
Source: http://www.state.nj.us/dep/gis/newmapping.htm



Note: No Wellhead Protection Area is located within the Borough of Northvale

V. Design and Performance Standards

The Borough will adopt the design and performance standards for stormwater management measures as presented at 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 to receiving water bodies. The design and performance standards to be adopted by the Borough will 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.

Groundwater recharge requirements will be implemented and will be a requirement for all new development and redevelopment projects that are within the jurisdiction of NJAC 5:21 (RSIS) or NJAC 7:8 (major development). It will be the applicant's responsibility to provide the necessary calculations to demonstrate (a) the groundwater recharge volume required for the development of the site, and (b) to adequately detail the structural and/or non-structural technique to provide the minimum recharge volume as determined in the calculations. A range of surface and subsurface techniques would be acceptable, subject only to satisfying the volume requirement as well as demonstrating adequate subsurface soil permeability.

In the Borough of Northvale, the general policy has been to relegate the primary maintenance responsibility for stormwater management features at larger developments (subdivisions) to the homeowner of the property on which the feature is situated. Since this procedure is prohibited by the Stormwater Rules, the policy will need to be reviewed and revised to an acceptable procedure. For developments, such as residential subdivisions, the approvals will need to include a provision to create a homeowners association or similar agreement. The association will then be responsible for the maintenance and upkeep of any on-site stormwater management improvements. This responsibility will be required to be noted on the deed and/or filed map for that particular development and shall also be a condition in the memorializing resolution and developer's agreement. Easements will be required to permit the Borough to access the feature and to perform any normal maintenance or remedial work in the event that the primary responsible party (association) fails to perform the required work. If, after notification, the responsible party does not perform the required work, the Borough DPW will address the situation and the association will be charged for the services.

For those features where the Borough has primary responsibility, the Borough personnel (DPW) will adhere to the operation and maintenance procedures found at NJAC 7:8-5.8. These procedures will include but are not limited to:

- Quarterly inspections for clogging and excessive debris buildup. Inspections will also be performed after any intense rainfall (exceeding one inch in a twenty-four hour period).

- Grass surfaces to be properly maintained.

- Annual inspection of structural components for cracking, settlement, erosion, deterioration, etc.

The Municipal Stormwater Control Ordinance for the Borough of Northvale has been prepared and adopted, utilizing the Model Stormwater Control Ordinance for Municipalities, found in Appendix D of the New Jersey Stormwater Best Management Practices Manual. The Ordinance has been submitted to the County for review prior to adoption by the Governing Body and is included herein as Appendix A.

During construction, Borough inspectors, such as the Borough Engineer's office and/or the Construction Official, will observe the construction of new or redevelopment projects to ensure that the stormwater management measures are constructed and function as designed.

A. Achievement of Goals

1. Reduce flood damage, including damage to life and property

The Borough adopted Ordinance 487 entitled "An Ordinance to Implement the National Flood Insurance Program in the Borough of Northvale, County of Bergen and State of New Jersey" and furthermore adopted Ordinance #573-87, amending and supplementing the above ordinance. The purpose of these ordinances is to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions. Special flood areas identified on Flood Insurance Rate Maps are based on 100-year storms. Further reduction to flood damage is achieved by adding a new amendment to the above. The amendment shall require adherence to NJDEP regulations regarding floodplains and riparian buffer requirements. Sparkill Creek has been delineated by NJDEP and flood hazard areas based on the Department's regulatory flood has been established for this waterway. Norwood Brook ahs been delineated from its mouth at Oradell reservoir upstream to Broadway in Norwood, and Tappan Run has been delineated from its confluence with Dorotockeys Run upstream to west Shore Railroad (Conrail-Consolidated Rail Corporation) in Norwood. The upstream sections of the two latter waterways in the Borough of Northvale have not been delineated to date by the Department. However, the Borough shall consider applying the requirements of NJAC 7:13-2.4 "Establishing of flood plain limits and encroachment lines on non-delineated watercourses." By following the NJDEP requirements, the floodplain will cover larger areas, since the NJDEP regulatory flood is based on 100-year storm under full developed conditions which may also be represented by an increase of 25% to the 100-year flood flow under existing conditions. The NJDEP regulations further require that structures that span the floodplain and/or act as control structures for the watercourse; such as, bridges, culverts, or low dams, to be designed so that any increase in flood elevations, upstream or downstream, will not subject existing

residential or commercial buildings to increased flood damages during this flood and more frequent floods. Furthermore, as noted above herein, West Brook and Norwood Brook within the Borough are under Category One waters. This special water resource protection area requires that a 300 ft. buffer zone be established. Adhering to this requirement will limit development adjacent to waterways and reduce flood damage.

2. Minimize, to the extent practical, any increase in stormwater runoff from and new development

The Borough currently follows RSIS regulations that do not allow increase in stormwater peak runoff in residential development. For all major developments, defined as projects that disturb one or more acre of land or increase the impervious surface by one-quarter acre or more as indicated herein on this plan, the Borough has adopted the NJDEP Stormwater Management Rules under Ordinance #803-2005. Pursuant to Section 4 of this Ordinance, the applicant has to provide hydrologic and hydraulic calculations demonstrating one of the following for any major development:

a. Post-construction runoff hydrographs for the 2-, 10-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events.

b. No increase, as compared to the preconstruction condition, in the peak runoff rates of stormwater leaving the site for the 2-, 10-, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land use ordinances in the drainage area.

c. Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75, and 80 percent, respectively, of the pre-construction peak runoff rates.

3. Reduce soil erosion from any development or construction project

This goal is achieved by adhering to the New Jersey's Soil Erosion and Sediment Control standards. Pursuant to Subsection 4.F of the Borough of Northvale's newly adopted Ordinance #803-2005 *"The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:34-39 et seq. and implementing rules."*

During construction, Borough inspectors will observe on-site erosion control measures and report any inconsistencies to the local Soil Conservation District. For those projects that are under their jurisdiction, Soil Conservation District personnel will inspect construction sites for compliance with the erosion control standards that exceed 5000 s.f. of disturbance, stand-alone single family lots are exempted.

4. Assure the adequacy of existing and proposed culverts and bridges and other in-stream structures

The adequacy of existing and proposed culverts and bridges and other in-stream structures is assured by requiring adherence to NJAC 7:13 "Flood Hazard Area Control Act Rules." The NJDEP regulations under this chapter specify all the requirements needed to assure the adequacy of existing and new structures, without causing any adverse effects upstream or downstream for the regulatory flood and more frequent ones.

A permit from the NJDEP for any new bridge or modifications/alterations to existing ones as defined in NJAC 7:13 is required.

VI. Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area; therefore, this plan does not need to be consistent with any regional stormwater management plans (RSWMPs). If any RSWMPs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent with the regional plan. NJDEP has a TMDL in place for Dorotockeys Run at Old Tappan Road in the Borough of Harrington Park (biological impairment) and for Norwood Brook at Dwars Kill on Blanch Avenue in Norwood (mercury concentration). No plans for reduction of any of the parameters have been established. If any TMDL plans are developed in the future, this MSWMP will be updated to incorporate the requirements of these plans within the Borough.

Pursuant to the adopted amendment of N.J.A.C. 7:9B-1.15 on August 2, 2004 by the Department to the regulations on Surface Water Quality Standards N.J.A.C. 7:9B, Hackensack River with all its tributaries, are included under Category One Waters. This plan is consistent with the existing and adopted amendments to Category One Waters and requires all regulations on Surface Water Quality Standards, as indicated under Subsection 4.G.8 of the Borough's Ordinance #803-2005, to be applied to West Brook and Norwood Brook within the Borough.

This Municipal Stormwater Plan is consistent with the Residential Site Improvement Standards (RSIS) at NJAC 5:21 adopted 1/6/1997 and revised 1/20/2004. These standards can be accessed at http://www.nj.gov/dca/codes/nj-rsis/sc7.shtml and include regulations regarding water quantity and quality. Borough of Northvale 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 of Northvale's Ordinance #803-2005 "Regulating Stormwater Control" 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 erosion control measures and report any inconsistencies to the local Soil Conservation District.

VII. Nonstructural Stormwater Management Strategies

The Borough of Northvale has adopted Nonstructural Stormwater Management Strategies presented in NJAC 7:8-5.3(b), under Ordinance #803-2005, Subsection 4.E., entitled "Nonstructural Stormwater Management Strategies." To incorporate these 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 to be considered for modification. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within 24 months of the effective date of the Stormwater Management Rules. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapters 105 "Flood Damage Protection," 159 "Site Plan Review," 178 "Subdivision of land," and 200 "Zoning" of the Borough Code were reviewed with regard to incorporating nonstructural stormwater management strategies and stormwater management rules. Several amendments to these chapters to incorporate these strategies shall be considered. Following is the summary of the revisions to be evaluated:

Section 105-7.A. Compliance Required; Violations and Penalties: Requires compliance with the terms indicated in Chapter 105 (Flood Damage Protection) and other applicable regulations. Penalties for noncompliance will be adopted by the Borough. This section will be amended to include reference to the Borough's Ordinance #803-2005 "Regulating Stormwater Control." Penalties for noncompliance have been adopted under Ordinance #803-2005 by reference to ordinance #601-88. This chapter shall further be amended to be consistent with all the NJDEP regulations regarding floodplains and preservation of near-stream vegetation as indicated under NJAC 7:13.

Section 159-8.A.(3) Minimum Requirements for Site Plan Approval: Indicates that adequate provisions for disposal of stormwater as approved by the Borough Engineer are required. This section will be amended to include adherence to the Borough's Ordinance #803-2005 "Regulating Stormwater Control."

Section 178-9.A (10) Sidewalks: Describes sidewalk requirements in the Borough. Language will 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.

Section 178-12.C: Streets: This section requires cul-de-sacs to have a minimum radius of 50 feet. Language will be added to this section to reduce the minimum radius of cul-de-sac designs. It shall require different minimum radii for cul-de-sacs with landscaped islands and cul-de-sacs with flush curbs. The latter type will have reinforced shoulder to accommodate larger equipment and emergency vehicles.

Section 178-12.M: Streets: This section requires cul-de-sacs to have a minimum radius of 50 feet. Language will be added to this section to reduce the minimum radius of cul-de-sac designs. It shall require different minimum radii for cul-de-sacs with landscaped islands and cul-de-sacs with flush curbs. The latter type will have reinforced shoulder to accommodate larger equipment and emergency vehicles.

Section 178-15.C. Natural Features: This section requires that natural features; such as, trees, brooks, hilltops, and views, be preserved whenever possible. This section will be amended to expand trees to forested areas to ensure that lead litter and other beneficial aspects of the forest are maintained in addition to the trees.

Section 200-4.B. Word Usage and Definition. GREEN AREA. Green area is defined as percentage of the lot not devoted to building, structures, paving, driveways, ingress and egress, sheds, open storage and similar uses and landscaped or left to remain in a wooded or natural state. The Borough shall consider amending this description to further clarify the definition of Green Area as pervious area that allows permeation and passage of surface water into ground.

The Borough's Limiting Schedule, includes minimum percentage of "Green area" in all districts, excluding RM (Residential Multi–Family) and AH2 (Affordable Senior Housing), which have designated "Maximum Total Site Coverage by Impervious Surfaces", under sections 200-16E. (6) (b), and 200-19.E (6) (b).

Section 200-7.C. Buffer Strips: Sets forth the buffer strip requirements for commercial use which adjoins or is adjacent to a residential use. The language of this section will be amended to recommend the use of native vegetation. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces

Section 200-8.C. (3) Buffer Strips: Sets forth the buffer strip requirements for Light Industrial Uses. It requires buffers to be landscaped with evergreens at least six feet in height. The language of this section will be amended to recommend the use of native vegetation. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Section 200-13.F. Off-street parking: This section requires that all off-street parking spaces and driveways be paved with asphalt or concrete. This section will be amended to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge.

Section 200-13.I. Off-street parking: This section sets forth the requirements of parking spaces for nonresidential use. Paragraph (3) of this section requires that all such parking areas to be paved with two inches of bituminous concrete. The Borough shall consider amending this section to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge.

Section 200-13.R. Off-street parking: Requires all parts of all yards not used for off-street parking to be adequately landscaped subject to approval by the approving authority. The language of this section will be amended to recommend the use of native vegetation for landscaping.

Section 200-16.F. (1). Buffer: Sets forth the buffer requirements in Multiple-family Housing District. It requires the buffer area to be kept in its natural state where wooded, and where natural vegetation is sparse or nonexistent, to be planted such as to provide a year-round natural screen. The language of this section will be amended to recommend the use of native vegetation where feasible. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Section 200-18.A. (3). Drainage and stormwater management: Sets forth the requirements for a stormwater management system in RM and AH2 Districts. Paragraph (b) stating "no increase in the rate of runoff for a one-hundred-year storm,..... (zero percent 0% increase in peak runoff)", shall be removed and shall be replaced by a new paragraph that requires adherence to the Borough's newly adopted Ordinance #803-2005 "Regulating Stormwater Control". These stormwater management measures require the post-construction peak runoff rates for the two, 10

and 100-year storm events to be 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates.

Section 200-18C. General design standards: (2) Landscaping. Describes the standards to be used for landscaping in RM and AH2 districts. This section shall be amended to recommend the use of native vegetation for general landscaping, islands or unpaved areas within a street, and any area of clearing as defined under paragraph (c) of this section.

Section 200-19.H. Buffer areas: Describes the design standards for buffer in AH-2 District, which is similar to Section 200-16.F. (1), noted above herein. Language will be added to this section to include the use of native vegetation. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces

VIII. Land Use/Build-Out Analysis

Figure 7 illustrates the existing land use in the Borough based on 1995/97 GIS information from NJDEP. This figure shows that there is no agriculture land within the Borough of Northvale. The barren land is shown at the southeast of the Borough and is indicated as two acres.

A more detailed land use analysis for the Borough was conducted in conjunction with the preparation of the master plan re-examination.

The Borough's Master Plan Re-examination, prepared on May 1999 indicates that based on measurement of undeveloped parcels, there are twenty one (21) acres of vacant land within the Borough. Three of these parcels are located on the east side of Union Street in "L1", Light Industrial Zoning, at northeast of Northvale, next to the Borough of Rockleigh; while the others are indicated as scattered throughout the Borough. Furthermore, as shown in Figure 2, the general map of the Borough, a small section of Bergen County (Rockleigh) Golf Course is located at the east side of the Borough, in "L1", Light Industrial Zoning. The area of this golf course within the Borough is estimated at 17 acres. However, since this golf course is county owned, the property is not considered developable.

The new regulations specify that if a municipality has a combined total of less than one square mile (640 acres) of vacant or agriculture lands, the municipality is not required to provide a build-out analysis. Therefore, build-out calculations for impervious cover are not required.

Figure 8 illustrates the HUC14s within the Borough. The Borough zoning map is shown in Figure 9. Figure 10 illustrates the constrained lands within the Borough.

Figure 7: Borough of Northvale's Soil Map–March 2005
Source: http://www.state.nj.us/dep/gis/newmapping.htm

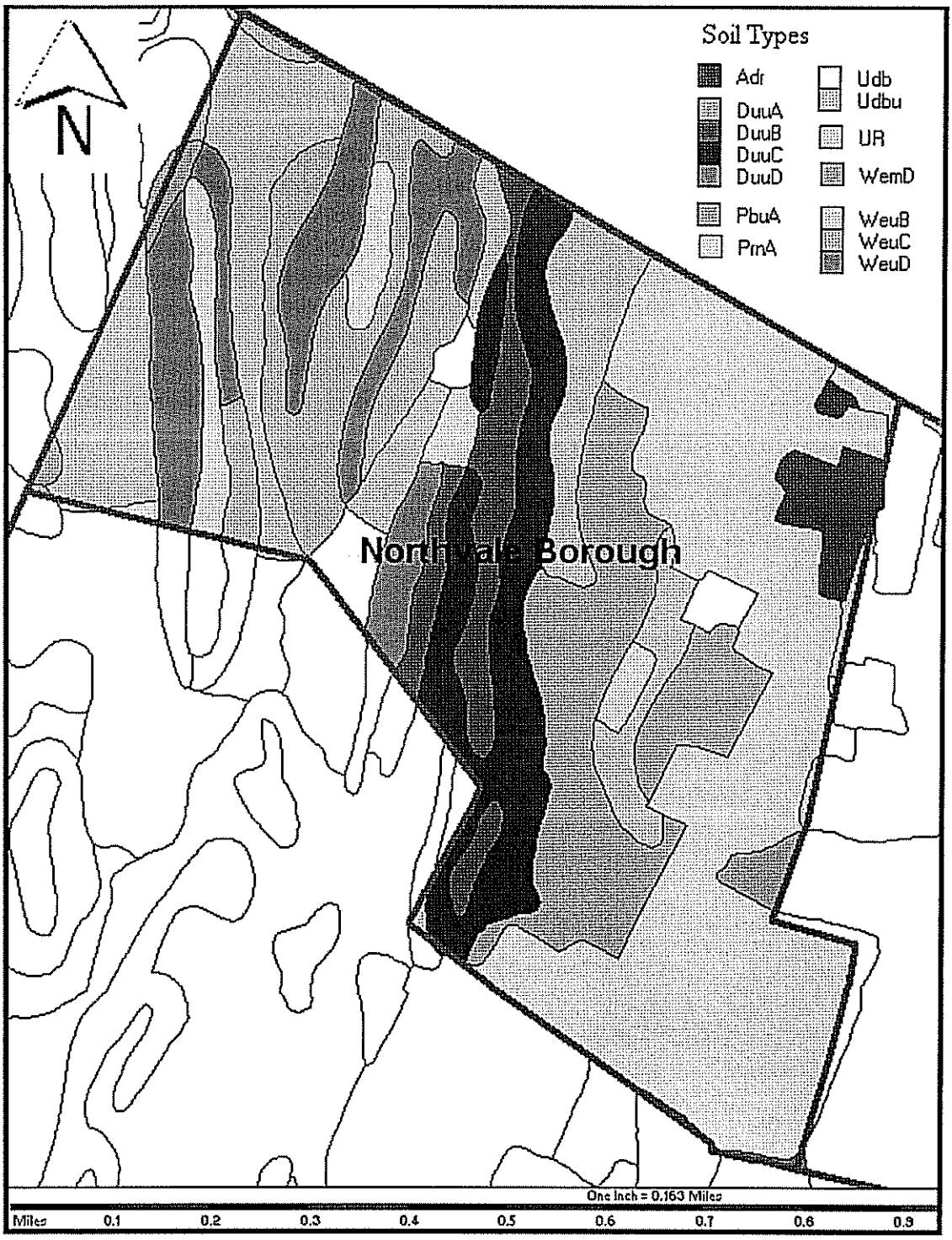


Figure 7: Borough of Northvale's Existing Land Use

Source: http://www.state.nj.us/dep/gis/newmapping.htm

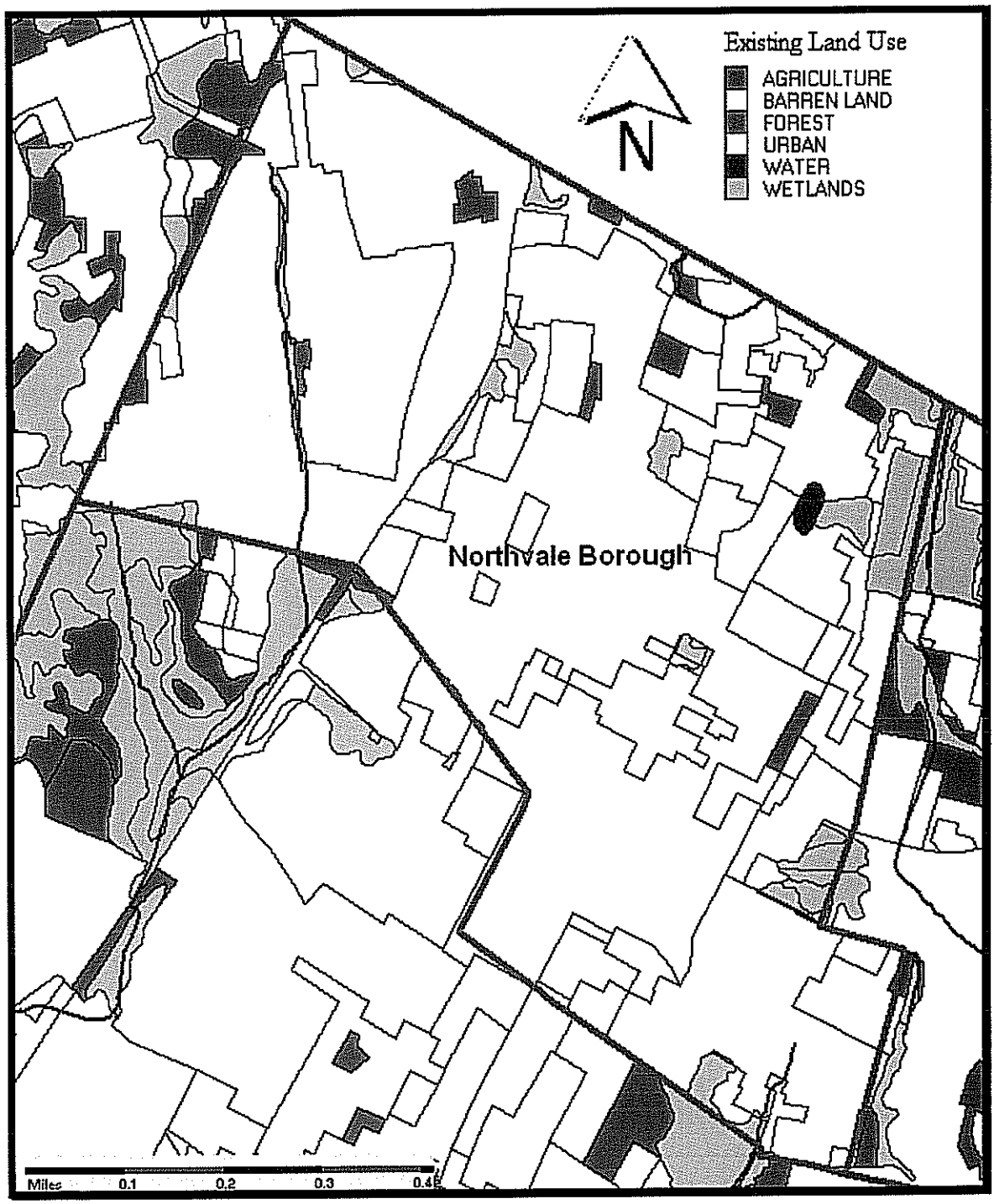
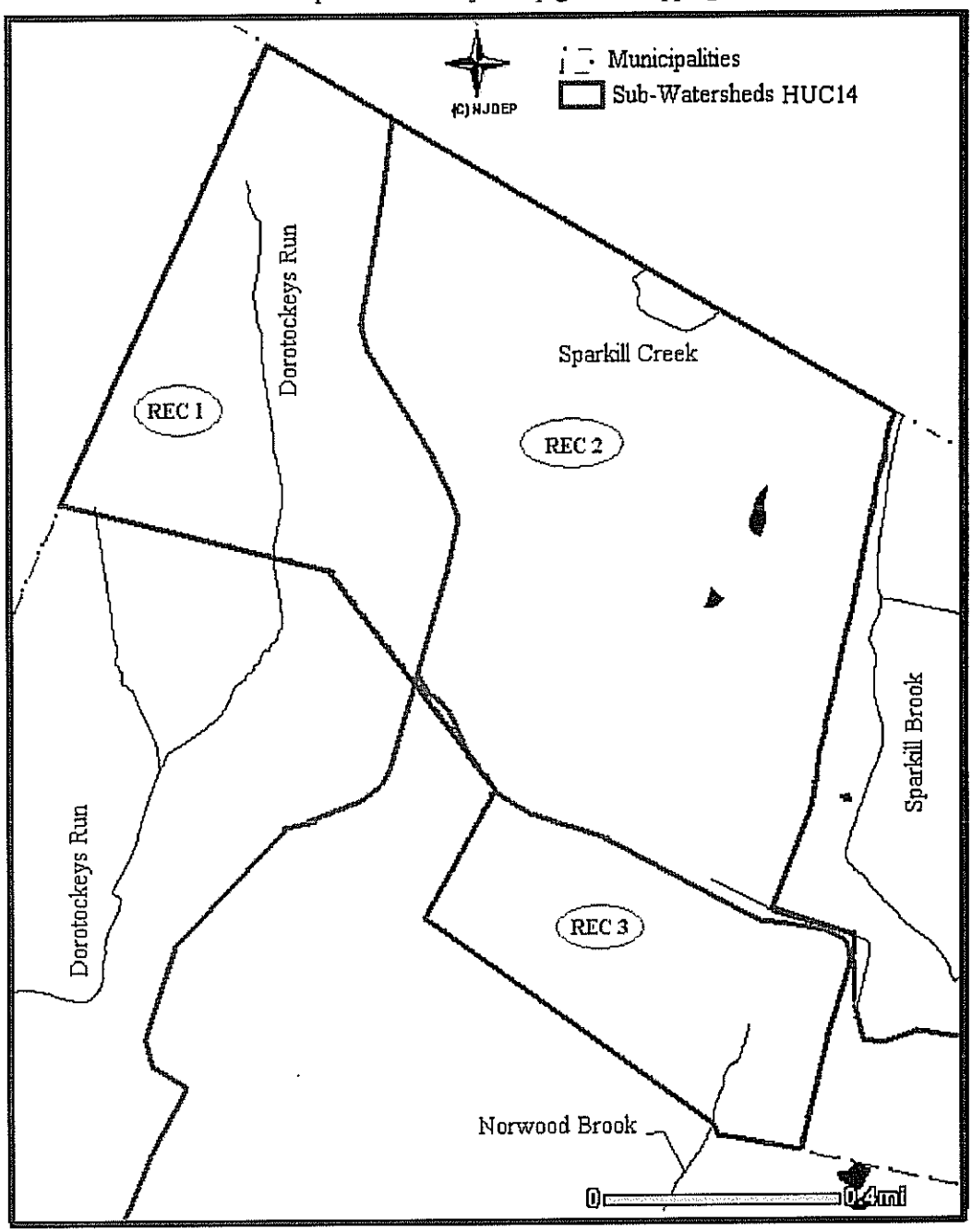


Figure 8: Hydrologic Units (HUC14s)
Source: http://www.state.nj.us/dep/gis/newmapping.htm



Sub-Watersheds (HUC14)

Rec	Sub-Watershed Name	Sub-Watershed ID	Hydrologic Unit Code (14 digit)	Watershed Name	Water-shed ID	Watershed Management Area	Management Area ID	Water Region	Water Region ID
1	Hackensack R (Oradell to Old Tappan gage)	05BA06	02030103170060	Hackensack R (above Hirschfield Brook)	05BA	Hackensack and Pascack	05	Northeast	1
2	Sparkill Brook	05AA02	02030101170020	Hudson River	05AA	Hackensack and Pascack	05	Northeast	1
3	Dwars Kill	05BA05	02030103170050	Hackensack R (above Hirschfield Brook)	05BA	Hackensack and Pascack	05	Northeast	1

Figure10: Zoning Districts Within Borough of Northvale
Source: Borough of Northvale (Prepared by Michael F. Kauker Assoc. Community and Environmental Planners, Butler, NJ, June 1990)
Modified schematically to match the March 14, 2001 version

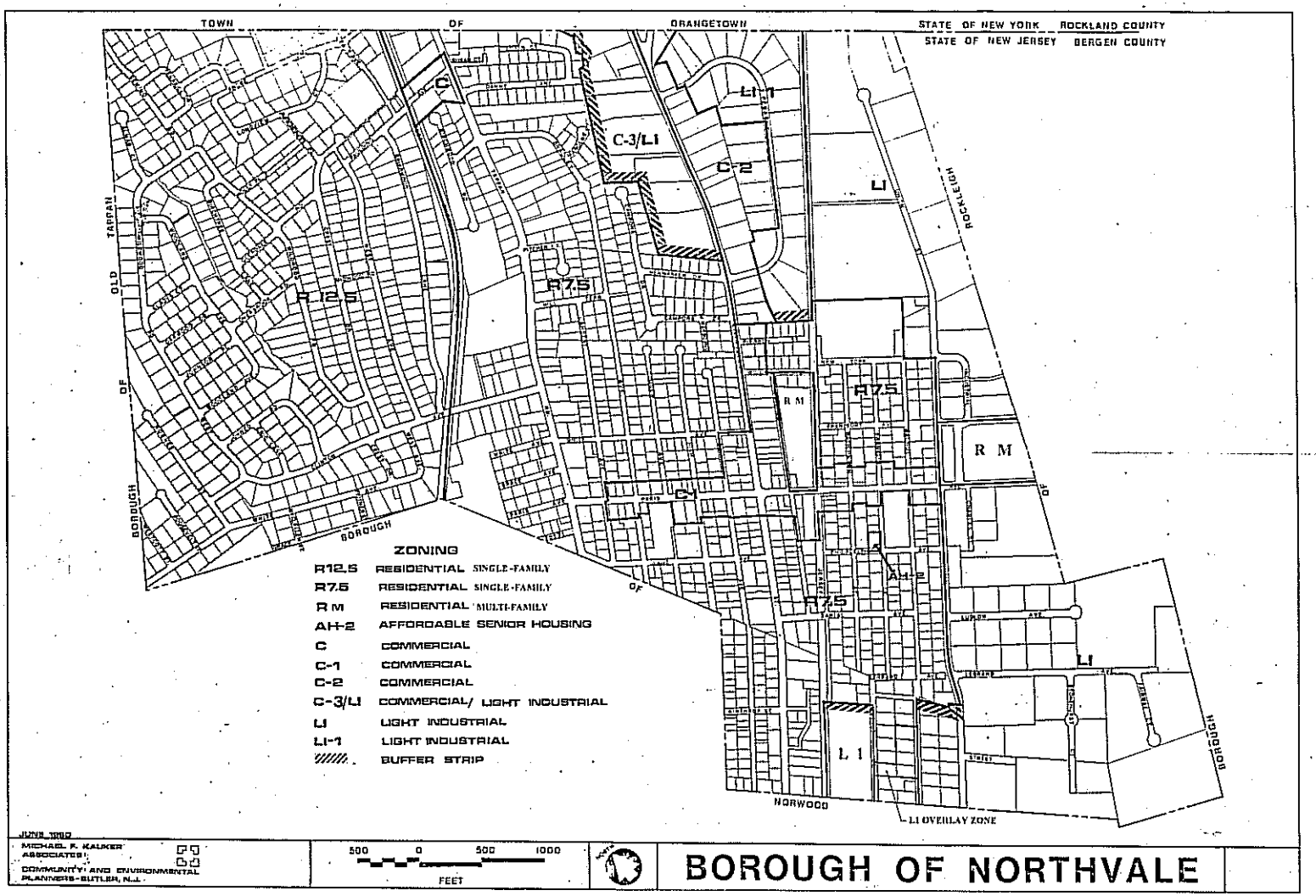
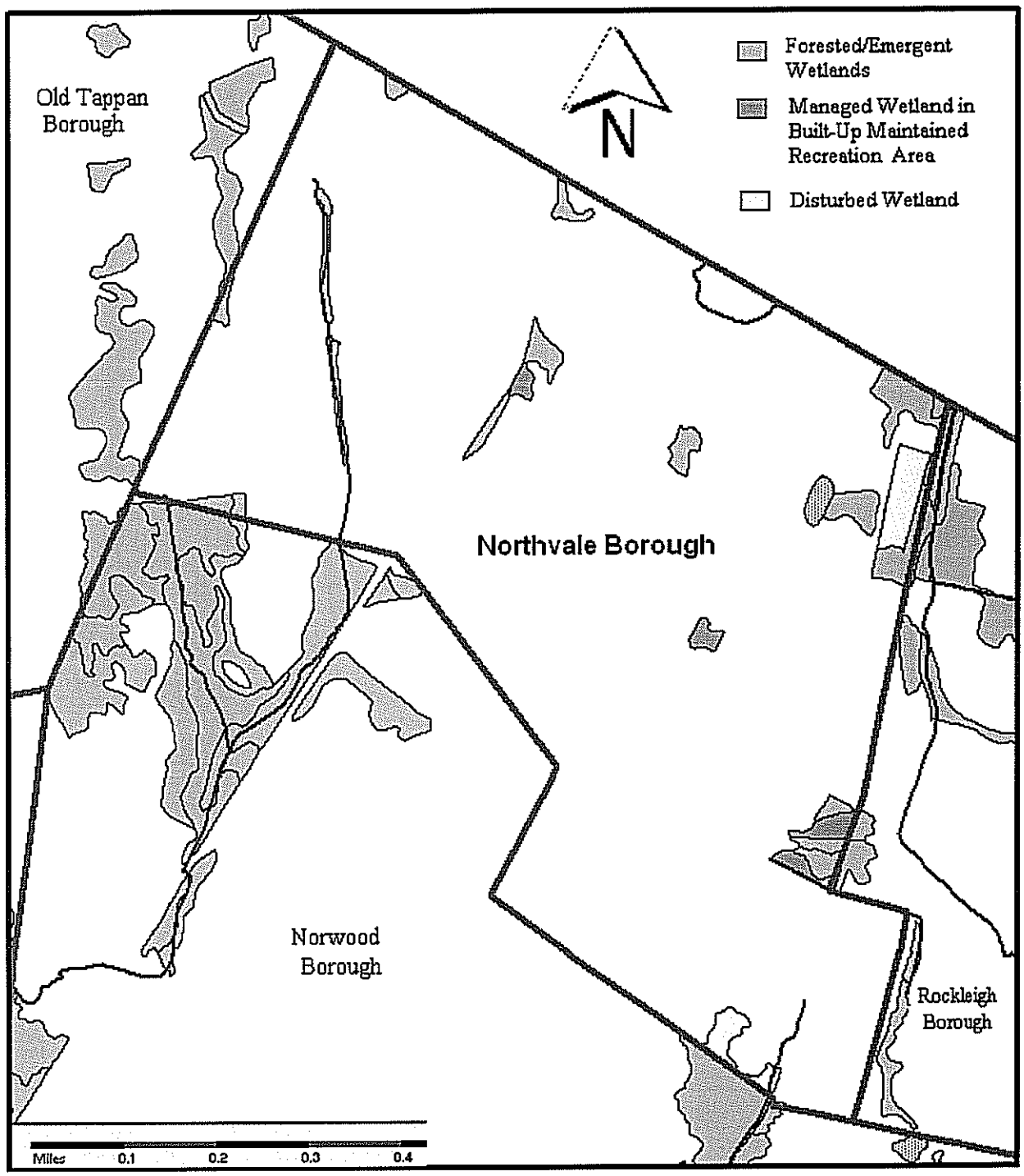


Figure 10: Wetlands and Water Land Uses Within the Borough – Constrained Land

Source: http://www.state.nj.us/dep/gis/newmapping.htm



IX. Mitigation Plans

In accordance with NJAC 7:8-4 a Mitigation plan is provided for proposed developments that are granted a municipal variance or exemption to the design and performance standards for stormwater runoff quality, stormwater runoff quantity, or ground water recharge establish under the stormwater management rules at NJAC 7:8-5.

A. Mitigation Project Criteria

1. The mitigation project shall be implemented in the same drainage area as the proposed development. The project must provide the additional groundwater recharge benefits, and/or protection from stormwater runoff quality and/or 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.
2. All applicants for a waiver from the design and performance standards for management of stormwater are to submit the following :
    - **a.** Identification of the "sensitive receptor" and document the physical impossibility to meet all or part of the requirements for water quality, water quantity, or ground water recharge peculiar to the subject property.
    - **b.** Documentation the extent of the defect from the stormwater management standards and how the mitigation plan offsets the defect.
    - **c.** Documentation that approval of the project in mitigation plan would not result in a localized adverse impact or result in a compliance defect that can not be compensated by offsite mitigation.
    - **d.** Documentation that a reduction in the size, scale, or layout of the project will not sufficiently reduce the size of defect from the stormwater standards.
    - **e.** All design details, drawings, calculations and all other information necessary to evaluate the proposed mitigation project.
    - **f.** A list of the persons responsible for the construction and maintenance of the mitigation facilities including documentation of the acceptance for said responsibility. The designation of an individual single family homeowner as a responsible party is not permitted.
    - **g.** A maintenance plan for the mitigation project.
    - **h.** Provide all required local state and applicable permits necessary to install the mitigation facility.
    - **i.** Documentation that the construction of the mitigation project will coincide with the construction of the proposed project. No certificate of

occupancy or final approval will be granted until the mitigation plan receives final approval.

3. Standards for the Special Water Resources protection area can not be waived.
4. Selection of an appropriate mitigation project for a requested waiver/exemption must adhere to the following requirements:
    a. The project must be within the same area that would contribute to the receptor impacted by the project. *Note that depending on the specific performance standard waived, the sensitive receptor and/or the contributory area to that receptor may be different.* If there are no specific sensitive receptors that would be impacted as the result of the grant of the waiver/exemption, then the location of the mitigation project can be located anywhere within the municipality, and should be selected to provide the most benefit relative to an existing stormwater problem in the same category (quality, quantity or recharge).
    b. Legal authorization must be obtained to construct the project at the location selected. This includes the maintenance and any access needs for the project in the future.
    c. The project should be close to the location of the original project, and if possible, be located upstream at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but on a similar hydraulic distance to the sensitive receptor. For example, if the project for which a waiver is obtained discharges to a tributary, but the closest location discharges to the main branch, it may be more beneficial to identify a location discharging to the same tributary.
    d. For ease of administration, if sensitive receptors are addressed, it is preferable to have one location that addresses any and all of the performance standards waived, rather than one location for each performance standard.
    e. It must be demonstrated that implementation of the mitigation project will result in no adverse impacts to other properties.
    f. Mitigation projects that address stormwater runoff quantity can provide storage for proposed increases in runoff volumes, as opposed to a direct peak flow reduction.

5. The municipality may allow a developer to provide funding or partial funding to the municipality towards the development of a Regional Stormwater Management Plan. . The Borough, may further allow this funding to be spent towards an overall study of stormwater management facilities, such as culvert capacity analyses, streambank stabilization, etc. The funding must be equal to or greater than the cost to implement the required 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.

B. Administrative Requirements

1. The Borough shall submit an annual report, as required by the NJPDES permit, to the NJDEP Division of watershed management (DWM) on the variances or exemptions from stormwater management standard issued.
2. The annual report is to include both projects reviewed by the municipality under Municipal Land Use law as well as the Borough's own projects that are unable to fully comply with design and performance standards.

X. Special Water Resource Protection Area(s)

Special water resource protection areas have been established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:

1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided. (2)Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.

b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in

the "Standards For Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq.

c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standards For Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:

1) Stabilization measures shall not be placed within 150 feet of the Category One waterway;
2) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;
3) Temperature shall be addressed to ensure no impact on the receiving waterway;
4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;
5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
6) All encroachments proposed under this section shall be subject to review and approval by the Department.

d. A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Section 4.G(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.

e. Paragraph G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004 , provided that the construction begins on or before February 2, 2009.

f. The following watercourses in the Borough of Northvale have been identified as Category One watercourses; Dorotockeys Run and Norwood Brook.

XI. Sources for Maps

It is noted that different sources for maps have been used. The source for Figures 2 and 3, is Bergen County GIS, http://gis.co.bergen.nj.us/website/viewer1/viewer.htm. Figure 3 was prepared by BergenSWAN on June 2003. NJDEP site http://www.state.nj.us/dep/gis/newmapping.htm is the source for Figures 5 through 8, and 10. The source for Figure 4 is USGS and as developed by DeLorme, New Jersey, TopoQuads. The zoning map, Figure 9, is based on a map entitled "Borough of Northvale" (Prepared by Michael F. Kauker Assoc. Community and Environmental Planners, Butler, NJ, June 1990) Modified schematically to match the March 14, 2001 version.

XII. Abbreviations

AH2 -Affordable Senior Housing

AMNET - Ambient Biomonitoring Network

BMP- Best Management Practices

C1 - Category One waters, designated for purposes of implementing the antidegradation policies set forth at N.J.A.C. 7:9B-1.5(d).

FW1 - Fresh waters as designated in N.J.A.C. 7:9B-1.15h.

FW2 - General surface water classification applied to those fresh waters that are not designated as FW1 or pineland waters.

HUC- Hydrologic Unit Code

GIS - Geographic Information System

MSWMP-Municipal Stormwater Management Plan

NJDEP - The New Jersey Department of Environmental Protection

NJPDES- New Jersey Pollutant Discharge Elimination System.

NJIS - New Jersey Impairment Score

NT- "Nontrout waters" means fresh waters that have not been designated in N.J.A.C. 7:9B-1.15(b) through (h) as trout production or trout maintenance.

RM -Residential Multi –Family

RSIS - Residential Site Improvement Standards

RSWMP- Regional Stormwater Management Plan

PCWS - Public Community Water Supply

PURD - Planned Unit Residential Development

SWPP- Source Water Protection Program

SWMP- Stormwater Management Plan

TMDL - Total Maximum Daily Load

USEPA – United States Environmental Protection agency

USGS - United States Geological Survey

WHPA - Well Head Protection Area

APPENDIX A

Northvale Boro, New Jersey

Showing Growth in Developed Use Areas from 1986 to 1995/97

Legend

- Municipal Boundary
- Roads
- Streams
- Lakes
- Developed Areas in 1986
- Developed Area Growth from 1986 to 1995/1997

The yellow outlined areas delineate areas that were developed as of 1986. The solid yellow areas have been developed between 1986 and 1995/97. The total area of impervious surface (buildings, sidewalks, driveways, parking lots, etc.) is about 355 acres. About 1 acre of this total was added since 1986. The total area of impervious surface constitutes 44% of the total (806) acres in the municipality.