ENVIRONMENTAL RESOURCE INVENTORY

THE TOWNSHIP OF MANSFIELD

WARREN COUNTY

NEW JERSEY

Prepared By:

THE TOWNSHIP OF MANSFIELD
ENVIRONMENTAL COMMISSION

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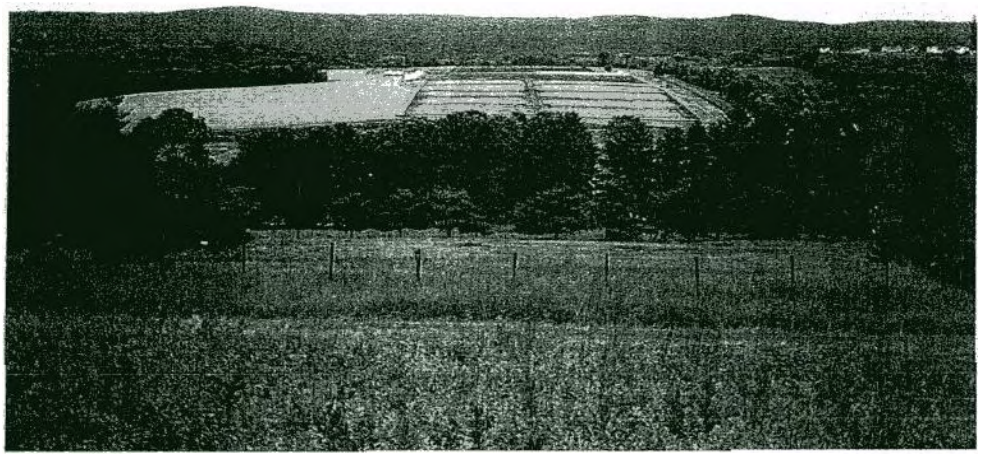

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Cover photograph: Rockport Pheasant Farm / NJDEP Wildlife Management Area.

1.0 Introduction

An Environmental Resource Inventory is intended to identify and describe the community's natural resources. Those resources - the soil, water, air, forests, fields, and waterways - are fundamental to its character and they are the foundation for its economic success and its quality of life. The protection and wise use of those resources is essential to the public health, safety, and welfare of current and future residents. The Environmental Resource Inventory provides the basis for the development of methods and steps to preserve, conserve, and utilize those resources.

Mansfield Township's natural resources have shaped the lives of its residents for generations - first to the farmers who settled in the Township and made a living from the rich soil, abundant water and conducive growing conditions. In recent years the residential development and the population growth have brought new challenges to the area, and documenting the natural resources and abiding the laws of the state and the county has made even more necessary the merging of environmental resources and needs of a growing community.

Two New Jersey state laws give environmental commissions the authority and responsibility for conducting resource inventories:

1. The Environmental Commission Enabling Legislation (N.J.S.A. 40:56A) states that: A commission organized under this act shall have power to conduct research into the use and possible use of the open land areas of the municipality. It shall keep an index of all open marshlands, swamps and other wetlands, in order to obtain information on the proper use of such areas, and may from time to time recommend to the planning board, or, if none, to the mayor and governing body of the municipality, plans and programs for inclusion in a municipal master plan and the development and use of such areas.

2. The Municipal Land Use Law (MLUL) (N.J.S.A. 40:56D-1 *et seq.*) requires municipalities to have a land use plan element in their master plan, including but not necessarily limited to, topography, soil conditions, water supply, drainage, flood plain areas, marshes, and woodlands (N.J.S.A. 40:55D-28b[2]).

Preparing an Environmental Resource Inventory requires gathering all the existing information that can be found about a township's resources, and presenting it in a form that is useful to a broad audience. Like any scientific report, the Inventory is current at a particular moment in time and must be updated to reflect the township's many changes.

The Municipal Land Use Law requires municipalities' Master Plan to have a land use plan including, but not necessarily limited to, topography, soil conditions, water supply, flood plains, wetlands, and woodlands. This ERI is a revised version of the 1997 NRI document, which was funded by federal dollars from the Environmental Protection Agency (EPA Section 319h) being passed through the New Jersey Department of

Environmental Protection (NJDEP) to the Musconetcong Watershed Association (MWA) as part of the Musconetcong Watershed Non-point Source Pollution Demonstration Project.

This document was prepared with the aid of a grant from the New Jersey Department of Environmental Protection, Environmental Services Program. With this grant, the Environmental Commission has undertaken the production of maps covering the following categories:

- Aquifers and Wellhead Protection Areas
- Steep Slopes
- Soil Series
- Digital Elevation Model
- Bedrock Geology
- 2004 Land Use Classifications
- 1995 Land Use / Land Cover
- Surface Hydrology
- Farmland Soils & Preserved Farms
- Open Space and Preserved Farmland
- Critical Wildlife Habitat
- Groundwater Recharge
- Recommended Maximum Septic System Density
- Water Quality Classifications and Highlands Designation
- Municipal Base Map
- Municipal Zoning

In addition, research was done by Environmental Commission members updating the various categories supports the maps.

The Township Committee, Planning Board, Zoning Board of Adjustment and the residents of Mansfield Township have access to this report to aid in the planning and decision making process for growth, expansion, preservation and conservation.

General Description

Mansfield Township, located in rural Warren County in northwestern New Jersey, encompasses an area of 30 square miles and lies largely within the valleys of the Musconetcong River, which forms its southern boundary, and of the Pohatcong Creek, but also includes a small portion of the Pequest River Valley within its northern corner. These valleys all trend northeast/southwest, have a generally rolling terrain, and are for the most part underlain by limestone that provides fertile soils. Each, however, has a distinctive character of its own. In the largest of them, the Musconetcong, the landscape is varied by broad slatey/shale uplands broken in places by deep ravines cut by small streams. The Pohatcong Valley constricts quite sharply about the middle of the Township and becomes quite wet in places, giving rise to the 18th century appellation of Timber Swamp. Glaciations in the Pequest Valley has left extensive

gravel deposits and an irregular terrain with many knobs and dips at the northern tip of the Township. The valleys are separated by two chains of low, gneiss hills that are broken by several gaps and saddles. While their sides are quite steep, the tops of the hills are often fairly level in places and suitable for agriculture. The gneiss is rich in iron ore, deposits of which are also present in the slatey/shale uplands. Iron ore, water power sites along the streams, and rich limestone soils are natural resources that attracted early white settlers to the area.

The major transportation arteries of Mansfield Township historically have followed the same northeast/southwest course as its physical features. Principal among them, all in the Musconetcong Valley, are State Route 57, which follows the old Washington Turnpike at its west end--the abandoned Morris Canal, and the old Morris and Essex Railroad line. An important secondary route, Jackson Valley Road, passes up the Pohatcong Valley and, crossing through a gap, follows Rockport Road to Hackettstown. The only major north/south route in the Township runs northward from Route 57 through Port Murray and Mount Bethel towards the Pequest Valley. Local circulation is provided by many Township roads.

The oldest communities in Mansfield Township are Anderson and Beattystown, located in the Musconetcong Valley along Route 57. Both were settled in the 18th century, the latter around a grist mill built before the Revolution and the former around a tavern built in 1790. Rockport and Port Murray are communities that owe their origins to the construction of the Morris Canal. Both developed adjacent to the canal boat basins in the middle decades of the 19th century. Rockport, a hamlet of about 16 buildings, was quickly surpassed by Port Murray in size and importance, no doubt a result of the establishment of a railroad station at the latter place. Port Murray remains the chief village of the Township and contains approximately 70 structures. Karrsville and Mount Bethel are the place-names of hamlets in the Pohatcong Valley that had some local importance in the 19th century, but today they are no more than loose collections of single-family dwellings.

Outside of these communities the landscape of Mansfield Township is overwhelmingly rural except along its eastern border and along portions of Route 57. Farmsteads with complexes of 18th, 19th and 20th century structures are scattered across the valleys and to a lesser extent on the hills. In the valleys and less so on the hills, they are surrounded by extensive, well cultivated crop, meadow, and pasture lands. On some of the more marginal farmlands, various stages on natural succession from scrubby, overgrown fields to woods are in evidence. This trend is much more pronounced on the hills which are now largely forested.

Non-farm dwellings, outside the villages, are scattered around the entire Township, largely on the more marginal farmlands and uplands and along major roads. Most are of post World War II construction. Several subdivisions of single family homes are also present. One west of Anderson between Route 57 and the Anderson-Asbury Road was begun in the 1930s. Diamond Hill, Brantwood Estates, Sunnyview and Kensington Estates are the names of developments near Beattystown built in the past four decades. Two apartment complexes were erected along the eastern edge of the Township,

adjoining Hackettstown. The Country Meadow Estates development was constructed between Route 57 and Rockport Road.

With few exceptions, commercial uses are found scattered along Route 57. They are more concentrated at its eastern end at Newburg where several malls have been developed. There are a few major industrial sites in the Township, namely Borealis, NYK Industries and Andrex Systems.

In 2004 Mansfield Township celebrated its 250th anniversary, and with appropriate resolve to protect its future, the contributions of the Environmental Commission will serve to protect and preserve the natural resources of the area.

Mansfield Township Environmental Commission

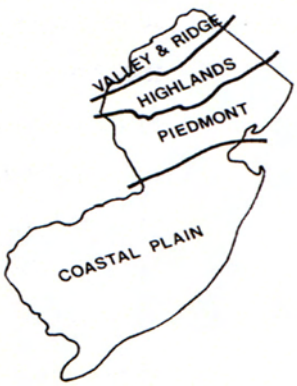
Ruth A. Panté, Chair

2.0 Location of Mansfield Township

Mansfield Township is 29.9 square miles in land area, and is located in the eastern section of Warren County in northwest New Jersey, as depicted on **Figure 1 - *Mansfield Township Location Map***. The Township is bordered by Liberty and Independence Townships to the north, by Hackettstown to the northeast, by White Township to the west, by Washington Township (Warren County) to the southwest, and by the Musconetcong River along its entire eastern boundary. Across the river to the east is Washington Township (Morris County) and Lebanon Township (Hunterdon County). Numerous interstate, state, and county roadways are located in the vicinity of Mansfield Township, all contributing to the continued suburban sprawl development pressure to the Township. The major state and interstate roadways providing easy access to Mansfield include Routs 31, 46, 57, 78, and 80 (see **Appendix A - *Municipal Base Map*** and **Appendix B – *Municipal Zoning***).

According to the 1999 Master Plan, the 1990 population of Mansfield Township was 7,154, and the majority of Township acreage, approximately 55%, was qualified farmland (see **Appendix C - *Land Use Classifications***).

3.0 Geology and Topography



Geology - All of Mansfield Township is located within the New Jersey Highlands physiographic province (New England Reading Prong). Middle and Late Proterozoic age rocks of the NJ Highlands underlie a series of broad, rounded or flat-topped northeast trending ridges including Jenny Jump Mountain, Marble Mountain, Scotts Mountain, County House Mountain, Pohatcong Mountain, Upper Pohatcong Mountain, and Allamuchy Mountain. These ridges are separated by broad, northeast trending valleys lying 400-600 feet below the ridge crests which are underlain by Paleozoic dolomite, limestone, sandstone, and shale of the Kittatinny Valley Sequence. Rocks of the Kittatinny Valley Sequence underlie valleys within the Highlands.

Appendix G, *Bedrock Geology*., presents bedrock map units, bedrock faults, bedrock folds, and abandoned iron mines within Mansfield. Limestone geology in Mansfield Township coincides with the three valleys (Musconetcong, Pohatcong, Pequest) in three separate watersheds. **Appendix N - *Aquifers and Wellhead Protection Areas*** and **Appendix O - *Groundwater Recharge***, present the ground water in Mansfield. The physiography and ground-water yields of the Cambro-Ordivician carbonate (limestone) formations situated within Mansfield Township are summarized as follows:

KITTATINNY VALLEY SEQUENCE

- ***Bushkill Member*** forms smooth, rolling hills and underlies poorly drained valleys. Soil cover within the Martinsburg shale is less than 15 feet to absent, with local deposits of glacial drift up to 50 feet thick.

  Bushkill Hydrology - Yields of 100 gpm have been reported in the Bushkill member near faults and near fold axes. In general, well yields prove to be adequate for domestic needs, with most wells exceeding 3 gpm. A thick overburden may help contribute to good sustained yields. Most water-bearing seams are shallower than 200 feet, with some seams up to 400 feet deep.

- ***Jacksonburg Limestone*** forms subdued topography between rock Kittatinny terrain and smooth, rolling Martinsburg terrain. Jacksonburg Limestone is approximately 150 feet thick in the Musconetcong Valley. Outcrops are infrequent, but soil cover may be thin, and may receive significant runoff from adjacent units. Locally thick deposits of drift up to 30 feet may occur. Sinkholes occur and can be large. The thickest accumulation of the Jacksonburg is in the Pohatcong Valley, where it was mined for cement in the past.

  Jacksonburg Hydrology - Yields generally poor to moderate, 5 to 20 gpm, but generally adequate for domestic supplies with most wells exceeding 10 gpm.

Yields tend to be higher in lower part, with occasional yields of 100 gpm.

- ***Wantage Sequence*** lie atop the Kittatinny Supergroup as thin, locally-preserved accumulations of sandstone, siltstone and minor carbonate.

Beekmantown Group (Lower Ordovician and Cambrain)

- ***Beekmantown Group (Lower and Upper Part) and Allentown Dolomite*** (lowest Lower Ordivician to Upper Cambrian) occurs in highly variable topography. The upper members form irregular, steep, rocky terrain with bedrock pinnacles and shallow soil cover in intervening depressions where numerous small sinkholes may occur. Lower members form benched topography, with lowest units underlying stream valleys or wetlands, and middle and upper units forming rocky terraces with shallow to moderate soil cover and subdued rocky exposures. Large springs and sinkholes occur in lower member, where the largest springs in the State occur. Lower contact of Allentown Dolomite can be gradational into the Leithsville Formation.

  Beekmantown/Allentown Hydrology - Yields are highly variable, and in the upper member are poor to fair at 3 to 25 gpm. Most wells are barely adequate for domestic needs. Yields in lower member good to prime, with most wells yielding between 10 and 50 gpm. Frequent wells in lower member in excess of 100 gpm with some yields exceeding 500 gpm.

Leithsville Formation and Hardyston Quartzite

- ***Leithsville Formation*** is found in variable topography with the Upper (Wallkill) member underlying stream valleys and marshes. Soil cover is shallow to deep usually with shallow water table. Middle (Hamburg) member forms topographic high separating lower and upper members. Hamburg terrain often a prominent ridge, sometimes steep, with shaley rock exposures or thin soil cover on deep slope. Lower (Califon) member rarely exposed, forms shallow depression with moderate to deep soil cover with many sinkholes in lower unit.

  Leithsville Hydrology - Well yields range from moderate to prime, depending on geologic unit. Yields in lower and upper members good to prime, with typical yields from 10 to over 1000 gpm. Yields in middle member tend to be significantly lower, with some good yields of 50 gpm where conditions are favorable.

- ***Hardyston Quartzite*** is a fine to coarse grained quartzite, arkosic sandstone, and dolomitic sandstone formed in smooth topographic bench at the base of granitic uplands with a thin to moderate soil cover.

  Hardyston Hydrology - Well yields tend to be poor.

NEW JERSEY HIGHLANDS

Middle Proterozoic Rocks, are locally prominent as the broad, rounded or flat-topped northeast trending ridges, particularly the Oxford Mountain and Upper Pohatcong Mountain ridgelines in Mansfield. Well yields vary, depending on the geologic structure and unit encountered. Layered gneisses are often more prolific than massive granitic units where proximity to brittle faults may affect yield greatly. These Precambrian rocks are divided into the following:

- ***Byram Intrusive Suite:*** Hornblende Granite, Hornblende Syenite, Biotite Granite, Microperthite Alaskite.
- ***Lake Hopatcong Intrusive Suite:*** Pyroxene Granite, Pyroxene Syenite, Pyroxene Alaskite.
- ***Metasedimentary Rocks:*** Potassic Feldspar Gneiss, Biotite-Quartz-Feldspar Gneiss, Homblende-Quartz-Feldspar Gneiss, Pyroxene Gneiss.
- ***Losee Metamorphic Suite:*** Quartz-Oligoclase Gneiss.
- ***Rocks of Uncertain Origin:*** Hypersthene-Quartz-Oligoclase Gneiss, Amphibolite.

Topography - As exhibited in **Appendix H - *Digital Elevation Model*** and **Appendix I – *Steep Slopes*,** there are two major ridgelines in a southwest / northeast trend, topographically dividing Mansfield Township into physically distinct limestone valleys and highlands.

The *Oxford Mountain* ridgeline is located in the northwestern portion of the Township and ranges in peak elevations from 931 feet above mean sea level (msl) to 1140 feet msl. The Oxford Mountains slope northwest to the Pequest River Valley where the elevations range from 460 feet msl to 500 feet msl, and southeast to the Pohatcong Creek Valley where elevations range from 440 feet msl to 880 feet msl.

The *Upper Pohatcong Mountain*, where elevations range from 860 feet msl to 1213 feet msl, slopes northwest to the Pohatcong Creek Valley, and southeast to the Musconetcong River Valley where elevations range from 380 feet msl to 520 feet msl.

Appendix H - *Digital Elevation Model* and **Appendix I - *Steep Slopes*** both indicate that the highest Township elevation is 1213 feet above mean sea level (msl) at the northern end of the Upper Pohatcong Mountain ridgeline, north of Rockport. The ***Steep Slopes*** map highlights the areas of the Township having steep slopes, greater than 25%, defined as critical slopes. Most of these steep slopes are located on both faces of

the Oxford Mountain ridge, and on the southeastern face of the Upper Pohathong Mountain ridge. In addition, some of the tributary streams to the Musconetcong River are located in steep sloping wooded gorges.

Land and soil disturbances dramatically increase the amount of sediments to the local watercourses, and also cause the negative combination of severe soil erosion and woodland losses in the steeply sloping areas.

4.0 Soils

Table 1 lists all soil types located within the Township of Mansfield, as depicted on **Appendix J - *Soil Series.***

Table 1 - Mansfield Township Soils

Adrian muck (poorly drained)
Annandale gravelly loam (well drained; erodible)
Annandale very stony loam (well drained)
Hartley loam (moderately well drained)
Bartley gravelly loam (moderately well drained)
Bartley stony loam (moderately well drained)
Califon gravelly loam (moderately well drained to somewhat poorly drained; erodible)
Califon very stony loam (moderately well drained to somewhat poorly drained)
Cokesbury loam (poorly drained)
Cokesbury very stony loam (poorly drained)
Edneyville gravelly loam (well drained)
Edneyville extremely stony loam (well drained)
Edneyville- Parker Rock outcrop, steep (well drained)
Fredon loam (poorly drained)
Halsey loam (very poorly drained)
Hazen loam (well drained)
Hazen cobbly loam (well drained) Hazen gravelly loam (well drained)
Hero loam (moderately well drained)
Hero gravelly loam (moderately well drained)
Lyons silt loam (poorly - very poorly drained)
Middlebury loam (moderately well drained to somewhat poorly drained)
Nassau rocky silt loam (excessively drained)
Nassau shaly silt loam (excessively drained)
Nassau - Rock outcrop complex (ex. drained)
Parker gravelly sandy loam (excessively drained)
Rock outcrop-Parker-Edneyville association
Rock outcrop-Wassaic complex (well drained)
Washington loam (well drained)
Washington gravelly loam (well drained; erodible)
Washington very stony loam (well drained)
Wassaic gravelly loam (well drained)
Wassaic rocky gravelly loam (well drained)

Appendix E - ***Farmland Soils & Preserved Farms,*** presents the preserved farmlands and the locations of prime farmland, statewide importance farmland, unique farmland, and lower ranked soil within Mansfield Township, as classified by the US Department of Agriculture.

Soils were mapped in several categories. The first, ***Prime Farmlands,*** is mapped in dark green and includes all those soils in Land Capability Class I and selected soils from Capability Class II. Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for those uses. It has the soil quality, growing season, and moisture supply needed for economical production and sustained high yields of crops, when treated and managed according to acceptable farming methods. Prime Farmlands are not excessively erodible or saturated with water for long periods of time; they do not flood frequently or are protected from flooding. As can be seen from the map, most of Mansfield Township's Prime Farmland tend to correspond to the floors of the limestone valleys. These soils should receive the highest priority for agricultural preservation.

Table 2 presents the following soil types which qualify as prime farmland soils, according to the Warren County Prime Farmland Inventory.

Table 2 - Prime Farmland Soils

Bartley loam
Bartley stony loam
Califon gravelly loam
Edneyville gravelly loam
Hazen loam
Hazen cobbly loam
Hazen gravelly loam
Hero loam
Hero gravelly loam
Middlebury loam
Washington loam
Washington gravelly loam
Wassaic gravelly loam

The second category, soils of ***Statewide Importance***, is mapped in light green and includes soils in land Capability Class II and III that do not qualify as Prime Farmland. These soils are nearly prime and economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields as high as Prime Farmland if conditions are favorable. Soils in this category are found in smaller areas and often follow the edges of prime farmlands. While typically less productive than the prime soils, these soils are often part of farms based primarily on prime soils. Thus, these soils of ***Statewide Importance*** should receive a high priority for preservation.

Unique Farmlands are soils used for specialty crops of considerable importance. Mapped in yellow, they are mostly of Carlisle-Adrian association. These soils have been used for more than 100 years in the production of specialty vegetable crops and, more recently, for the production of sod. Substantial areas in this category are wetlands. Thus, agricultural concerns need to be balanced with environmental concerns in these areas.

Shown in beige on the map are ***Lower Ranked*** soils. These areas generally conform to ridge tops, rock outcrop, steeply sloping mountain sides, and urbanized areas. Although not suited for crop farming, such areas may contain valuable timber resources and should not be overlooked in general planning for agricultural protection.

Hydric Soils - The USDA scientists and the National Wetlands Inventory scientists have identified soil types as hydric soils, and have grouped them according to their degree of association with wetlands. **Group 1** hydric soils are soils that nearly always display consistently hydric conditions. **Group 2** hydric soils are soils displaying consistent hydric conditions in most places, but additional field verification is needed. **Group 3** hydric soils display hydric conditions in few places, and additional field verification is needed. **Table 3** depicts a list of the hydric soils present within the Township of Mansfield. These soil types are highlighted in **Appendix J - *Soil Series***.

Table 3 - Hydric Soils in Mansfield Township

Soil Name	Group
Adrian muck	1
Cokesbury loam	1
Cokesbury very stony loam	1
Fredon loam	2
Halsey loam	1
Lyons silt loam	1

5.0 Stream Watersheds and Water Quality

All of the land area within the Township of Mansfield drains into three major watersheds: **Musconetcong River, Pohatcong Creek and the Pequest River.** These three watersheds are located within the Upper Delaware River Watershed Management Area 1. A watershed is defined as an area of land that drains into a particular receiving water body, (i.e. river, lake, stream, etc.), separated by higher elevations and ridgeline boundaries. Each watershed includes not only the waterway itself but also the entire land area that drains to it. **Appendix L - *Surface Hydrology*** depicts the three (3) major watershed divides, and the sub-watersheds within Mansfield. The following is a brief description of each of the watersheds.

Musconetcong River Watershed - The Musconetcong River, which eventually drains to the Delaware River, begins at Lake Hopatcong and forms the eastern border of Mansfield between Washington Township in Morris County and Lebanon Township in Hunterdon County. All Township land east of the Upper Pohatcong Mountain Ridgeline drains to eight (8) smaller streams including Trout Brook, Hances Brook and six (6) unnamed watercourses, tributary to the Musconetcong River. Land uses within the Musconetcong River watershed is a mixture of farm, industrial, commercial and residential (see **Appendix C - *Land Use Classifications***).

Ambient water quality monitoring of the Musconetcong River is performed at five locations along the entire river. In Mansfield, water quality is monitored at Beattystown. Results presented in the *"New Jersey State Water Quality Inventory Report -1992"* from all of the stations indicate that the overall water quality is good with generally low amounts of pollution where some water use standards (fishing, swimming) are periodically not met. Lake Hopatcong and Lake Musconetcong have excessive nutrients and aquatic weed growth, however these act as pollution sinks to prevent the same nutrients from entering the river. The only water quality problem reported at the Lake Hopatcong outlet was elevated stream temperatures during the summer months. Downstream of the Lake, although having good overall water quality, experiences greater surface water pollution problems. Water quality monitoring results from Beatttystown, indicate that total phosphorus was exceeded in 43% of all samples collected from 1986 -1990. Fecal coliform concentrations were elevated, but slightly lower than upstream at Lockwood. The entire length of the Musconetcong River supports a healthy fish community.

According to the *"New Jersey State Water Quality Inventory Report -1992* there are six facilities that discharge "point source pollution" to the Musconetcong River, five of which are upstream of Mansfield Township. The upper reaches of the Musconetcong River are believed to be receiving increased amounts of non-point source pollution as a result of areawide suburban development. Increasing stormwater runoff from impervious surfaces and from storm sewers has been identified as the primary surface water quality problem in the Hackettstown area. Downstream of Hackettstown, including Mansfield Township, chemical and bacterial contamination from agricultural crop

production and pasture lands are on the decline. In contrast, so called non-point sources of siltation and erosion from ongoing construction activities, nutrients and bacteria from malfunctioning septic systems, and road salts, oil and grease from highway runoff are the primary water quality threats to the Musconetcong watershed.

According to the most recent *"New Jersey State Water Quality Inventory Report -1994"* water quality testing results of the ambient monitoring (1986-1990) indicate that the Musconetcong River is in good overall condition, and a comparison between test results from prior years (1983-1987) indicates that water quality has declined at Lake Hopatcong, but has improved at Beattystown.

Pohatcong Creek Watershed - The Pohatcong Creek begins just northeast of the Mansfield border in Independence Township, and flows through the Pohatcong Valley and Jackson Valley, eventually to the Delaware River. Willever Lake is located on the Pohatcong Creek, just north of Jackson Valley Road. The land area in Mansfield between the Pohatcong Mountain ridgeline and the Oxford Mountain ridgeline drains directly into the Pohatcong Creek, or to the four small unnamed watercourses which are tributary to the Pohatcong Creek. The land within this watershed is predominately in agricultural use or forested.

The water quality monitoring of the Pohatcong Creek at New Village, located downstream of Mansfield Township, indicates that the water quality is fair, with pollution amounts varying from moderate to high levels. Certain water uses are prohibited at this location due to very high concentrations of fecal coliform, especially during the warm seasons. Also present are high levels of total phosphorus, and elevated stream temperatures from June to August. Because of these seasonal problems, overall water quality is rated as poor during the summer.

Fecal coliform concentrations averaged nearly 1,090 MPN/100ml with 88% exceeding the 200 MPN/100ml criterion. Total phosphorus levels average over twice the 0.1 mg/l state criterion and were above this level in almost 80% of the all samples collected. Stream temperatures above the 19° C criterion for trout maintenance streams were frequent throughout the June to August period.

According to the *"New Jersey State Water Quality Inventory Report -1992"* the Phillipsburg Sewage Treatment Plant discharging to Lopatcong Creek is the only recorded point source discharging to Pohatcong Creek. Current surface water pollution is believed to be from non-point sources primarily from agricultural cropland runoff and livestock (cattle and chicken) operations. The Pohatcong Creek watershed is known to have the highest soil erosion rates in New Jersey.

According to the latest *"New Jersey State Water Quality Inventory Report -1994"* water quality testing was conducted on the Pohatcong Creek the results of the ambient monitoring (1986 -1990) indicate that the Pohatcong Creek remains in fair condition, but

a comparison between prior test results (1983-1987) indicates that surface water quality in the Creek has declined.

Pequest River Watershed - The Pequest River begins near Newton in Sussex County, flowing just north of Mansfield in a southwesterly direction eventually to the Delaware River. The Pequest River does not flow through Mansfield, although several small streams, tributary to the Pequest, are located within the Township. The northwestern portion of Mansfield, west of the Oxford Mountain ridgeline, drains to the Pequest River or to one of the smaller tributary streams. The Furnace Brook and Cat Swamp sub-watershed area drains the northwestern most comer of Mansfield to the Pequest River. The Pequest Fish & Wildlife Management Area is a large area of state owned lands, partially located within northwest Mansfield Township in the vicinity of County Welfare House, Janes Chapel Road, Pequest Road and Route 625.

Ambient water quality monitoring of the Pequest River is performed at Pequest (White Township), downstream of Mansfield Township. Results presented in the *"New Jersey State Water Quality Inventory Report -1992"* indicate that the overall water quality is good, although conditions do degrade to fair quality in the warm-weather months. Fecal coliform contamination, elevated phosphorus, and inorganic nitrogen are the principal sources of water quality degradation. Point sources of pollution to the River are limited and controlled by regulation, while non-point sources of pollution are again recognized as the largest contributing factor in current water quality degradation. The Pequest River is impacted by ever increasing suburban development, with historic agricultural land use and activities (cropland runoff, and animal waste runoff) on the decline.

According to the latest *"New Jersey State Water Quality Inventory Report -1994",* water quality testing results of ambient monitoring (1986-1990) indicate that the Pequest River is in good condition, but a comparison of prior test results (1983-1987) indicates that the surface water quality of the Pequest River at Pequest (White Township) has declined.

The facility listed as having New Jersey Pollution Discharge Elimination System (NJPDES) permits within the Township of Mansfield are:

> Borealis - NJPDES permit # NJ0028657, discharges industrial/commercial waste water to the Musconetcong River.

The NJDEP Surface Water Quality Standards (NJAC 7:9B) contain surface water quality designation, class definitions and quality criteria for the protection and enhancement of surface water resources throughout New Jersey. The following is a brief listing of the designations which apply to surface waters within Mansfield. **Appendix K** describes the ***Water Quality Classifications and Highlands Designations***; *Table 4* presents the NJDEP Surface Water Quality classifications for the freshwater streams within Mansfield.

- ***FWI*** means those freshwaters (hat originate in and are wholly within Federal or State parks, forests, fish and wildlife lands, and other special holdings, that are to be maintained in their natural state of quality (set aside for posterity) and not subject to any man-made wastewater discharges as designated in NJAC 7:96-1.15(h) Table 6.

- ***FW2*** means the general surface water classification applied to those freshwaters that are not designated as ***FW1***.

- ***Trout Production Waters (TP)*** means waters designated for use by trout for spawning or nursery purposes during their first summer.

- ***Trout Maintenance Waters (TM)*** means waters designated for the support of trout throughout the year.

- ***Non-Trout Waters (NT)*** means freshwaters that have not been designated as trout production or trout maintenance. These waters are generally not suitable for trout because of their physical, chemical, or biological characteristics, but are suitable for a wide variety of other fish.

- ***Category One Waters (C1)*** means those waters designated in NJAC 7:9B 1.15 (c) through (h) for the purpose of implementing the antidegradation policies for protection from measurable changes in water quality characteristics because of their clarity, color, scenic setting, other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources. These waters may include but are not limited to:

    1. Waters originating wholly within Federal, Interstate, State, County, or Municipal parks, forests, fish and wildlife lands and other special holdings that have not been designated as FW1 waters;
    2. Waters classified as FW2 Trout Production waters and their tributaries;
    3. Surface waters classified as FW2 Trout Maintenance or FW2 Non-trout that are upstream of waters classified as FW2 Trout Production;
    4. Shellfish waters of exceptional resource value; or
    5. Other waters and their tributaries that flow through or border, Federal, State, County, or Municipal parks, forests, fish and wildlife lands and other special holdings.

Table 4

Surface Water Quality of the Rivers and Streams Within Mansfield Township

Musconetcong River Watershed

Musconetcong River	F1/V2 - *Trout Maintenance*
Hances Brook	*FW2 - Trout Production - Category 1 waters*
Trout Brook	*FW2 - Trout Maintenance- Category 1 waters*

Pohatcong Creek Watershed

Pohatcong Creek	
Source to Karrsville Bridge	*FW2 - Trout Production Category 1 waters*
Karrsville Bridge to Delaware River	*FW2 - Trout Maintenance*

Pequest River Watershed

Pequest River	
Tranquility bridge to Townsbury bridge Townsbury bridge to Delaware River Segments and tributaries within the Pequest Wildlife Management Area	*FW2 Trout Production Category 1 waters FW2 - Trout Maintenance*
	FW2 - Non-Trout Category 1 waters
Furnace Brook Railroad bridge to Pequest River	*FW2 - Non-Trout*

6.0 Floodplains. Stream Corridors, and Wetlands

Floodplains - A floodplain is the relatively flat area or lowlands adjoining the channel of a river, stream, or watercourse which has been or may be covered by floodwaters. Floodplain protection is critical to the stream environment as well as the public safety.

The floodplain area adjacent to a stream functions naturally, as follows:

1) stores flood waters, thereby reducing flooding to adjacent and downstream lands;
2) acts as a natural filter of sediments and riparian buffer from non-point source pollutants;
3) acts as a groundwater recharge area;
4) provides natural wildlife habitat and linear corridors

Statistical / Engineering studies have been conducted to correspond rainfall amounts and floodplain limits for various storm intensities, including the regulated 100 year storm event. A 100 year storm has an average calculated frequency of occurrence equal to once in 100 years, and therefore only very severe storms floods to the delineated 100 year floodplain.

The NJDEP Land Use Regulation Program regulates all stream encroachments, including vegetation clearing and grading, within the delineated New Jersey Flood Hazard Area *(NJFHA)* on state studied streams, and the 100 year floodplain on unstudied streams. The NJFHA is calculated as the 100 year floodplain plus a 25%. The NJDEP has state adopted studies and maps of the NJFHA limits for the Musconetcong River, the Pohatcong Creek, Trout Brook, and Hance's Brook. Tables 5, 6, 7, and 8 present the NJFHA flood elevations for these state studied streams, corresponding to the stream stationing and associated floodplain limits depicted on Exhibit 3. Property owners proposing activities near streams within the Township that that are not state-studied will be required by NJDEP to determine the extent of the regulated 100 year floodplain limits for the stream.

Freshwater Wetlands - The U.S. Corps of Engineers (USCOE) and the U.S. Environmental Protection Agency (EPA) jointly define wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". Wetlands generally include forested, shrubby, and emergent swamps, marshes, bogs, limestone fens, and similar areas with the following three characteristics.

- **Vegetation** - Prevalent wetlands vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.

- **Soil** - Soils are present and have been classified as hydric, or they

possess characteristics that are associated with reducing soil conditions.

- **Hydrology** - The area is inundated either permanently or periodically at mean water depths less than 6.6 feet, or the soil is saturated at or near the surface at some duration during the growing season of the prevalent vegetation.

Table 5

New Jersey Flood Hazard Area (NJFHA) Elevations for the Musconetcong River

Stream Station	Location	Stream Bottom Elevation feet (msl)	NJFHA Elevation feet (msl)
1069+50	Washington Twp. Line	371.8	383.7
1081+80	Mowder Road	374.0 Bridge Elv. - 383.8	384.7
1100+00		375.0	386.3
1120+00		378.6	388.1
1140+00		381.5	392.8
1150+60	Mowder Hill Road Anthony Road	383.5 Bridge Elv. - 395.6	396.0
1160+00		386.5	397.0
1180+00		395.8	403.6
1200+00		401.0	411.9
1206+00	Pennywell Road	404.4 Bridge Elv. -414.2	415.5
1220+00		406.9	418.5
1240+00		407.9	
1252+00	Stephensburg Road Thomas Road	409.1 Bridge Elv. - 424 4	424.0
1260+00		412	424.4
1280+00		415	425.8
1300+00		417.1	431.8
1320+00		420.4	433.7
1323+30	Stephensburg Road	431.5	435.9
1340+00		426.2	436.7
1360+00		427	438.5
1374+00	Ruth Lane	443.1	443.7
1378+50	confluence with Hance's Brook	433.5	444.1
1380+00		434.1	444.1
1400+00		438.7	447.9
1420+00		444 5	452.2
1440+00		450.9	457.3
1460+00		455	463.7
1468+50	Kings Highway	460.3 Bridge Elv. – 469.0	468.5
1480+00		463.8	471.4
1500+00		469.4	479.0
1516+20	Newburgh Road	473 Bridge Elv. - 482.9	484.6
1519+00	Dam/Spillwav	482.8	486.0
1520+00		480	486.2
1540+00		480	491.3

Note: Stream stationing is taken looking upstream and corresponds to the stationing on the NJDEP NJFHA mapping for the corresponding streams. These maps were prepared by Anderson-Nichols Co. Inc., dated September, 1982.

Table 6

New Jersey Flood Hazard Area (NJFHA) Elevations for the Pohatcong Creek

Stream Station	Location	Stream Bottom Elevation feet (msl)	NJFHA Elevation feet (msl)
1154+00	Washington Twp. Line Farm Driveway	465.0 Bridge Elv. - 472.0	473.9
1160+00		468.2	477.7
1166+10	Tunnel Road	472.3 Bridge Elv. - 482.1	482.6
1180+00		476.5	485.0
1182+40	Farm Driveway	478.3 Bridge Elv. - 484.5	485.6
1200+00		478.8	487.1
1205+50	Willever Lake Dam Farm Driveway	Dam Elv. - 493.9	493.9
1216+10	Willever Lake Bridge	Bridge Elv. - 492.6	495.4
1220+00		485.0	495.4
1228+80	Dirt Road	485.0 Bridge Elv. - 491.0	495.8
1240+00		488.8	496.4
1257+00	Hoffman Road	497.0 Bridge Elv. - 503.7	503.9
1260+00		497.6	504.5
1280+00		506.5	513.0
1300+00		521.5	527.3
1320+00	Jackson Valley Road	537.0 Bridge Elv. - 544.5	545.5
1340+00		560.0	566.7
1357+00	Mitchell Road	586.5	594.1
1360+00		592.5	599.2
1372+00	Dam	617.5 Dam Elv. - 624.0	627.6
1380+00		653.1	657.6
1382+50	Jackson Valley Road	661.0 Bridge Elv. - 668.5	670.0
1383+90		Dam Elv. - 667.6	671.5
1400+00		671.6	679.2
1420+00		687.5	692.5
1434+50	Smith Road	705.0 Bridge Elv. – 712.8	714.6
1440+00		714.6	721.3
1460+00		746.9	751.0
1474+80	.lane's Chapel Road	777.0	782.0

Note: Stream stationing is taken looking upstream and corresponds to the stationing on the NJDEP NJFHA mapping for the corresponding streams. These maps were prepared by Anderson-Nichols Co. Inc., dated September, 1982.

Table 7

New Jersey Flood Hazard Area (NJFHA) Elevations for the Trout Brook

Stream Station	Location	Stream Bottom Elevation feet (msl)	NJFHA Elevation feet (msl)
1544+70	Confluence with Musconetcong River	482.0	491.8
1547+10	Route 57	485.8	495.9
1571+70	Township line	496.2	506.3

Table 8

New Jersey Flood Hazard Area (NJFHA) Elevations for the Hance's Brook

Stream Station	Location	Stream Bottom Elevation feet (msl)	NJFHA Elevation feet (msl)
1380+48	Confluence with Musconetcong River	437.1	444.0
1384+70	Route 57	447.3	448.3
1400+00		451 4	456.9
1409+10	Waters Road	Bridge Elv. - 466.4	466.0
1419+00	Hazen Road	Bridge Elv. - 476.4	477.7
	Grand Avenue	479.9 Bridge Elv. - 494.7	494.7

Note: Stream stationing is taken looking upstream and corresponds to the stationing on the NJDEP NJFHA mapping for the corresponding streams. These maps were prepared by Anderson-Nichols Co. Inc., dated September, 1982**.**

Appendix D – *Land Use / Land Cover* and **Appendix M – *Critical Wildlife Habitat*** depict the areas of freshwater wetlands located within the Township of Mansfield. These maps provide a reasonable generalized location of the presence of wetlands, but field verification is necessary to accurately identify the extent of wetland systems. Palustrine (freshwater) wetlands and shallow open waterbodies (ponds) occur in Mansfield Township, and are represented by three major types:

- ***Palustrine Emergent Wetlands*** are commonly recognized as freshwater marshes, meadows, fens dominated by herbaceous vegetation including persistent and nonpersistent grasses, rushes, sedges, and other grass-like plants such as cattail, woolgrass phragmites, tussock sedge rice cut grass, purple loosestrife, etc. Emergent wetlands may be flooded for variable periods from as little as a couple of weeks early in the growing season to permanently flooded throughout the year.
- ***Palustrine Scrub-Shrub Wetlands*** are shrub swamps and bogs dominated by woody vegetation less than 20 feet in height. The dominant hydrophytic shrubs include speckled alder, smooth alder, willows, buttonbush, silky dogwood, northern arrowwood red osier dogwood, meadow sweet, steeplebush, pepperbush, and highbush blueberry.
- ***Palustrine Forested Wetlands*** are the most abundant and widely distributed wetlands in the State of New Jersey, and appear to be the most abundant in Mansfield Township. Most forested swamps are associated with the Township stream corridors, and in the higher elevation springs, seeps, and depressions. Forested wetlands are dominated by trees taller than 20 feet. The majority of the forested wetlands in northern New Jersey are deciduous forested wetlands, with some evergreen forested wetlands restricted to the northern-most areas, particularly in Sussex County. Red maple swamps are the predominant forested wetland type in northern New Jersey, but many other wetland trees are intermixed, including white ash, silver maple, pin oak, sycamore, American elm, black willow and black gum.

In New Jersey, the NJDEP Freshwater Wetlands Protection Act Rules (NJAC 7:7A) regulate activities in freshwater wetlands, and freshwater wetland transition areas (buffers) extending 50 to 150 feet beyond the wetland edge. Wetlands are divided into three classifications based on resource value, and the width of the transition area surrounding the wetland is dependent on this resource value classification:

Exceptional resource value wetlands require a 150 foot wide transition area, and exhibit the following characteristics:

1. Those which discharge into FW-1 waters or FW-2 Trout Production (TP) waters or their tributaries or
2. Those which are present habitats for threatened or endangered species, and which remain suitable habitat for breeding, resting or feeding by these species during the normal period these species would use the habitat.

Ordinary resource value wetlands not requiring a regulated transition area, shall be freshwater wetlands that do not exhibit the characteristics enumerated in

the exceptional resource value description, and are isolated wetlands with an area more than 50% surrounded by development, and less than 5,000 square feet in size, and certain drainage ditches, swales, or detention systems.

Intermediate resource value wetlands, require a 50 foot transition area and are considered all freshwater wetlands in Mansfield not defined as exceptional or ordinary.

As depicted on **Appendix K - *Water Quality Classifications and Highlands Designation,*** the northeast portion of Mansfield is located within surface water quality designated watersheds that flow to FW2-Trout Production (FW2-TP(C1)) streams. All of the freshwater wetlands located within FW2-TP(C1) watersheds are classified by NJDEP as exceptional resource value wetlands requiring the regulated 150 foot wetlands transition area buffer. Other wetlands within Mansfield could be classified as exceptional if they are present habitats for threatened or endangered species, and which remain suitable habitat for breeding, resting or feeding by these species during the normal period these species would use the habitat.

7.0 Vegetation & Wildlife

Vegetation - Lower winter temperatures and shorter growing seasons provide North Jersey with the climate for three major types of ***terrestrial plant habitats,*** evident within the Township of Mansfield. Typical plant species of each plant habitat and community are found in **Appendix M – *Critical Wildlife Habitat.***

- ***North Jersey Ridges and Steep Slopes*** terrestrial plant habitat occurs mainly on the gneiss, shale and sandstone areas in the Highlands region and include the driest plant habitats in North Jersey and are associated with ridgetops, steep slopes and rock outcroppings in Mansfield Township. The *Chestnut Oak forest, the Pitch Pine-Scrub Oak forest and the Successional Lichen-moss stage* (rock outcrop areas) are the three types of ***plant communities*** characteristic of the *North Jersey Ridges and Steep Slopes* habitat. Because of the underlying bedrock geology in Mansfield, the high ridges are rounded and only the *Chestnut Oak Forest* plant community is prevalent in these areas of the Township.

  The chestnut oak is found in many forest types, but appears to be able to reproduce and develop better than other oaks on drier and poorer soil conditions characteristic of the higher slopes. Other trees commonly identified within the Chestnut Oak Forest include the red oak, white oak, scarlet oak, black birch, pitch pine, black oak, red maple, pignut and shagbark hickories, sassafras, black cherry and white pine.

- ***North Jersey Uplands*** terrestrial plant habitat includes the well drained (mesic) land areas in Mansfield, which are represented by the rounded milder slopes and hilltops, as well as the non-wetland valleys and lands of flat topography. The Mixed Oak Forest, Hemlock - Mixed Hardwood Forest, and the Sugar Maple - Mixed Hardwood Forest are the three types of mesic upland plant communities within the North Jersey Uplands habitat. Typical examples of each of the three forest types can be found in the area, however, they mix and merge with each other.

  The *mixed oak forest* gets its name from the three species of oak (red oak, white oak, black oak) which are most abundant among the large trees that form the natural forest canopy at a height of about 60 to 100 feet. Two other species, chestnut oak and scarlet oak, are present but not as common in the North Jersey mesic upland mixed oak forest.

  The *hemlock - mixed hardwood forest* occurs on cooler and moister sites located in ravines, or on steep, lower, north facing slopes. Typically, more than half the larger trees of the forest are Eastern hemlocks, which are evergreens that retain their needles throughout winter. Some of the other large trees associated with evergreens include black birch, yellow birch, sugar maple, and basswood, American beech, white oak, red oak, black oak, white ash, and red maple. The fallen needles of hemlock create a very acidic condition on the forest floor, which combined with the lack of sunlight year around appears to discourage the development of dense undergrowth (shrubs and herbs). Many of the hemlock-mixed hardwood

forests are now infested by an introduced Asian insect, the hemlock woolly adelgid, which have destroyed large areas of hemlock forest in northeastern New Jersey.

The *sugar maple - mixed hardwood forest* occurs on more fertile sites within Northern New Jersey. The Sugar maple is the most abundant of the three forest types, but associated with it in large numbers, are oak trees and a wide variety of hardwood trees. Commonly occurring species are white oak, red oak, black oak, white ash, tulip tree, black birch, yellow birch, red maple, basswood, American beech, and hickories with scattered stands of hemlock, white pine, American elm, and black walnut.

- ***North Jersey Freshwater (Palustrine) Wetland*** habitats include small areas of marshes, swamps, open waters, and Riverine floodplains, as discussed in Section 6.0.

Wildlife - The wildlife population of any area depends on the availability of food, cover, and water in a suitable combination. Mansfield Township consists of mostly open-agricultural fields, undeveloped woodlands and forests, river and stream corridors, and large lot rural residential areas. All provide good to excellent habitat opportunities for a variety of mammals, songbirds, waterfowl, amphibians and fish within the New Jersey Highlands (see **Appendix M - *Critical Wildlife Habitat***). Wildlife species present within Mansfield Township's rural habitat may include observations of the following:

- **Large mammals:** White tail deer, Eastern coyote, Black bear, beaver;

- **Small mammals:** Woodchucks, cottontail rabbits, raccoons, skunks, opossum, gray squirrel, red squirrel, chipmunks, moles, mice, shrews, bats, red fox, gray fox, muskrats, long tailed weasel, porcupine;

- **Birds & Waterfowl:** Mallard ducks, Canadian geese, great blue heron, green heron, white egret, black crows, pigeons, mourning doves, meadowlarks, killdeers, tufted titmouse, nuthatches, juncos, bluejays, cardinals, catbirds, downy woodpecker, black-cap chickadee, robins, warblers, grosbeaks, ruby-throated hummingbird, blackbirds, house finch, sparrows, goldfinches, Baltimore oriole, mockingbird;

- **Fish:** Native brook trout, White sucker, golden shiner, blacknose dace, bluegill sunfish, pumpkinseed sunfish.

- **Reptiles & Amphibians:** Eastern box turtle, Eastern painted turtle, five-linked skink, eastern garter snake, eastern ribbon snake, red spotted newt, red-backed salamander, American toad, northern leopard frog, spring peeper, bull frog, green frog, wood frog.

Table 9 presents the list of the Rare Species and Natural Communities Presently

Recorded in Mansfield Township. ***Table 10*** presents a summary of Endangered and Threatened Species found in the NJ Highlands and their habitat. The Generalized Natural Heritage Index Map prepared by the New Jersey Natural Heritage Data Base indicates that the western half of the Township has many "documented locations - known precisely", and a few "documented locations known within 1.5 miles".

Table 9

Rare Species and Natural Communities in Mansfield Township

Vertebrates	
Accipiter Cooperii	Cooper's Hawk
Buteo Lineatus	Red-Shouldered Hawk
Clemmys Insculpta	Wood Turtle
Dolichonyx Oryzivorus	Bobolink
Passerculus Sandwichensis	Savannah Sparrow
Pooecetes Gramineus	Vesper Sparrow
Strix Varia	Barred Owl

Table 10
Endangered and Threatened Species and their Habitat

Species	State Status	Federal Status	Regional	Habitat
Bobcat	E		resident	swamps, forest
Short-nose Sturgeon	E	LE	resident	rivers
Lake Chubsucker	T		resident	lakes
Blanding's Turtle	T		resident	marshes, ponds, lakes
Northern Cricket Frog	T		resident	wetland buffers
Bog Turtle	E	C2	resident	bogs, sluggish streams
Timber Rattlesnake	E		resident	mountain slopes
Wood Turtle	T		resident	streams and buffers
Pied-billed Grebe	Eb		resident, migrant	ponds w/ reed margins
Cooper's Hawk	E		resident, migrant	forest
N. Goshawk	T		resident, migrant, winter	forest
N. Harrier	Eb		migrant, winter	ridges, fields, marshes
Red-shouldered Hawk	T,Eb		resident, migrant	swamps, forest
Osprey	T		resident, migrant	ridges, reservoirs
Bald Eagle	E	LE	former resident, now migrant, winter	ridges, reservoirs
Peregrine Falcon	E		migrant	ridges, water areas
American Bittern	T		migrant	marshes
Great Blue Heron			resident, migrant	swamp, marsh, pond
Barred Owl	T		resident	swamp, moist woods
Short-eared Owl	Eb		migrant, winter	fields, farms
Red-headed Woodpecker	T		migrant	ridges, swamps
Cliff Swallow	T		resident, migrant	dams, bridges, buildings
Bobolink	T		resident, migrant	uncut fields
Savannah Sparrow	T		resident, migrant	uncut fields
Grasshopper Sparrow	T		resident, migrant	uncut fields
Vesper Sparrow	Eb		resident, migrant	farmland, fields
Eastern Wood Rat	T	C2	resident	talus slopes

State:
E - Endangered
Eb - Endangered Breeding Population
T - Threatened
Tb - Threatened Breeding Population
Federal:
LE - Taxon is formatlly listed as endangered C2 - Candidate, category 2 - taxon may beappropriate for listing, but more data are needed.

8.0 Water Supply and Wastewater

Water Supply and Wastewater – Details are presented in **Appendix N – *Aquifers and Wellhead Protection Areas*, Appendix O – *Groundwater Recharge*,** and **Appendix P – *Recommended Maximum Septic System Density.*** Except for the Anderson Area of Mansfield Township the residences and business depend on private groundwater supply. The Anderson Area of the Township is serviced by public water supply which comes from two Township wells located in the Anderson area.

Wastewater Treatment - Other than the following two areas described below the Township of Mansfield relies on private septic, and/or cesspool facilities for sewage disposal.

Airport Road/Rockport Road Area - The portion of the Township located east of Airport Road and south of the lots fronting on Rockport Road, is serviced by publicly maintained sanitary sewers. The sanitary sewer pipes in this area of the Township, collect and deliver the sanitary sewerage to the *Hackettstown Municipal Utilities Authority - Water Pollution Control Facility..*

Diamond Hill Estates - Diamond Hill Estates, a residential subdivision constructed in the mid 60's, is serviced by a public sanitary sewer facility.

9.0 Historic and Scenic Features

The New Jersey and National Registers of Historic Places lists the following locations within the Mansfield Township, as of December 31,1995.

- **Beattystown Historic District,** Route 57 & Kings Highway. Beattystown, settled in 1750, was an farming, milling, manufacturing and trading settlement along the Musconetcong River listed on the State Register: 8/10/90, and on the National Register: 9/28/90

- **Miller Farmstead,** (c1830) located on Route 57, was listed on the State Register on 9/28/88, and on the National Register on 9/11/89

- **The Morris Canal,** which parallels the Erie Lackawanna Railroad line, bisected Mansfield, along the base of the Pohatcong Mountain in the Musconetcong River Valley. The canal, which only small portions still exist today, went through the hamlets of Rockport, and Port Murray. Photo # depicts the Rockport Boat Basin and canal towpath, located in the hamlet of Rockport, which still exists today. The Morris Canal was listed on the State Register on 11/26/73, and on the National Register on 10/1/74.

- **Mount Bethel Methodist Church,** (c1844) located at the intersection of Snyder Road and Mount Bethel Road was listed on the State Register 10/26/79 and on the National Register 2/29/80.

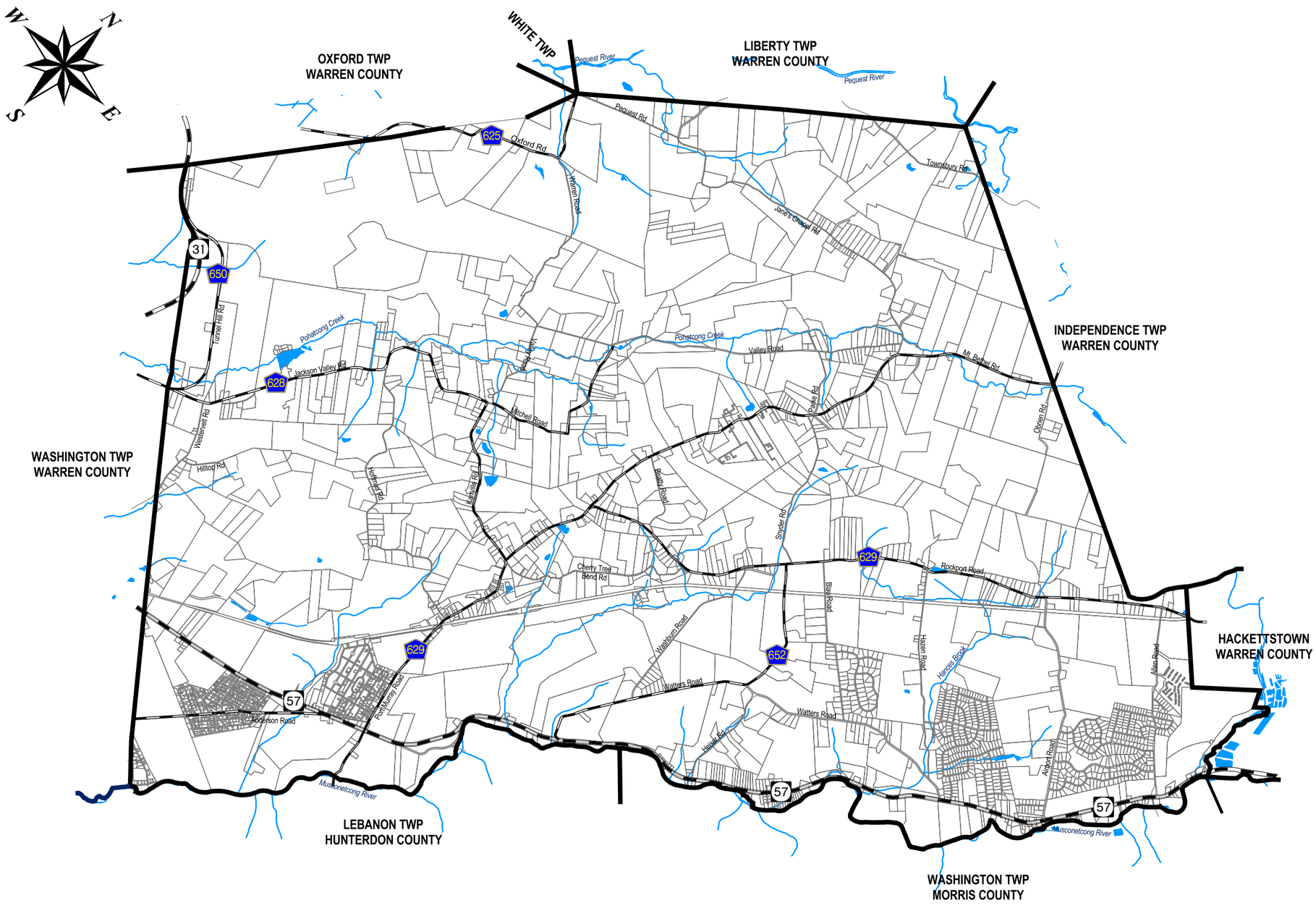
- **Penwell Lime Kiln #1** has received comments from the State Historic Preservation Officer.

Appendix F - ***Open Space and Preserved Farmland*** and **Appendix E –** ***Farmland Soils and Preserved Farms*** demonstrate the large portion of Mansfield Township which has been preserved. These include lands preserved by the Township, as well as the county and the state.

FIGURE #1: LOCATION OF MANSFIELD TOWNSHIP WITHIN WARREN COUNTY

Municipal Base Map

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

- *Municipal Boundaries*
- *Parcels*
- *Streams*
- *Open Water*

Township Roads

- *Municipal*
- *County*
- *State*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Lakes and Streams based upon NJDEP GIS Database

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

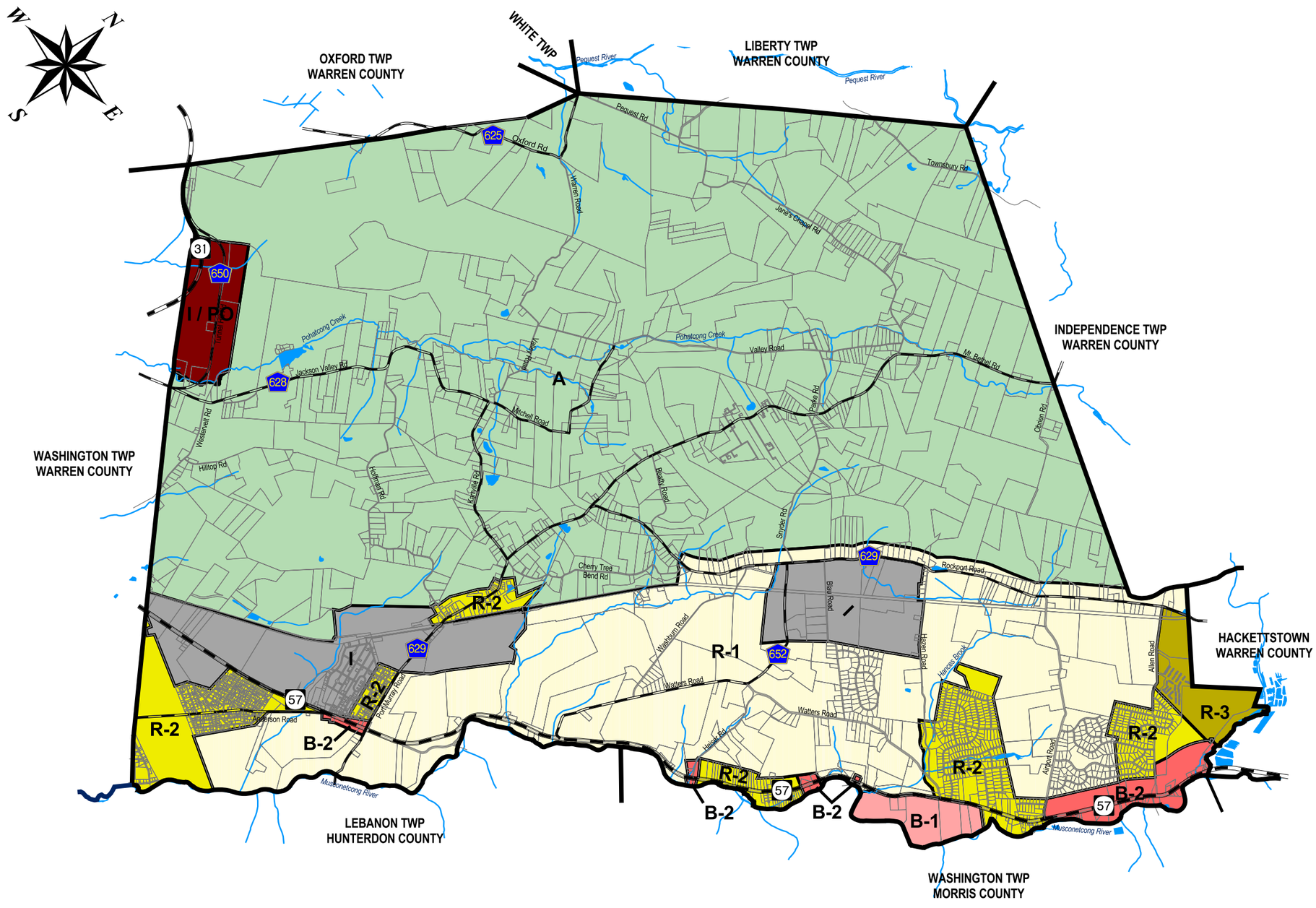
SCALE: 1"=4000'

Map Prepared by:

WHITE
ENVIRONMENTAL SERVICES
985 Belvidere Road
Phillipsburg, NJ 08865
(908) 387-1501
wenviro@ptd.net

Municipal Zoning

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Municipal Zoning

- *A: Single Family Residential*
- *R-1: Single Family Residential*
- *R-2: Single Family Residential*
- *R-3: Single Family Residential*
- *B-1: Business District*
- *B-2: Business District*
- *I / PO: Industrial / Professional Office*
- *I: Industrial*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Municipal Zoning based upon information supplied by Mace Consulting Engineers, 2005.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

WHITE
ENVIRONMENTAL SERVICES
985 Belvidere Road
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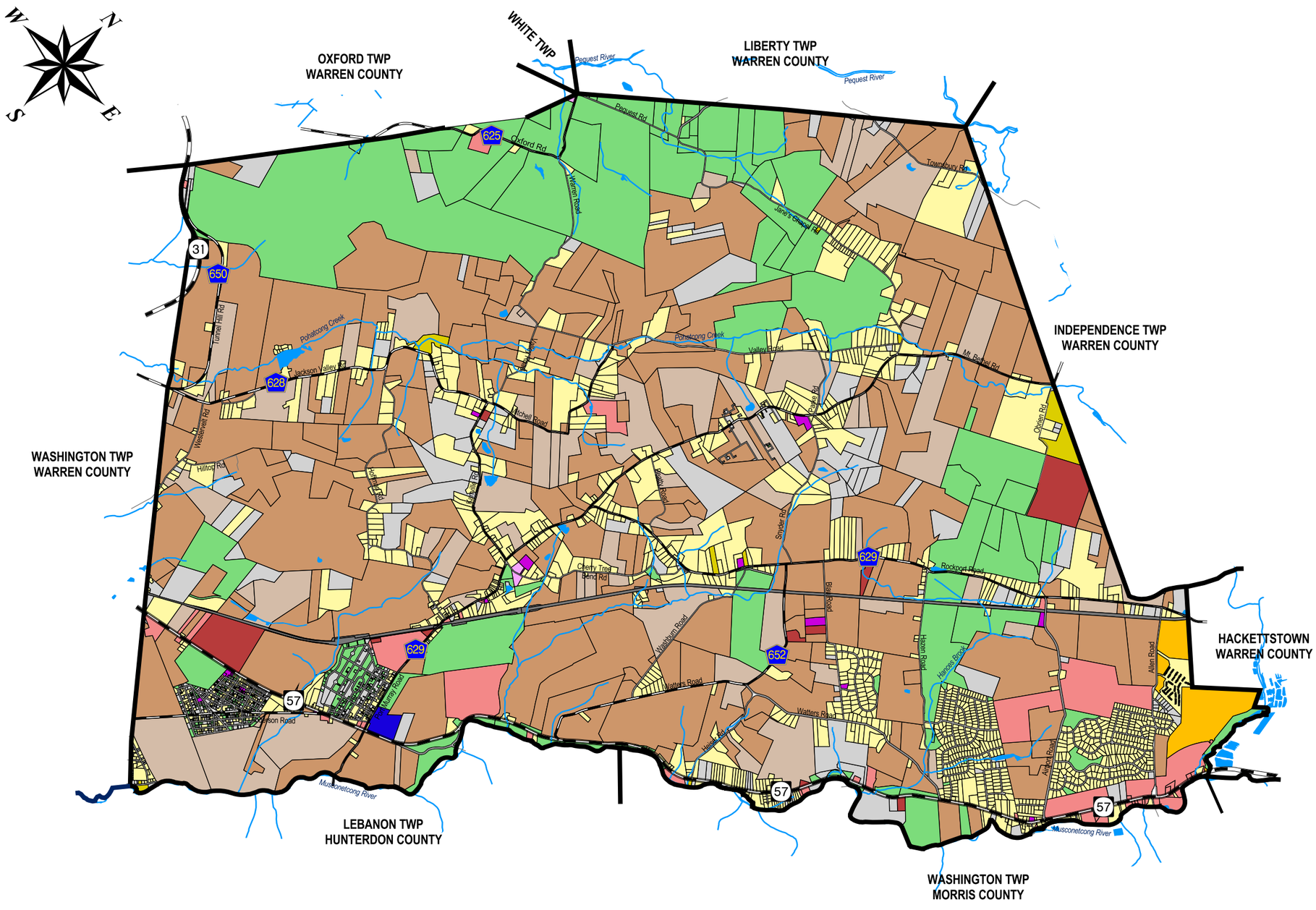
2004 Land Use Classifications

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

2004 Land Use Classifications

- *Vacant Land*
- *Residential*
- *Farm (regular)*
- *Farm (qualified)*
- *Commercial*
- *Industrial*
- *Apartment*
- *Railroad*
- *Public School Property*
- *Public Property*
- *Church & Charitable Property*
- *Cemeteries & Graveyards*
- *Other Exempt*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Land Use Classification based upon 2004 Tax Assessor's records.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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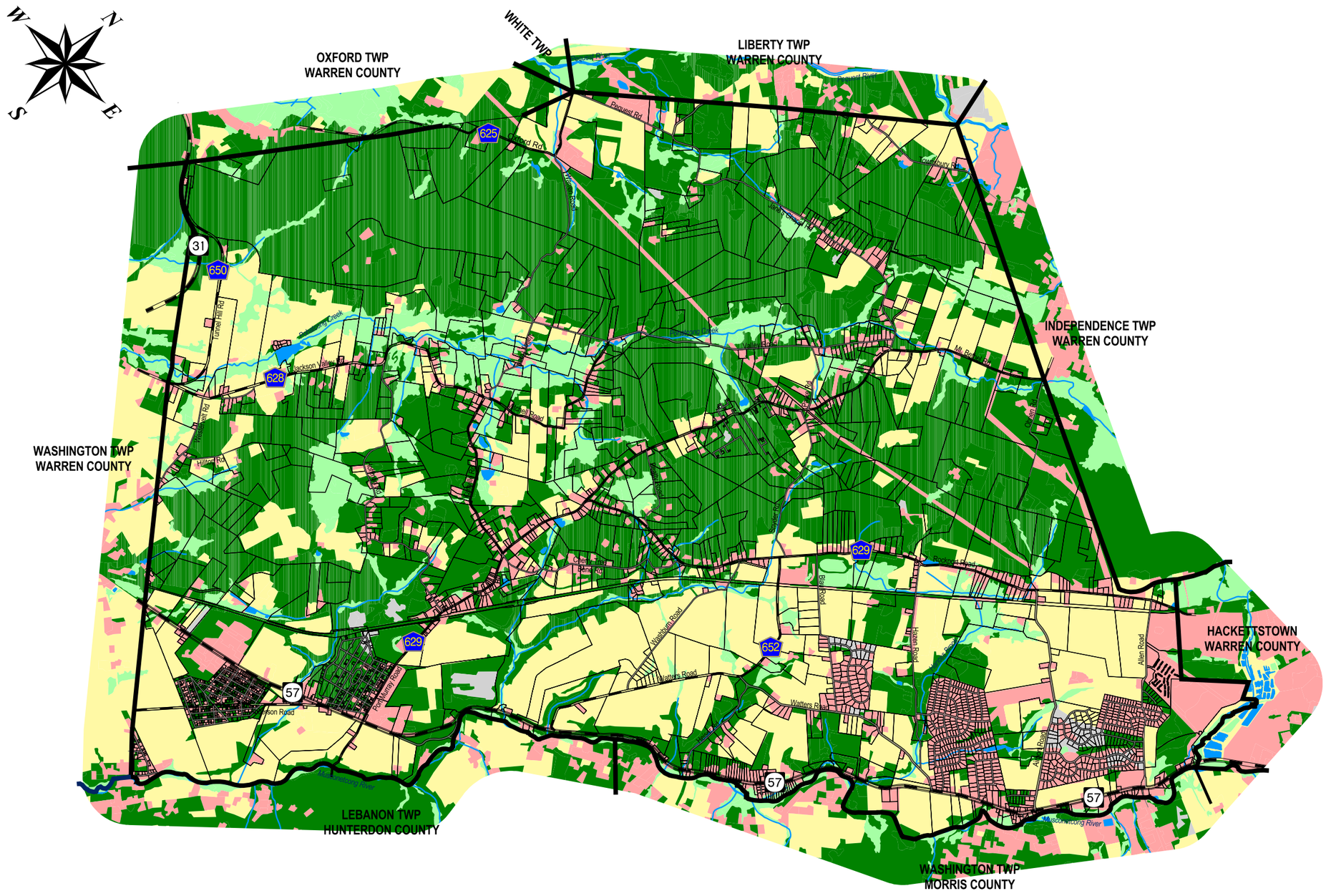
1995 Land Use / Land Cover

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

1995 Land Use / Land Cover

- *Forest*
- *Agriculture*
- *Developed*
- *Disturbed Land*
- *Wetlands*
- *Open Water*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Land Use / Land Cover data based upon 1995 NJDEP GIS Database.

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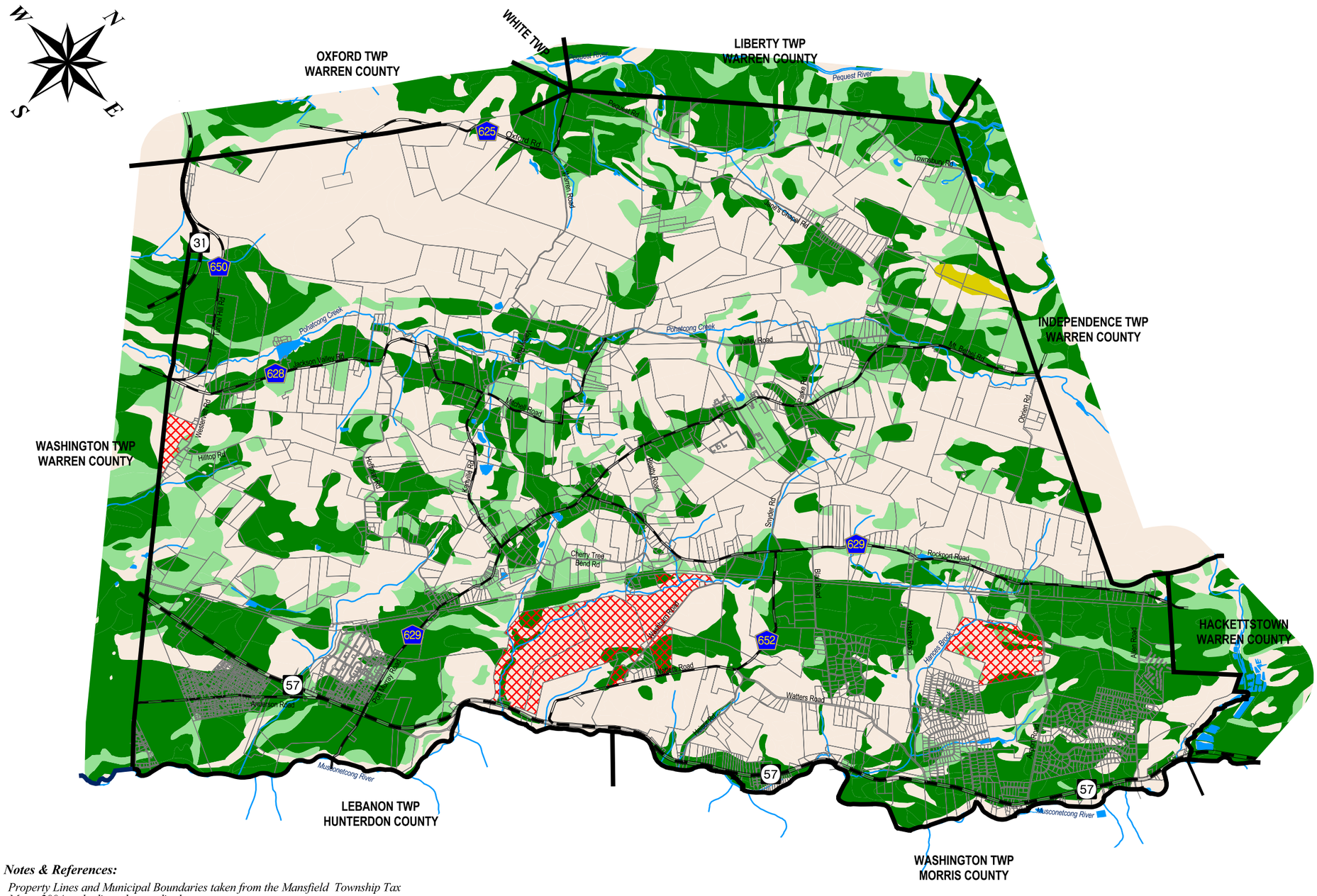
Farmland Soils & Preserved Farms

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Farmland Soils

- *Prime Farmland*
- *Statewide Importance*
- *Unique Farmland*
- *Lower Ranked Soil*
- *- Preserved Farmland*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Soil boundaries based upon NJDEP GIS database of the Warren County Soils Survey

Farmland Soils based upon USDA classification for New Jersey soils.

Farmland preservation based upon information supplied by the Warren County Department of Land Preservation, 2006.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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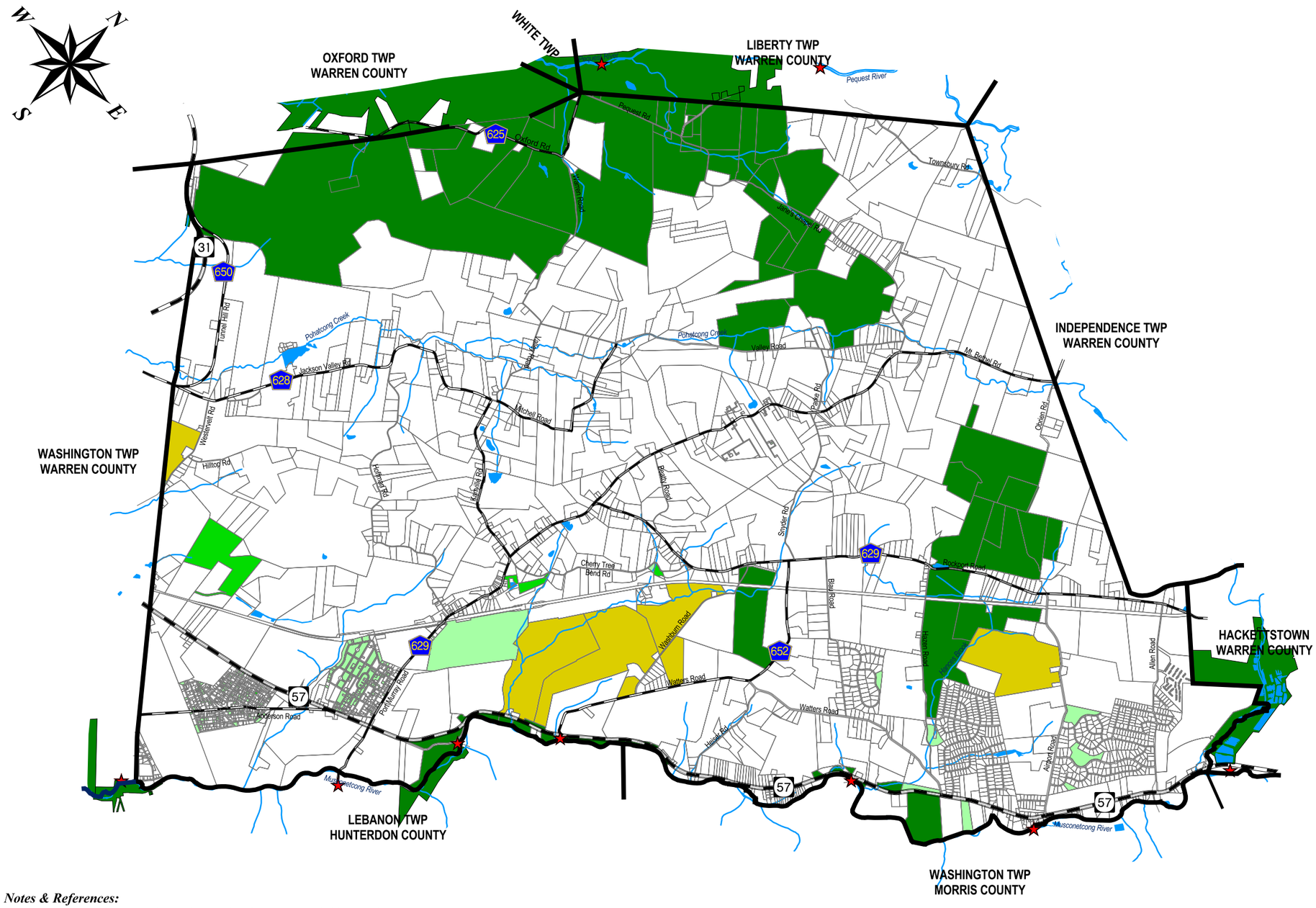
Open Space and Preserved Farmland

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Open Space & Preserved Farms
- *State Owned*
- *County Owned*
- *Municipal Owned*
- *Preserved Farmland*

★ - *Public Recreation Access*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Open Space based upon 2004 Mansfield Township Tax Assessor records and NJDEP GIS Database.

Farmland preservation based upon information supplied by the Warren County Department of Land Preservation, 2006.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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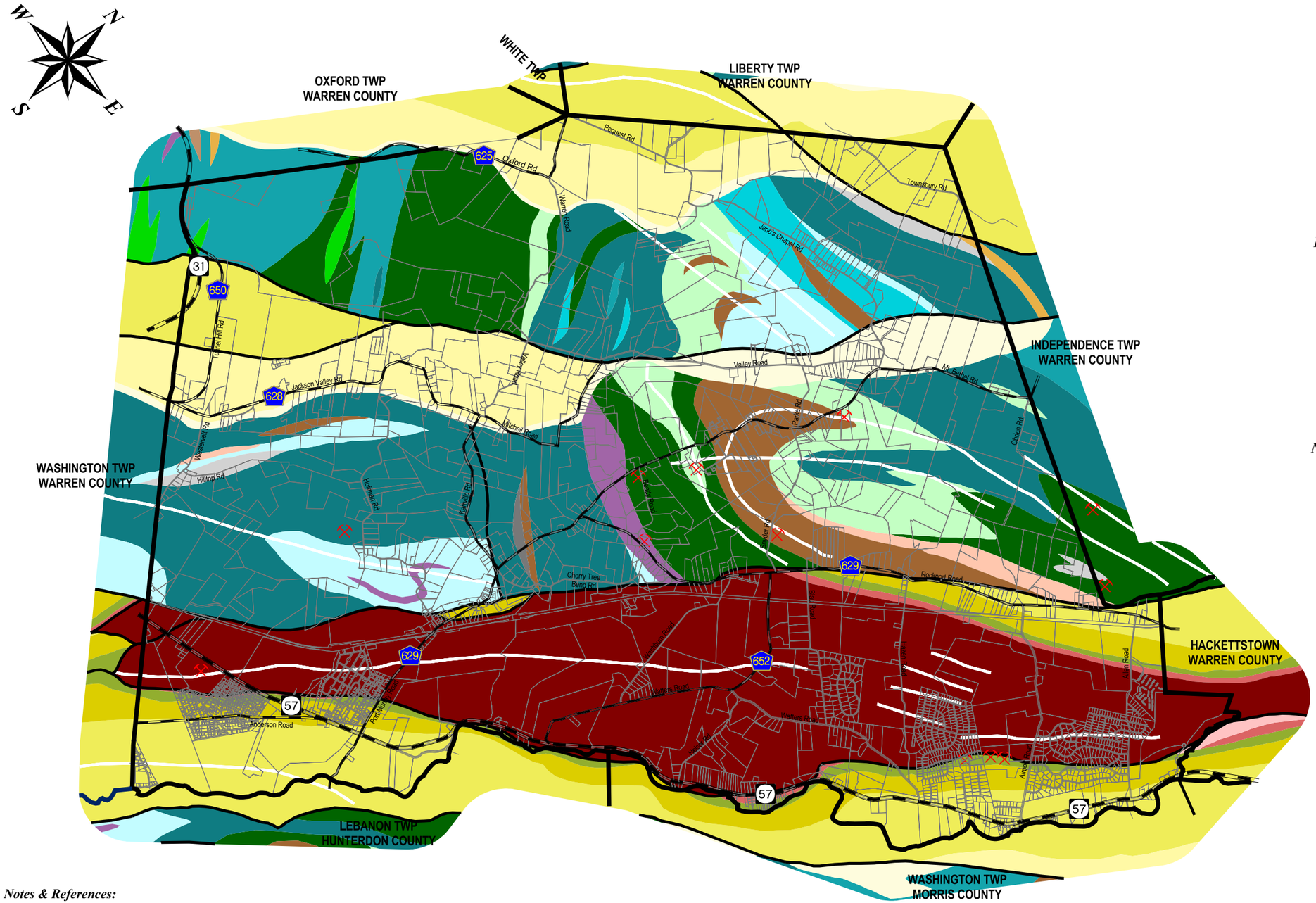
Bedrock Geology

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

KITTATINNY VALLEY SEQUENCE

- *Bushkill Member*
- *Jacksonburg Limestone*
- *Wantage Sequence*

Beekmantown Group (Lower Ordovician and Cambrain)

- *Beekmantown Group - Upper Part*
- *Beekmantown Group - Lower Part*
- *Allentown Dolomite*
- *Leithsville Formation*
- *Hardyston Quartzite*

NEW JERSEY HIGHLANDS

Byram Intrusive Suite (Middle Proterozoic)

- *Hornblende Granite*
- *Hornblende Syenite*
- *Biotite Granite*
- *Microperthite Alaskite*

Lake Hopatcong Intrusive Suite (Middle Proterozoic)

- *Pyroxene Granite*
- *Pyroxene Syenite*
- *Pyroxene Alaskite*

Metasedimentary Rocks (Middle Proterozoic)

- *Potassic Feldspar Gneiss*
- *Biotite-Quartz-Feldspar Gneiss*
- *Hornblende-Quartz-Feldspar Gneiss*
- *Pyroxene Gneiss*

Losee Metamorphic Suite (Middle Proterozoic)

- *Quartz-Oligoclase Gneiss*

Rocks of Uncertain Origin (Middle Proterozoic)

- *Hypersthene-Quartz-Oligoclase Gneiss*
- *Amphibolite*

- Bedrock Faults
- Bedrock Fold
- Abandoned Iron Mine

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Bedrock Geology based upon NJGS GIS Database, "Bedrock Geology for New Jersey", 2004.

Abandonded Mines based upon NJGS GIS database " Abandoned Mines of New Jersey", 2005.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

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SCALE: 1"=4000'

Map Prepared by:

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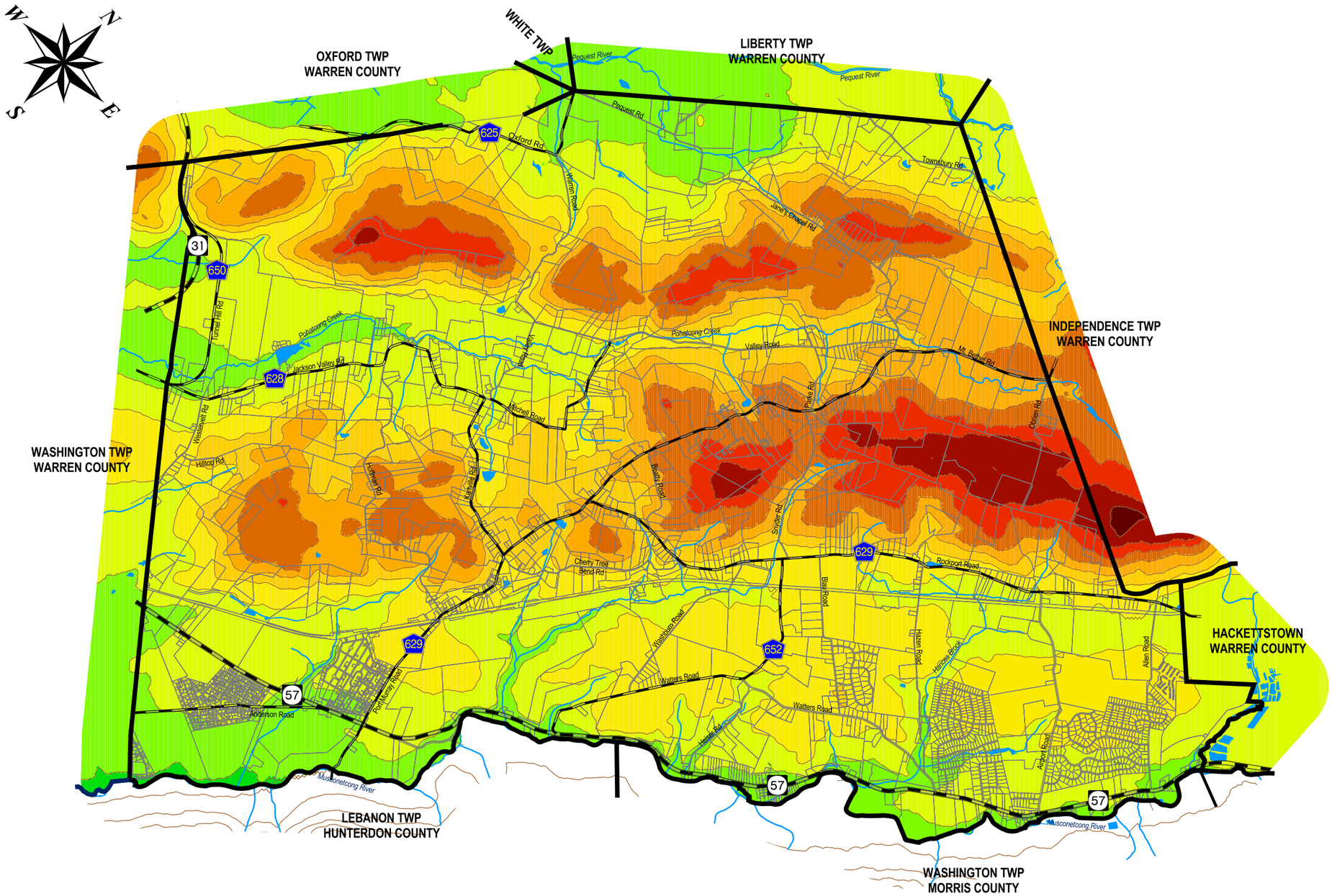
Digital Elevation Model

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Feet Above Sea Level

- *<200 ft*
- *201 - 300 ft*
- *301 - 400 ft*
- *401 - 500 ft*
- *501 - 600 ft*
- *601 - 700 ft*
- *701 - 800 ft*
- *801 - 900 ft*
- *901 - 1000 ft*
- *1001 - 1100 ft*
- *1101 - 1200 ft*
- *1201 - 1300 ft*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Elevation Model based upon data from the Warren County Environmental Resources Inventory.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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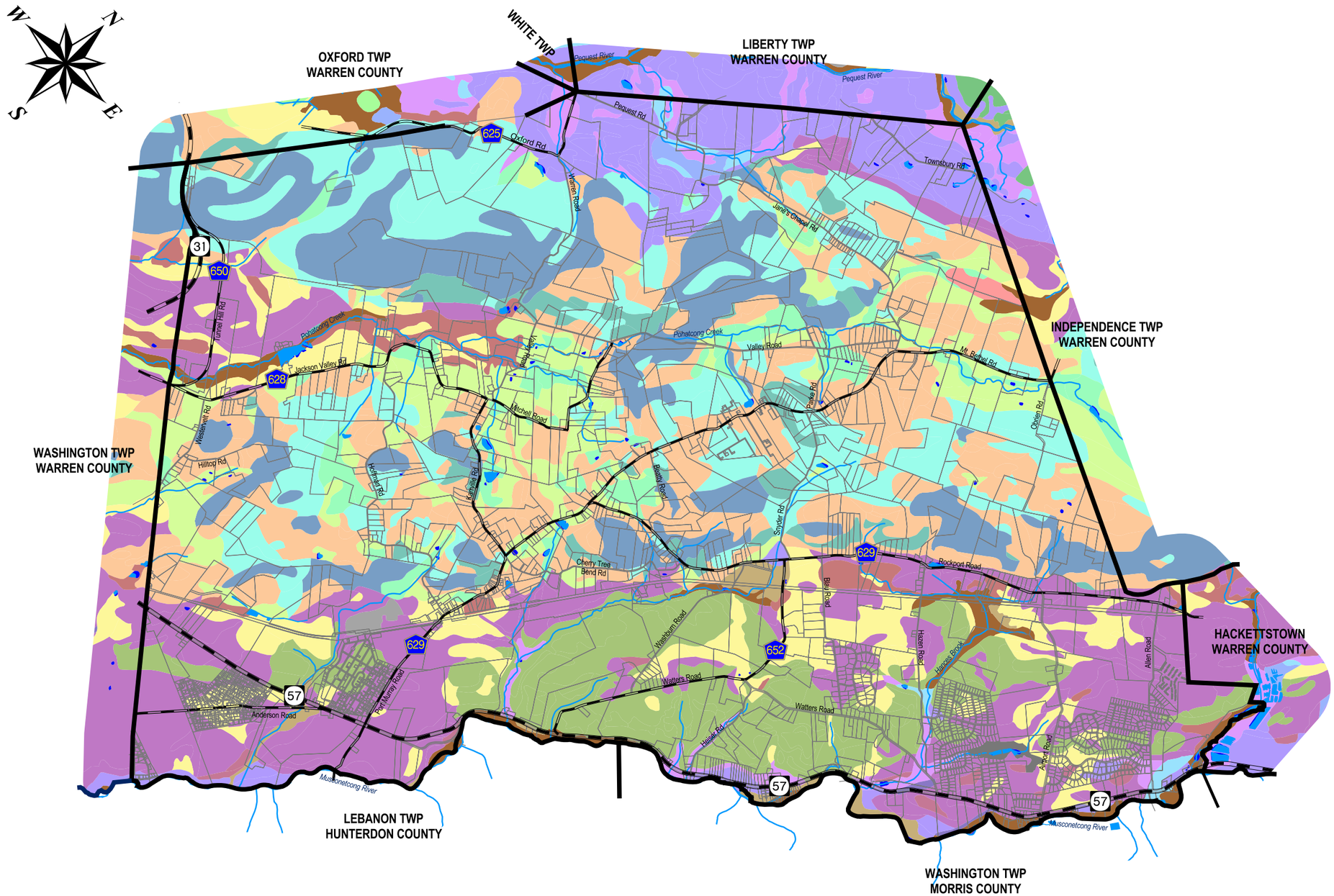
Soil Series

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Soil Series

- *Adrian*
- *Annandale*
- *Bartley*
- *Califon*
- *Carlisle*
- *Cokesbury*
- *Edneyville*
- *Fredon*
- *Halsey*
- *Hazen*
- *Hero*
- *Lyons*
- *Middlebury*
- *Nassau*
- *Palmyra*
- *Parker*
- *Rock-Parker-Ed*
- *Rock-Wassaic*
- *Washington*
- *Wassaic*
- *Wayland*
- *Water*
- *Dump*
- *Quarry*
- *Pits*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Soil Series based upon NJDEP GIS database.

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4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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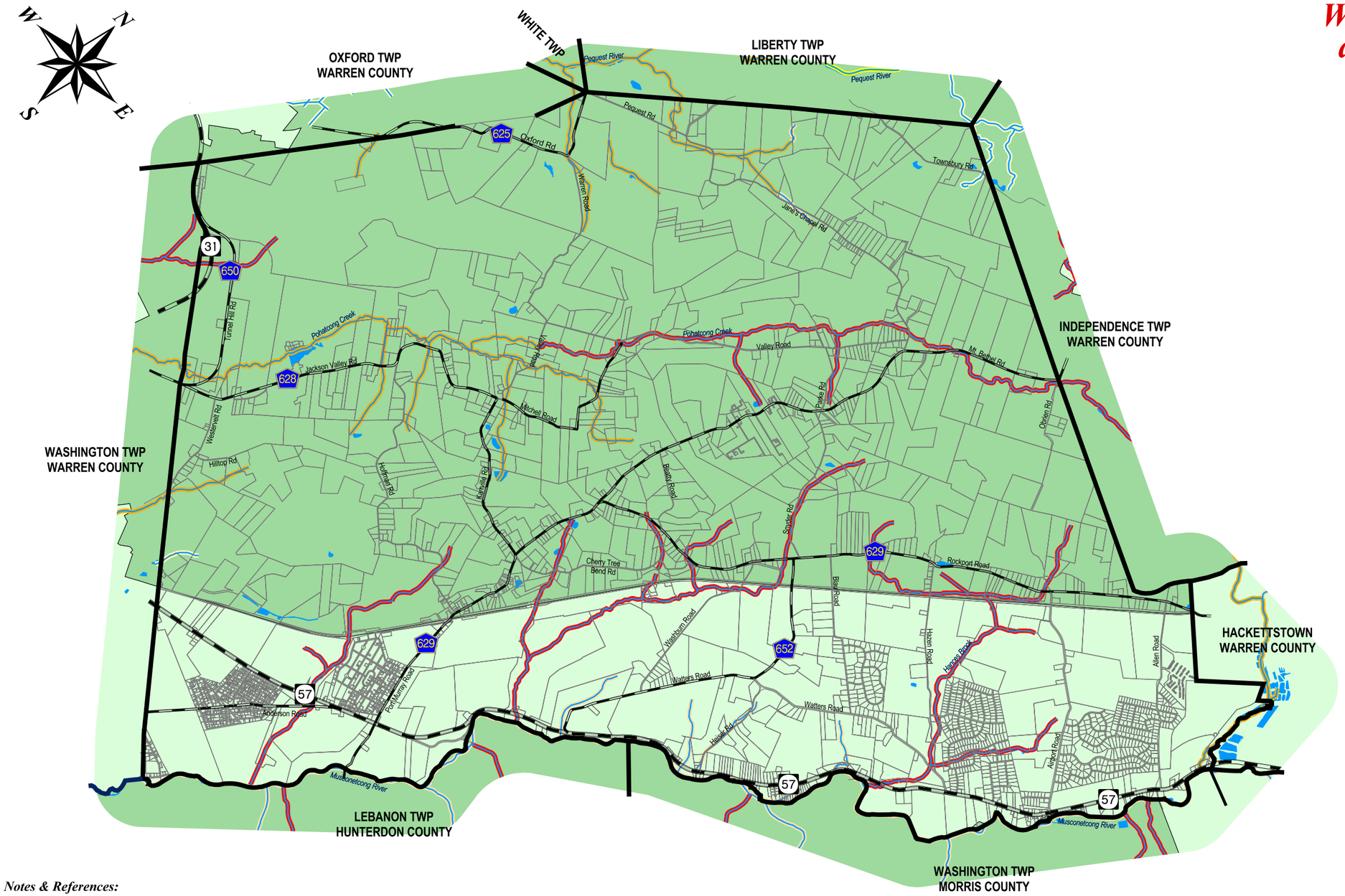
Water Quality Classifications and Highlands Designation

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Water Quality Classifications based upon NJDEP GIS database: "NJDEP Surface Water Quality Standards of New Jersey", 8/30/05.

NJ Highlands Designation based upon NJDEP GIS database: "NJ Highlands Preservation and Planning Area", December, 2005.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

MAP LEGEND:

NJDEP Water Quality Classification
- *Non-Trout*
- *Non-Trout (C1)*
- *Trout Maintenance*
- *Trout Maintenance (C1)*
- *Trout Production (C1)*

NJ Highlands Designation
- *Highlands Preservation Area*
- *Highlands Planning Area*

4000 0 4000 8000 Feet

SCALE: 1"=4000'

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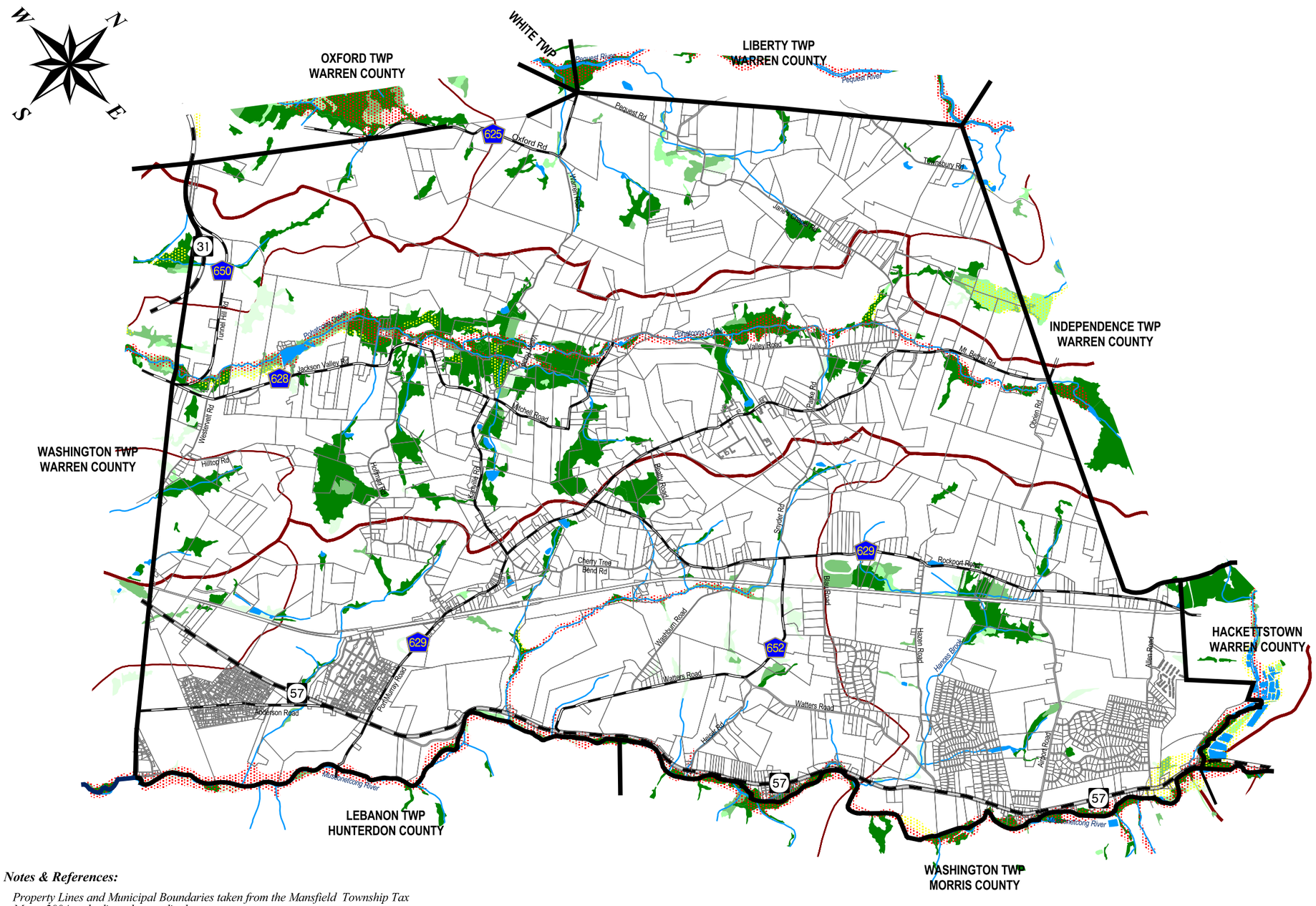
Surface Hydrology

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

- *Streams*
- *Open Water*
- *Drainage Basins*
- *Watersheds*

Flood Prone Areas

- *USGS Documented Floodprone Area*
- *Undocumented Floodprone Area*

Freshwater Wetlands

- *Disturbed Wetlands*
- *Herbaceous Wetlands*
- *Scrub / Shrub Wetlands*
- *Forested Wetlands*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Lakes, Streams & Drainage Basins based upon NJDEP GIS Database.

Flood Prone Areas based upon NJDEP GIS mapping of USGS data.

Wetlands based upon 1986 NJ Freshwater Wetlands Inventory / NJDEP GIS Database.

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4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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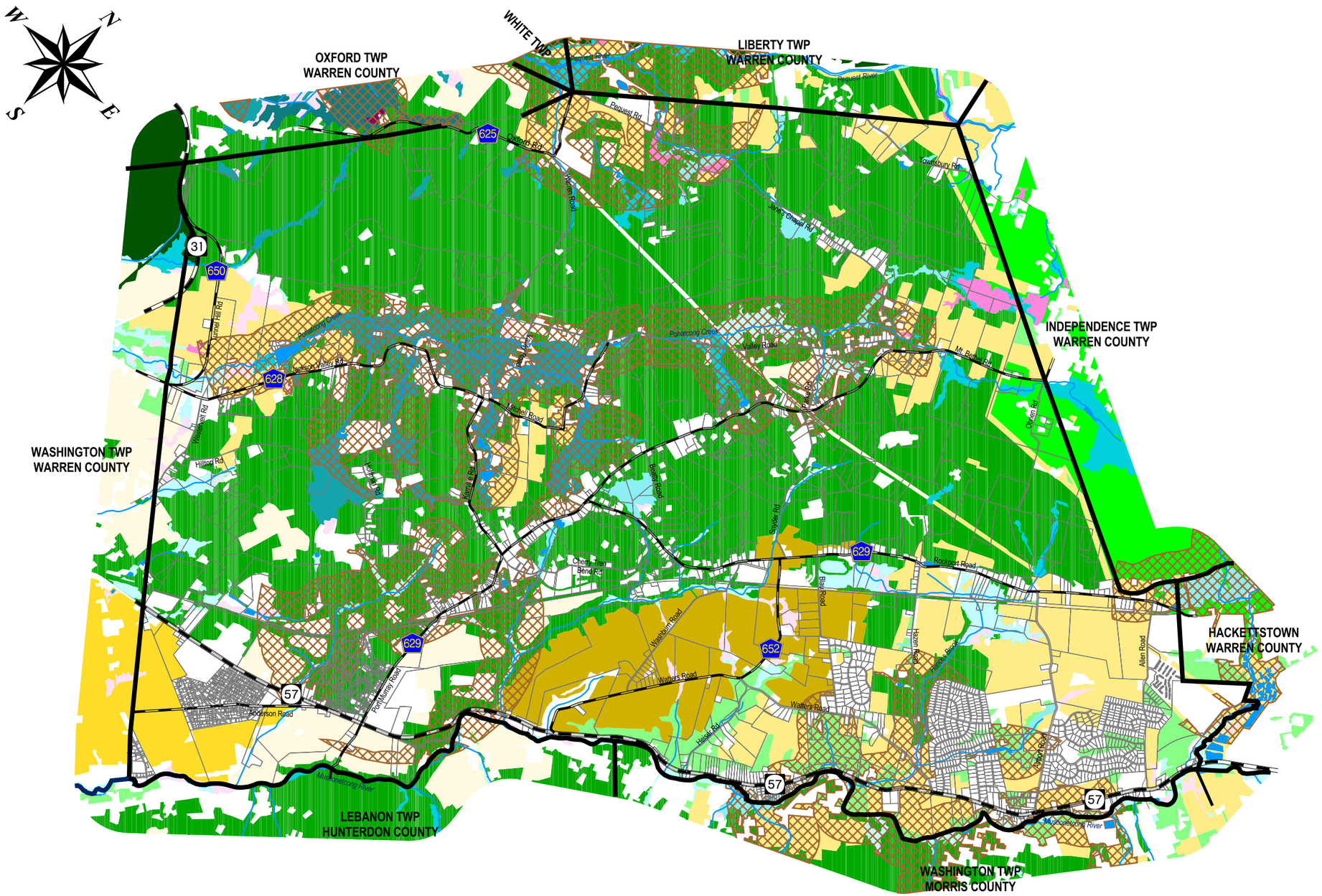
Critical Wildlife Habitat

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Emergent Wetlands Habitat
- *Suitable Habitat*
- *Special Concern*
- *State Threatened*
- *State Endangered*
- *Federal T & E*

Grasslands Habitat
- *Suitable Habitat*
- *Special Concern*
- *State Threatened*
- *State Endangered*
- *Federal T & E*

Forested Wetlands Habitat
- *Suitable Habitat*
- *Special Concern*
- *State Threatened*
- *State Endangered*
- *Federal T & E*

Forest Habitat
- *Suitable Habitat*
- *Special Concern*
- *State Threatened*
- *State Endangered*
- *Federal T & E*

- Wood Turtle Habitat

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Threatened and Endangered Species Habitat based upon NJDEP GIS Database, "The Landscape Project, Version 2"; February 2004.

There are no NJDEP Natural Heritage Priority Sites identified within the Township.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

SCALE: 1"=4000'

Map Prepared by:

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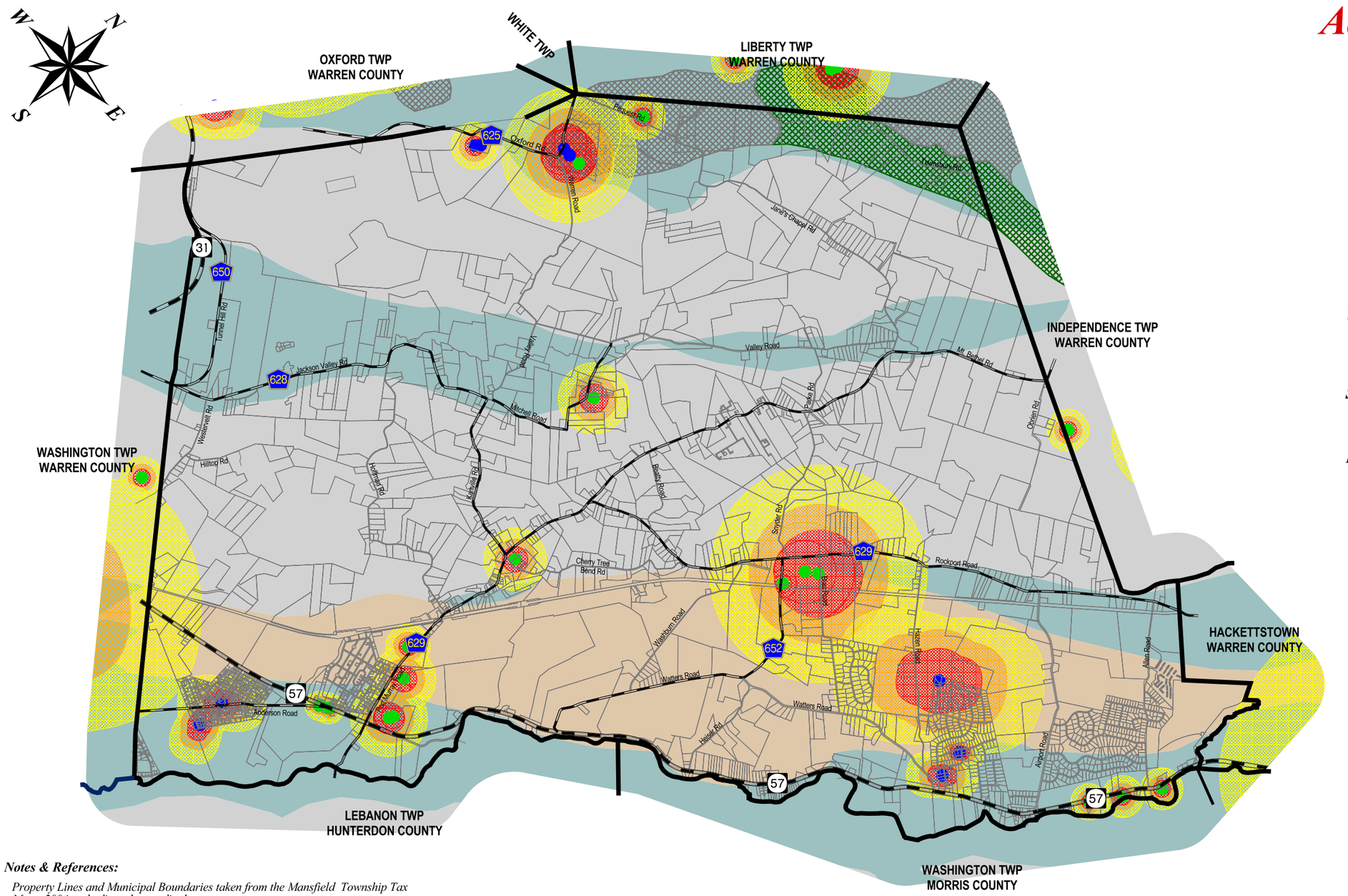
Aquifers and Wellhead Protection Areas

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

- *Wells: Community*
- *Wells: Non-community*

Wellhead Protection Areas
- *- 2 Year Travel Time*
- *- 5 Year Travel Time*
- *- 12 Year Travel Time*

Surficial Aquifers
- *- Morainic Deposits*
- *- Sand and Gravel*

Bedrock Aquifers
- *- Igneous and metamorphic rocks*
- *- Martinsburg Formation and Jutland Sequence*
- *- Jacksonburg Limestone, Kittatinny Supergroup, and Hardyston Quarzite*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Surficial and Bedrock Aquifers based upon NJGS, GIS database, 1998.

Wells base upon NJGS, GIS databases: "New Jersey Public Community Water Supply Wells Database", 2004 and "Public Non-Community Water Supply Wells in New Jersey", 2004.

Wellhead Protection Areas based upon NJGS GIS Databases: " New Jersey Public Community Water Supply Well Head Protection Areas", 2002 and "Warren County Public Non Community Well Head Protection Area Delineations", 2003.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

4000 0 4000 8000 Feet

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Map Prepared by:

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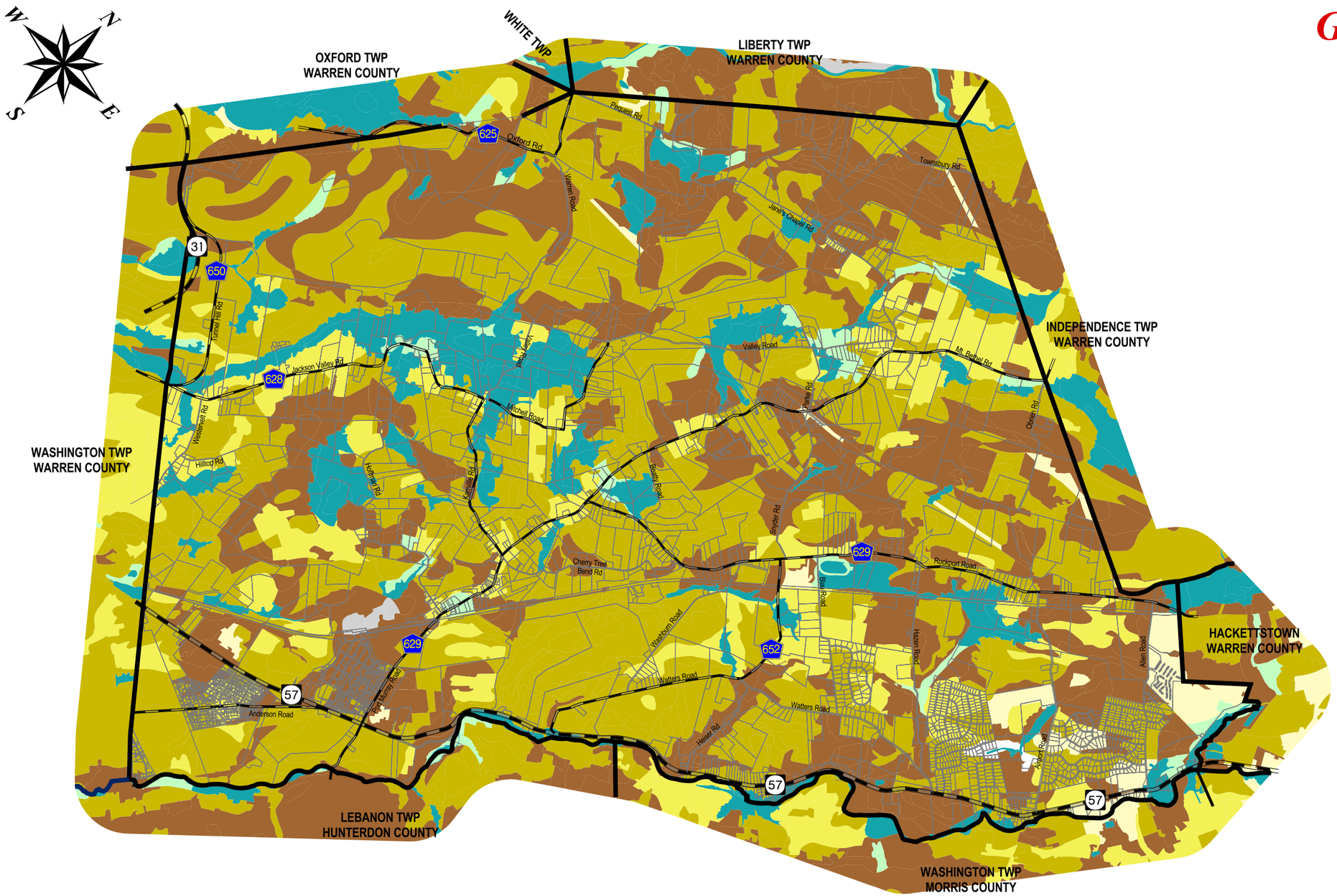
Groundwater Recharge

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Groundwater Recharge Rates

- *16 to 22 in/yr*
- *13 to 15 in/yr*
- *10 to 12 in/yr*
- *1 to 9 in/yr*
- *No Recharge*
- *Hydric Soil*
- *Wetlands and Open Water*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Groundwater Recharge Rates based upon NJGS GIS Database "Ground-Water Recharge for Warren County, NJ", 10/8/04.

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4000 0 4000 8000 Feet

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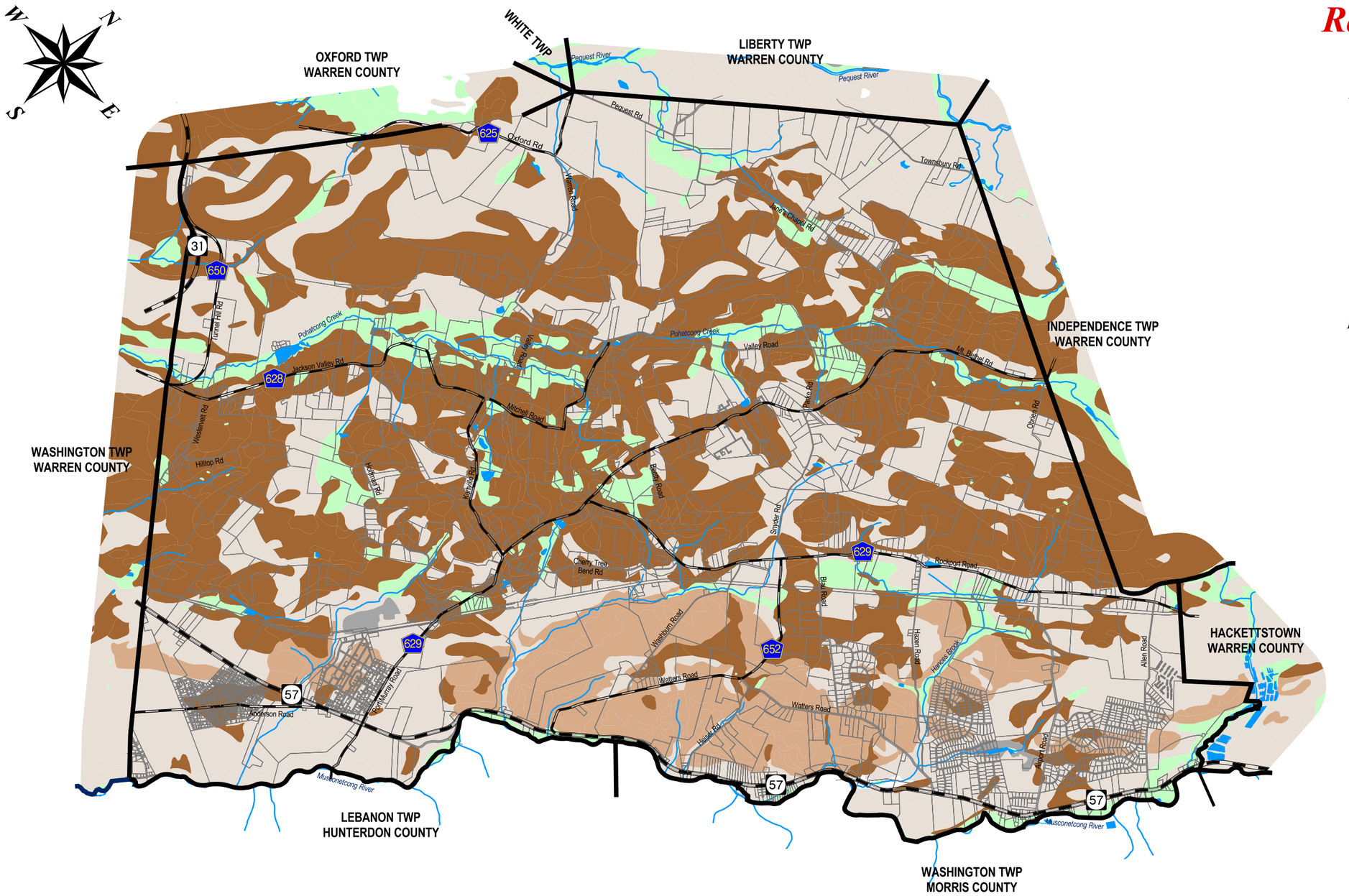
Recommended Maximum Septic System Density

Environmental Resources Inventory
Mansfield Township
Warren County, New Jersey
January, 2006



MAP LEGEND:

Recommeded Maximum Septic System Density based upon a Nitrate Dilution target value of 4.0 for a household of 3 people.

- *2.0 acres per system*
- *2.3 acres per system*
- *2.4 acres per system*
- *Hydric Soils (No systems recommended)*
- *Disturbed Soils (variable)*

Notes & References:

Property Lines and Municipal Boundaries taken from the Mansfield Township Tax Maps, 2004 and adjusted accordingly.

Recommended Septic System Densities based upon NJGS Nitrate-Dilution Model for New Jersey, version 5.0.

This map was developed using NJDEP and NJGS Geographic Information System digital data, but this secondary product has not been verified by the NJDEP or NJGS and is not State - authorized.

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