

BOROUGH OF RINGWOOD

PASSAIC COUNTY, NEW JERSEY



MUNICIPAL STORMWATER MANAGEMENT PLAN

JANUARY 30, 2005

LATEST REVISION DATE: MARCH 28, 2005

INTRODUCTION

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Ringwood (“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 Manage 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 describes long-term operation and maintenance measures for existing and future stormwater facilities.

The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

GOALS

The goals of this MSWMP are to:

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

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and

corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

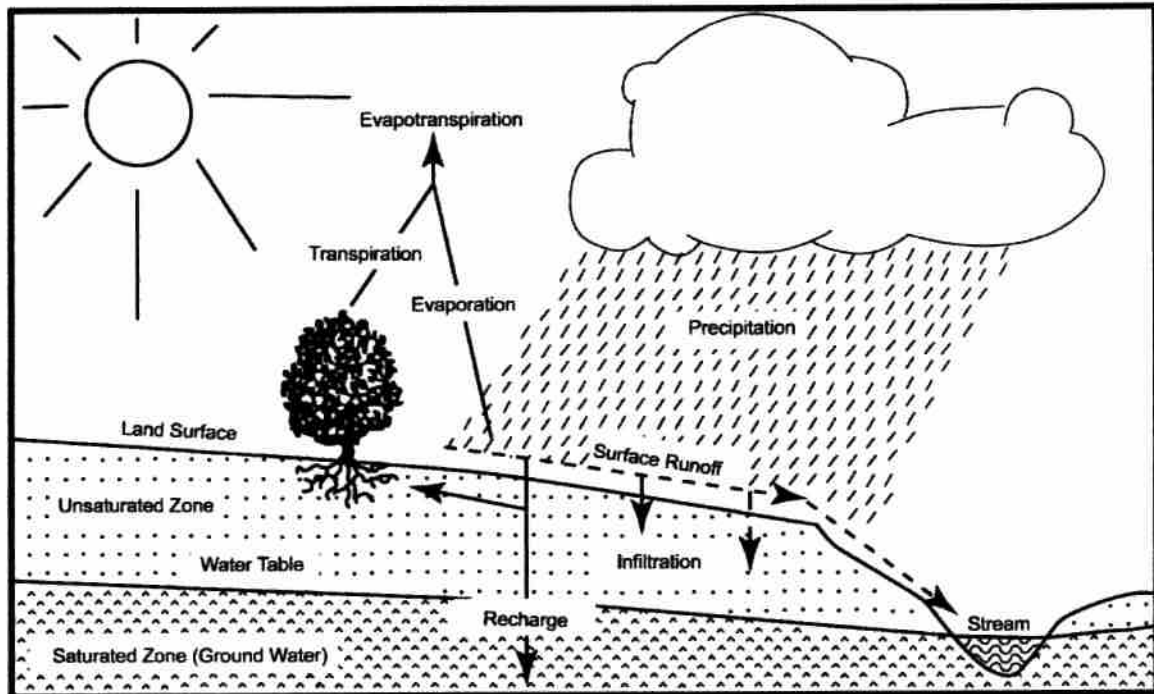
STORMWATER DISCUSSION

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

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

In addition to 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 a detention or retention basin can become heated and raise the temperature of the downstream waterway, adversely affecting cold-water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Figure A: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

BACKGROUND

The Borough of Ringwood encompasses 28 square mile area in the northern part Passaic County. Figure 1 depicts the Borough's boundary and its topography on the USGS quadrangle maps. The entire Borough is located in the New Jersey Highlands Region. The New Jersey Highlands Region is an approximately 1,000 square mile area within portions of 7 counties and 87 municipalities. The Highland Region was created by the State of New Jersey to protect the drinking water of sixty-four percent of New Jersey residents, or about 5.4 million people. In fact, the entire Borough is located in the Highlands Preservation Area portion of the Highlands Region. The Highlands Preservation Area has been designated as having exceptional natural resource value. Figure 2 depicts the surface water and wetlands throughout the Borough while Figure 3 depicts the surface waters, watersheds, and hydric soils throughout the Borough.

The Borough of Ringwood is a rural neighborhood community with over sixty-five percent of its land being open space. Figure 4 depicts the designated open space land throughout the Borough. The Borough is divided into a westerly and easterly half by the Wanaque Reservoir. On the west side, the population is scattered throughout the area. These homes are generally serviced by individual wells, individual septic systems, and propane or oil fuel. The homes on the easterly side, the population is more dense and is concentrated around the three community lakes (Cupsaw Lake, Erskine Lakes, and

Skyline Lakes). These homes are generally serviced by municipal water, individual septic systems, and natural gas. In recent years, the Borough's population has decreased from 12,623 people in 1990, to 12,396 people in 2000.

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 lists of waters impaired or threatened by pollutants, for which one or more Total Maximum Daily Loads (TMDL's) are needed. Listed below are the waterways in the Borough that are listed in the Integrated List Sublist 5 with Priority Rankings:

<u>Waterbody</u>	<u>Impairment</u>	<u>Priority</u>
1. Erskine Lake	Fecal Coliform	High
2. Monksville Reservoir	Mercury	High
3. Ringwood Creek at Manor Road in Ringwood State Park	Temperature	Medium
4. Skyline Lakes	Fecal Coliform	High
5. Wanaque Reservoir	Mercury	High
6. West Brook	Temperature	Medium

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require NJDEPS permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of streams corridors, retrofitting stormwater discharges, and other BMP's.

There have not been any TMDL's developed for any of the above waters. If any TMDL's are developed in the future, this Stormwater Management Plan will be updated to be consistent with them.

Figure 5 and Figure 6 are maps which are required as part of the Municipal Stormwater Management Plan. Figure 5 depicts the soil recharge groups of the Borough and Figure 6 shows the Borough's wellhead protection areas.

DESIGN AND PERFORMANCE STANDARDS

The Borough will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the county for review and approval within (24 months of the effective date of the Stormwater Management Rules.)

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

PLAN CONSISTENCY

The Borough is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Borough; therefore, this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs. If any RSWMPs or TMDLs are developed in the future, this 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 requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

MITIGATION PLANS

Where the developer cannot meet the requirements of the Municipal Stormwater Management Plan (MSMP) on site, the Developer may seek a variance or exemption from the performance standard from the regulatory authority administering the land use application (Planning Board or Board of Adjustment). The Developer must then provide for a mitigation plan that will offset those impacts.

This Mitigation Plan is provided for a proposed development that is seeking a variance or exemption from the stormwater management design and performance standards. Mitigation is

not an option until it is clearly demonstrated that on-site compliance is not practicable. Generally, the design and performance standards for the Mitigation Plan focus on three areas: (1) maintaining groundwater recharged from proposed development, (2) minimizing the proposed development's impact on flooding and (if applicable), (3) minimizing the proposed development's water quality impact on State waters.

In seeking a variance or exemption, the developer must first quantify the potential impact(s) created by granting the variance or exemption from the performance standard with regard to: groundwater recharge, TSS removal, nutrient removal and/or runoff quantity control. The Developer must then develop a mitigation project plan that will offset those impacts. Any off-site mitigation solution must be fully constructed by the Developer and approved by the Borough Engineer prior to commencing construction on the Developer's property.

Mitigation Project Criteria

The mitigation project must provide 120% relief from the impacts associated with the variance or exemption granted. Accordingly, the mitigation project shall provide additional groundwater recharge benefits, protection from stormwater quality degradation and/or stormwater quantity increases, depending on the impacts identified. The mitigation project must be implemented in the same drainage area as the proposed development.

If a suitable site cannot be located in the same drainage basin area as the proposed development, at the discretion of the Board, the mitigation project may provide mitigation in a nearby watershed where deemed by the Borough to have a greater need for improvement. Where the direct impacts of the variance or exemption from the performance standards cannot be mitigated, solutions that mitigate alternative pollutant parameters may be considered.

In developing either an on-site or an off-site mitigation project, 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.

Mitigation Solutions

In order of preference by the Board governing the application, the Developer may consider the following potential mitigation solutions:

- a. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, protection from stormwater runoff quality, and/or protection from stormwater runoff quantity from previously developed property that does not currently meet the design and performance standards outlined in the MSMP.

- b. The Developer can select one or more of the following mitigation projects. More detailed information on the projects can be obtained from the Borough Engineer. Listed below are specific projects that can be used in a mitigation project.

GROUND WATER RECHARGE

- Crescent Drive – Retrofit the existing stormwater collection system to remove 80% TSS and recharge the 2 year, 24 hour storm event.
- Borough Hall Parking Lot – Replace the existing deteriorated parking lot and drives with permeable pavement.

WATER QUALITY

- Pinewood Drive – Install stormwater measures that reduce 80% TSS.
- Library & Commuter Parking Lot – Install stormwater measures that recharge the 2 year, 24 hour storm event and remove 80% TSS.
- Install stormwater measures (siltation chambers) at Erskine Lake (at Mohawk Trail), Cupsaw Lake (at West Circle) and Skyline Lake (near Richard Court).
- Install stormwater measures (siltation chambers) at the outfalls of various lakes throughout the Borough.

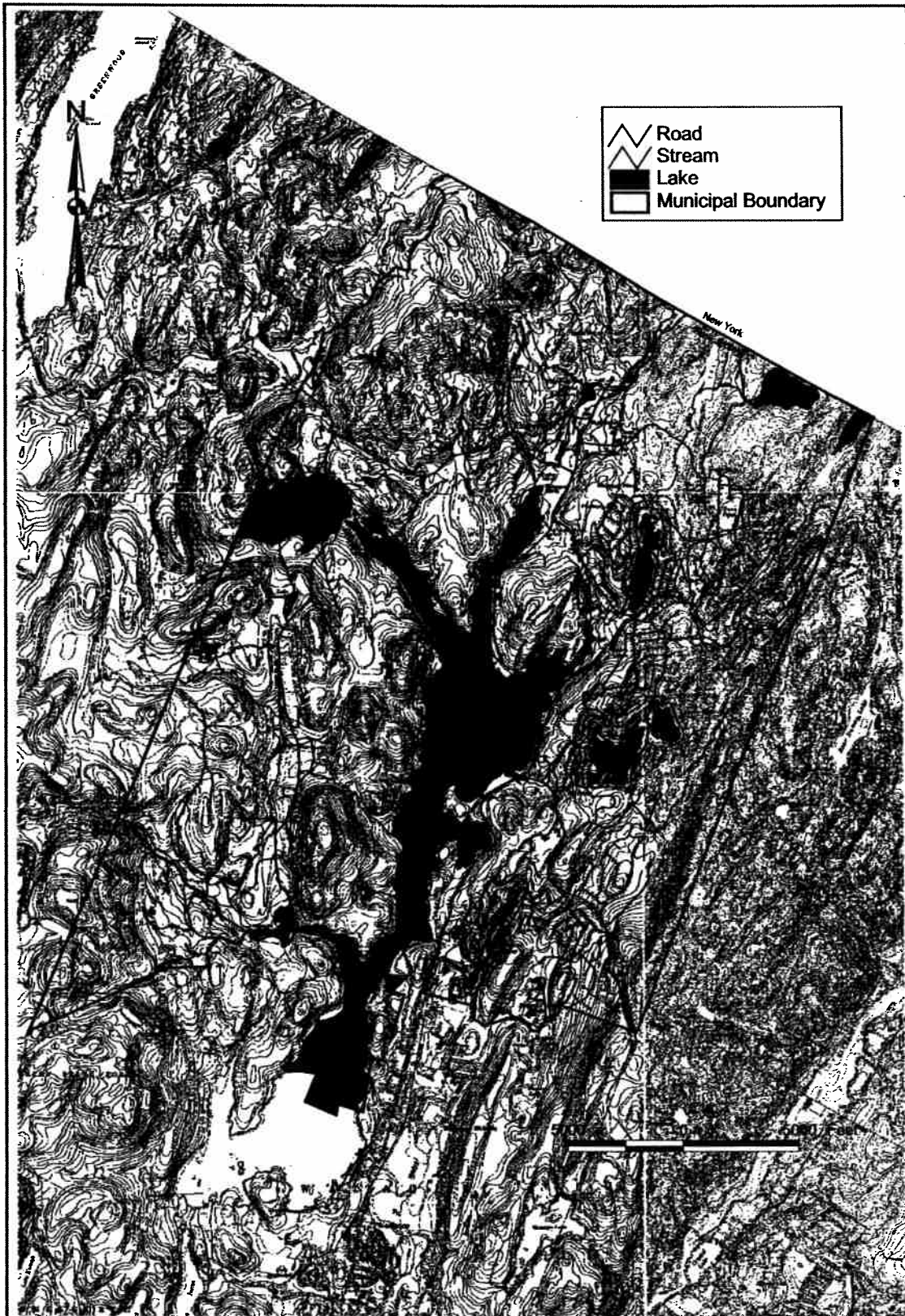
WATER QUANTITY

- Fieldstone Plaza Detention Plaza – Retrofit the existing detention basin to accommodate the 100-year storm event and recharge the 2 year, 24 hour storm event.
- Smokey Ridge Road/Hilltop Terrace – Install stormwater measures (inlets and pipe) to control stormwater on Smokey Ridge Road.
- Cupsaw Avenue/Longview Lane – Install stormwater measures (inlets and pipe) to control stormwater on Cupsaw Avenue.

- Robin Lane – Install stormwater measures (inlets and pipe) to control stormwater on Robin Lane.

- c. If none of the aforementioned plans meet the objectives of this MSMP, the Developer may petition the Board governing the application to design an alternative mitigation plan within the impacted watershed.
- d. Where the developer can demonstrate to the satisfaction of the Board governing the application that a mitigation project is not feasible or where the Borough deems it to be in the best interest of the Borough for the purpose of providing a regional mitigation solution, the Borough of Ringwood may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in the MSMP.¹ The funding must be sufficient to cover costs associated with the long-term maintenance requirements of the environmental enhancement project.

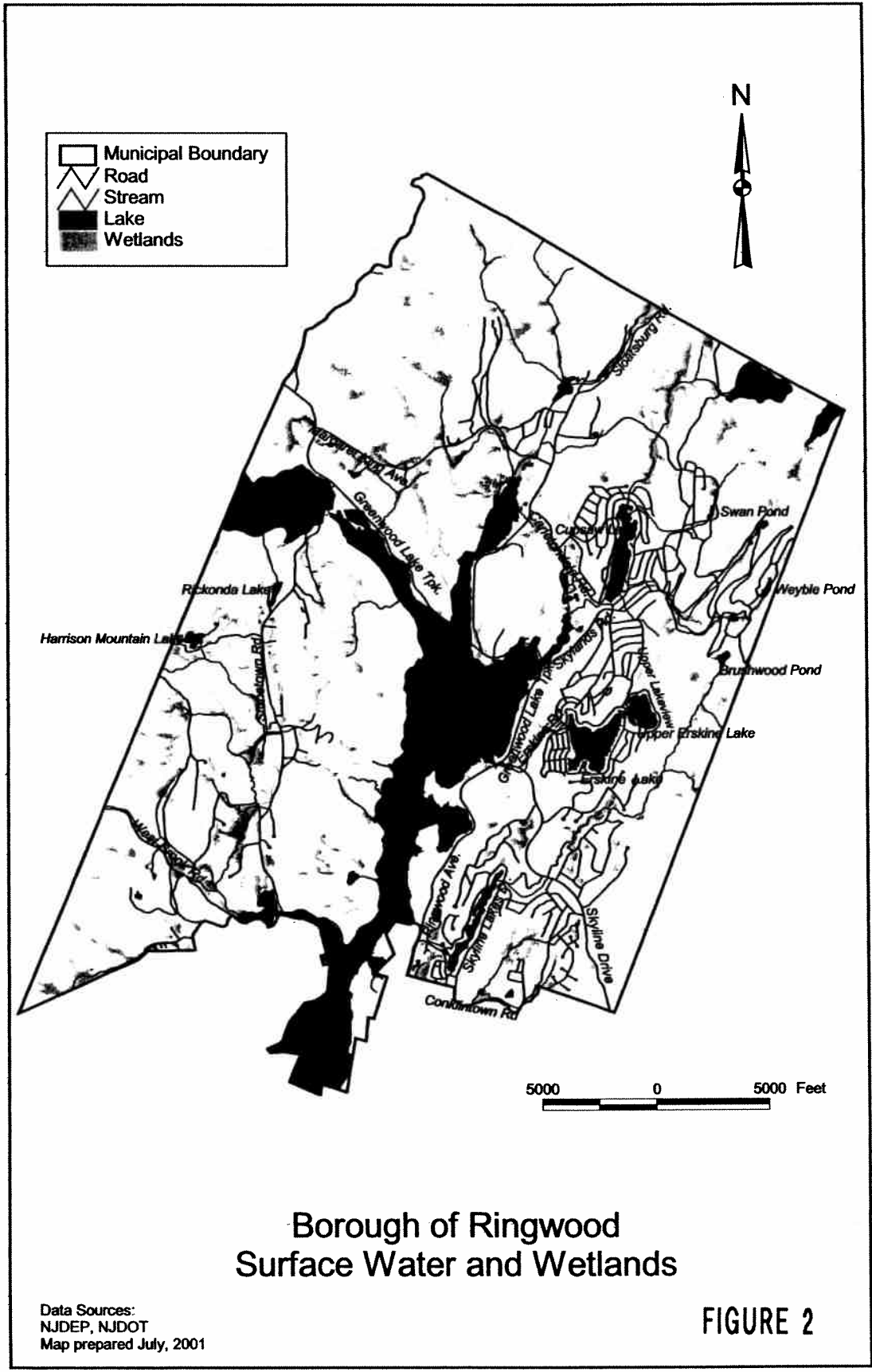
¹ Note: Proposed environmental enhancement projects will be included in a later version of the SWMP.



Data Sources:
NJDEP, NJDOT, USGS
Map prepared July, 2001

Borough of Ringwood Topography

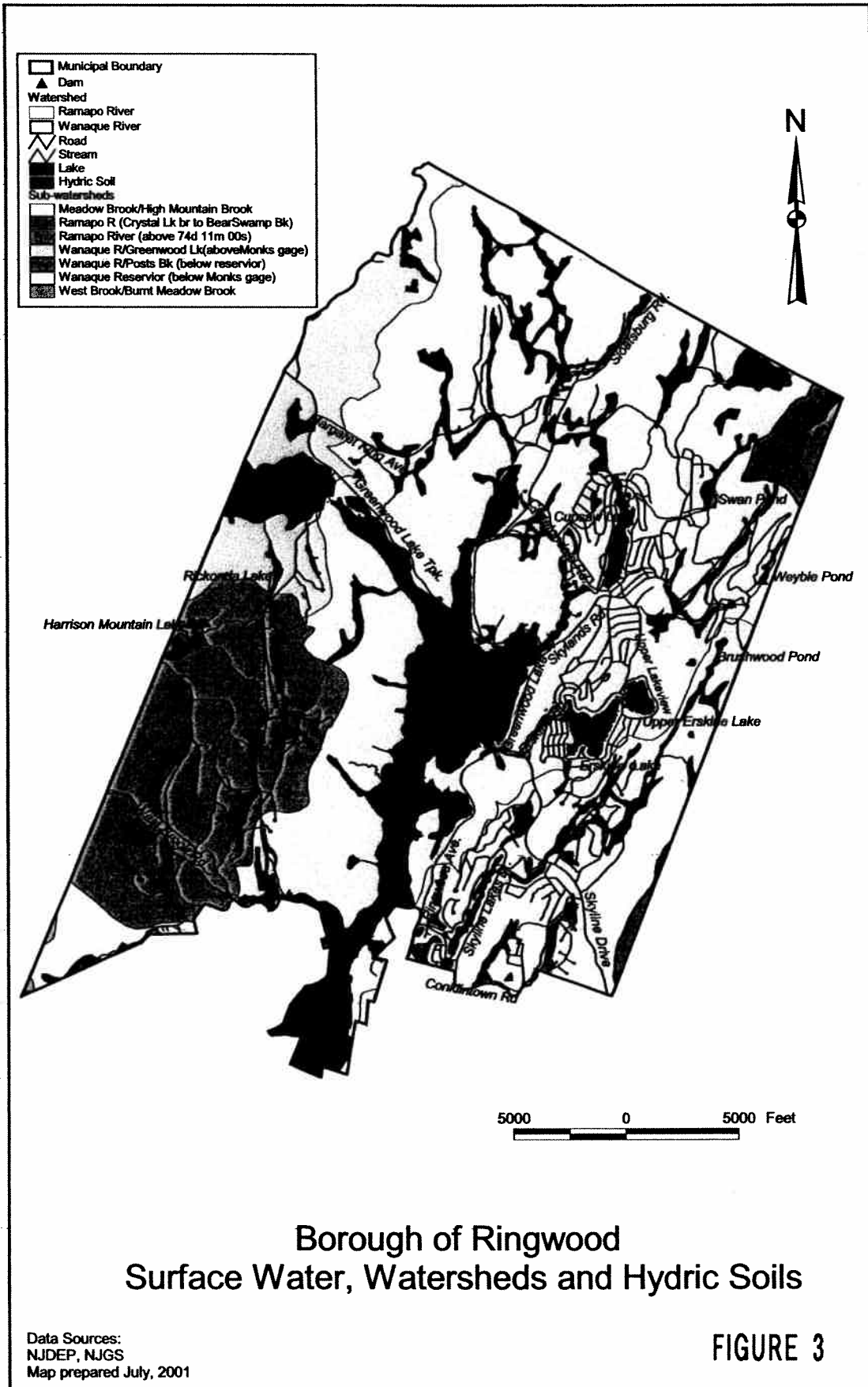
FIGURE 1

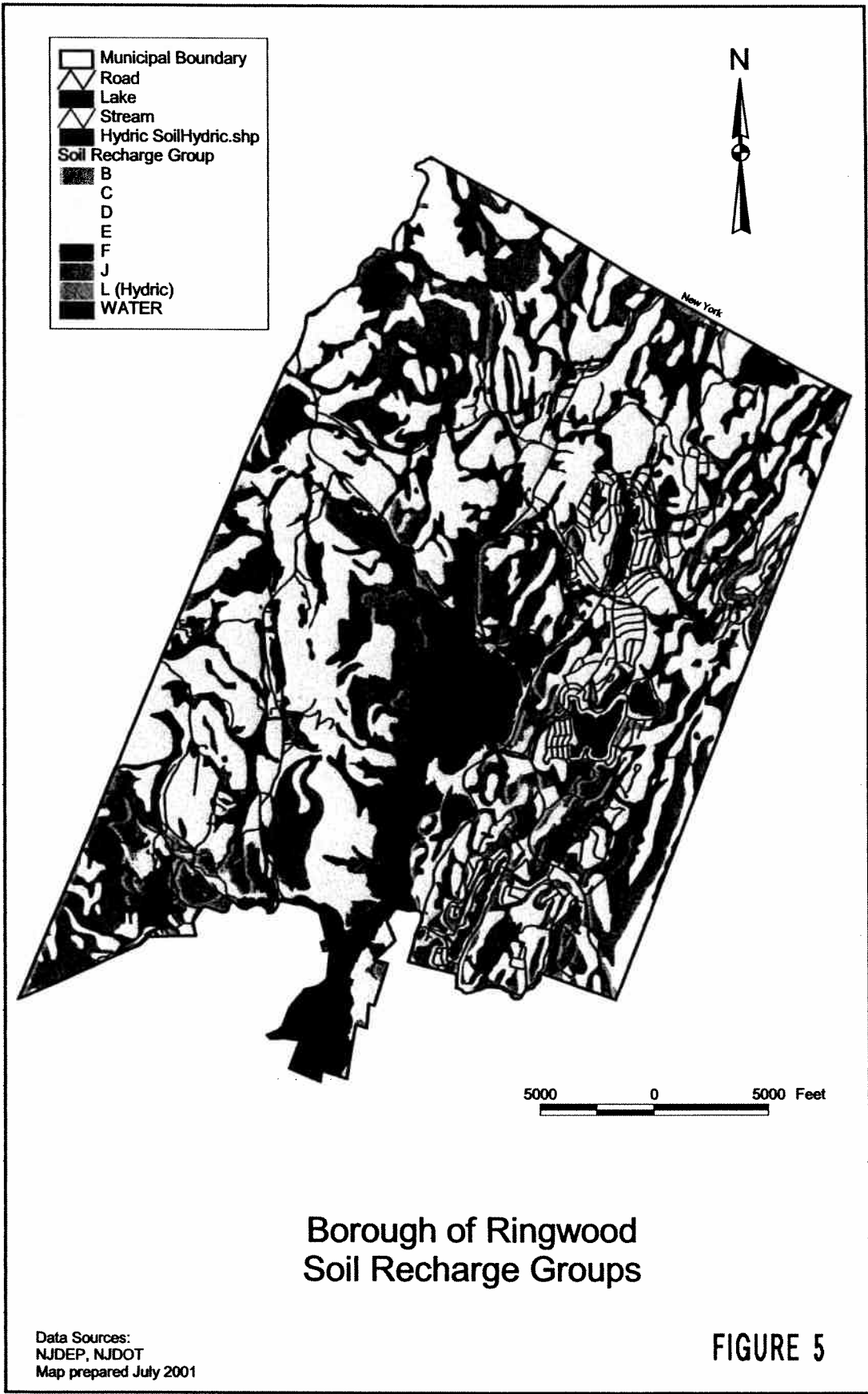


**Borough of Ringwood
Surface Water and Wetlands**

Data Sources:
NJDEP, NJDOT
Map prepared July, 2001

FIGURE 2





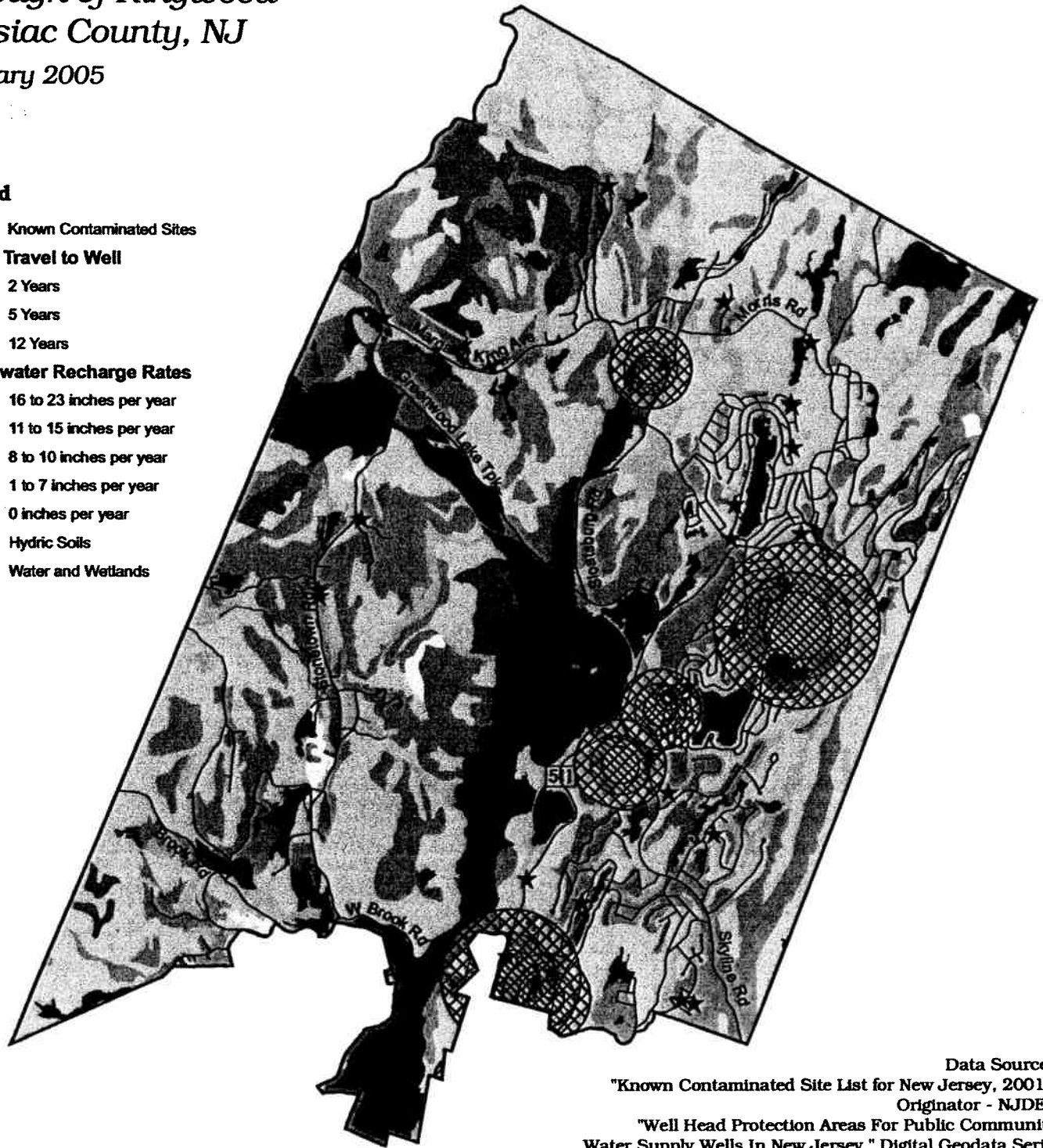
Aquifer Recharge, Well Heads and Known Contaminated Areas

Borough of Ringwood
Passiac County, NJ

January 2005

Legend

- ★ Known Contaminated Sites
- Time of Travel to Well**
 - 2 Years
 - 5 Years
 - 12 Years
- Groundwater Recharge Rates**
 - 16 to 23 inches per year
 - 11 to 15 inches per year
 - 8 to 10 inches per year
 - 1 to 7 inches per year
 - 0 inches per year
 - Hydric Soils
 - Water and Wetlands



Data Sources:
 "Known Contaminated Site List for New Jersey, 2001",
 Originator - NJDEP.
 "Well Head Protection Areas For Public Community
 Water Supply Wells In New Jersey " Digital Geodata Series
 DGS02-2, Originator - NJDEP, NJGS
 "DGS02-3: Ground-Water Recharge for
 New Jersey" Originator - NJDEP, NJGS

This map was developed using
 New Jersey Department of Environmental
 Protection Geographic Information System
 digital data, but this secondary product has
 not been NJDEP verified and is not State-authorized.

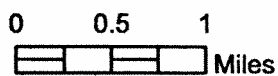


FIGURE 6