

ENVIRONMENTAL RESOURCE INVENTORY UPDATE FOR

2016

MONROE TOWNSHIP

MIDDLESEX COUNTY,

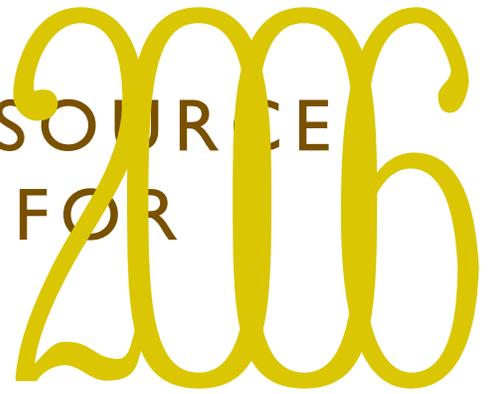
NEW JERSEY



Prepared by

 HEYER, GRUEL
& ASSOCIATES
COMMUNITY PLANNING CONSULTANTS

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MONROE TOWNSHIP MIDDLESEX COUNTY, NEW JERSEY

Historic Plan Element
Reference study by
Richard Grubb and Associates

Geology and Hydrogeology Element
Prepared by
Environmental Commission member
Karen C. Polidoro, Hydrogeologist

Scenic Resources Element
Prepared by
Environmental Commission

Heyer, Gruel & Associates, PA
Community Planning Consultants
63 Church Street, 2nd Floor
New Brunswick, NJ 08901
732-828-2200

Paul Gleitz, P.P. #5802, AICP

Aditi Mantrawadi, Associate Planner



Acknowledgements

MONROE TOWNSHIP

Richard Pucci, *Mayor*
Wayne Hamilton, *Business Administrator*

MONROE TOWNSHIP COUNCIL

Gerald W. Tamburro, *Council President*
Henry L. Miller, *Concil Vice-President*
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Leslie Koppel-Egierd, *Councilwoman*
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Sharon White, *Secretary*

DEDICATION

Joseph Montanti



1950-2006

Joe Montanti's enthusiasm and wisdom were an inspiration to all those who knew him. His vision of Monroe was beautiful and this Environmental Resource Inventory is an effort to make that vision a reality. Joe will be missed by all those who knew him. This Environmental Resource Inventory is dedicated to his memory so that future generations of Monroe residents will be able to live in the kind of Monroe that Joe envisioned.

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Introduction

The Environmental Resource Inventory (ERI) is an unbiased report of data that describes the current state of the various environmental resources in a community. It is a compilation of text and maps, and forms the baseline documentation that the community can use to evaluate, and possibly revise, planning documents, policy initiatives, and local ordinances to better protect the remaining resources, and when possible, improve the state of the natural environment.

The ERI is not a policy statement or a plan. Rather, it is an objective listing of the resources in the community. It can be used as a tool for Environmental Commissions, Planning Boards and Zoning Boards, as well as by the Township administration and the public at large. The ERI can be adopted as part of Master Plan, or it can be combined with policy statements and programs to create a Conservation Element for the Master Plan. ERIs are often the basis for resource protection ordinances in a community, which are designed to protect the resources inventoried in the ERI. Whether the ERI is an amendment to the Master Plan, a part of a Conservation Element, or a separate reference document, it is always seen as dynamic and revisable as circumstance on the ground evolve and change.

The legal authority for the drafting and adoption of an ERI is the Environmental Commission Enabling Legislation (N.J.S.A. 40:56A), which states, "Power to conduct research into the use and possible use of open land areas of the municipality.... It shall keep an index of the marshlands, swamps, and wetlands.... the proper use of such areas...recommend to the planning board.... plans and programs for a master plan and the development of such areas". Additionally, the Municipal Land Use Law (N.J.S.A 40:55D) requires a Land Use Plan element and states that "Whenever the environmental commission has prepared and submitted to the planning board and to the board of adjustment an index of the natural resources of the municipality, the planning board or the board of adjustment shall make available to the environmental commission an informational copy of every application for development submitted to the board".



Some of the basic uses for an ERI include

- Basis for Land Use Planning
- Guide for Site Plan Review
- Basis for Resource Protection Ordinances
- Land Capability Analysis/Carrying Capacity Analysis
- Sensitive Areas Maps
- Long Range Planning Tool for Flooding and Climate Change
- Educational Tool
- Save money now by highlighting trouble areas

Municipal Summary

The Township of Monroe occupies approximately 43 square miles of land area located in southern portion of Middlesex County. The Borough's of Helmetta and Spotswood and the Township's of Old Bridge, Manalapan, Millstone, East Windsor, Cranbury and South Brunswick surround Monroe while the Borough of Jamesburg forms a small island within the Township. The Township continues to be a semi-rural area even with the recent growth in population and homes from the numerous active adult communities that have been established within the Township.

The population of Monroe Township has increased from 22,255 in 1990 to 27,999 in 2000. The 2000 median age in Monroe was 58.9 years, which was significantly older than the Middlesex County median age of 35.7 years. The average household size has decreased from 2.31 persons in 1990 to 2.15 persons in 2000.

The housing stock of the Township is predominantly single-family dwelling units both detached and attached (86.2% combined). The median year for housing structures built was 1983. The Township is not a job intensive area as compared with the other municipalities within the County and region. Employment is focused in two light industrial areas within town and miscellaneous services jobs including employment provided through the retirement communities. Farming is still viable in Monroe including horse farms and several prosperous produce farms.





Municipal Infrastructure

SEWER

With the exception of a limited amount of septic systems, all sanitary sewage generated within Monroe Township is collected and transported to Middlesex County Sewerage Authority's (MCUA) regional treatment plant in Sayreville, N.J. After treatment, the effluent is discharged to the Raritan Bay. Monroe Township lies within three small watersheds. Sewage flows from all three watersheds are pumped to the MCUA's South River Interceptor.

MATCHAPONIX BROOK WATERSHED SEWERAGE FACILITIES

There is only one pumping station in this watershed; it is located at the eastern terminus of Ashmall Avenue. All sewage within the watershed flows by gravity to this pumping station. From there, it is pumped out of the Township to the Old Bridge Township Municipal Utility Authority's (OBTMUA) Iresick Brook Trunk Sewer which carries it to the MCUA South River Interceptor and ultimately to the MCUA sewage treatment plant for treatment and discharge to the Raritan Bay. There is one future pumping station planned along Mounts Mill Road to service the watershed south of the unnamed tributary to the Matchaponix Brook.

The MTMUA has a written agreement with the OBTMUA, which limits the Ashmall Avenue pumping station to no more than 2.0 MGD. Applying the NJDEP's peak factor of 2.5 for pumping stations, this station has a capacity of 0.67 MGD of average

daily flow.

MANALAPAN BROOK WATERSHED SEWERAGE FACILITIES

There are four minor and one major pumping stations in this watershed. All sewage flows within this watershed eventually flow to the Outcalt Pumping Station off Avenue K. The sewage is then pumped through a four-mile long, 20-inch diameter force main to the MCUA's South River Interceptor from where it flows in the end to the MCUA's sewage treatment plant in Sayreville, N.J. The treated effluent is discharged into the Raritan Bay. There are several existing major trunk sewers, which collect and transport sewage in the Manalapan Brook Watershed. These are the Manalapan Brook Trunk Sewer, the Phase VII Trunk Sewer and the West Trunk Sewer.

The capacity of the Outcalt pumping station is rated at 5.76 MGD. According to the MTMUA's 2003 Sewage Master Plan, build-out will require the O.P.S. capacity to be increased to 13.02 MGD. The Phase VII Trunk Sewer has a capacity limit of 8.43 MGD. Phase VII conveys flows to the O.P.S. from the Borough of Jamesburg, from portions of Monroe Township near Jamesburg, from the West Trunk Sewer and from the Upper Millstone River Watershed. The West Trunk Sewer carries sewage by gravity flow from the middle and upper reaches of the watershed to the Phase VII Trunk Sewer. The Manalapan Brook Trunk Sewer carries flows from the Borough of Helmetta and the northern portion of the Upper Millstone River Watershed. The capacity of most of these trunk sewers is adequate through the year 2010.

UPPER MILLSTONE RIVER WATERSHED SEWERAGE FACILITIES

In this watershed, the major sewage facilities include:

- Forsgate Pumping Station which pumps flows collected from much of the watershed through a 6 mile force main to the Phase VII Trunk Sewer in the Manalapan Brook Watershed;
- The Applegarth Road Pumping Station which collects flows from Rossmoor, the Forsgate Industrial Park, Greenbriar and Encore, then pumps them south to the Forsgate Pumping Station;
- The Concordia Pumping Station which pumps flows from a portion of Concordia and adjacent properties to the Forsgate P.S.;
- The Route 33 Pumping Station (nearing commencement of construction) which will pump sewage from the Rte. 33 corridor to the Forsgate P.S.;
- The Molly Pitcher Pumping Station which pumps flows from the NJTPA Rest Stop 7A to the Applegarth Road P.S.

The capacity of the Forsgate Pumping Station is 7.0 MGD influent and 3.5 MGD outgoing due to attenuation included in the design of the pumping station when it was converted from a sewage treatment plan. From the MTMUA's 2003 Sewerage Master Plan, the buildout sewage flows to this station are projected to be 11.87 MGD influent and 3.96 outgoing. This station's capacity cannot directly be increased. Likewise, the Phase VII Trunk Sewer, which receives the Forsgate P.S., has limited capacity for increases. Redirecting the

flows from the Applegarth Pumping Station to the Manalapan Brook Trunk Sewer, any needed extra capacity can be provided in both the Forsgate P.S. and the Phase VII Trunk Sewer.

WATER SERVICE - POTABLE

The Monroe Township Municipal Utilities Authority provides water service in the Township. Currently, the MTMUA maintains service throughout most of the developed portions of the Township. The potable service network consists of one integrated distribution system. The potable water supply is provided from a combination of groundwater sources and one surface water source. The groundwater is drawn from six potable wells and two irrigation wells owned and operated by MTMUA. The surface supply is purchased in bulk quantities from the Elizabethtown Water Company.

Much of the Township lies within Critical Area #1 and its margin as created by the Water Supply Management Act Regulations. These regulations prohibit the development of new production wells within the critical area and its margin. Surface supply opportunities within Monroe Township are limited to small streams or bulk purchases from adjacent water purveyors. Allocations from these streams are difficult and will require large areas of land for treatment facilities and storage reservoirs. The MTMUA has a bulk purchase agreement with Elizabethtown Water Company to buy a minimum of 0.5 MGD. The interconnection is physically capable of generating another 0.94 MGD, but Elizabethtown Water Company has limited supply allocations itself.

Currently, the MTMUA's 10-year water allocation permit allows an annual limit of 1,722 million gallons per year (MG/yr) from six wells. The maximum monthly withdrawal is limited to 247.6 MG/mo. If the rate of growth remains constant, the annual allocations are only sufficient through year 2010. It is obvious that additional water allocations will be needed from NJDEP to reach build-out using historical usage for projecting demands.

The single, largest water demand is that of irrigation. Summer demand peaks are 3 times the winter demands. This large irrigation demand need not be of the high quality required for potable purposes. Accordingly, the MTMUA has adopted a policy of developing non-potable sources of water for irrigation in all future development.

WATER SERVICE – NON-POTABLE

The only existing sources of non-potable water in the Township are groundwater wells, which the MUA no longer utilizes for domestic consumption due to changes in New Jersey's radionuclide regulations. Potable supplies must meet ever-increasing strict standards of quality as new technology finds new potential for health risks. Potential sources for non-potable supplies include: the Manalapan Brook, the Matchaponix Brook, the upper Millstone River and recycled water from either existing treatment plants such as Western Monmouth Utilities Authority (WMUA) and the State Home for Boys or possibly from future on-site package treatment plans built in large developments or commercial projects.

The streams mentioned above have limited flows during the summer irrigation season, so reservoirs are needed to store the water, which is available on a seasonal basis. Monroe needs sufficient non-potable irrigation supplies should be developed to meet the peak seasonal demands at build-out, which it does not have currently. In order to help implement a non-potable irrigation water policy, the MTMUA is requiring all major subdivisions to install separate distribution mains for non-potable irrigation use.

Public Open Space

Monroe Township contains 2761 acres of parks, public lands and recreational facilities of which the Township owns 823 acres. The Township owns a total of 678 acres or just over 2.5% of the 26,752 total acres in Monroe. The County owns 5% or 1,363 acres of the Township, while the State owns 2% or 575 acres.

LAND INVENTORY	
	Acres
State Land	575
County Land	1,363
Township Land	808
Board of Education	154
Preserved Farmland	959
Total	3,859

EXISTING PARKS		PROPOSED PARKS	
	Acres		Acres
DISTRICT 1		DISTRICT 1	
Daniel Ryan Memorial Park	12	Spotswood-Englishtown Road	15+
Community Center	4.5		
Avenue K - Outcault Park	37		
Subtotal	53.5		
DISTRICT 2		DISTRICT 2	
Thompson County Park	1600	Additional Recreation Parcel	30+
Girls Softball Complex	5		
Subtotal	1605		
DISTRICT 3		DISTRICT 3	
James Monroe Park	160	Community Center	20+
Total Existing Parks	1818.5		



EXISTING PARKS	
DISTRICT 1	
Daniel Ryan Memorial Park	1 football field, 1 Concession Stand, 1 Multi Purpose field
Community Center	1 Rink/Arena, 1 Roller Hockey, 1 Skate Park, 1 Gymnasium
DISTRICT 2	
Thompson County Park	2 Playgrounds, 4 Tennis Courts, 2 Basketball, 4 Baseball, 10 Soccer fields, 1 Path/Trail, 1 Multi purpose field
Girls Softball Complex	2 Softball, 2 Baseball fields, 1 Concession Stand
DISTRICT 3	
James Monroe Park	1 Play ground, 3 Baseball fields, 1 Path/Trail, 1 Concession Stand, 1 Field House
Total Existing Parks Acreage	908.5
PROPOSED PARKS	
DISTRICT 1	
Daniel Ryan Memorial Park addition	2 Playgrounds
Outcault Park	2 Playgrounds , 2 Tennis Courts, 2 Roller Hockey, 2 Baseball fields 1 Path/Trail, 1 Multi Purpose Fields
Spotswood-English Road	2 Playgrounds, 1 Path/Trail, 3 Multi Purpose Fields
Community Center	1 Playground
DISTRICT 2	
Additional Recreation Parcel	1 Playground, 2 Roller Hockey, 2 Multi Purpose fields
Girls Softball Complex	1 Softball Field
DISTRICT 3	
Community Center	1 Path/Trail, 2 Multi Purpose Fields
Pocket Parks	1 Gymnasium
Total Proposed Parks Acreage	71.3
TOTAL ACREAGE	979.8

BOARD OF EDUCATION RECREATION FACILITIES

The Township of Monroe has six schools that serve students in kindergarten through twelfth grade. Six sites for a total of 23 acres are owned by the Board of Education and contain active recreational facilities such as baseball and football fields, etc.

COMMUNITY CENTER

On October 23, 1993 Monroe Township opened a new community center, which is located on Monmouth Road. The building consists of 15,000 square feet and contains a full size gymnasium, two classrooms, kitchen and offices for the recreation department.

The Center is open seven days a week from 9:00 a.m. to 9:00 p.m. and hosts a multitude of activities including basketball, volleyball, golf instructions and aerobics. The meeting rooms are used by many civic groups in the Community such as the Boy and Girl Scouts, VFW and sporting groups, and the drama club to mention a few. The Center is in th process of doubling in size to serve current recreational needs.

BOARD OF EDUCATION FACILITIES		
	Acres	
DISTRICT 1		
Barclay Brook School	2	1 Playground, 2 Baseball fields, 1 Gymnasium
Brookside School	5	1 Playground, 1 Baseball field, 1 Gymnasium
Mill Lake School	2	1 Playground, 1 Baseball field
Woodland School	2	1 Playground, 1 Baseball field, 1 Gymnasium
DISTRICT 2		
Monroe High School	10	6 Tennis Courts, 2 Softball, 1 Baseball, 1 Soccer 1 Football, 1 Path/Trail,
DISTRICT 3		
Applegarth School	2	2 Baseball fields, 1 Path/Trail
TOTAL	23	

RECREATIONAL FACILITIES IN ADULT COMMUNITIES

The Active Adult Communities known as (PRC) in Monroe Township provide for a variety of recreational facilities for their residents. These facilities include tennis courts, bocce courts, clubhouse and swimming facilities, shuffleboard courts and four golf courses.

The golf courses are for the enjoyment of the community's residents, although the Concordia Golf Course is also open to outside membership. A total of 854 acres is retained as golf courses within the four PRC's and the Forsgate Country Club.

OPEN SPACE ACQUISITION PROGRAM

The acquisition program has been ranked by importance and each parcel has been designated as priority 1, 2 or 3 in order to plan available funding over a period of years. The priority 1 properties consist of parcels that are adjacent to existing parkland and would further the open space recreation objectives of expanding the existing parcels. In regard to the acquisition along the western side of Jamesburg-Perrineville Road, these unusually undersized former "wildcat" subdivided lots, would form very tranquil open space and compliment the fine qualities of Thompson Park in these areas.

Priority 2 properties include additional open space adjacent to Thompson Park, but Priority 2 designation focuses primarily on protection of the very sensitive environmental area extending north from the Millstone River Watershed Conservation Area. These parcels would compromise a special Millstone River Conservation Area.

Priority 3 parcels would continue the Millstone River Conservation Area and a Millstone River Corridor and would acquire infill parcels in the southern area of Thompson Park.

The Monroe Township Open Space Acquisition Program furthers the objectives of the Monroe Township Master Plan, which recommended that open space should be acquired to balance the residential growth that has and is continuing in Monroe Township. The plan will ensure adequate recreation and open space for present and future graduation generations in Monroe and Middlesex County.

The Master Plan has also designated the Millstone Preservation Area as a land area that is very environmentally sensitive and should be preserved as farmland or open space.

Priority	Block	Lot	Acres	Zoning	Wetlands	FHC	Farm	Forest
I	48	354 lots	21.1	R30	10%	10%		100%
I	48	135 lots	8.3	R30	5%	5%		100%
I	48	56 lots	3.3	R30				100%
I	76	21.02, 23.06	100.0	R30	50%			60%
I	76	25.01 - 25.20		R30	80%			50%
I	169	10	17.0	R30	80%	40%		15%
I	169	11.01	12.5	R30	60%	40%		55%
I	22	22	73.9	RR-FLP	100%	80%		80%
I	21	1	10.0	RR-FLP	55%			25%
I	21.01	1-16	1.1	RR-FLP	10%			80%
I	21.02	1-12	.8	RR-FLP	80%			100%
I	21.03	1-13	.8	RR-FLP	90%			100%
I	21.04	1-14	.8	RR-FLP	90%			100%
I		various	18.6	R6	80%			
Total Priority I sites			268.2	Acres				

Priority	Block	Lot	Acres	Zoning	Wetlands	FHC	Farm	Forest
2	77	7	44.0	R60	50%	60%		50%
2	28	3.05	17.3	R60	5%	40%	85%	15%
2	29	2.01	60.7	RR-FLP	25%		75%	15%
2	30	11 & 12	25.5	R3A	5%	5%	90%	10%
2	6	11	160.0	RR-FLP	70%	90%	55%	20%
2	7	1	88.3	RR-FLP	100%	100%		80%
2	7	2	30.0	RR-FLP	100%	100%		100%
2	6	7	1.9	RR-FLP	100%	100%		100%
2	6	8	8.4	RR-FLP	100%	100%		100%
2	6	9	8.9	RR-FLP	100%	100%		100%
2	6	10	4.3	RR-FLP	100%	50%		100%
2	6	6	113.0	RR-FLP	60%	100%	80%	20%
2	20	28.07	5.3	RR-FLP	5%		100%	
2	20	28.06	17.7	RR-FLP	60%		100%	
2	20	28.05	13.7	RR-FLP	10%		80%	20%
2	20	28.04	12.2	RR-FLP	60%		100%	
2	20	25.03	26.5	RR-FLP	70%		80%	
2	19	17.07	39.0	RR-FLP	80%	80%	75%	25%
2	17	1	59.0	RR-FLP	20%	60%	90%	10%
2	16	1	34.0	RR-FLP	25%	30%	95%	5%
2	6	5.01	65.0	R3A	90%	75%	100%	
2	6	4.02	25.5	R3A	100%	100%	85%	15%
2	6	48	5.0	RR-FLP	100%	60%		100%
2	6	49	4.8	RR-FLP	100%	5%		100%
2	6	40	80.0	RR-FLP	60%	95%	85%	15%
2	6	46	15.0	RR-FLP	35%	100%	50%	50%
2	6	45	8.7	RR-FLP		50%		90%
2	6	43.02	12.8	RR-FLP	80%	100%		100%
2	53	18.4	18.9	R3A	90%			100%
2	53	18.5	.3	R3A	90%			100%
2	53	18.6	13.5	R3A	90%			100%
2	106	1.01	46.1	R60	80%	80%		100%
Total priority 2 sites			1039.7	Acres				

Priority	Block	Lot	Acres	Zoning	Wetlands	FHC	Farm	Forest
3	49	18	78.0	R60	10%	10%		10%
3	27	17.01	1.0	R30				50%
3	27	17.02	2.4	R30				50%
3	28	6	17.4	R60	90%	75%	75%	15%
3	28	10.16	19.6	R60	50%	50%	75%	
3	29	4	26.1	RR-FLP	85%			15%
3	40	5	6.8	PRC-2				
3	52	9	4.2	R30	90%	100%		20%
3	52	10	9.5	R30	90%	100%		60%
3	52	11	0.9	R30	100%	90%		
3	8	3	42.8	RR-FLP	75%	100%	80%	20%
3	8	6	30.0	RR-FLP	90%	100%	80%	20%
3	8	7	44.8	RR-FLP	80%	100%	80%	20%
3	8	8.01	5.0	RR-FLP	100%	100%		
3	17	7	55.7	RR-FLP	100%	100%		100%
3	17	8	34.3	RR-FLP	100%	100%		100%
3	18	18	24.9	RR-FLP	100%	90%		100%
3	18	17	75.8	RR-FLP	90%	100%		100%
Total Priority 3 Sites			479.1	Acres				



Current Land Use Land Cover

Monroe Township is dominated by the natural features of wetlands, forests and farmlands, and covered to a much less extent by residential, commercial and industrial uses. The land area is approximately 42.16 square miles, or 26,982.29 acres. The following chart is a summary of land uses in the Township derived from the 2002 NJDEP Land Use/Land Cover GIS data. While this data is now four years old, it is the most current data available.

Land Use 2002	Acres	Percent Total
Wetlands	8,285.51	30.71
Forest	4,605.64	17.07
Agriculture	4,648.66	17.23
Recreational Land	1039.88	3.85
Residential, Rural, Single Unit	1302.01	4.83
Residential, Single Unit, Low Density	1494.63	5.54
Residential, Single Unit, Medium Density	936.43	3.47
Residential, Multifamily	1143.44	4.24
Residential, Mixed	247.66	0.92
Transportation/Communications/Utilities	385.35	1.43
Commercial/Services	418.97	1.55
Industrial	393.00	1.46
Other Urban	840.85	3.12
Barren Lands	932.31	3.46
Water	307.95	1.14
Total Area (From Land Use Data)	26,982.29	100.00



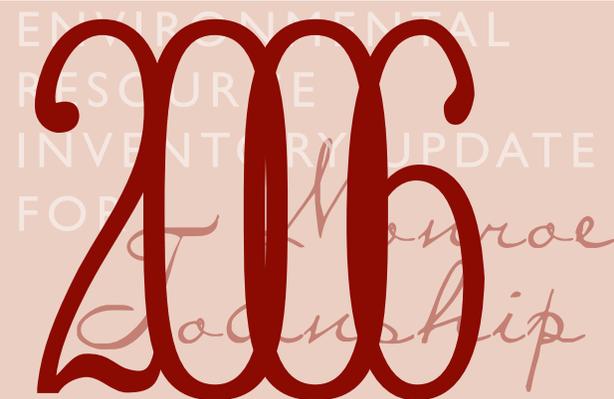
The single largest land use identified in the Township is wetlands, which occupies 8,285.51 acres, or just more than 30 percent of the total land. Forest, which covers slightly more than 4,600 acres, is the second most predominant land-use. Agriculture is the third significant land use in the Township, well known for its many small farms, covering nearly 4,650 acres of land. These three land uses combine to cover 65 percent of all the land in the community, and promote its low-density, rural character of farming and natural and open spaces.

Residential land uses in the Township are very light. Most prevalent are single unit homes located in rural areas, low density or medium density, covering 1,302 acres, 1,495 acres and 936 acres respectively. Multi-family residential and mixed residential uses occupy 1,143 acres and 248 acres, respectively.

Other important land uses in the area are transportation, communications, & utilities, which includes roads, bridges, and railroads. In Monroe Township, this use covers more than 380 acres. Recreational land, including playgrounds and school athletic fields, takes up a little over 1,000 acres, while unused, barren land occupies 932 acres. Commercial and service-oriented uses, including retail stores, take up 419 acres and industrial uses take up just over 390 acres.

Watersheds

A watershed is an area that drains into a common waterway, such as a stream, lake, estuary, wetland, or, ultimately, the ocean. The watershed includes both the waterway itself and the entire land area that drains into it. Geographical features such as hills and slopes separate distinct watershed systems. Watershed Management Areas (WMAs) are the regulatory units of NJDEP's Division of Watershed Management for categorizing, managing and protecting watersheds throughout the State. Monroe Township is divided into two primary WMAs, the Lower Raritan River Drainage (WMA 9) and the Millstone River Drainage (WMA10).



THE LOWER RARITAN RIVER DRAINAGE WATERSHED MANAGEMENT AREA

The Lower Raritan River Drainage WMA includes watersheds draining into the lower portion of the Raritan River, South River, and Lawrence Brook. This WMA lies mostly in Middlesex, Somerset and Monmouth Counties, and includes the Mainstem Raritan River, South River, Lawrence Brook, Manalapan River, and Matchaponix Brook watersheds. In particular, the northeast part of Monroe Township lies within the South River watershed, and according to GIS data, 57% of the Township is located in the South River watershed. The South River watershed is divided into two sub-watershed districts in the Township, the Manalapan Brook and the Matchaponix Brook watersheds.

The South River begins at Duhernal Lake in Spotswood and flows to the Raritan River at Sayreville. It is formed by the confluence of Manalapan (20 miles long) and Matchaponix (15 miles) Brooks, and it drains an area of 133 square miles. Other tributaries include Deep River and Tennants Brook. Land use in the upper part of this area is predominantly agriculture and forests. New industrial and residential developments are becoming incorporated into these areas and there is existing, older development in the South River sub-watershed. The population of this drainage area is concentrated in Spotswood, Old Bridge, East Brunswick and Sayreville. There are 5 NJPDES permitted dischargers in the South River Watershed and 11 biological monitoring stations in the South River and Lawrence Brook Watersheds combined.

The Mainstem Raritan River begins at the confluence of the North and South Branches to the Raritan Bay north of Sandy Hook. It is 31 miles long and drains parts of Somerset, Union, Middlesex and Monmouth Counties before emptying into the Raritan Bay. It is a densely populated drainage area, consisting of primarily urban and suburban land uses, with some industrial and commercial centers. There are two low dams in this river, Fieldsville Dam and Calco Dam. There are many small, recreational lakes and ponds in the area. The watershed has more than 70 NJPDES permitted dischargers and 29 biological monitoring stations.

The Raritan River is impacted by non-point source pollution from urban and suburban development. Additional non-point source pollution from landfills affects the lower portions of the river. Runoff from urban surfaces, storm sewers and roadways is an increasing problem in the watershed. Additional contamination sources are suspected from the land disposal of wastewater and from local chemical spills. The Raritan River near Bound Brook saw significant improvements since the beginning of the 1980s. The primary cause for improvement was the reduction in discharges from the American Cyanamid facility. In 1985 the company's discharge had been redirected to the Somerset Raritan Valley SA treatment plant.

THE MILLSTONE RIVER DRAINAGE WATERSHED MANAGEMENT AREA

The Millstone River Drainage WMA includes watersheds draining into the northern coastal plain of New Jersey, principally the Millstone River and its tributaries. This WMA lies mostly in Hunterdon, Middlesex, Somerset, Mercer, and Monmouth Counties, and includes the Millstone River, Stony Brook, and Bedens Brook watersheds. In particular, the southwest part of Monroe Township lies within the Millstone River watershed, and according to GIS data, 43% of the Township is located in the Millstone River watershed.

The Millstone River drains an area of 271 square miles, including parts of Hunterdon, Somerset, Middlesex, Mercer and Monmouth Counties. Major tributaries include Stony Brook, Cranbury Brook, Bear Brook, Ten Mile River, Six Mile River, and Bedens Brook, and the largest impoundment is Carnegie Lake. Land use in the Millstone River watershed is primarily suburban development with scattered agricultural areas, although there is extensive, recent development present in the upper portion. The population centers in this drainage basin are Princeton Township and Borough, Manville, South Brunswick Township, East and West Windsor Townships, Hightstown and Pennington Boroughs. There are over 40 NJPDES permitted dischargers and 81 biological monitoring sites in the entire WMA.

Flooding is a natural phenomenon in the Millstone River area. U.S. Geological Survey (U.S.G.S.) hydrologic data indicate that major floods occurred in 1936, 1938, 1948, 1955, 1960, 1961, 1971, January

1996, October 1996, September 1999 for the lower Millstone River valley. This significant problem is addressed in the Floodplains section of this report.

Monroe Township watersheds will continue to experience intense pressure from development. As land development and impervious cover continues to increase, stormwater related issues such as maintaining water quality, reducing impervious cover, and improving groundwater recharge will become even more crucial in order to attain the goals and objectives of both state and local governmental agencies.



Surface Hydrology

Monroe Township features a number of waterways from two important river systems, the South River and the Upper Millstone River systems. The important waterways include the Manalapan and Matchaponix Brooks, and the Millstone River. Lake Manalapan, an impoundment located in north-central Monroe, just south of the Borough of Jamesburg, is fed by the Manalapan. There are also numerous smaller tributaries and lakes that are important to the residents of Monroe.

MANALAPAN BROOK

Manalapan Brook enters the Township from the southeast and travels northwest to Lake Manalapan, where it turns northeast to merge with Matchaponix Brook. It suffers from pollution at different points along its course. It has slight to moderately elevated phosphorus levels, but acceptable levels of inorganic nitrogen. The latest testing suggests a problem with lead in the Brook.

New Jersey PIRG lists the following contaminants at specified locations in Manalapan Brook:

Near Manalapan:

- Fecal coliform
- Total phosphorus

Near Spotswood:

- Fecal coliform
- Total phosphorus
- pH

Near Federal Road in Monroe Twp.:

- Severely impaired



MATCHAPONIX BROOK

The Matchaponix winds up the eastern border of Monroe and merges with Manalapan Brook near the Borough of Spotswood. Flowing to the north and northeast, it eventually feeds into South River, which in turn merges with the Raritan River. According to the USEPA in 2002, the Matchaponix is listed as impaired with levels of fecal coliform surpassing safe levels, and a high pH. It also has slight to moderately elevated phosphorus levels. In addition, the inorganic nitrogen levels recorded in the Matchaponix are very elevated. There is a lead problem in the Brook, as well as a potential zinc problem. However, according to the Consumer Confidence Report of 2004 conducted by United Water, the Manalapan/Matchaponix drinking water sources either met or surpassed all standards for drinking water quality as set by NJDEP. It should be noted, however, that that monitoring excluded asbestos, pesticides, and synthetic organic compounds, and included a reduction waiver for volatile organic compounds.

New Jersey PIRG lists the following contaminants at specified locations in Manalapan Brook:

Near Spotswood:

- Fecal coliform
- Total phosphorus
- pH

MILLSTONE RIVER

The Millstone River flows northwest through the southernmost portion of Monroe Township. It too eventually merges with the Raritan River near Manville. The River is 38 miles long and flows from Millstone Township in Monmouth County to the Raritan River near Manville. The River was stocked with Northern Pike in 1997, 1998, 1999, 2000, 2001, 2002, and 2003.

Nutrient enrichment, as reflected in total phosphorus, varies in the Millstone. It ranges from mild, near Manalapan, to severe at Blackwells Mill. The pattern for inorganic nitrogen is different. It is moderate (but acceptable) near Manalapan, very high at Grovers Mill, and lower again at Blackwells Mill. Grovers Mill shows severely depressed dissolved oxygen in the summer and fall. Elevated lead appears to be a problem in numerous locations. In addition, violations were recorded near Manalapan for zinc and at Grovers Mill for cadmium.

Sediments, nutrients, and pesticides are suspected of coming from croplands, and are believed to be severe in the East Windsor area where chronic fish kills have occurred in the past. It is a combination of agricultural and urban runoff that is suspected of degrading the fish communities in the upper Millstone River. Other nonpoint pollution sources have been reported in the Millstone watershed. Fuel oil spills have occurred in the Upper Millstone, causing fish kills. Landfills are assessed as problems, both in the upper watershed where recreational usage and ground water are impacted, and in South Brunswick where leachate

from a municipal landfill has been noted by local authorities as a problem.

NJPIRG lists the following contaminants and locations associated with the Millstone River:

Near Manalapan:

- Fecal coliform
- Total phosphorus
- pH

Near Grovers Mill:

- Fecal coliform
- Total phosphorus
- Dissolved oxygen

Near Kingston:

- Fecal coliform
- Total phosphorus
- Temperature
- pH

Near Blackwells Mills:

- Fecal coliform
- Total phosphorus

Near Weston:

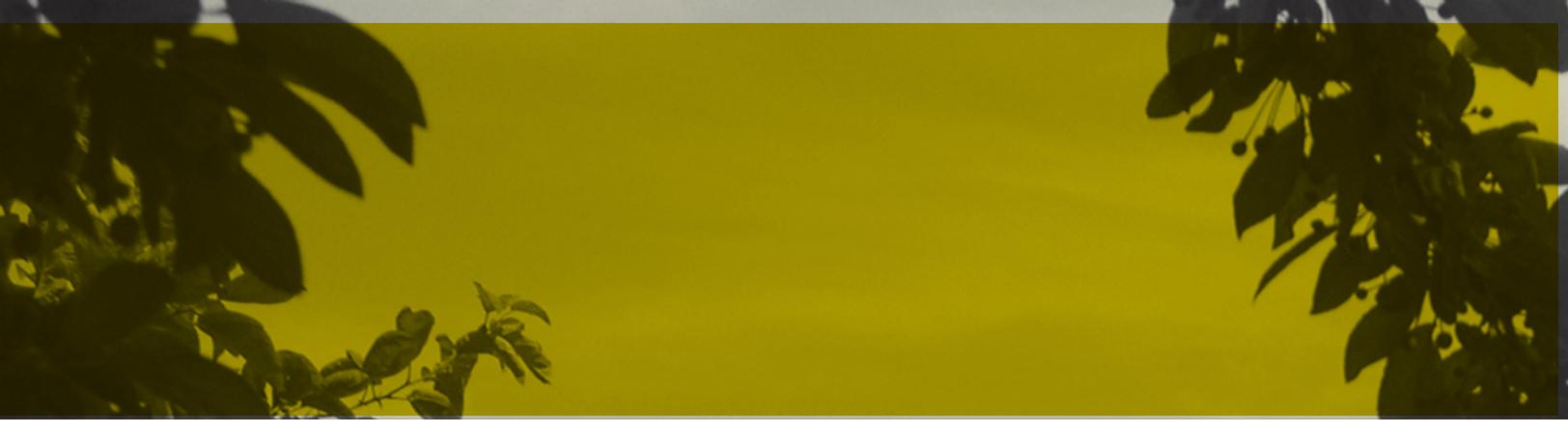
- Fecal coliform
- Total phosphorus
- pH

MANALAPAN LAKE

Manalapan Lake is a 48-acre lake at the downstream end of the Manalapan River. It is owned by Middlesex County, and located in Thompson Park, a 675-acre county park, just south of the Borough of Jamesburg. It is an impoundment that was dammed with concrete in 1910 after an earlier wooden dam washed away in a storm. The NJDEP Division of Fish and Wildlife stocks Lake Manalapan with different types of fish. In 2000 and 2003, the Lake was stocked with Channel Catfish. In 1999, it was stocked with Large Mouth Bass. In general, the Lake does not suffer from significant pollution. According to the USEPA Total Maximum Daily Loads analysis, the Lake is slightly impaired with nutrient pollution. The analysis found an unacceptable level of phosphorous originating from both point and nonpoint sources, but it ranked the severity of the pollutant as low.

SMALLER TRIBUTARIES

There are many smaller tributaries of the major rivers and brooks in Monroe Township. The Cranbury, Barkleys and Wigwam Brooks are tributaries of Manalapan Brook. Other smaller waterways in the southern area of Monroe that connect to the Millstone River include Shallow Brook, Cedar Brook, and Bentley Brook. Private bodies of water include Carroll's Lake, Dey's Pond, and Toth Pond. Carroll's Lake affords recreational swimming. Lake Marguerite is a dry lake located near the Spotswood border.



Soils

Knowledge of soil types, characteristics, and their geographic distribution can inform the planning and policy processes and influence the smart growth and development of a community. Data on soil depth, permeability, water table, and other physical properties are useful when determining the suitability of soils for foundation construction, location of septic fields, landscaping, and construction of roads, athletic fields and parks. The soil data in this report is provided by the National Resources Conservation Service of the United States Department of Agriculture, which started conducting national soil samples in 1999 and continues today.

Monroe Township has 62 different soils, divided into 26 major types. The land is generally level to gently sloping with most of the soils being 0 to 5 percent sloped. The most prevalent soils are the Sassafras series located throughout the central area of the Township, accounting for a little less than a quarter of the total land. These are deep well-drained soils that are often located on uplands and side slopes. Ranging from 0 to 15 percent, Sassafras soils are suitable for many urban uses. Woodstown series is the second most common soil type in the Township, consisting of an eighth of the total land. These soils consist of deep, moderately well-drained soils with 0 to 5 percent slopes. They are located on intermediate positions, on terraces and on toe slopes. The third major soil type is Fallsington series (8.2% of total land) that consists of deep, poorly drained soils located in low-lying flats and basins with slopes ranging from 0 to 2 percent.

The next three major soil types are the Elkton series (5.80 %), Humaquepts (5.17%), and Keyport series (4.76%). The Elkton series consists of deep, poorly drained soils found on broad low-lying flats, basins, and drainage-ways. Humaquepts consist of somewhat poorly drained to very poorly drained soils on flood plains with slopes ranging from 0 to 2 percent. They are subject to flooding several times each year. The Keyport Series consists of deep, moderately well drained soils located



on divides, terraces, side slopes and toe slopes. Slopes range from 0 to 15 percent.

The Hammonton series consists of deep, moderately well drained or somewhat poorly drained soils that are located on terraces. Slopes range from 0 to 3 percent. The Evesboro series consists of deep, excessively drained soils that are found on uplands, sandy knolls and terraces, and slope ranges from 0 to 15 percent.

Soil Series	Acres	Percent Total
Sassafras loam	598.02	23.47
Woodstown loam	315.02	12.37
Fallsington loam	208.87	8.20
Elkton loam	147.88	5.80
Humaquepts	131.81	5.17
Keyport loam	121.2	4.76
Mattapex silt loam	109.47	4.30
Atsion sand	107.22	4.21
Shrewsbury sandy loam	101.47	3.98
Matapeake loam	99.79	3.92
Downer loamy sand/loam	89.54	3.51
Galloway loamy sand	65.2	2.56
Evesboro sand	60.07	2.36
Lakehurst sand	56.19	2.21
Holmdel sandy loam	54.08	2.12
Sassafras-Urban land complex	49.29	1.93
Hammonton sand/loam	36.29	1.42
Pemberton loamy sand	35.35	1.39
Pits, sand, gravel, clay	35.01	1.37
Manahawkin muck	34.12	1.34
Tinton loamy sand	26.67	1.05
Woodstown-Urban land complex	20.92	0.82
Lakewood sand	19.09	0.75
Fort Mott loamy sand	11.43	0.45
Psammments	9.43	0.37
Mullica sandy loam	2.86	0.11
Klej loamy sand	0.89	0.03
Othello silt loam	0.44	0.02
Total Acres	2,547.63	100%

SOIL TYPES AND DEVELOPMENT CONSTRAINTS

AtsA	Atsion sand, 0 to 2 percent slopes	The seasonal high water table limits this soil for most types of community development due to risk of frequent flooding.
DocB	Downer loamy sand, 0 to 5 percent slopes	The soil is suitable for most urban uses. However, the high water table limits its use for houses with basements and septic tank sewage disposal fields. The soil is limited for use as recreational areas by the loose, sandy surface.
DocC	Downer loamy sand, 5 to 10 percent slopes	The main limitations to use this soil as sites for dwellings and some other types of community development are poor filter, seepage and slope. The sandy surface limits recreation uses. Erosion and sedimentation are hazards in areas cleared of trees.
DoeB	Downer sandy loam, 2 to 5 percent slopes	This soil is generally suitable for most urban uses but the main limitations to use this soil for playgrounds and other recreational use are poor filter and seepage
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded	The seasonal high water table, the low permeability and low strength are the main limitations of this soil. The low strength is a limitation of the soil as a site for local roads and streets.
EveB	Evesboro sand, 0 to 5 percent slopes	Runoff is very slow and the high water table can limit houses with basements and septic disposal fields. The main limitations for recreational areas are poor filter, cutbanks caving and sandiness.
EveC	Evesboro sand, 5 to 10 percent slopes	The main limitations to use of this soil as sites for dwellings and some other types of community development are poor filter, cutbanks caving, slope and sandiness.
EveD	Evesboro sand, 10 to 15 percent slopes	The main limitations to use of this soil as sites for all urban uses, especially dwellings and some other types of community development are poor filter, cutbanks caving, slope and sandiness.
FamA	Fallsington sandy loam, 0 to 2 percent slopes	The seasonal high water table is a major limitation of the soil for urban use, especially for septic systems, dwellings with basements, and roads and streets.
FapA	Fallsington loam, 0 to 2 percent slopes	The seasonal high water table, frost action and shrink-swell potential are the major limitations of this soil for urban use, especially for roads and streets.
FodB	Fort Mott loamy sand, 0 to 5 percent slopes	The rapid permeability in the substratum causes a hazard of ground-water pollution in areas of this soil used for waste disposal.
GamB	Galloway loamy sand, 0 to 5 percent slopes	
GamkB	Galloway loamy sand, clayey substratum, 0 to 5 percent slopes	

HbmB	Hammonton loamy sand, 0 to 5 percent slopes	Limitations of this soil for use as sites for dwellings with basements, septic disposal fields, recreation areas, and sanitary landfills are the seasonal high water table, poor filter and cutbanks caving.
HbmkB	Hammonton loamy sand, clayey substratum, 0 to 5 percent slopes	The perched seasonal high water table and the slow permeability are the major limitations of the soil for urban use, especially for septic systems, dwellings with basements, and roads and streets. The limitation of the water table can be reduced by using subsurface drains or open ditches.
HboA	Hammonton sandy loam, 0 to 2 percent slopes	Limitations of this soil for use as sites for dwellings with basements, septic tank disposal fields, sanitary landfills, and roads and streets are the seasonal high water table, poor filter and cutbanks caving.
HocA	Holmdel sandy loam, 0 to 2 percent slopes	Limitations of this soil for use as sites for dwellings and some types of community development are the seasonal high water table and cutbanks caving. Runoff is slow and erosion is a slight hazard.
HocB	Holmdel sandy loam, 2 to 5 percent slopes	Limitations of this soil for use as sites for dwellings and some types of community development are the seasonal high water table and cutbanks caving. Runoff is medium and erosion is a slight hazard.
HodA	Holmdel fine sandy loam, 0 to 2 percent slopes	Limitations of this soil for use as sites for dwellings and some types of community development are the seasonal high water table and cutbanks caving.
HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	These soils are poorly suited to urban uses and the main limitations are the seasonal high water table and frequent flooding (in early spring or after a heavy rainfall).
KemA	Keyport sandy loam, 0 to 2 percent slopes	Limitations for dwellings with basements, septic tank filter fields, and some recreation areas are the seasonal high water table, shrinking and swelling, slow percolation, and the high frost action potential.
KemB	Keyport sandy loam, 2 to 5 percent slopes	Limitations for dwellings with basements, septic tank filter fields, and some recreation areas are the seasonal high water table, shrinking and swelling, slow percolation, and the high frost action potential.
KemD	Keyport sandy loam, 10 to 15 percent slopes	Limitations of use of this soil as sites for dwellings with basements, septic tank filter fields, and some recreation areas are the seasonal high water table, shrinking and swelling, slow percolation, slope, and the high frost action potential.
KeoA	Keyport loam, 0 to 2 percent slopes	The slow permeability, high frost-action potential, and seasonal wetness limit this soil for most urban uses.
KeoB	Keyport loam, 2 to 5 percent slopes	The main limitations of this soil for urban uses are the seasonal high water table (limits dwellings with basements), the slow permeability (limits on-site septic systems) and high frost-action potential (limits local roads and streets).

KeoC	Keyport loam, 5 to 10 percent slopes	The main limitations of this soil for urban uses are the seasonal high water table (limits dwellings with basements) and the slow permeability (limits on-site septic systems).
KeoD	Keyport loam, 10 to 15 percent slopes	The main limitations of this soil for urban use are the slope, the seasonal high water table, the slow permeability, erosion, and the frost-action potential. These especially affect on-site septic systems, dwellings with basements, and local roads and streets.
KkgB	Klej loamy sand, 0 to 3 percent slopes	The main limitations to use of this soil as sites for dwellings with basements, septic tank filter fields, sanitary landfills and most recreation areas are seasonal high water table (between October and April), cutbanks caving and sandiness. The high sand content also limits most recreational uses.
LakB	Lakehurst sand, 0 to 5 percent slopes	The seasonal high water table (between October and April) limits the soil as sites for houses with basements, septic disposal fields and sanitary landfills. The high sand content limits its use for most recreational uses.
LasC	Lakewood sand, 5 to 10 percent slopes	Limitations for dwellings and some other types of community development are poor filter, cutbanks caving, sandiness and slope. The rapid permeability of the soil is a limitation for sanitary landfills.
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	The main limitations of this soil as sites for most urban uses are ponding, flooding, cutbanks caving and subsidence of the surface layer due to low strength.
MbrA	Matapeake silt loam, 0 to 2 percent slopes	Generally suitable for most urban uses, the permeability limits the soil as a site for septic tank absorption fields and most recreation uses.
MbrB	Matapeake silt loam, 2 to 5 percent slopes	Generally suitable for most urban uses, the permeability limits the soil as a site for septic tank absorption fields and most recreation uses.
MbuA	Mattapex silt loam, 0 to 2 percent slopes	The permeability and the seasonal high water table limit this soil for most non-farm uses, especially as a site for septic tank filter fields, dwelling foundations, and local roads and streets. Water ponds for short periods in depressions, and such areas are usually difficult to drain.
MbuB	Mattapex silt loam, 2 to 5 percent slopes	The permeability and the seasonal high water table limit this soil for most non-farm uses, especially as a site for septic tank filter fields, dwelling foundations, and local roads and streets.
MumAr	Mullica sandy loam, 0 to 2 percent slopes, rarely flooded	The main limitations for most urban uses are the seasonal high water table (from November to June), cutbanks caving and ponding on the surface due to poor drainage.
PegB	Pemberton loamy sand, 0 to 5 percent slopes	The main limitations to the use of this soil as sites for dwellings or some other types of community development are the seasonal high water table, frost action and cutbanks caving.

PHG	Pits, sand and gravel	These are areas that have been excavated for sand and gravel. Trees have re-grown in some pits and some abandoned pits are used as dumps. The properties and characteristics differ from place to place. For most uses onsite investigation and evaluation are needed.
PHM	Pits, clay	These are borrow pits that have been excavated for clay. Some of the pits have been smoothed and some have mounds. Some areas are used for sanitary landfills or for building sites or recreation areas. For most uses onsite investigation and evaluation are needed.
PssA	Psamments, 0 to 3 percent slopes	These soils consist of well drained soils such as sandy fill material placed in low, poorly drained areas. The properties and characteristics differ from place to place. For most uses onsite investigation and evaluation are needed.
PsuB	Psamments, waste substratum, 0 to 8 percent slopes	These are reclaimed areas or areas used as sanitary landfills where 24 to 48 inches of sandy fill material has been placed over refuse. It is subject to subsidence and uneven settling, and decomposition of the refuse causes liquid and gas formation. For most uses onsite investigation and evaluation are needed.
SacA	Sassafras sandy loam, 0 to 2 percent slopes	Suitable for most urban uses with few or no limitations.
SacB	Sassafras sandy loam, 2 to 5 percent slopes	Generally suitable for most urban uses. Limitations to some types of community development are cutbanks caving and frost action.
SacC	Sassafras sandy loam, 5 to 10 percent slopes	The main limitations of this soil for urban uses are cutbanks caving, frost action and slope.
SadB	Sassafras gravelly sandy loam, 2 to 5 percent slopes	The only limitations to use of this soil for development are cutbanks caving and frost action. The permeability in the subsoil is a limitation of this soil as a site for waste disposal. The slope and gravel content limit recreation uses.
SadC	Sassafras gravelly sandy loam, 5 to 10 percent slopes	The main limitations to use of this soil as sites for development are cutbanks caving, frost action and slope. The permeability in the subsoil is a limitation of this soil as a site for waste disposal. The slope and gravel content limit recreation uses.
SadD	Sassafras gravelly sandy loam, 10 to 15 percent slopes	The main limitations to use of this soil as sites for development are cutbanks caving, frost action and steep slope. The permeability in the subsoil is a limitation of this soil as a site for waste disposal. The slope and gravel content limit recreation uses. Erosion is a hazard due to the steep slope.
SafA	Sassafras loam, 0 to 2 percent slopes	Suitable for most urban uses with few or no limitations. Limitations for waste disposal.

SafB	Sassafras loam, 2 to 5 percent slopes	Suitable for most urban uses with few or no limitations. Limitations for waste disposal.
SapB	Sassafras-Urban land complex, 0 to 5 percent slopes	Suitable for most urban uses with few or no limitations. Soils and urbanized areas (such as concrete, asphalt, buildings or other structures) present in an intricate pattern.
ShrA	Shrewsbury sandy loam, 0 to 2 percent slopes	The main limitations to the use of this soil as sites for dwellings or some other types of community development are a seasonal high water table (usually between the surface and depth of 1 foot from October to June), slow percolation, frost action and cutbanks caving. Runoff is slow and water ponds on the surface.
ThgB	Tinton loamy sand, 0 to 5 percent slopes	The soil is suitable for most urban uses, with the limitation for dwellings or some other types of community development is cutbanks caving. The slope is a limitation for playgrounds.
WoeA	Woodstown sandy loam, 0 to 2 percent slopes	The main limitations to the use of this soil as sites for dwellings and some other types of community development, including local roads and streets, are seasonal high water table (in late winter and early spring), frost action and cutbanks caving.
WoeB	Woodstown sandy loam, 2 to 5 percent slopes	The main limitations to the use of this soil as sites for dwellings and some other types of community development, including local roads and streets, are seasonal high water table (in late winter and early spring), frost action and cutbanks caving.
WeekA	Woodstown sandy loam, clayey substratum, 0 to 2 percent slopes	The seasonal high water table (in late winter and early spring) and slow permeability in the substratum limit the soil for some urban uses.
WeekB	Woodstown sandy loam, clayey substratum, 2 to 5 percent slopes	The seasonal high water table (in late winter and early spring) and slow permeability in the substratum limit the soil for some urban uses.
WogA	Woodstown loam, 0 to 2 percent slopes	The main limitations to the use of this soil as sites for dwellings or some other types of community development are seasonal high water table, frost action and cutbanks caving.
WogB	Woodstown loam, 2 to 5 percent slopes	The main limitations to the use of this soil as sites for dwellings or some other types of community development are seasonal high water table, frost action and cutbanks caving.
WooB	Woodstown-Urban land complex, 0 to 5 percent slopes	Soils and urbanized areas (such as concrete, asphalt, buildings or other structures) present in an intricate pattern.



Geology

Monroe Township is located within the New Jersey Coastal Plain Physiographic Province. This province is part of the northern Atlantic Coastal Plain aquifer system, which extends from Long Island, New York to the southeast boundary of North Carolina, and is the major drinking water resource for the southern half of New Jersey. The New Jersey Coastal Plain is about one-fifth of the northern Atlantic Coastal Plain. In general, this province is characterized by a southeastward thickening wedge of unconsolidated gravel, sand, silt, and clay of Early Cretaceous (about 60 million years ago) to Holocene or present age, which are more than 6,500 feet thick in southern Cape May County. (1)

Generally, the surficial geologic sediments in Monroe vary from oldest on the west to youngest on the east side of the Township. Sediments along the NJ Turnpike and in areas of the Township known as Prospect Plains, Union Valley, Applegarth, and extending west terminating at Gravel Hill, are Miocene Age (about 5 million to 20 million years ago) and are known as the Pennsauken Formation. The Pennsauken varies in thickness in these areas of town from 60 feet thick near the New Jersey Turnpike Interchange 8A and Prospect Plains areas of town to 40 feet thick near Half Acre and 20 to 30 feet thick in the Gravel Hill, Applegarth, and southern portions of town along the Millstone River (3). The Pennsauken Formation is greater than 60 feet thick along Half Acre Road between Prospect Plains Road and Forsgate Road where the surface elevation in the town is 160 feet above mean sea level. In and around Thompson Park the Pennsauken Formation is about 50 feet to 60 feet thick. The Pennsauken is generally characterized by orange to reddish-brown, angular to subrounded, coarse- to fine-grained sand, gravel, silt, clay, cobbles, and boulders (2) (3). The Pennsauken Formation is also mapped in the Township as paralleling Buckelew Avenue (County Route 522) from an area just northwest of Barclay Brook/Brookside Schools and trending southeast along Route 522 towards Englishtown (3). The Pennsauken in this portion of town is about 20 feet thick. The Pennsauken

Formation is also mapped in the area of the intersection of Grace Hill Road and Spotswood-Gravel Hill Road and north to the intersection of Spotswood-Gravel Hill Road and Matchaponix Avenue. In this area, the Pennsauken is less than 20 feet thick.

The younger sediments, beginning in a curved line parallel to the Manalapan Brook and defined by the Outcalt section, Jamesburg, Thompson Park, and the area immediately west of Gravel Hill were deposited in the Pleistocene and Holocene Ages (about present to 1 million years ago). These sediments are known as Colluviums (weathered material) and Alluvium (river / stream) deposits, which are comprised of poorly-sorted sand, gravel, silt, and clay comprised of dominantly quartz rich sands with variable amounts of heavy minerals, glauconite, chert, and clasts of ironstone-cemented horizons (2). The Colluvium and Alluvium deposits are also mapped in the southern portion of town in a small area along Cedar Brook in Prospect Plains and in the lower elevated areas along Cranbury Brook and the Millstone River. The youngest sediments (Recent Age) in the township are mapped along the streams, brooks, and rivers as Alluvium and Swamp deposits.

Bedrock geology beneath the Township is comprised of the Magothy Formation, Merchantville Formation, Woodbury Formation, and Englishtown Formation. These units are listed from oldest to youngest and are the oldest to the northwest and youngest to the southeast of the Township. These formations are encountered directly beneath the surficial sediments. The Magothy Formation (Upper Cretaceous) is comprised of fine- to

coarse-grained sand, stratified with thin to thick clayey beds. The major sand mineral is quartz, with mica and feldspar as minor constituents. In general this formation transgresses from fluvial (terrestrial deposits from streams) near the base of the formation to more marine in the upper portion of the formation, suggesting a slow transgression from terrestrial to marine during its deposition (4). The Magothy sediments in the Township are greater than 250 feet thick and occur in a northeast-southwest trending line beginning northwest of Prospect Plains near Forsgate Country Club and extends northeast through Jamesburg, including parts of Thompson Park, north of Pergola Avenue, and north of Texas Road to the Outcalt section of the Township.

The Merchantville Formation outcrop area is narrower than the outcrop area of the Magothy Formation and is comprised of mainly glauconitic sand with high quartz content, which is very clayey and silty. The Merchantville is thick-bedded with grayish-olive-green to dark-greenish-grey sediments (3). The Merchantville is about 20 feet to 60 feet thick exists in a northeast-southwest trending line from Prospect Plains to the northern end of Thompson Park (with a small finger of the Merchantville Formation mapped along Manalapan Brook and terminating just south of Schoolhouse Road), to the northeast of Buckelew Avenue across the west end of Grace Hill Road, extending northeast toward North State Home Road and Matchaponix Avenue to Spotswood-Englishtown Road in the area of the State Home for Boys and then northeast along Matchaponix Road to Texas Road.

The Woodbury Formation outcrops southeast of the Merchantville Formation and is mapped in the Township in the southern portion of town west and east of Applegarth Road between Wyckoff's Mills-Applegarth Road and Union Valley Road. The Formation trends in a northeast-southwest line between Union Valley and Prospect Plains sections of town toward the northeast and includes the areas of Thompson Park and northeast of the Park where the State Home for Boys is located. There is an area along the southern portion of the Manalapan Brook where the Woodbury is mapped as a 1-mile wide area (roughly 0.5 mile to the northeast and 0.5 mile southwest of Manalapan Brook) in the central and southern portion of the town beginning at Schoolhouse Road and terminating on Federal Road between the Gravel Hill and Tracy sections of town. The Woodbury Formation is a dark-grey clay-silt which weathers brown and orange pink ⁽⁴⁾. The Woodbury is a massive unit with thin stringers of glauconite near to top and finely dispersed pyrite, carbonaceous matter, and small pieces of carbonized wood throughout the Formation ⁽⁴⁾. The Woodbury maintains a fairly consistent thickness of about 50 feet throughout most of its outcrop belt ⁽⁴⁾.

The Englishtown Formation is present in the southern portion of town in a 2-mile wide area trending northeast southwest between Applegarth section and Perrineville Road northeast along Perrineville Road to Prospect Plains Road and east to Gravel Hill. The Formation is also present along Buckelew Avenue beginning at the intersection of Schoolhouse Road and Buckelew Avenue where the formation is less than a half-mile wide and widening to an area greater than 2 miles wide

as the formation extends southeast towards Englishtown. The Englishtown Formation is about 100 feet to 150 feet thick in the township area and is comprised of fine- to coarse-grained medium to dark-grey sand, with gravel. Feldspar, glauconite, and muscovite are minor sand constituents and the unit is pyretic, especially in carbonaceous-rich beds ⁽⁴⁾.

Footnotes:

- (1) *Martin, Mary 1990, Ground-Water Flow In The New Jersey Coastal Plain, Regional Aquifer-System Analysis; U.S. Geological Survey Open-File Report 97-528.*
- (2) *Newell, Wayne L and others. 2000. Surficial geologic map of central and southern New Jersey; U.S. Geological Survey Miscellaneous Investigations Series Map I-2540-D.*
- (3) *Stanford, Scott D. 2002. Surficial Geology of the Jamesburg Quadrangle, Middlesex and Monmouth Counties, New Jersey; Department of Environmental Protection New Jersey Geologic Survey Open-File Map OFM 45.*
- (4) *Owens, James P. and others. 1998. Bedrock geologic map of central and southern New Jersey; U.S. Geological Survey Miscellaneous Investigations Series Map I-2540-B.*



Hydrogeology

The New Jersey Coastal Plain Aquifer System covers about 4,200 square miles. More than half of the land area is below an altitude of 50 feet above sea level. The area is largely surrounded by salty or brackish water and is bounded by the Delaware River on the west, Delaware Bay on the south, the Atlantic Ocean on the east, and Raritan Bay on the north (1).

Ground water use for public supply in the Coastal Plain area was about 250 million gallons per day (MGD) in 1978. Use of surface water for public supply in this same area amounts to 79 MGD. Of the estimated 400 MGD withdrawn from the Coastal Plain aquifer system in 1978, approximately seventy-five percent (75%) was used for drinking water purposes to serve 2.3 million people (1).

Estimates for industrial and commercial consumption of ground water range from 75 MGD (USGS, 1978) to 97 MGD (NJ Water Supply Master Plan, WSMP, 1976). Agriculture is also a major consumer of ground water, pumping anywhere from 11 MGD (USGS, 1978) to 50 MGD (NJWSMP, 1976). No accurate tally of domestic consumption in the Coastal Plain Area is available; however, the New Jersey Water Supply Master Plan estimates that as much as 40 MGD of ground water was pumped to private households (1).

The New Jersey Coastal Plain sediments are a seaward-dipping wedge of alternating layers of sand, silt, and clay overlying crystalline bedrock. The Cretaceous Age sediments in Monroe Township (Potomac-Raritan-Magothy aquifer, Merchantville Formation and Woodbury Clay confining units, and Englishtown aquifer system) generally strike northeast-southwest and gently dip 10 feet to 60 feet per mile to the southeast. The overlying late Tertiary Age and Quaternary Age sediments in Monroe (Pennsauken Formation and Alluvial deposits) are generally flat lying. Recharge to these sediments is by infiltration of precipitation, leakage from surface water bodies, and lateral flow from other states. Water is discharged from the aquifers as flow to surface water bodies, evapotranspiration and withdrawals from wells (2).

The portion of the Potomac-Raritan-Magothy aquifer system that outcrops in the Township is the Magothy Formation. In this northern part of the Coastal Plain, the Potomac-Raritan-Magothy aquifer system is divided into two aquifers. They are the Old Bridge aquifer (Magothy age) and the Farrington aquifer (mainly Raritan age) (1).

The Old Bridge sand member of the Magothy Formation is predominantly a light-colored fine to medium sand which is extensively cross-bedded and inter-bedded with dark-grey laminae and local clay layers. The aquifer thickness is reported to be anywhere between 40 feet to as much as 100 feet thick (3, 4). The Old Bridge aquifer is an extremely important aquifer in the southern portion of the Middlesex County and supplies more than half of the water used for industrial and public water supplies (4). Water quality from the Old Bridge sand is excellent probably because most of the water used is pumped from or near its recharge areas where water is not confined by an overlying clay. At least two of Monroe Township's supply wells in the northern part of the township pump water from the Old Bridge aquifer. These wells are about 200 feet deep and at the time they were drilled, yielded anywhere between 500 and 900 gallons per minute (gpm). Generally, the well screens are installed to tap water from coarse sand and gravel layers (about 160 feet below ground surface [bgs] in one well log) which are well below clay lenses noted at 50 feet and then again at 120 feet below ground surface.

One supply well in the township has been installed to tap water from a deeper aquifer (Farrington aquifer), which is a sandy member of the Raritan

Formation, present below the Magothy Formation. The Farrington aquifer is comprised of a fine to medium-grained quartz sand, which is cross-bedded and very micaceous and inter-bedded with thin to thick dark silt beds (3). Reported thicknesses of the Farrington Sand are 34 feet to 80 feet thick (3, 4). Monroe Township's well at the time it was installed was capable of yielding about 800 gpm. The well log for this well indicates that the top of the Farrington aquifer in Monroe is about 273 feet bgs. A thick confining unit known as the Woodbridge Clay separates the Old Bridge aquifer from the Farrington aquifer and occurs between about 260 feet and about 273 feet bgs.

Overlying the Potomac-Raritan-Magothy Formation is the Woodbury-Merchantville Confining Unit, which is made up of the Woodbury Clay and the Merchantville Clay. These units are each about 50 feet to 60 feet thick. They are both a black micaceous clay, but also contain some sand and hydrogeologically are typically considered together as a 100 foot thick relatively impermeable layer of clay between the underlying Potomac-Raritan-Magothy Formation and the overlying Englishtown Formation (4). Much of the central portion of the township is underlain by the Woodbury-Merchantville Clays which results in the formation of many of the township's wetland areas.

The Englishtown Formation is a fine- to coarse-grained medium to dark-grey sand, with gravel and overlies the Merchantville and Woodbury confining unit. This aquifer is generally about 100 feet thick and is overlain by the Marshalltown-Wenonah confining unit in the extreme southeastern portion of the township. The Englishtown Formation

outcrops in Monroe Township as described in the Geology section above. Water from the Englishtown Formation is good quality, although more mineralized than the Old Bridge or Farrington aquifers (4).

The Pennsauken Formation (discussed in the Geology section above) varies in thickness, but is as much as 60 feet thick in selection portions of Monroe. Large supplies of water have not been developed from the Pennsauken Formation, although many small water supplies for domestic and farming uses have come from wells tapping the Pennsauken. The principal importance from a hydrogeologic standpoint is the fact that the Formation readily absorbs water from precipitation and transmits it to the underlying aquifers tending to increase their effective intake area. Much of the intake area of the Farrington and some of the intake of the Old Bridge aquifers are overlain by the Pennsauken (4).

The colluvial and alluvial deposits are recently deposited materials that are relatively impermeable and of no importance as a source of large water supply development in Monroe.

Below is an excerpt from the U.S. Environmental Protection Agency (USEPA) website concerning the sole source aquifer designation for the Coastal Plain Aquifer System of New Jersey:

The Coastal Plain Aquifer System of New Jersey is an interrelated hydrologic system which responds to natural and manmade stresses. The wedge of unconsolidated sediments underlying the Coastal Plain Aquifer System of New Jersey

is comprised of a series of hydrologic units that have varying thickness, lateral extent, and water-bearing characteristics. Some of the units act as aquifers, while others act as confining beds. Previous to development by wells, the groundwater system is in a state of dynamic equilibrium.

Withdrawal of ground water by wells is a stress superimposed on a previously balanced groundwater system. The response of an aquifer to pumping stresses may result in an increase in recharge to the aquifer, a decrease in the natural discharge, a loss of storage within the aquifer, or a combination of these effects. Also, the response of an aquifer to stress may extend beyond the limits of the aquifer being evaluated.

The following findings, which are the basis for the determination:

- (1.) The New Jersey Coastal Plain Area depends upon the under-lying Coastal Plain Aquifer System for seventy-five percent (75%) or more of its drinking water to serve 3 million people.*
- (2.) Data show that the formations of the New Jersey Coastal Plain Area are hydrologically inter-connected such that they respond collectively as an interrelated aquifer system.*
- (3.) If the aquifer were to become contaminated, exposure of the persons served by the system would constitute a significant hazard to public health.*
- (4.) Alternative supplies capable of providing fifty (50) percent or more of the drinking water to the designated area are not available at similar economic costs (1).*

According to the New Jersey Department of Environmental Protection (NJDEP), New Jersey Geological Survey webpage (www.state.nj.us/dep/njgs/geodata/dgs02-2.htm), well head protection area (WHPA) delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Area Protection Program (SWAP). The delineations are a first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP. WHPA delineation methods are described in "Guidelines for Delineation of Well Head Protection Areas in New Jersey". The webpage indicates that Monroe Township is included on the list of Public Community Water Supply Delineations as of March 8 2005.

Based on the excerpt from the USEPA and NJDEP New Jersey Geological Survey websites, growth in Monroe needs to carefully consider the long term effects of all future land development with respect to the designation of the New Jersey Coastal Plain as a Sole Source Aquifer and with respect to Monroe Township's water supply resources and established well head protection areas.

Footnotes:

1. USEPA website <http://www.epa.gov/region2/water/aquifer/petition>
2. Martin, Mary 1990, *Ground-Water Flow in the New Jersey Coastal Plain, Regional Aquifer-System Analysis*; U.S. Geological Survey Open-File Report 97-528.
3. Owens, James P. and others. 1998. *Bedrock geologic map of central and southern New Jersey*; U.S. Geological Survey Miscellaneous Investigations Series Map I-2540-B.
4. Barksdale, Henry C. and others. 1943. *The Ground-Water Supplies of Middlesex County, New Jersey*; State of New Jersey State Water Policy Commission, Special Report 8.

Steep Slope

Disturbance to steep slopes can affect plant life and drainage patterns, increase the amount and speed of runoff and can cause erosion, soil creep, slumping (sections of soil shifting down and outward on the slope), and landslides.

Runoff carries eroded sediments to lowland areas, to wetlands, ponds, lakes and streams, where the resulting turbidity and siltation can damage or destroy aquatic life and disrupt the ability of wetlands to filter and purify water. This combination of increased runoff and siltation affects the ability of streams and wetlands to retain water, changing the pattern and rate of the water's rise and fall and causing increased flooding. Turbidity and siltation also contribute to the eutrophication process in lakes, speeding the natural aging process.

Dramatic runoff problems often result when slopes are covered with impervious surfaces, such as buildings, roads, driveways and parking lots. Since water can't percolate into the soil, it runs off the site, picking up speed as it travels across these surfaces. Eroding surrounding soils, this high velocity runoff carries increased amounts of silt into nearby surface waters.

In addition to the obvious problems of runoff, erosion and landslides, altering the soils or vegetation on slopes may also reduce the percolation of water into the soil and disrupt the recharge of groundwater and aquifers. Aquifers in areas of steep bedrock, as in parts of northern New Jersey, do not contain much water. Poorly designed or excessive development that disrupts aquifer recharge while increasing the demand for water for human consumption can result in periodic or permanent water shortages. Aquifers can be damaged by the heavy road salting typical in hilly areas and from septic installation on slopes, where soils are thin or otherwise unsuitable for leach fields. In such areas, septic effluent may seep out on the face of the hillside.



Steep slopes are inclines in land topology greater than 15 percent, and can deter development due to high construction costs and possible negative environmental impacts. There are very few areas of Monroe Township with this feature. The greatest example can be found cutting through the middle of the Township along the main tributary of Manalapan Brook and ringing Manalapan Lake, which has slopes in excess of 25 percent in some parts. Other steep slopes occur along other tributaries of the Manalapan Brook and other brooks. The entire Township is located within the Inner Coastal Plain, which is characterized by relatively flat land and is typified by soils of 0 to 8 percent slopes.

Caution should be exercised when planning in areas with steeply sloped terrain. Disturbances to plant vegetation can cause soil erosion, which in turn can pollute streams and cause sedimentation problems. Likewise, alteration in drainage patterns and increases in the amount and speed of runoff and can cause erosion, soil creep, slumping (sections of soil shifting down and outward on the slope), and landslides. For the most part, development should be avoided on steep slopes to avoid these problems and to conserve what are in many cases aesthetic corridors these natural landforms provide.

Wetlands, land which is either submerged or retains water at ground level for a portion of the year, includes marshes, swamps, and bogs. They cover approximately 15,500 acres of land in the Township as identified in the Wetlands map.

Wetlands

Wetland areas provide natural flood control by storing excess water and releasing it to surface waters over time. Wetlands also serve as filtration systems, removing pollutants from the water table and storing them in biomass; and they serve as ground water recharge areas. As the total wetland area decreases and their natural functions decrease over a period of years, the overall quality and quantity of the surface water flow within the watershed is altered. Often, expensive man-made utilities are required to make up for the loss of wetlands.

A community that incorporates growth while maintaining or improving wetlands and wetlands function can achieve lower flood peaks, fewer drought periods, more wildlife and wildlife habitat, and better surface water quality than comparable watersheds with fewer wetlands. Wetlands also provide recreational opportunities for boating, hiking and bird watching.

The NJDEP Land Use Regulation Program manages Stream Encroachment Permitting in the state, more information, such as that provided below, is available at the programs website: <http://www.state.nj.us/dep/landuse/fw.html>

Freshwater wetlands protection is governed by section 404 of the “Federal Water Pollution Control Act Amendments of 1972” as amended by the Clean Water Act of 1977”. The Freshwater Wetlands Protection Act requires NJDEP to regulate virtually all activities proposed in the wetland, including cutting of vegetation, dredging, excavation or removal of soil, drainage or disturbance of the water level, filling or discharge of any materials, driving of pilings, and placing of obstructions. If you want to pursue activities in an area within 150 feet of a wetland, you may be in a transition area (sometimes called a buffer) and you may need a DEP transition area waiver. A transition area is a strip of land bordering the wetlands. The width of the transition area may vary



from 150 feet down to nothing, depending on the value of the particular wetland. For example, a wetland containing endangered species habitat would require a 150-foot wide transition area, whereas a small wetland in a ditch might not require any transition area at all. Most freshwater wetlands require a 50-foot transition area.

NJDEP has developed a system for the classification of freshwater wetlands based upon criteria, which distinguish among wetlands of exceptional resource value, intermediate resource value, and ordinary resource value.

Freshwater wetlands of exceptional resource value shall be freshwater wetlands, which exhibit any of the following characteristics:

- (1) Those which discharge into FW-1 water and FW-2 trout production (TP) waters and their tributaries; or
- (2) Those which are present habitats for threatened or endangered species, or those which are documented habitats for threatened or endangered species which remain suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat. A habitat shall be considered a documented habitat if the department makes a finding that the habitat remains suitable for use by the specific documented threatened and endangered species, based upon information available

to it, including but not limited to, information submitted by an applicant for a freshwater wetlands permit. An applicant shall have the opportunity to request the department that a documented habitat not result in the classification of a freshwater wetland as a freshwater wetland of exceptional value if the applicant can demonstrate the loss of one or more requirements of the specific documented threatened or endangered species, including, but not limited to wetlands or overall habitat size, water quality, or vegetation density or diversity.

Freshwater wetlands of ordinary value shall be freshwater wetlands, which do not exhibit the characteristics enumerated in subsection a. of this section, and which are certain isolated wetlands, man-made drainage ditches, swales, or detention facilities.

By default, freshwater wetlands of intermediate resource value are all freshwater wetlands not considered ordinary or exceptional.

There are many small activities that can be pursued in a transition area under general permits, like the general permits discussed above, for activities in freshwater wetlands. In addition, in some cases the transition area's shape may be altered to allow an activity, without diminishing its total size. This is called transition area averaging.

Wetland have certain characteristics that provide benefits to surrounding communities, as such care should be taken to protect them. They provide natural flood and stormwater control by slowing water runoff and temporarily storing excess water and slowly releasing it to surface waters. They also serve as aquifer recharge areas. They can server as chemical and biological purifiers, as well as sediment filtration systems, removing and storing silt and organic matter and from water to protect downstream water quality. Wetlands provide breeding, nesting and feeding grounds for a diversity of wildlife, including migratory waterfowl. As the total area of wetlands and their natural functions decrease, the overall quality and quantity of surface water is altered. Often, expensive man-made utilities are required to make up for the loss of wetlands. Fisheries, recreation, open space and aesthetic, education and scientific research...

The southern half of Monroe Township is dominated by wetlands. These wetlands are found through out the floodplains of the Manalapan Brook, Cranbury Brook, Bentley Brook and the Millstone River. Development throughout this area is constrained by the presence of wetlands on most sites. However, wetlands transition area averaging allows development to continue in the various upland areas that are interspersed throughout the wetlands. Significant portions of the area have either been purchased for open space preservation or are targets for acquisition.

The wetlands found within the northern half of the Township are found primarily along Matchaponix Brook and Manalapan Brook and their tributaries. These wetland areas are far more linear in nature and it is likely that significant wetlands areas have already been disturbed by development over the previous century.

Many of the wetlands area are protected by their coincidence with the flood hazard area zones that prohibit development and the protection afforded by the Freshwater Wetlands Act. However, through general permits and wetlands transition area averaging, significant amounts of wetlands are still threatened throughout the Township and remain an open space acquisition priority.



Flood Plains

Floodplains are a vital part of any river or estuary ecosystem, acting as water filters and wildlife nurseries. They are important for the maintenance of water quality, providing fresh water to wetlands and backwaters while diluting salts and nutrients. Floodplains are major centers of biological life in the river and estuary ecosystem and improve the overall health of the habitat used by many species of birds, fish, and plant. They are important biologically, as they represent areas where many species reproduce and as such are important for breeding and regeneration cycles.

New Jersey regulates construction in the floodplain under the Flood Hazard Area Control Act, N.I.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. The NJDEP Land Use Regulation Program manages Stream Encroachment Permitting in the state, more information, such as that provided below, is available at the programs website: <http://www.state.nj.us/dep/landuse/se.html>

The state regulates work in floodplains for two reasons. First, such regulation protects the person who is building from loss of life and property in case of a flood. Flooding causes an estimated \$3 billion of damage in the United States every year. State regulations minimize the damage by ensuring that buildings are placed in safe areas, and are constructed to withstand high water.

The second reason to regulate building in flood plains is to protect other properties along the stream or pond from flood damage. When you build on a flood plain and the waters begin to rise, the buildings on your property displace water thus increasing the height of the rising waters and making the flooding worse everywhere along the banks. In addition, your buildings and pavement cover the natural ground surface that would have helped soak up the water. Therefore, the more buildings and pavement allowed, the higher the flood



waters along that water body will rise, and the worse the flooding problems will get. Even if a building is permissible in the flood plain, regulations are necessary to ensure that it is strongly constructed so that it won't wash away in floodwaters, causing danger and damage downstream.

The flood plain is made up of two parts - the floodway and the flood fringe. The floodway is the inner area where floodwaters are deep and move fast. The floodway always includes the streambed or lakebed where the water normally flows, and usually extends to the top of the bank (if there is a defined bank) and sometimes beyond. The flood fringe is the outer area where floodwaters move more slowly, appearing more still, like a lake or pond.

A building in a floodway will block the water's flow, backing up water and causing flooding upstream to worsen. A building in a flood fringe will prevent floodwaters from spreading out, thus forcing floodwaters downstream faster and increasing downstream flooding.

There are two types of stream encroachment permits - minor and major. If the flooding impact of an activity is easy to assess, and the activity will have only minor impacts on flooding, the activity will require a minor permit. An activity whose flooding impact cannot be assessed without complex calculations, and which may have a substantial impact on flooding, will require a major permit. For example, a minor permit is

required for a utility line, footbridge, or single family home (that is not part of a larger development), while a major permit is required for a road crossing over a stream, or a large or complex project. In some cases, the work you want to do may not require a permit at all.

If you need to apply for a major or minor permit, you will probably have to hire a licensed engineer to prepare drawings of the proposed work. In addition, for a major permit, you will need the engineer to prepare calculations showing the effect of your project on upstream and downstream flooding conditions.

The 100-year floodplain boundary area has been established by the Federal Emergency Management Administration (FEMA) to denote floodwater impoundment areas. These areas are highly restrictive in order to avoid destruction of flood areas and the destruction of property that has been improperly located and therefore subject to flooding. FEMA designates different flood hazard areas according to the chance of annual flooding.

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study by approximate methods of analysis. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. Mandatory flood insurance purchase

requirements apply.

Zone AE and A1-A30

Zones AE and A1-A30 are the flood insurance rate zones that correspond to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study by detailed methods of analysis. In most instances, Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 1-percent shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average flood depths derived from the detailed hydraulic analyses are shown within this zone. In addition, alluvial fan flood hazards are shown as Zone AO on the Flood Insurance Rate Map. Mandatory flood insurance purchase requirements apply.

Zones B, C, and X

Zones B, C, and X are the flood insurance rate zones that correspond to areas outside the 1-percent annual chance floodplain, areas of 1-percent annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1-percent annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1-percent annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is

not required in these zones.

Several areas of Monroe Township are located in what the Federal Emergency Management Agency (FEMA) considers to be a flood hazard area. The floodplain in the Township has similar locational characteristics as wetlands. The Township contains floodplain mainly in the southeastern section of the community and partly in the northern section along the major stream corridor such as Manalapan, Millstone and Matchaponix Brooks.

The floodplain in combination with the wetlands provides additional open space areas within the Township. Within the Township zoning, a delineation of the 100-year floodplain is established. As outlined in the zoning, no development can occur within this zone.

\$108-6.20. FHC FLOOD HAZARD/ CONSERVATION DISTRICT.

A. The Flood Hazard/Conservation District boundaries shown on the accompanying Zoning Map* are the flood hazard areas that were delineated by the Federal Department of Housing and Urban Development for the National Flood Insurance Program which was enacted in 1968 to protect house buyers who qualify for insurance. The limits of the Flood Hazard/Conservation District were determined through consideration of areas of stream flooding and proximity to environmentally sensitive areas. The exact boundaries of the flood hazard areas are set forth in current maps prepared by the Federal Emergency Management Agency (FEMA) and the New Jersey Department of Environmental Protection. Areas not detailed shall be established

according to the procedure as set forth in succeeding paragraph (3).

- (1) No principal or accessory building shall be permitted in the flood hazard area as determined by maps prepared by the Federal Emergency Management Agency (FEMA) and/or the New Jersey Department of Environmental Protection.
- (2) Realignment, channelization or piping of the waterway within this district shall be a conditional use subject to the approval of the New Jersey Department of Environmental Protection.
- (3) In the absence of detailed maps delineating the flood hazard areas by elevation, an applicant shall apply to the State of New Jersey Department of Environmental Protection for establishment of a stream encroachment line.

Critical Habitat Areas

The NJDEP Endangered and Non-Game Species Program created the Landscape Project as an ecosystem level approach to identifying and protecting species habitat in the state. The program identifies critical habitat areas and ranks them by the presence or absence of priority, threatened or endangered species. The habitat areas are divided into five broad habitat types, grasslands, forested wetlands, forest, emergent wetlands and beach. These five habitat types are then mapped into habitat blocks and the habitat blocks are ranked based on the presence or absence of priority, threatened or endangered species. Specific habitat areas for bald eagle foraging areas, urban peregrine falcon nests, and wood turtles have further augmented the information gathered for the different habitat types.

GRASSLAND HABITAT

The critical area maps for grassland dependent species were generated by selecting specific land-use classes from NJDEP's Land Use/Land Cover data set, aggregating the various, contiguous habitat patches into single grassland habitat patched and then ranking each patch for the presence or absence of Federal and State priority, threatened or endangered species.

- Agriculture Confined Feeding Operations
- Agriculture Cropland And Pastureland
- Agriculture Orchards/Vineyards/Nurseries/Horticultural Areas
- Agriculture Other Agriculture
- Other Urban Or Built-Up Land



Monroe has all of or portions of 80 distinct grassland habitat patches that either lie entirely within or that cross over into adjacent municipalities that total approximately 2620 acres of suitable grasslands habitat and 2300 acres of priority grasslands habitat, meaning habitat that is known to be inhabited by priority species.

FORESTED WETLAND

The critical area maps for forested wetland dependent species were generated by selecting specific land-use classes from NJDEP's Land Use/Land Cover data set, aggregating the various, contiguous habitat patches into single forested wetland habitat patched and then ranking each patch for the presence or absence of Federal and State priority, threatened or endangered species.

- Wetlands Atlantic White Cedar Swamp
- Wetlands Coniferous Scrub/Shrub Wetlands
- Wetlands Coniferous Wooded Wetlands
- Wetlands Deciduous Scrub/Shrub Wetlands
- Wetlands Deciduous Wooded Wetlands
- Wetlands Mixed Forested Wetlands (Coniferous Dominant)
- Wetlands Mixed Forested Wetlands (Deciduous Dominant)
- Wetlands Mixed Scrub/Shrub Wetlands (Coniferous Dominant)
- Wetlands Mixed Scrub/Shrub Wetlands (Deciduous Dominant)

Monroe has all of or portions of 263 distinct forested wetland habitat patches that either lie entirely within or that cross over into adjacent municipalities that total approximately 2980 acres of suitable forested wetland habitat and 5160 acres of priority forested wetland habitat, meaning habitat that is known to be inhabited by priority species.

FOREST

The critical area maps for forest dependent species were generated by selecting specific land-use classes from NJDEP's Land Use/Land Cover data set, aggregating the various, contiguous habitat patches into single forest habitat patched and then ranking each patch for the presence or absence of Federal and State priority, threatened or endangered species.

- Forest Coniferous Brush/Shrubland
- Forest Coniferous Forest (>50% Crown Closure)
- Forest Coniferous Forest (10-50% Crown Closure)
- Forest Deciduous Brush/Shrubland
- Forest Deciduous Forest (>50% Crown Closure)
- Forest Deciduous Forest (10-50% Crown Closure)
- Forest Mixed Deciduous/Coniferous Brush/Shrubland
- Forest Mixed Forest (>50% Coniferous With >50% Crown Closure)
- Forest Mixed Forest (>50% Coniferous With 10%-50% Crown Closure)

- Forest Mixed Forest (>50% Deciduous With >50% Crown Closure)
- Forest Mixed Forest (>50% Deciduous With 10-50% Crown Closure)
- Forest Old Field (< 25% Brush Covered)
- Forest Plantation
- Forest Severe Burned Upland Vegetation

Monroe has all of or portions of 102 distinct forested wetland habitat patches that either lie entirely within or that cross over into adjacent municipalities that total approximately 430 acres of suitable forested wetland habitat and 19,600 acres of priority forested wetland habitat, meaning habitat that is known to be inhabited by priority species.

EMERGENT WETLAND

The critical area maps for emergent wetland dependent species were generated by selecting specific land-use classes from NJDEP's Land Use/Land Cover data set, aggregating the various, contiguous habitat patches into single emergent wetland habitat patched and then ranking each patch for the presence or absence of Federal and State priority, threatened or endangered species.

- Wetlands Agricultural Wetlands (Modified)
- Wetlands Former Agricultural Wetland (Becoming Shrubby)
- Wetlands Freshwater Tidal Marshes
- Wetlands Herbaceous Wetlands
- Wetlands Saline Marshes
- Wetlands Severe Burned Wetlands

- Wetlands Vegetated Dune Communities
- Wetlands Wetland Rights-Of-Way (Modified)

Monroe has all of or portions of 281 distinct emergent wetland habitat patches that either lie entirely within or that cross over into adjacent municipalities that total approximately 2000 acres of suitable forested wetland habitat and 260 acres of priority forested wetland habitat, meaning habitat that is known to be inhabited by priority species.

WOOD TURTLE HABITAT

Critical areas for wood turtles are mapped following a four-step process. First, a one-mile radius is placed around each wood turtle sighting location in Natural Heritage Program Database. A 322-meter buffer is then applied to all streams that fall within this one-mile radius. The NJDEP Land Use/Land Cover data set is then overlaid on the buffered areas and all areas classified as urban, with the exception of power-line rights-of-way, are deleted from the buffer. NJDEP Freshwater Wetland Maps are overlaid on the stream buffers, and all wetlands that intersect the buffer are clipped within the one-mile radius and are merged into the stream/buffer polygon. The final step of the process involves a detailed quality control check and revision of each polygon to ensure biological accuracy. The wood turtle model is a stand-alone layer that is not used to value habitat patches.

Monroe has all of or portions of 5 wood turtle habitat patches that either lie entirely within or that cross over into adjacent municipalities.

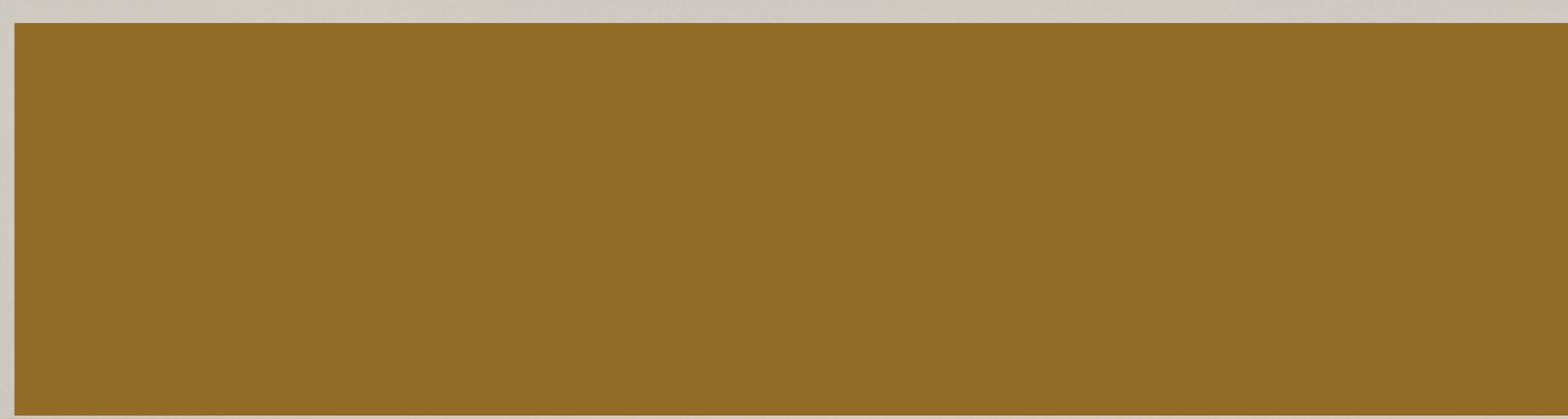
NATURAL HERITAGE PROGRAM DATABASE REPORT

Animal Species of Concern Reported in Monroe Township

Common Name	Scientific Name	Federal Status	State Status	G Rank	S Rank
black-throated green warbler	<i>Dendroica virens</i>		Special Concern	G5	S3B
carpenter frog	<i>Rana virgatipes</i>		Special Concern	G5	S4
eastern box turtle	<i>Terrapene carolina</i>		Special Concern	G5	S5B
Fowler's toad	<i>Bufo woodhousii fowleri</i>		Special Concern	G5	S4
Kentucky warbler	<i>Oporornis formosus</i>		Special Concern	G5	S3B
northern parula	<i>Parula americana</i>		Special Concern	G5	S3B
spotted turtle	<i>Clemmys guttata</i>		Special Concern	G5	S4
veery	<i>Catharus fuscescens</i>		Special Concern	G5	S3B
wood turtle	<i>Clemmys insculpta</i>		Threatened	G4	S3

Rare Plant Species and Ecological Communities

Scientific Name	Common Name	Federal Status	State Status	Regional Status	G Rank	S Rank	Date Observed	Identified
Vascular Plant								
<i>Calamovilfa brevipilis</i>	Pine Barren Reedgrass			LP	G4	S4	1940-09-29	Y
<i>Carex barrattii</i>	Barratt's Sedge			LP	G4	S4	1941-11-27	Y
<i>Liatris scariosa var. novae-angliae</i>	Northern Blazing-star		E	LP, HL	G5? T3	SH	1940-09-29	Y
<i>Lygodium palmatum</i>	Climbing Fern			LP, HL	G4	S2	1996-10-31	Y
<i>Methanthium virginicum</i>	Virginia Bunchflower		E	LP, HL	G5	S1	????-??-??	Y
<i>Solidago elliotii</i>	Elliott's Goldenrod			HL	G5	S3	1994-09-21	Y



Aquifers

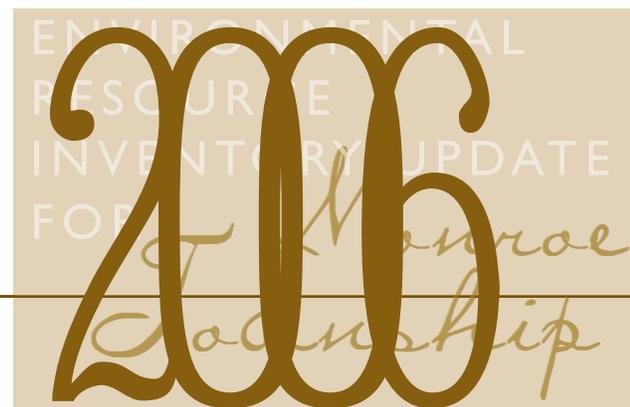
Ground water is stored in, and moves slowly through, moderately to highly permeable rocks called aquifers. When a water-bearing rock readily transmits water to wells and springs, it is called an aquifer. Public and private water supply wells are drilled into the aquifers for potable water supplies in a community. Precipitation is the method of ground water recharge into the porous rock of the aquifer. The rate of recharge is not the same for all aquifers, though, and that must be considered when pumping water from a well. Pumping too much water too fast draws down the water in the aquifer and eventually causes a well to yield less and less water and eventually run dry.

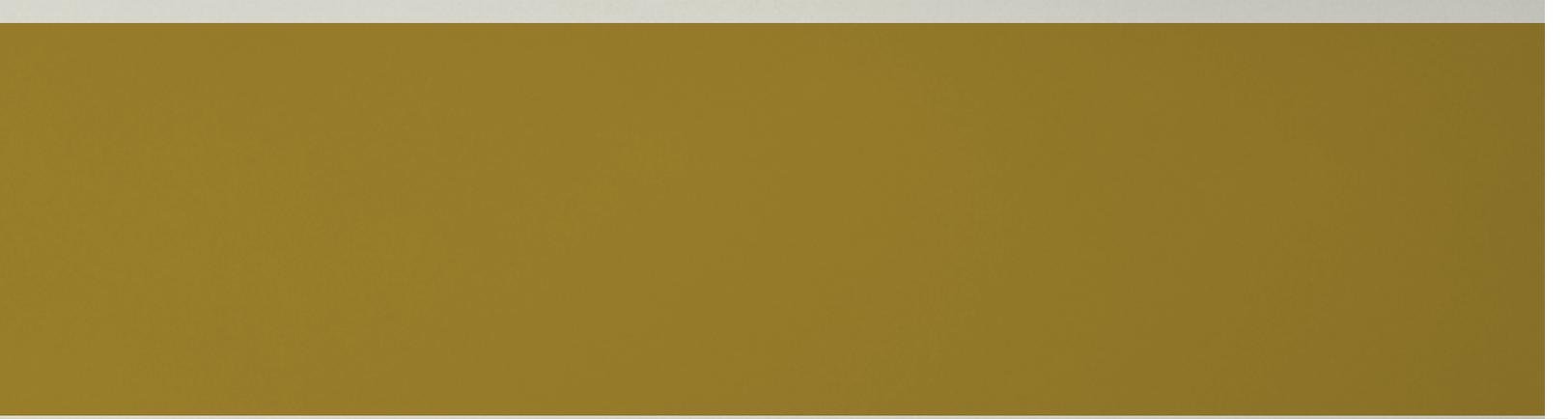
The Aquifers of New Jersey are classified as either bedrock or surficial aquifers and confining units. The bedrock-aquifer coverage includes fractured-rock aquifers of the Valley and Ridge, Highlands, and Piedmont physiographic provinces, and aquifers and confining units of the Coastal Plain physiographic province. The surficial-aquifers include glacial sediment exceeding 50 ft. thickness in northern New Jersey, and surficial sediment thicker than 50 ft. overlying Coastal Plain aquifers and confining units.

The Aquifers of New Jersey are also ranked by their yield rates or the gallons for minute that can be expected from wells in each aquifer. The ranking consists of a scale from A through E, as follows:

A - greater than 500 gallons per minute, B - 251 to 500 gallons per minute, C - 101 to 250 gallons per minute, D - 25 to 100 gallons per minute, E - less than 25 gallons per minute.

Aquifer Name	Aquifer Rank
Potomac-Raritan-Magothy aquifer system	A: > 500 gallons per
Merchantville-Woodbury confining unit	E: < 25 gallons per minute
Englishtown aquifer system	B: = 251 to 500 gallons per minute
Marshalltown-Wenonah confining unit	E: < 25 gallons per minute
Mt. Laurel-Wenonah aquifer	C: = 101 to 250 gallons per





Ground Water Recharge Areas

Ground water recharge is defined as the natural process of infiltration and percolation of rainwater from land areas or streams through permeable soils into water-holding rocks that provide underground storage in aquifers. The Groundwater Recharge Map in this ERI is an estimation of ground-water recharge for Middlesex County using the NJGS methodology from NJ Geological Survey Report GSR-32 “A Method for Evaluation of Ground-Water-Recharge Areas in New Jersey. Land-use/land-cover, soil and municipality-based climatic data were combined and used to produce an estimate of ground-water recharge in inches/year. Recharge was then ranked by volume (billions of gallons/year) using natural breaks in the percentage of total volume.

Rank	Recharge Rate	Acres
A	15 to 18 in/yr	355
B	11 to 14 in/yr	10,630
C	9 to 10 in/yr	3,621
D	1 to 8 in/yr	1,317
E	0 in/yr	78
L	Hydric soils	1,153
W	Wetlands	8466.18
X	No recharge calculations	7

Monroe is generally blessed with adequate recharge potential throughout the Township, with the notable caveat that large portions of the Township are composed of wetlands or hydric soils.

The mapping of public community water supply wells and wellhead areas in Monroe is shown in the Wellhead Protection Areas Map. According to the NJDEP, “A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public



Public Community Water Supply Wells & Wellhead Protection Areas

Community Water Supply (PCWS) well that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two, five, and twelve-year period of time for unconfined wells. Confined wells have a fifty foot radius delineated around each well serving as the wellhead protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations” (see NJAC 7:10-11.7(b) 1).

- Unconfined wells are completed in the uppermost-saturated aquifer at that location
- Confined wells are sunk through an impermeable stratum down into an aquifer, which is sandwiched between two impermeable strata. The majority of confined aquifers are classified as artesian because the hydraulic head in a confined well is higher than the level of the top of the aquifer. If the hydraulic head in a confined well is higher than the land surface it is a "flowing" artesian well.

Well Head Protection Area delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Area Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP program.

The Wellhead Protection Areas Map indicates that the NJDEP has mapped 11 Public Community Water Supply wells in Monroe Township. The Monroe Township Municipal Utilities Authority owns all of the wells in the Township.

Well Name	Well Owner	Well Address	Completion Date	Well Type	Pump Rate
Well 5	Monroe Twp MUA	Mystic Lane	11/15/1954	Unconfined	500
Well 12	Monroe Twp MUA	Poosum Hollow Rd	03/15/1961	Unconfined	650
Well 8A	Monroe Twp MUA	Perrineville Rd	10/00/1974	Confined	1000
Well 17	Monroe Twp MUA	Rossmoor Golf Course	08/14/1980	Unconfined	800
Well 16A	Monroe Twp MUA	Middlesex Blvd	07/07/1983	Unconfined	1100
Well 12A	Monroe Twp MUA	Nassau Rd & Mayflower Way	08/28/1996	Unconfined	0
Well 20	Monroe Twp MUA	Union Valley Rd	08/01/1998	Confined	0
Well 21	Monroe Twp MUA	Half Acre Rd	12/00/00	Unconfined	2100
Well 22	Monroe Twp MUA	Cranbury-Half Acre Rd	10/22/2002	Confined	1400
Well 23	Monroe Twp MUA	Cranbury Station Rd	10/00/2003	Unconfined	1200
Well 11 ASR	Monroe Twp MUA	Abeel Rd	06/15/1961	Unconfined	450

Well Name	Geologic Formation	Hydrologic Formation	Watershed
Well 5	Magothy Formation - Old Bridge Sand member	Upper Potomac-Raritan-Magothy aquifer	Millstone
Well 12	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Lower, South, and Lawrence Brook
Well 8A	Magothy Formation - Old Bridge Sand member	Upper Potomac-Raritan-Magothy aquifer	Lower, South, and Lawrence Brook
Well 17	Magothy Formation - Old Bridge Sand member	Upper Potomac-Raritan-Magothy aquifer	Millstone
Well 16A	Magothy Formation - Old Bridge Sand member	Upper Potomac-Raritan-Magothy aquifer	Millstone
Well 12A	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Millstone
Well 20	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Millstone
Well 21	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Millstone
Well 22	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Millstone
Well 23	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Millstone
Well 11 ASR	Raritan Formation - Farrington Sand member	Middle Potomac-Raritan-Magothy aquifer	Millstone

The Wellhead Protect Areas Map also indicates that there are four public community water supply wells that do not have wellhead protection areas delineated. It is unclear why NJDEP has not delineated the protection areas for these wells. It is also apparent that there are public community water supply wells in Old Bridge Township, Helmetta Borough, Spotswood Borough and Jamesburg Borough that have wellhead protection areas that extend into Monroe.

New Jersey NJDEP Known Contaminated Sites List



Known Contaminated Sites

The KCS-NJ report is a list of sites where contamination of soil and/or ground water is confirmed at levels greater than applicable cleanup criteria or environmental standards. The data included in the KCS-NJ report is as of April 1, 2005. The KCS-NJ report is produced by the New Jersey Department of Environmental Protection (NJDEP) Site Remediation and Waste Management Program (SRWM) in response to state law N.J.S.A. 58:10-23.16-17, which requires the SRWM to prepare a list of sites that have been contaminated by hazardous substances. The report also satisfies obligations under the New Jersey New Residential Construction Off-Site Conditions Disclosure Act (N.J.S.A 46:3C1 et seq.).

Sites included in the KCS-NJ report can undergo a wide variety of remedial activities, ranging from relatively simple “cut and scrape” cleanups to highly complex cleanups. The sites with complex contamination issues can have several sources of contamination, which can affect both soil and groundwater at the same time. Several groups or remedial bureaus within the SRWM Program manage these cleanups. It is possible for more than one bureau to be involved at one site at the same time. A site being regulated under more than one statute or regulation often drives this scenario. However, this report lists only the main contact bureau for the site. The link available within this web site, entitled “What Contact Bureaus Do,” explains what types of sites each bureau manages and lists phone numbers for each bureau. For further information contact NJDEP’s Site Remediation Program and Waste Management (SRWM) lead program, which are identified with each site listed in this database. Contact information for SRWMs lead program can be acquired at <http://www.state.nj.us/dep/srp>.



Site Name	Site Address	Agency Tracking Number	Lead Agency
15 Edward Avenue	15 Edward Ave	G000061889	BFO-S
165 Disbrow Hill Rd	165 Disbrow Hill Rd	G000060691	BFO-S
189 Dey Grove Road	189 Dey Grove Rd	191591	BFO-S
196 Dey Grove Road	196 Dey Grove Rd	220101	BFO-S
338 Buckelew Avenue	338 Buckelew Ave	216620	BFO-S
46 So Rhoda Street	46 So Rhoda St	129557	BFO-S
48 South Rhoda Street	48 South Rhoda St	129560	BFO-S
7 Michael Lane	7 Michael Ln	236637	BFO-S
81 Bergen Mills Road	81 Bergen Mills Rd	191935	BFO-S
Applegarth Care Center	189 Applegarth Rd	005852	BSCM
Arthur Gundacker Property	Spotswood Englishtown Rd	G000004503	OWR
Englishtown Game Farm	22 Gertler Rd	168318	BFO-S
H A B D	Texas Rd	G000032355	BFO-S
Highways & Bridges Area 5-2 Garage	Hoffman Station & Prospect Rds	031302	BSCM
John Holm & Son Inc	Longstreet Rd	013800	BSCM
Jurgesky & Bergen Mills Rd	Jurgesky & Bergen Mills Rd	188025	BFO-S
Monroe Township Landfill	Spotswood Gravelhill Rd& Matchaponix Ave	G000004439	BCM
Monroe Twp	Perrineville Rd	000696	BSCM
NJ Training School For Boys	State Home Rd	013859	BSCM
Raceway	992 Rt 33 East	030171	BSCM
Rock Monroe LLC	Half Acre Rd	215834	BFO-S
Thompson County Park	Perrineville Rd	012729	BSCM
Vreeland Transport	Pergola St	G000029963	CEHA
9 Monroe Blvd	9 Monroe Blvd	G000040010	BFO-S

BFO-S - Bureau of Field Operations - Southern
BFO-S is responsible for overseeing the remediation of sites located in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Middlesex, Monmouth, Ocean and Salem counties. The types of cleanups handled by BFO-S are considered moderate in remedial complexity, ranging from the remediation of a single source of contamination to several sources. The cleanup may include ground water contamination. Remediations are conducted, by responsible parties, under the state's Brownfield and Contaminated Site Remediation Act, the Spill Compensation and Control Act, the Solid Waste Management Act, the Water Pollution Control Act, the Industrial Site Recovery Act and the Underground Storage of Hazardous Substances Act.

BSCM - Bureau of Southern Case Management (formerly BUST)
BSCM primarily oversees environmental cleanups at sites subject to the Underground Storage of Hazardous Substances Act where remediation may involve soil and/or ground water. Sites under this program are also subject to the state's Brownfield and Contaminated Site Remediation Act, the Spill Compensation and Control Act, the Solid Waste Management Act and the Water Pollution Control Act.

OWR - Office of Wellfield Remediation
OWR uses public funds from state sources to install potable well treatment systems (POETS) and new water lines to provide a safe public water supply.

BCM - Bureau of Case Management
BCM oversees complex remedial activities that are conducted by responsible parties. In addition, BCM has the authority to use public funds for remedial activities, when responsible parties are recalcitrant or where immediate environmental concern situations exist and a willing or able responsible party does not exist. These sites involve multiple environmental media and/or contaminants and include ground water contamination. Remedial activities are conducted under the federal Superfund program, the Resource Conservation and Recover Act (RCRA) Corrective Action program, the New Jersey's Brownfield and Contaminated Site Remediation Act, the Spill Compensation and Control Act, the Solid Waste Management Act and the Water Pollution Control Act.

CEHA - County Environmental Health Agency
NJDEP has authorized certain county health departments to oversee remedial activities that involve residential home heating oil tanks that have not impacted ground water. However, No Further Action letters are still issued by the Department. The participating counties are Bergen County (201) 634 - 2780, Camden County (856) 374 - 6049 and Hudson County, (201) 223 - 1133. In addition, all 21 counties are approved to receive certain low environmental concern cases for review and possible investigation when appropriate.

Site Name	Status	Status Date	Remedial Level	Contamination Source And Case Status
15 Edward Avenue	Assigned To Program	April 16, 2001	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
165 Disbrow Hill Rd	Assigned To Program	January 26, 2001	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
189 Dey Grove Road	Assigned To Program	March 19, 2003	C2: Formal Design - Known Source Or Release With Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
196 Dey Grove Road	Assigned To Program	January 22, 2004	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
338 Buckelew Avenue	Assigned To Program	November 20, 2003	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
46 So Rhoda Street	Assigned To Program	October 16, 2001	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
48 South Rhoda Street	Assigned To Program	September 14, 2001	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
7 Michael Lane	Assigned To Program	September 15, 2004	C2: Formal Design - Known Source Or Release With Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
81 Bergen Mills Road	Assigned To Program	March 27, 2003	B: Single Phase Ra - Single Contamination Affecting Only Soils	A: Sites With On-Site Sources Of Contamination
Applegarth Care Center	Nfa-A (Limited Restricted Use)	October 10, 2002	C2: Formal Design - Known Source Or Release With Groundwater Contamination	C: Closed Sites With Restrictions
Arthur Gundacker Property	Assigned To Program	June 1, 1989	C3: Multi-Phased Ra - Unknown Or Uncontrolled Discharge To Soil Or Groundwater	A: Sites With On-Site Sources Of Contamination
Englishtown Game Farm	Assigned To Program	November 25, 2002	B: Single Phase Ra - Single Contamination Affecting Only Soils	A: Sites With On-Site Sources Of Contamination
H A B D	Assigned To Program	October 3, 1997	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination

Highways & Bridges Areaa 5-2 Garage	Assigned To Program	January 9, 1998	C2: Formal Design - Known Source Or Release With Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
John Holm & Son Inc	Assigned To Program	February 21, 1995	C2: Formal Design - Known Source Or Release With Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
Jurlgesky & Bergen Mills Rd	Assigned To Program	October 29, 2004	B: Single Phase Ra - Single Contamination Affecting Only Soils	A: Sites With On-Site Sources Of Contamination
Monroe Township Landfill	Assigned To Program	August 11, 1982	D: Multi-Phased Ra - Multiple Source/ Release To Multi-Media Including Groundwater	A: Sites With On-Site Sources Of Contamination
Monroe Twp	Assigned To Program	June 17, 1997	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
NJ Training School For Boys	Assigned To Program	August 16, 1991	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
Raceway	Assigned To Program	March 2, 2004	C2: Formal Design - Known Source Or Release With Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
Rock Monroe LLC	Assigned To Program	October 30, 2003	B: Single Phase Ra - Single Contamination Affecting Only Soils	A: Sites With On-Site Sources Of Contamination
Thompson County Park	Assigned To Program	July 14, 2000	C2: Formal Design - Known Source Or Release With Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
Vreeland Transport	Assigned To Program	October 17, 1996	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination
9 Monroe Blvd	Assigned To Program	February 16, 2000	C1: No Formal Design - Source Known Or Identified-Potential Groundwater Contamination	A: Sites With On-Site Sources Of Contamination

NEW JERSEY NJDEP NEW JERSEY POLLUTANT DISCHARGE ELIMINATION SYSTEM

The discharge of pollutants to the ground waters of the State is regulated by the Department under the authority of the New Jersey Water Pollution Control Act (WPCA) N.J.S.A. 58:10A. The WPCA specifies that “No person shall discharge any pollutant except in conformity with a valid NJPDES permit.” The permit program is called NJPDES which stands for New Jersey Pollutant Elimination System, and the regulations are found at N.J.A.C. 7:14A. The NJPDES Program protects ground and surface water quality by assuring the proper treatment and discharge of wastewater (and its residuals) and storm water from various types of facilities and activities. The program issues permits to limit the mass and/or concentration of pollutants which may be discharged into ground water, streams, rivers, and the ocean.

The types of regulated facilities range from campgrounds, schools, and shopping centers to industrial and municipal wastewater dischargers. Before a new wastewater treatment plant can be constructed, its proposed discharge must be authorized under a NJPDES permit. The permit will contain discharge pollutant limits sufficient to safeguard the integrity of the receiving water body. The limits also provide an engineer with the information needed to determine how to design a new treatment plant, or upgrade an existing one.

Ground Water Discharge:

NJPDES permits are required for discharges to ground water of both sanitary and industrial wastes which limit the mass and/or concentration of pollutants discharged, are issued to sanitary and industrial facilities that have ongoing, operational discharges of wastewater to ground water. The pollution control requirements contained in NJPDES ground water permits are those conditions necessary to restrict the discharge of pollutants to the ground waters of the state and protect the public health and the environment.

The types of discharge activities that are regulated by the Division of Water Quality and its NJPDES program include: surface impoundments; infiltration/percolation lagoons; overland flow systems; spray irrigation systems; and various types of subsurface disposal systems that are classified as underground injection systems. The types of facilities regulated include: mines, pits and quarries; schools and hospitals; potable water treatment plants; large corporate office buildings; industrial manufacturing facilities; campgrounds and mobile home parks; food processors; and sewage treatment plants and other dischargers of wastewater that can impact ground water, including dredge spoils disposed onto land. Discharges from past activities such as spills, or from the impact of non-operating or closed landfills are not regulated by the Division of Water Quality and its NJPDES program, and must obtain pollution control approvals such as MOAs or voluntary cleanups.

NJPDES Ground Water Discharge locations in Monroe Township

	Pipe Category	Type of Permit	Current status of the individual pipe	Receiving waters
Applegarth Care Center	Underground injection sanitary	General NJPDES permit.	Existing in the Point Source Permitting Regions	Infiltration pond or ground injection
B & J Warren & Sons Inc.	Infill/Percolation Lagoon – Industrial	Standard NJPDES permit.	Existing in the Point Source Permitting Regions	Infiltration pond

Surface Water Discharge:

This regulated activity involves the discharge of treated effluent from various municipal and industrial facilities directly into a river, stream, or the ocean. These facilities operate under the authority of a NJPDES permit which limits the mass and/or concentration of pollutants discharged.

NJPDES Surface Water Discharge locations in Monroe Township

	Pipe Category	Discharge Type	Current status of the individual pipe	Receiving waters
NJDC – Jamesburg	Sanitary discharge	Municipal Minor - publicly owned sewage treatment plants which discharge less than 1 MGD	Existing in the Point Source Permitting Regions	Matchaponix Brook
Hub Servall Record Mfg. Co.	Non-contact cooling water	Non-contact Cooling Water	Existing in the Point Source Permitting Regions	Shallow Brook via unnamed tributary
B & J Warren & Sons Inc.	Storm water	Industrial Minor - based on the amount of pollutant(s) in the effluent	Permits transferred to Bureau of Non-point Pollution Control	Manalapan Brook via unnamed tributary
National Metallizing	Industrial discharge	Industrial Minor - based on the amount of pollutant(s) in the effluent	Revoked/Terminated - Pipe no longer permitted for discharge	Shallow Brook via storm sewer

FEDERAL EPA TOXIC RELEASE INVENTORY SYSTEM

Toxic Release Inventory System (TRIS) is a national database of toxic chemical use, storage and/or release to the environment (air, water or land). There are over 300 toxic chemicals listed in the database. TRIS was created under authority of Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and the Pollution Prevention Act (PPA) of 1990. Toxic Release Inventory

System's purpose is to encourage planning for response to chemical accidents and to provide the public and government information about possible chemical hazards in communities.

None of the listed sites are labeled as being in Monroe Township, but the site locations in the geographic information system data place the facilities in Monroe Township.

Program Id Number	Name	Address	Township	Year Reported
08512NTNLMABEEL	Honeywell Nmd	20 Abeel Rd.	Monroe	1987
08512MGRMB30ENG	M. Grumbacher Inc.	30 Englehard Dr.	Monroe	1988
08831BSFCR1065C	BASF Corp.	1065 Cranbury & S. River Rd.	South Brunswick	1987

FEDERAL EPA RESOURCE CONSERVATION AND RECOVERY ACT FACILITIES

Congress enacted the Resource Conservation and Recovery Act (RCRA) in 1976. RCRA's primary goals are:

- To protect human health and the environment from the potential hazards of waste disposal,
- To conserve energy and natural resources,
- To reduce the amount of waste generated,
- And to ensure that wastes are managed in an environmentally sound manner.

RCRA regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals. Hazardous wastes are wastes that exhibit certain characteristics that may be regulated by RCRA. A waste may be considered hazardous if it is ignitable (i.e., burns readily), corrosive, or reactive (e.g., explosive). Waste may also be considered hazardous if it contains certain amounts of toxic chemicals. In addition to these characteristic wastes, EPA has also developed a list of over 500 specific hazardous wastes. Hazardous waste takes many physical forms and may be solid, semi-solid, or even liquid.

According to the EPA regulations, solid waste means any garbage, or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi- solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

Rcra Id Number	Name	Address	Township
NJ0001163765	Nielsen & Bainbridge	17 S Middlesex Ave Cn9300	Monroe
NJ0001366558	Marten Transportation	4 S Middlesex Rd	Monroe
NJD085640563	Carpenter Technology Corp	Englehard Industrial Park	Monroe
NJDI47331672	Apple Dry Cleaners	100 Applegarth Rd	Monroe
NJD981133929	Hans Custom Cleaners	365 Englishtown Rd	Spotswood
NJD982716706	Dole Packaged Foods Co	3 S Middlesex Ave	Monroe
NJD986567402	NJ Water Co	Pergola & Buckelew Ave	Jamesburg
NJD986571610	Fasson Roll Division Inc	3 Fitzgerald Ave	Cranbury
NJD986579613	Matrix Development Group Inc	12 S Middlesex Ave	Monroe
000009641328	Forsgate Country Club	Forsgate Dr & Possum Hollow Rd	Monroe
NJ0000298356	Spotswood Borough Of - DPW	3rd St Cross New Brunswick	Spotswood
NJ0002085074	Monroe French Cleaners	399 Spotswood - Englishtown Rd	Monroe
NJD002365484	Cappella Inc	Applegarth Rd	Monroe Twp
NJD068711514	Alzo Inc	Federal Rd E	Monroe Twp
NJD094248002	Honeywell International Inc	20 Abeel Rd	Cranbury
NJD980500771	BASF Wyandotte Corp - Brook	Englehard Dr Building C	S. Brunswick
NJD980583173	Applegarth Middle School	227 Applegarth Rd	Monroe
NJD980647036	Jamesburg Central Office NJ Bell	Ss Forsgate Dr	Jamesburg
NJD981137318	Farrs Towing & Repair Inc	Applegarth & Union Valley Rd	Monroe
NJD981489602	Suburban Transit Corp	Box 279 Rfd I Rte 33	Monroe
NJD981873987	Training School For Boys Jamesburg	State Home Rd	Monroe

NJD982271082	East Brunswick High School	Cranbury Rd	East Brunswick
NJD982271728	Laszlo & Marta Inc	Cranberry Rd & Docks Corner	Monroe Twp
NJD982275034	Konica Business Machines USA	1075 Cranbury S River Rd	Jamesburg
NJD982281776	JCP & L Spotswood Substation	Main St & Daniel Rd	Spotswood
NJD986573228	Princeton Fuel Oil Co	196 Buckelew Rd	Jamesburg
NJD986577377	Parkway Cleaners	1031 b Applegarth Rd	Monroe
NJD986581726	M & S Gasoline Station	Devoe Ave & Monmouth Rd	Monroe Twp
NJD986586550	NJ Turnpike Auth - Interchange 8a	NJ Turnpike M P 73.7	Monroe
NJD986594992	Clearbrook Maintenance Bldg	Applegarth Rd - Monroe Twp	Monroe
NJD986639045	Spotswood Borough Of Daniel Rd Water Plt	Daniel Rd	Spotswood
NJD986650141	Congress Hill Farm	725 Federal Rd	Monroe
NJD986651982	Monroe Twp Of Board Of Ed	Rte 522 & Schoolhouse Rd	Monroe
NJD986652022	Bureau Of Dangerous Goods	99 Applegarth Rd	Monroe
NJ0001038009	Setco Inc	34 Engelhard Dr	Monroe
NJD011344264	Perrines Pontiac Inc	200 Buckelew Ave	Jamesburg
NJD053300778	M Grumbacher Inc	30 Engelhard Dr	Monroe
NJD078247905	BASF Corp	Cranbury Rd & Rte 522	South Brunswick
NJD986619336	Davlyn Industries Inc	7 Fitzgerald Ave	Monroe

Many of the listed sites are labeled as being as not in Monroe Township, but the site locations in the geographic information system data place the facilities in Monroe Township.

FEDERAL EPA PERMIT AND COMPLIANCE SYSTEM

The Permit and Compliance System (PCS) contains data on the National Pollution Discharge Elimination Systems (NPDES) permit-holding facilities. The PCS contains information on the permitted facility, compliance schedule, outfall schedule, permit limits, discharge monitoring reports, enforcement actions and violations. The facilities are broken down into major facilities and minor facilities.

PCS ID Number	Name	Address	Township
NJ0124273	Jack's Auto Wreckers	568 Old Bridge Englishtown Rd	Monroe
NJ0028479	NJ Training School For Boys	State Home & Grace Hill Rds	Monroe
NJ0053473	B & J Warren & Sons Inc	Hoffman Station Road	Monroe
NJ0124532	Davlyn Industries	7 Fitzgerald Avenue	Monroe
NJ0126233	Suburban Trails	1009 Rt 33	Monroe
NJ0127655	Setco Inc	34 Engelhard Dr	Monroe

FEDERAL EPA COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY INFORMATION SYSTEM

Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) is the Superfund Database authorized under the Superfund Amendment and Reauthorization Act (SARA) of 1986. The database contains information on hazardous waste sites including an inventory of sites, planned and actual site activities, and financial information. The CERCLIS Facilities layer shows the best-known location of facilities regulated under the Comprehensive Environmental Resource Conservation and Liability Act (CERCLA) and managed in the CERCLIS database.

CERCLIS ID Number	Name	Address	Township
NJD981873987	Jamesburg School For Boys	State Home Road	Jamesburg
NJD986619336	Davlyn Industries	7 Fitzgerald Avenue	Cranbury
NJ0001038009	Setco Inc	34 Engelhard Dr	Cranbury
NJDI16280983	B & J Warren & Sons Inc	Hoffman Station Road	Monroe

FEDERAL EPA AEROMETRIC INFORMATION RETRIEVAL SYSTEM - AIR FACILITY SUBSYSTEM

Aerometric Information Retrieval System - Air Facility Subsystem features locations of stationary sources of air pollution that are regulated by the U. S. EPA, state and local air pollution agencies. The AFS subsystem contains emissions, compliance data, and permit data for stationary sources regulated by the U.S. EPA and state and local air pollution agencies. This information is used by states in preparation of State Implementation Plans (SIPs), to track the compliance status of point sources with various regulatory programs, and report emissions estimates for pollutants regulated under the Clean Air Act.

Program ID	Name	Address	City	Class	Compliance
Nj0083267	Honeywell International Inc	20 Abeel Rd	Monroe	Actual Or Potential Controlled Emissions > 100 Tons/Year As Per Alabama Power Decision.	In Compliance Certification
Nj0819898	Monroe Twp Bd. Of Ed High School	Perrineville Hightstown Rd	Monroe		
Nj0083232	BASF Corp Polymers Div	1065 Cranbury S River Rd	South Brunswick	Actual Or Potential Emissions Are Above The Applicable Major Source Thresholds	In Compliance Certification
Nj0998235	Davlyn Industries Inc	7 Fitzgerald Ave	Cranbury	Potential Emissions Are Below All Applicable Major Source Thresholds If And Only If The Source Complies With Federally Enforceable Regulations Or Limitations.	In Compliance Inspection

FEDERAL EPA NATIONAL PRIORITY LIST

National Priority List (NPL) Sites are a subset of the CERCLIS (Superfund) database. The NPL Sites layer depicts the area of concern surrounding NPL Sites.

CERCLIS ID	Site Name
NJD097400998	JIS Landfill
NJD980505671	Monroe Township Landfill





Scenic Resources

The Monroe Township Environmental Commission has identified Scenic Roadways in the Township that help give Monroe the special sense of place that residents have come to know and enjoy. These roadways are essentially rural farm roads that yield scenic vistas and provide a glimpse of the agricultural history that has shaped Monroe.

Scenic Roadways are rural lanes that have developed over time, primarily as farm roads leading from farms to markets. The area designated as scenic roadways can be in a way to help preserve their natural and cultural importance.

Scenic Roadways are designed to:

- Preserve and encourage the restoration of the natural setting along the roadways
- Provide views of significant landscape features such as agricultural land and associated facilities

The identified Scenic Roadways include:

1. Spotswood-Englishtown Road from south of Mounts Mills Road to North State Home Road
2. Mounts Mills Road from Schoolhouse Road to Spotswood-Englishtown Road
3. Perrineville Road from Route 33 to Prospect Plains Road
4. Perrineville Road from Schoolhouse Road to Pergola Avenue
5. Schoolhouse Road from Perrineville Road to Spotswood-Gravel Hill Road
6. Spotswood-Gravel Hill Road from Schoolhouse Road to North State Home Road
7. Federal Road from Perrineville Road to Spotswood-Englishtown Road
8. Prospect Plains Road from Perrineville Road to Hoffman Station Road
9. Gravel Hill Road from Federal Road to Hoffman Station Road
10. Dey Grove Road from Perrineville Road to North Bergen Mills Road
11. North Bergen Mills Road from Dey Grove Road to Federal Road
12. Mills Road from Perrineville Road to the border
13. England Road from Old Mount Road to Federal Road
14. Old Mount Road from Applegarth Road to England Road
15. Applegarth Road from Cranbury Station Road to Route 33
16. Small Portion of Union Valley Road



Historic Resources

INTRODUCTION

Historic properties include prehistoric and historic archeological sites, historic districts, buildings, structures, objects, and the historic environment in which they exist. The historic structures, districts and archeological sites around us add drama and interest to the physical setting which New Jersey citizens inhabit today by providing a sense of continuity with the past. Monroe Township has a number of historic resources that are worth preserving because they provide a physical link to the past, contribute to the sense of community in the present and offer a degree of continuity as the Township advances into the future. Historic preservation contributes to attractive streetscapes, stable neighborhoods, economic development and increased property values. The Historic Preservation Plan Element highlights the benefits of preserving the local heritage, identifies sites listed on and recommends future sites for the State and National Registers of Historic Places.

IMPORTANCE OF HISTORIC AND CULTURAL RESOURCES

In addition to providing a link with the past, historically significant resources have the potential to contribute significantly to local culture, education, economic development and quality of life. The aesthetic, cultural and social benefits of historic preservation are well documented. They include an enhanced visual environment, reinforcement of local character and creation of sense of place.

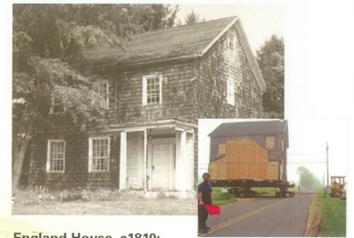


SITE PLAN DEY FARM HISTORIC SITE (PROPOSED)



Charles Dey Home, 1930

This farmhouse was built in three phases. The first was the rear, c1820. The left side was added c1860, and the addition on the right was completed c1900. Charles and Rose Dey came to this Monroe farm c1927 from Dayton. Later, the farm was taken over by their only son, Charles. He and his wife, Florence, raised their family here. The farm was sold in 1997 and acquired by the MTHPC in 2001.



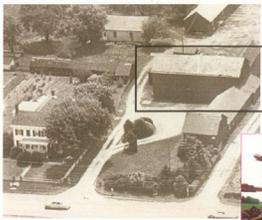
England House, c1810:

In May of 2004, the England House was moved across the pastures of the Oschner Family to its present location on a lot adjacent to the Dey Farm Historic Site. It is currently in the process of being put on a new foundation. The England house – still bearing many of its original features – is an exceptional example of early life in Monroe Township.



Whitson/Byrne Barn,

c1790s: In February 2004, MTHPC obtained this Dutch-style barn from the property on Applegarth Road/Cranbury Station where The Crossings Development is presently being built. It too has been dismantled at the developer's cost and awaits restoration at the historic site.



Harvey H. Dey Barn, c1800s

(not shown on site plan): In June, 1994, the main timberframe barn from the Harvey H. Dey homestead was dismantled and is intended to be re-assembled at the Dey Farm Historic Site. The H. H. Dey farm was formerly on Rt. 33 where the Renaissance at Monroe development is located.



Prospect Plains School House, c1850:

One room school house formerly located on Prospect Plains Road, behind the Wawa. The school was in use until c1936, when the two 'modern' schools were put into service. Later, the building was used as Monroe's first Town Hall in 1938, then the Recreation Department in the 1970s and finally a Food Pantry for the poor before it was closed in 2003. MTHPC obtained the schoolhouse – the last remaining example of an early one-room school – in January 2004, when it was dismantled at the developer's expense and put into storage awaiting future reconstruction at the Dey Farm Historic Site.

DEY FARM HISTORIC SITE

The Dey Farm Historic Site on Old Church Road is part of a developing historic hamlet sponsored by the MTHPC in an initiative to honor and preserve Monroe's heritage for the education and enjoyment of the community's future generations.

The first steps towards this initiative were taken in 1994 with the dismantling and preservation of the H.H. Dey Barn. Since then, contributions including multiple charitable gifts as well as the support of the Township, have enabled the MTHPC to acquire 40+ acres to dedicate to the historic site.

MTHPC has succeeded in saving several historic buildings, including barns and the Prospect Plains schoolhouse. These buildings have been carefully dismantled, catalogued and placed in storage awaiting future reassembly on the historic site.

Several Museum displays will be erected in the various buildings, exhibiting a diverse collection of historic artifacts, including ancient Native American Indian tools and arrowheads, 18th and 19th century farming equipment, and common household goods demonstrating the lifestyles of Monroe's ancestors. A particularly treasured item on display is a block of wood, cut from a grand old oak tree beneath which General Washington held council on June 27, 1778 preceding the Battle of Monmouth.

In the future, this collection, as well as a library and the town's historic archives including maps, genealogical data, and photo archives will be housed within the Dey Farm house.

HISTORY OF MIDDLESEX COUNTY

Middlesex County was designated in 1683 as one of the East Jersey's four original counties along with Bergen, Essex and Monmouth. Early patterns of settlement were found along the most important transportation routes – the Raritan River and two roads following old Indian paths: Upper Road/King's Highway, which is now Route 27, and the Lower Road, which is George's Road. The county was mainly agrarian in the 17th and early 18th centuries. Industrialisation in the later part of 18th century, powered by the area's many streams, continued into the nineteenth century industrialization leading to the growth of many urban areas. By the twentieth century, the northeastern and central parts of the county became largely urbanized. Meanwhile, the rest of the County remained primarily rural, with established villages and towns being in filled with buildings of late nineteenth and twentieth century construction.

Twentieth century development has followed major highways such as Route 1 and the New Jersey Turnpike, while the older urbanized centers having suffered from a lack of new investment are now undergoing revitalization. Southern Townships, such as Plainsboro, Monroe and South Brunswick, are under constant development pressure.

HISTORY OF MONROE TOWNSHIP

Middlesex County, as mentioned earlier, was formed in 1683 and subdivided into Woodbridge, Perth Amboy and Piscataway Townships. Initially part of Piscataway Township and then South Amboy Township, the residents of western South Amboy formed Monroe Township by referendum on April 9, 1838 and named the community after President Monroe. For many decades, it was largely a farming community; when parts of the township blossomed into the more densely-packed neighborhoods of Helmetta, Jamesburg, and Spotswood in the late 19th century, they seceded. Its current boundaries were established in 1887. Monroe Township borders South Brunswick Twp, Cranbury Township, Helmetta, Spotswood, Old Bridge Twp, Manalapan Township, Millstone Township, East Brunswick Township and East Windsor Township. Clearbrook Park, Concordia, Rossmoor and Whittingham are census-designated places and unincorporated areas located within Monroe Township.

The Township's first settler was reportedly a Scotsman named James Johnstone who settled on Manalapan Brook in 1685. Several settlers followed him and resided along the banks of Manalapan and Matchaponix Brooks in the late seventeenth and early eighteenth centuries. The community of Spotswood, situated at the confluence of Manalapan and Matchaponix Brooks, is the oldest settlement in the Monroe area. Shortly after 1685 another Scotsman settled west of Spotswood along the Manalapan Brook at the site of future Jamesburg. The eighteenth century saw an influx of additional settlers, many of who were involved

in agricultural pursuits, while others worked in the iron-working and lumbering industries. Local streams such as the Manalapan Brook and Millstone River supplied sufficient waterpower for the numerous grist mills in the township. Agricultural activities flourished in Monroe well into the nineteenth century. Many small agricultural-based hamlets, such as Red Valley (Applegarth), Half-Acre, Union Valley, and Dey Grove, among others, contained blacksmiths, distilleries, mills, post offices, stores and taverns to serve the needs of the local farming population.

The success of an increasingly diverse agricultural industry was dependent upon transportation routes, which brought goods to larger market centers. Lawrie's Road was improved considerably after it was chartered by the Bordentown and South Amboy Turnpike Company in 1816. Another significant transportation improvement was the construction of the Camden and Amboy Railroad in 1833. The United New Jersey Railroad and Canal Company was part of the Pennsylvania Railroad system in New Jersey, including their main line to New York City (now Amtrak's Northeast Corridor). Prior to 1872, its main lines were the Camden and Amboy Rail Road and Transportation Company (C&A), the first railroad in New Jersey and one of the first in the U.S., and the New Jersey Rail Road and Transportation Company (NJRR), the first railroad across the New Jersey Palisades. Two (or three) of those railroads crossed each other near the water mill of James Buckelew, and the area where this occurred became the town of Jamesburg. About 1855, almost 20 years later, James Buckelew formed the Jamesburg and Freehold Agricultural Railroad to transport passengers to the

Jersey shore and ship goods to and from hinterland areas of Monroe and neighborhood communities, such as Engli d the township's rural landscape to more suburban. In 1970, the first age-restricted community of Rossmoor was built, followed by five other large retirement communities: Concordia, Clearbrook, Greenbriar at Whittingham, The Ponds, and Encore. These retirement communities doubled the population of Monroe to over 24,000. Accompanying the growth in retirement communities has been growth in light industry and limited commercial development. However, Monroe has retained its semi-rural character, particularly in southern and eastern portions of the township. (Source: Cultural Resources Inventory, Richard Grubb & Assoc., Inc. April 2002; Heyer, Gruel & Assoc., PA, Master Plan of Monroe Township, Dec 1998).

CONSTRAINTS TO HISTORIC PRESERVATION IN MONROE TOWNSHIP

The NJ Office of Historic Preservation conducted a statewide survey that asked people what the challenges to historic preservation were. The most common answers were: Demolition or neglect of historic structures, lack of economic incentive to stimulate private preservation, and lack of general public information/education. Other constraints to historic preservation in Monroe Township include:

1. Decline in the number and size of farms.
2. Substantial building and economic development interests that threaten historic and culturally significant sites in older urban communities and undeveloped rural areas
3. Economic pressures such as declining state and federal fiscal support, and increasing demand for suburban residential development, infrastructure and roadways.

PREVIOUS EFFORTS IN HISTORIC PRESERVATION IN MONROE TOWNSHIP

The Historic Preservation Plan of 1998 Master Plan:

Preserve and protect the historical sites within the township.

1. Preserve significant historical sites through a historical survey of each site.
2. Nominate historically significant structures to the State and Federal historical register.
3. Adopt a historic preservation ordinance.
4. Establish an area for a Historical Village adjacent to the Municipal Complex.

Monroe Township has an active Historical and Cultural Commission and now designated as the Monroe Township Historic Preservation Commission. It has compiled a list of potential historic sites. It is now the Monroe Township Historic Preservation Commission. The commission hired Richard Grubb & Associates of Cranbury, New Jersey to prepare an inventory of historic buildings, structures, sites and districts in the Township. This inventory is based on the list compiled by the Commission. This inventory also identifies areas with high potential for prehistoric archeological resources. (See Table XII-2)

RELATION TO OTHER PLANS

2002 NJ Historic Preservation Plan: Historic, Cultural and Scenic Resources:

Protect, enhance, and where appropriate rehabilitate historic, cultural and scenic resources by identifying, evaluating and registering significant historic, cultural and scenic landscapes, districts, structures, buildings, objects and sites and ensuring that new growth and development is compatible with historic, cultural and scenic values. The policies of the 2002 NJ Historic Preservation Plan are listed below:

1. Identification and Inclusion: Coordinate the identification of historic areas, historic sites, landscapes, archaeological sites and scenic corridors for inclusion in state and national registers and in county and municipal planning documents.
2. Municipal Plans: Include historic surveys and scenic corridors in local master plans.

3. Preservation Guidelines: Ensure uniformity in guidelines used by all levels of government for the preservation and rehabilitation of historic buildings.
4. Historic Resources and Development Regulations: Protect the character of historic sites, landscapes, structures and areas through comprehensive planning, flexible application of zoning ordinances, construction codes and other development regulations.
5. Archaeological Resources: Investigate, protect and document archaeological resources identified prior to disturbance of the site. Encourage voluntary, expedited documentation of archaeological finds that might not otherwise be investigated, especially in private construction sites.
6. Historic Resources and Infrastructure: Locate and design public and private capital improvements to protect historic resources and their settings from the immediate and cumulative effects of construction and maintenance of these improvements.
7. Historic Structure Re-use and Affordable Housing: Promote adaptive reuse of historic structures to provide affordable housing, where appropriate, in ways that respect architectural and historic integrity.
8. "Main Street" Programs: Promote "Main Street" and other programs to aid in protecting historic sites and structures during revitalization of traditional downtown areas.
9. Identification and Delineation of Scenic and Historic Corridors: Participate in the coordination of state, regional and local government identification and delineation of scenic and historic corridors throughout New Jersey, and take the necessary steps to protect them.
10. Greenways, Scenic and Historic Corridors: Establish within a regional greenway system publicly accessible portions of scenic and historic corridors to provide passive and active recreational and cultural opportunities.
11. Development Patterns and Design to Support Scenic and Historic Values: Manage development and redevelopment to maintain, complement and enhance scenic and historic values within identified and delineated scenic and historic corridors.
12. Protection and Preservation of Scenic and Historic Corridors: Protect scenic and historic corridors by appropriate means and preserve them by using easement purchase, density transfers, fee simple purchase and other innovative and effective mechanisms.
13. Museums: Support museums, libraries, interpretive centers, archives and other public buildings as repositories of past culture and showcases for contemporary culture, and locate them in Centers, where appropriate, as interconnected components of community-based learning networks.
14. Civic Design and Public Art: Encourage high-quality design of all public buildings and landscapes, and promote the use of art in all public buildings and spaces.
15. Economic Development: Use historic preservation as a tool to promote economic development.

NATIONAL REGISTER OF HISTORIC SITES

Monroe Township’s only historic resource listed in the State and National Register of Historic Places is the Holmes-Tallman House, is also known as Brown’s Corner House. Built circa 1860 by Jacob Holmes, it is located at the intersection of South River-Cranbury and Browns Corner Road. The site was nominated to the National Register in 1979 as a significant example of a Carpenter’s Italianate farmhouse (Grieff 1979).

Although only one site is included in the National Historic, Monroe Township contains several sites of historic importance. Research conducted at the State Historic Preservation Office (SHPO) in Trenton identified five historical resources that

represent the only archaeological resources listed or eligible for listing on the National Register of Historic Places (See Table ###). These resources consist of two archeological sites that retain significant information regarding eighteenth century iron working and nineteenth century milling activities – the Ten Eycks Forge Site (Grossman, et al. 1976) and the Pocohontas Snuff Mill (New Jersey Department of Transportation 1989), a railroad – the Camden and Amboy Mainline Railroad, and a bridge that is demolished – the Rue Road Bridge (demolished) (A.G. Lichtenstein & Associates, Inc. 1994; Cultural Resources Consulting Group 1997). The necessary applications would have to be completed to include these sites in the National Historic Register of State Register.

National Register-Eligible or listed Historic Resources in Monroe Township

	Resource	Type	Eligibility Data
1	Ten Eycks Forge Site	Archeological	SHPO Opinion:2/14/77 Determination:11/29/77
2	Holmes-Tallman House	Architectural	SR: 7/5/79 NR: 9/12/79
3	Pocahontas Snuff & Tobacco Mill	Archeological	SHPO Opinion: 3/1/90
4	Camden & Amboy Railroad Main Line	Railroad	SHPO Opinion: 10/4/91
5	Rue Road Bridge (NJDOT # 125B055) over Matchaponix.	Bridge	SHPO Opinion: 2/18/93

INVENTORY OF SIGNIFICANT HISTORIC RESOURCES

Statewide Historic Contexts

The 1997 NJ Historic Preservation Plan has set up statewide historic contexts that organize historic events and resources in chronological order to enable broad categorizations and evaluations.

Statewide Historic Contexts

	Period	Timeline
1.	Paleo Indian and Early Archaic	11,500 - 8,000 years ago
2.	Middle Archaic	8,000 - 6,000 years ago
3.	Late Archaic	6,000 - 3,000 years ago
4.	Early/Middle Woodland	3,000 - 1,200 years ago
5.	Late Woodland	1,200 years ago - 1500 A.D.
6.	European Intrusion	A.D. 1500 - A.D. 1700
7.	Initial Colonial Settlement	A.D. 1630 - A.D. 1775
8.	Early Industrialization, Urbanization, and Agricultural Development	A.D. 1775 - A.D. 1860
9.	Suburban Development	A.D. 1840 - A.D. 1940
10.	Immigration and Agricultural, Industrial, Commercial, and Urban Expansion	A.D. 1850 - A.D. 1920
11.	Metropolitan New Jersey	A.D. 1910 - A.D. 1945
12.	Modern New Jersey	A.D. 1945 - Present

Pre-Historic Archeological sites in Monroe Township

Little is known about the prehistoric occupants of Monroe Township. Based on a research conducted by John Katerba and Warren Barnes, it appears that Monroe Township has been occupied by Native Americans for at least 6,000-7,000 years. The earliest known archeological materials from Monroe Township are linked to the Middle Archaic Period, with a higher frequency of artifacts

from the Late Archaic, Early Woodland, and Late Woodland Periods.

The majority of prehistoric sites in Monroe Township are situated along the Millstone River. The Millstone River is an ancient watershed that has a very high density of prehistoric sites in adjacent townships (Hunter Research, Inc. 1993), and such sites tend to contain deeply buried, intact deposits through aeolian (wind blowing) and colluvial (slope wash) processes (New Jersey Department of Transportation 1986). In addition, the Millstone River has a very high probability for containing Paleoindian sites due to the age of the watercourse (over 1 million years). Due to these reasons, areas surrounding the Millstone River are believed to

have the greatest potential for containing intact, National Register-eligible archaeological deposits. Prehistoric sites are also represented along Cranbury Brook, Manalapan Brook, Matchaponix Brook, and Wigwam Brook (See Table ###). Sites along these watercourses with intact deposits may also be potentially eligible for listing on the National Register of Historic Places due to the general lack of detailed information available about the prehistoric occupation of the Township. In contrast, archaeological sites in the northern portion of the Township may be situated closer to the surface, with maximum depths of 1 to 2 feet, because of an environmental setting similar to the Outer Coastal Plain.

There are 22 known prehistoric archeological sites recorded in Monroe Township, 15 of which are formally registered at the New Jersey State Museum

in Trenton. A variety of prehistoric materials, including a possible Native American burial, have been found near Thompson Park indicating a long antiquity of Native occupation overlooking Manalapan Brook. Monroe Township has also been the site of several Native trails. One of the largest Native trails within, or in the vicinity of, Monroe Township was the Crosswicksunk trail which is believed to have led from New Brunswick to the Hightstown area. Another trail passed by Pigeon Swamp through Jamesburg and joined the great Crosswicksunk Trail which crossed the State to the shore at Englishtown. There was also a trail that connected a number of Indian villages on the South River and the Matchaponix Brook. Based on this information, it is clear that Monroe Township was accessible to Native groups and was within an established transportation corridor during prehistoric and early historic times.

Prehistoric Archaeological Sites in Monroe Township

Smithsonian #/Site Name	Time Period	Function	Watercourse	Reference
28-Mi-15/Matchaponix	Unknown	Village	Matchaponix Brook	S&S 1913:47
28-Mi-16/Jamesburg	Unknown	Campsite	Lake Manalapan Manalapan Brook	S&S 1913:47
28-Mi-50	Unknown	Unknown	Cranbury Brook	NJSM
28-Mi-51	Unknown	Unknown	Tributary, Millstone River	NJSM
28-Mi-52	Unknown	Unknown	Millstone River	NJSM, Cross 1941:225
28-Mi-53	Unknown	Unknown	Millstone River	NJSM
28-Mi-56/De Bauns	Archaic	Unknown	Millstone River	NJSM
28-Mi-57/Bethel	Prehistoric, Contact, Early Historic	Native Settlement	Wigwam Brook	NJSM, H. Kerwin
28-Mi-59/Probasco	Unknown	Unknown	Millstone River	ISS
28-Mi-60/Wyckoff's Mills	Middle Archaic, Late Woodland	Unknown	Millstone River	NJSM
28-Mi-72	Unknown Prehistoric	Cemetery	Manalapan Brook	NJSM
28-Mi-114/Wiesnick	Archaic	Unknown	Millstone River	NJSM, RPA 1979
28-Mi-118/Glenn Rock Pit Site	Late Archaic, Prehistoric	Unknown	Wigwam Brook	NJSM
28-Mi-144/Azierwitz Farm	Unknown	Unknown	Millstone River	Cross 1941:225
28-14-7-8-8/Smith	Unknown	Unknown	Millstone River	ISS
Site 1/Ely Farm, Unregistered	Middle Archaic, Late Woodland	Unknown	Cranbury Brook	J. Katerba*
Site 2/ Unregistered	Archaic, Woodland	Unknown	Cranbury Brook	J. Katerba
Site 3/Unregistered	Late Woodland	Unknown	Cranbury Brook	J. Katerba
Site 4/Thompson Park/Rue Road, Unregistered	Late Archaic	Unknown	Manalapan Brook	J. Katerba
Site 5/W. Barnes Site, Unregistered	Archaic, Woodland	Unknown	Manalapan Brook	J. Katerba
Site 6>Showers Farm, Unregistered	Archaic	Unknown	Manalapan Brook	J. Katerba
Wetlands Mitigation Bank, Unregistered	Unknown	Unknown	Millstone River	LBA 2000

The Probasco site (28-Mi-59) may be situated in East Windsor Township, Mercer County, but is listed under Middlesex County sites and the New Jersey State Museum.

ISS – Indian Survey Sites

NJSM – New Jersey State Museum

NJDOT – New Jersey Department of Transportation

RPA – Resources Preservation Associates, Inc. 1979

S&S – Skinner & Schrabisch

J. Katerba – John Katerba, Monroe Township Historic Preservation Commission, personal communication, June 2001

LBA – Louis Berger & Associates, Inc. 2000

Historic Archeological sites in Monroe Township

There are also a number of historic archeological resources are present in Township such as cemeteries, churches, schools, mills, a distillery, a blacksmith shop, an eighteen century Native settlement, an iron forge, Revolutionary War sites and the Monroe Oak which is also the logo of Township. Bethel and the Pocohontas Snuff Mill are the only archeological sites that are registered at the New Jersey State Museum. Currently, no National Register-eligible prehistoric sites exist in Monroe Township.

Of all the identified archeological site, one of the most important is the Bethel site (28-Mi-57), the location of David Brainerd's Indian Mission, occupied from 1746 to 1760, in the vicinity of Thompson Park between Perrineville Road and Wigwam Brook. David Brainerd's Indian Mission consisted of 160 log homes, a church, school and agricultural fields for wheat and Indian Corn and was occupied between 1746-1760. In 1760, the occupants were moved to the Brotherton Reservation in Shamong Township, Burlington County where they lived until the early 1800's (Federal Writer's Project 1938:16).

The Pocahontas Snuff Mill is an important National Register – eligible site that is the site of a nineteenth century snuff and tobacco mill located to the immediate south of Rue Road at Matchaponix Brook. Mill remains consist of a semi-rectangular, timber foundation with dimensions of 60 feet by 35 feet, and several vertical piles. A trash midden was found on the northeast side of Matchaponix Brook that could be related to the snuff mill. The Spotswood area was famous for the production of snuff, or finely ground tobacco

leaf, in the early to late nineteenth century. Snuff was used for recreation and medicinal purposes. J. Perrine originally owned the Pocohontas Snuff Mill in the mid-1850s (New Jersey Department of Transportation 1989).

Monroe Township has a number of gristmills supported by local streams such as the Manalapan Brook and Millstone River. The Ten Eyck Forge was built about 1750 at Outcalt and Ensley's Mills built in 1792 at the future location of Jamesburg (Clayton 1882:803-804) and two most important historic gristmill sites. The Ten Eycks Forge site is another National Register – eligible site located where Old Forge Road crosses Manalapan Brook at the northern boundary of the Township. Early settler Peter Ten Eycks built the eighteenth century forge in 1750. The forge site is situated within a hardwood swamp and was defined by the presence of two low-lying mounds that overlay the remains of the forge structure and the former forge dam. The Ten Eycks Forge site represents the remains of one of the earliest surviving forges in Middlesex County.

Monroe Township was used as camping grounds by the American Army on their way to Freehold for the Battle of Monmouth in 1778 (Di Ionno 2000:85). Several sites in the Township are cited including Molly Pitcher's and General George Washington's campgrounds. Several roads may have been used by American troops on their way from Cranbury to Freehold, including Union Valley Road, Federal Road and Gravel Hill Road. In addition, the Red Tavern may have played a role in the Revolutionary War (Sinnott 1905:38). Archaeological and documentary research would confirm the locations

of the above referenced Revolutionary War–related sites. High potential for historic resources include areas surrounding historic farmlands.

Other areas considered sensitive for historic archaeological resources include all historic towns and hamlets, and areas surrounding historic transportation routes. Historic hamlets in Monroe Township include Outcalt, Wyckoff’s Mills, Prospect Plains, Applegarth (Red Tavern), Cranbury Station, Hoffman Station, Tracy Station, Rhode Hall, Mount’s Mills, Half-Acre, Gravel Hill and Union Valley (Clayton 1882; Heyer, Gruel & Talley, PA 1998). Many of these hamlets had early mill sites, general stores, taverns, distilleries, churches, railroad stations, post offices, blacksmith shops, and residential dwellings, and historic cemeteries, which were usually family plots or church, related plots.

Historic Residential Buildings

In 1978, the Middlesex County Cultural and Heritage Commission commissioned Heritage Studies of Princeton to perform a countywide historic sites inventory. In Monroe Township, the survey identified six architectural resources as “possibly” eligible for the National Register of Historic Places: L.C. Perrine Farm (no. 61); Mount House (no. 47); Stichell House (no. 28); Voorhees House (no. 72); Harrison Farm (no. 84); and State Home for Boys (no. 108) (Heritage Studies, Inc. 1979). A supplemental survey performed in 1985 identified only the Perrine Farm and Mount House as eligible for the National Register (Guter and Foster 1985). Due to either a lack of significance or loss of integrity, the remaining four properties were not recommended eligible.

The period between 1830 and 1860 was a period of growth common to rural New Jersey due to the advent of the Camden and Amboy Railroad (1831) and the Freehold and Jamesburg Railroad (1851) that gave rise to new railroad communities and promoted agricultural prosperity by giving local farmers access to larger markets. The oldest extant houses in Monroe date to the mid to late eighteenth century. Although most of the homes date to the eighteenth century, most have undergone extensive exterior alterations over time.

Eighteenth Century (Pioneer) Architecture:

One of the most intact of Monroe’s historic farmhouses is 21 England Road (no. 72). Located at the end of a private lane, the original section of the house dates to circa 1766. It is 1-1/2 stories tall with a lean to and shed roof wall dormer on the east façade and perpendicular to the original house, the main block is 2-1/2 stories tall, three bays wide with a small shed roof porch at the east bay over a paneled door with sidelights and transom. The exterior is clad with cedar shingle siding with exposed clapboard underneath. 21 England Road is locally significant as a well-preserved and intact example of an early (pioneer) Monroe farmhouse that retains its historic outbuildings and surrounding acreage and should be considered eligible for the National Register.

Wind Knoll (no. 83), is an impressive house sited at the northwest corner of Hamilton Station Road and Prospect Plains road and dates the house to 1787. An intact outbuilding lies at the rear of the property. The Stechell Farmstead (no. 28) at 70 Old Church Road is a five-bay center hall dwelling with an eighteenth century section. This house is

recommended in the present investigations as a contributing element to a rural agricultural district.

The Mount House (no. 47), on the north side of Route 33, also dates to the late eighteenth century. The western three bays appear to be the original section of this house with the eastern two bays added at a later date. The center entry is entered through a small porch with jigsaw brackets and turned columns. This house and property represents the last remnant of a once extensive and influential family land holding – an example of a rural farmstead that retains sufficient integrity to convey its historic and architectural significance. The Mount House was recommended eligible for the National Register in 1978 and 1985 (Heritage Studies, Inc. 1979; Guter and Foster 1985). The Mount House could be considered as endangered because of its proximity to Route 33.

Federal Architecture:

The William Applegate House on Union Valley Road is a notable example (no. 9). This 2-1/2 story, five bay - center hall has a pitched roof and singled exterior. A distinguishing feature of the house is the dentil molding below the cornice. The Applegate House departs from the typical vernacular dwelling found in the Township and embodies a more distinctive element of style. Because the house is unique to the Township and retains a sufficient amount of architectural integrity, it should be considered eligible for the National Register.

A vernacular example of the Federal style includes the Peterson homestead on the east side of Halsey Reed Road (no. 16). 211 Cranbury-Station Road at

Applegarth Road (no. 10) is also a five bay center hall with flanking internal end chimneys with an exposed chimney back at the east façade. A Federal Period house that retains its historic outbuildings and acreage includes the Indyck Farm (no. 29) on the west side of Old Church Road and the future home of the Monroe Historical Museum consists of a rear section of the house that dates to circa 1820.

Greek Revival Architecture:

An example of Greek Revival architecture in Monroe Township is 242 Cranbury Station Road (aka Pop's Farm Market (No. 4) consists of a main block three bays wide with the entrance the eastern bay. 201 Applegarth Road opposite Halsey Reed Road (No. 12) is an example of vernacular Greek Revival style.

Italianate Architecture:

The most important Italianate dwelling is the circa 1860 Holmes-Tallman House, the only building listed in the National Register (no. 120). Its proximity to a rapidly industrializing section of Monroe and South Brunswick Townships makes this a potentially endangered property. 135 Prospect Plains Road (no. 112) is a two-story, five-bay building is two bays deep with a center entrance. The building is currently being converted from residential to professional use. The only brick residence in the Township is 81 Hoffman Road (no. 95).

Late Nineteenth – Early Twentieth Century Architecture:

There was very little building activity in Monroe Township during the last quarter of the nineteenth century. In early twentieth century, Bernarr

MacFadden began building “Physical Culture City” in Outcalt in northern Monroe. Several examples of the early twentieth century American Foursquare were built in the Township, including the dwelling at Applegarth and Halsey Reed Roads (no. 19). Ranch style homes on subdivided farmland were seen after World War II, and as farmland was further divided, it was developed as suburban retirement and gated communities.

Historic Non-Residential Buildings

The important non-residential buildings in Monroe Township are:

The New Jersey State Reform School (no. 108) - Founded in 1867, the site is a sprawling complex of brick Victorian buildings that includes dormitories, a chapel and vocational and farm buildings. A circa 1750’s cemetery believed to hold the remains of French prisoners from the French and Indian War may lie on this property (no. C4), but in 1985, after several key buildings were demolished, the property was recommended not eligible (Guter and Foster 1985).

Forsgate Country Club (no. 125) - Designed by architect Clifford Winderhock in 1931 in the Colonial Revival Style. The East Course at Forsgate was designed by noted American golf course architect Charles Banks, and remodeled in the late 1980’s by Carlton Gipson (Cornish and Whitten 1993:199, 273, 496).

Schools – Monroe Township replaced six condemned school buildings with identical two-story brick edifices, one on Applegarth Road and the other on Jamesburg-Englishtown Road (nos. 20 and 109) in the 1930s. The last remaining one room

school house near the intersection of Prospect Plains and Applegarth Road is currently abandoned and boarded up, and its fate remains uncertain (no. 115). A former Sunday school still extant on Gravel Hill Road is presently used as garage. The last historic church in the Township burned in 1925. The Township has no intact mills or industrial sites.

Transportation

In 1831, the Camden and Amboy Railroad (no. 121), the first railroad in the state and the third in the country, built its line between Bordentown and South Amboy. In 1850, the railroad straightened its alignment, but some of the stone sleepers from the original alignment remain (no. 127). These 500 pound granite blocks are spaced at regular intervals, many buried under several inches of dirt, within an approximately 200 foot long corridor in the northern part of the Township. In 1991, the Camden and Amboy Mainline Railroad received a SHPO Opinion of National Register of Eligibility. This Opinion does not include the abandoned section of the railroad.

The Freehold and Jamesburg Agricultural Railroad (no. 122), chartered in 1851, operated between Englishtown and Freehold to provide an outlet for the Township’s agricultural products. In the late nineteenth century, the railroad was absorbed by the Pennsylvania Railroad, and passenger service ceased in 1962. The rails of this line are still intact although there is no service.

The Rue Road Bridge over Matchaponix Brook, a Warren pony truss built in 1990, was the only bridge in the Township eligible for the National Register. It was replaced in the late 1990’s.

Cemeteries

Marked burial sites in the Township include the Hoffman cemetery (no. C3) on Hoffman Station Road, and the Union Valley Methodist Church Cemetery (No. C1) on Gravel Hill Road. There are doubtless other unmarked family burial grounds in the Township, including the Applegate family burial ground (no. C2), which is overgrown and lies somewhere near Old Church Road, and the Ried cemetery off Perrineville Road (no. C6).

The Monroe Oak (No. 117)

Symbol of Monroe Township, the Monroe Oak is more than 300 years old and eminently occupies a historic crossroads near the site of the former Railroad Hotel. The Monroe Oak is a rare, surviving example of a “William Penn” tree planted around the time the great Quaker arrived in America. Vital statistics of the Monroe Oak include a circumference of 17’7” and a height of 65’. Since 2000, the Monroe Oak has been protected by a Township ordinance to ensure its preservation.

Historic Districts proposed by the Cultural Resources Inventory In April 2002

Proposed Cranbury Station Historic District (No. 15): In 1979, the district was recommended eligible for the National Register for its significance as an agricultural shipping point for local farmers for the first railroad in the state – the Camden and Amboy Railroad. This area lies in both Monroe and Cranbury Townships.

Proposed Prospect Plains Historic District (No. 119): This linear district is important for its history

as a shipping point located along the east side of the former Camden and Amboy Railroad, the first railroad chartered in New Jersey. The original former post office and general store still exist, along with four private residences and a 1930’s garage.

Proposed Monroe Rural Agricultural District (No. 125): The boundaries of this district are Cranbury Station to the north, Old Church Road to the east, Wycoffs Mills Road to the south and Hasley Road / Wycoffs Mills Road to the west. It has 13 houses and the Applegarth School. The former Dey farmhouse on Old Church Road has been proposed for use as the township museum.

Recommendations

The inventory identified five historic resources within Monroe Township that are listed in or eligible for the National Register of Historic Places. (See Table XII-1) No prehistoric archeological resources are considered eligible; however detailed investigation could determine that some exist within Monroe Township. As a result of this inventory, three individual properties and three historic districts are recommended eligible for the National Register.

Individual Properties recommended eligible for National Register

	Address	Inventory #
1	21 England Road	72
2	The William Applegate House	9
3	The Mount House	47

Historic Districts recommended eligible for National Register

	District Name	Inventory #
1	Cranbury Station Historic District	15
2	Prospect Plains Historic District	119
3	Monroe Rural Agricultural District	125

It is also recommended that a National Register nomination should begin with Prospect Plains, because of its central location in the township, high visibility due to high volumes of pedestrian and vehicular traffic, and its proximity to the Monroe Oak—the Monroe Township symbol.

This inventory should assist in accomplishing the future objectives of nominating significant resources to the State and National Register of Historic Places and the adoption of a preservation ordinance. The adoption of strong versus weak historic preservation ordinance could be a valuable preservation tool.

According to Michael L. Gregg, Principal Historic Preservation Specialist at the SHPO: “A strong ordinance is one where the Historic Preservation Commission’s decisions regarding effects to historic landmarks and decisions regarding avoiding. Minimizing and mitigating adverse effects are binding upon the applicant. With weak ordinance, the Historic Preservation Commission’s decisions are advisory to a Planning Board or Board of Zoning Adjustment, which in turn makes the decisions.”

An in-depth evaluation should be conducted of the recommended historically significant districts

and resources to ascertain whether any warrant a petition to be placed to the State or National Registers. Measures to protect these significant historic resources should be included as part of the zoning and planning process. In order to implement these recommendations, an historic Preservation Ordinance should be adopted which is now feasible in that the Township has established the Historic Preservation Commission. The Ordinance would regulate management of specific sites and historic districts, which should be established based on the cultural resource survey recommendations. It is recommended that the Historic Preservation Ordinance be completed in accordance with requirements for the State Certified Local Government Program.

Detailed Inventory

The historical sites that still exist should be recommended to the State and National Historic Register and the hamlets should be nominated for designation as hamlets in the State Development and Redevelopment Plan.

The Crossroads Of The Revolution

The Township also served as a campsite for George Washington and the Continental Army during the battle of Monmouth. The map also indicates the approximate location of Washington’s route to the battle. The National Park Service has undertaken a study entitled, “The Crossroads of the Revolution”. The objective is that sites and the route be designated a National Heritage Area and to that end acquire properties in order to preserve the approximate route and significant campsites along the route. The Historical Preservation Commission through the Township Council should request

that the National Park Service include Monroe Township within this study. A meeting to that affect was held with the State of New Jersey Green Acres Department.

List of Sites Shown in Historic Sites Map

1	Union Valley- Half Acre Road, east side, south of Clear Brook
2	Union Valley- Half Acre Road, east side, south of # 1, south of Clear Brook
3	Union Valley- Half Acre Road, west side, 2000' north of Union Valley Rd.
4	Gravel Hill-Union Valley Road, north side / Methodist Church Parsonage
5	Union Valley- Half Acre/Cranbury Station Road, northwest corner
6	123 A Union Valley Road, north side, between Old Church and Union Valley-Half Acre Road.
7	Union Valley Road, south side, between Old Church and Union Valley-Half Acre Road
8	Union Valley / Old Church Roads, southwest corner
9	Union Valley Road, south side, 1000' east of Applegarth Road
10	211 Cranbury Station Road, north side at Applegarth Road
11	Union Valley Road, north side, 200'west of Applegarth Road
12	Cranbury Station Road, north side, east of railroad tracks
13	257 Cranbury Station Road, north side, east of railroad tracks
14	242 Cranbury Station Road, south side, 2200' west of Applegarth Road/ Pops Farm Market and Greenhouse
15	Cranbury Station Historic District, Monroe & Cranbury Townships
16	Halsey Reed Road, east side, north of bend in road
17	Halsey Reed Road, north side, 1/2 mile west of Prospect Plains Road
18	Halsey Reed Road, north side, 1/4 mile west of Prospect Plains Road
19	Applegarth Road, east side, 1000' north Halsey Reed Road
20	Applegarth Road, east side / Monroe Township School #2 / Applegarth Middle School
21	Applegarth Road, west side, south of Cranbury Station Road / Byrne Bros. Farm

22	Applegarth Road, east side, 1500' north of Halsey Reed Road
23	201 Applegarth Road, east side, at Halsey Reed Road
24	Wyckoff's Mills Road, north side, east of township border
25	Old Church Road, west side, 1000' south of Union Valley Road
26	93 Old Church Road, east side, 1400' south of Union Valley Road
27	75 Old Church Road, on Federal Road, north side, 400' east of Old Church Road / Old Church Farm
28	70 Old Church Road, west side, 175' north of Federal Road / Stechell House
29	60 Old Church Road, west side, 400' south of Federal Road / Dye Farm
30	49 Old Church Road, east side, 2000' south of Federal Road
31	Mount Road, north side, 1000' west of England Road / Applegate House
32	Old Church Road, west side, north of Mount Road, at end of farm lane
33	Union Valley-Applegarth Road, north side, between Applegarth and Old Church Rds.
34	Old Church Road, south side, 1500' west of Old Church Road
35	5 Wyckoff's Mill Road, 1000' east of Applegarth Road
36	Wyckoff's Mill Road, 300' feet east of Applegarth / Blacksmith house
37	136 Applegarth Road, west side, north of Millstone River at end of farm lane
38	124 Applegarth Road, west side, south of Millstone River
39	Applegarth Road, west side, north of Bentley Road
40	482A Applegarth Road, north of Bentley Road / D. Dey House
41	Butcher Road, Route 33, southwest corner / Over Billy's Inn
42	Route 33, south side, 1400' east of municipal boundary
43	Etra Road, north side, 450' east of municipal boundary on private drive
44	Disbrow Hill Road, west side
45	Disbrow Hill Road, east side, 2000' north of Etra Road
46	Disbrow Hill Road, north side, 1500' south of Route 33
47	Route 33, north side, 1/2 mile west of Perrineville Road / Mount House
48	Route 33, north side, 1500' west of Perrineville Road
49	Perrineville Road, east side south of Millstone River
50	125 Old Road Applegarth, south side, 750' north of county line
51	Old Road Applegarth, north side
52	Jamesburg-Perrineville Road, east side, just north of Old Road Applegarth
53	Old Road Applegarth, south side, 1600' east of Jamesburg-Perrineville Road
54	Perrineville Road, west side, 1000' north of Millstone

55	Bergen Mills-Gravel Hill Road, west side, 750' south of Jurgelsky Road
56	Jurgelsky Road, south side, 3000' west of Bergen Mills Road
57	Jurgelsky Road, south side, 3500' west of Bergen Mills Road
58	Dey Grove Road, north side, 3000' east of Perrineville Road
59	330 Grove Road, north side, 400' east of Perrineville Road
60	Dey Grove Road, south side, 2500' west of north Bergen Mills Road
61	70 Bergen Mills-Gravel Hill Road, south side, between Jurgelsky and Dey Grove Roads / L.C. Perrine Farm
62	Bergen Mills Road, east side between Federal and Dey Grove Roads
63	186 Federal Road, north side, 3500' east of Perrineville Road
64	Federal Road, north side, 2000' east of Perrineville Road
65	Federal Road, north side, 1000' east of Perrineville Road
66	Federal Road, north side, 400' west of Perrineville Road
67	Federal Road, north side, 1400' west of Perrineville Road
68	Federal Road, north side, 3000' west of Perrineville Road
69	Federal Road, north side, 200' east of England Road
70	Federal Road, south side, 2000' east of England Road
71	Federal Road, south side, 250' west of England Road
72	21 England Road, east side, between Federal and Mount Roads, at end of farm lane
73	Longstreet Road, north side, 1000' east of England Road
74	Union Valley Road, south side, 800' east of Union Valley- Half Acre Road
75	Union Valley Road, south side, 1500' east of Union Valley- Half Acre Road
76	Southwest corner, Union Valley- Gravel Hill / Perrineville Road
77	Union Valley- Gravel Hill Road, north side, 3000' east of Union Valley Road
78	Union Valley- Gravel Hill Road, north side
79	Prospect Plains Road, north side, 600' east of Perrineville Road
80	Hoffman Station Road, west side, 500' west of Prospect Plains Road
81	Hoffman Station Road, west side, Determine location
82	Northeast Hoffman Station / Prospect Plains Road
83	340 Hoffman Station Road, 750' east of Prospect Plains Road / Wind Knoll
84	Hoffman Station Road, north side, 300' east of Prospect Plains Road
85	Union Valley- Gravel Hill Road, south side, 750' west of Hoffman Station Road
86	Gravel Hill Road, east side, opposite Union Valley Road

87	Gravel Hill Road, south side, 700' south of Union Valley Road
88	Gravel Hill Road, west side, 2000' south of Union Valley Road
89	Gravel Hill Road, south side, 2400' south of Union Valley Road (south of bend)
90	Gravel Hill Road, east side, 1750' north of Federal Road
91	Gravel Hill Road, east side, 800' north of Federal Road
92	Perrineville Road, west side, 2500' north of Federal Road, at end of private lane
93	Hoffman Station Road, north side, 1000' east of Mount Mills Road
94	101 Hoffman Station Road, south side, 1500' east of Mount Mills Road
95	81 Hoffman Station Road, south side, 3000' east of Mount Mills Road
96	Jamestown-Englishtown Road, north side, opposite Hoffman Station Road / Sea Breeze Farms
97	Spotswood- Englishtown Road, east side, 1000' north of Buckelew Avenue
98	560 Jamestown-Englishtown Road, north side, 2000' west of Hoffman Station Road
99	Jamestown-Englishtown Road, north side, 2500' west of Hoffman Station Road / Etsch Farms
100	201 Mount Mills Road, north side east of Spotswood- Englishtown Road
101	Mount Mills Road, south side, east of Schoolhouse Road
102	253 Mount Mills Road, north side, 1000' east of Schoolhouse Road
103	Mount Mills Road, south side, 1500' east of Schoolhouse Road
104	Mount Mills Road, north side, 2000' east of Schoolhouse Road
105	Spotswood- Englishtown Road, east side, 1600' north of Mount Mills Road
106	Spotswood- Englishtown Road, east side, 1000' south of Rue Road at end of private lane / Indyke Farms
107	Spotswood- Englishtown Road, east side, 1000' north of Rue Road / Former Police Headquarters
108	New Jersey Training School for boys and girls (New Jersey State Reform School)
109	Buckelew Avenue, east side, 2000' south of Jamesburg-Monroe border / Township School #1
110	387 Buckelew Avenue, west side / Farmer Al's
111	302 Schoolhouse Road, north side
112	135 Prospect Plains Road, north side
113	136 Prospect Plains Road, south side
114	142 Prospect Plains Road, south side, 200' east of Half-Acre Road
115	Prospect Plains School / Prospect Plains Road, south side, east of Applegarth Road
116	96 Applegarth Road, southwest corner of Applegarth / Prospect Plains Road
117	Monroe Oak / northwest intersection of Prospect Plains / Applegarth Roads
118	231 Prospect Plains Road, north side, west of railroad

119	Potential Prospect Plains Historic District
	16 Public Road
	14 Public Road
	12 Public Road
	10 Public Road
	8 Public Road / Cranberries Gourmet Shoppe
	6 Public Road
	4 Public Road / Garage
120	Holmes-Tallman House (Brown's Corner House)/southeast corner of Cranbury Road and Brown's Corner Road
121	Camden & Amboy Railroad Historic District
122	Jamesburg and Freehold Railroad
123	Lawrie's Road
124	Bordentown-South Amboy Turnpike
125	Monroe Rural Agricultural District
126	Forsgate County Club/Forsgate Drive and Possum Hollow Road
127	Original Camden & Amboy Railroad Sleepers
128	284 Perrineville Road/Half-Acre Four Room School

HISTORIC ARCHEOLOGICAL SITES

B-1	Union Valley Methodist Protestant Church / Gravel-Hill-Union Valley Road, south side, 400' east of Union Valley-Half-Acre Road
B-2	Wyckoff's Mill/Millstone River near Monroe-East Windsor boundary
B-3	Pleasant Hill School/Wyckoff's Mill Road, west side near Indian Run Brook
B-4	Red Tavern Site/Applegarth Road, west side, south of Wyckoff's Mill Road
B-5	Distillery Site/Applegarth Road, east side, near Millstone River
B-6	Pleasant Grove School/Route 33, north side
B-7	Dey Grove School/north of Dey Grove Road-Bergen Mills Road intersection
B-8	Washington's Headquarters- Story Farm/Gravel Hill Road north side
B-9	American Revolution Campground/Gravel Hill Road, north side
B-10	Molly Pitcher Campsite/Hoffman Station Road, south side, just east of Prospect Plains Road
B-11	General Lafayette Site/Jamesburg-Englishtown Road, east side, north of Spotswood-Englishtown Road
B-12	Davison Blacksmith Shop/Buckalew Avenue, west side, north of Gravel Hill Spotswood Road
B-13	Mount's Mill Site/Matchaponix Brook near Englishtown Road
B-14	Pocahontas Snuff and Tobacco Mill Site/Matchaponix Brook, south of Rue Road Bridge
B-15	Ten Eycks Forge Site/Old Forge Road and Manalapan Brook
B-16	Wigwam Grove/Perrineville Road, west side near Jamesburg- Monroe border
B-17	Bethel/Thompson Park, between Perrineville Road and Wigwam Brook
B-18	Old Church/Old Church Road, west side, 1500' south of Federal Road
B-19	Old Church School/Old Church Road, west side, 1600' south of Federal Road
B-20	School/Schoolhouse Road, south side, east of Buckalew Avenue

CEMETERIES

C-1	Union Valley Methodist Church Cemetery/Gravel-Hill-Union Valley Road, south side, 400' east of Union Valley-Half-Acre Road
C-2	Applegate Family Burial Ground/between Mount, Old Church, Federal and England Roads
C-3	Hoffman Cemetery (Old Story Burying Ground)/Hoffman Station Road, south side
C-4	French Cemetery at New Jersey Training School
C-5	Old Church Cemetery/Old Church Road, west side, 1500' south of Federal Road
C-6	Reid Cemetery/Perrineville Road, south of Millstone River



Residential & Non-Residential Growth

MPO 2015 PROJECTIONS

Monroe Township is utilizing the population, employment and household forecasts produced by the North Jersey Transportation Planning Authority (NJTPA) since the State has not come out with growth numbers as of yet. According to their estimates, the population in Monroe Township will increase by 11,950 by the year 2015, an overall increase of 42.6 percent. Employment is forecasted to increase at a rate of 19.6 percent while households will increase by 41.3 percent. Middlesex County is forecasted to have a slightly lower growth pattern than Monroe Township overall. NJTPA projects that the County will increase 12.2 percent in population, 14.9 percent in employment and 14.9 percent in households.

North Jersey Transportation Planning Authority						
Population, Employment & Household						
	2000	2005	2010	2015	# Change 2000-2015	% Change 2000-2015
Monroe Township						
Population	28,000	35,890	38,050	39,950	11,950	42.6
Employment	9,230	9,740	10,290	11,040	1,810	19.6
Household	12,540	15,470	16,680	17,720	5,180	41.3
					# Change 2000-2015	% Change 2000-2015
Middlesex County	2000	2005	2010	2015		
Population	750,162	785,575	819,729	854,035	103,873	12.2
Employment	406,183	428,930	452,123	477,859	7,676	14.9
Household	265,815	279,649	294,702	312,332	46,517	14.9



HISTORIC TRENDS

The historic information is currently incomplete due to how records were kept in the past and the ability only to get selected information from the Division of Codes and Standards at this time. In looking at historic trends for Monroe Township, the granting of CO's for residential units has been significant the past ten years. Over the past ten years, Monroe Township has been granting 300 to 700 residential COs per year. Factoring the number of demolitions that have happened over the past ten years, there has been a growth of 3,942 new residential units.

Historic Trends - Residential										Actual
	95	96	97	98	99	00	01	02	03	04
CO	..	563	697	515	351	361	470	527	476	542
DEMO	..	5	5	1	3	0	1	1	2	0
NET	..	558	692	514	348	361	469	526	474	542

The Township has also had steady growth in non-residential development, especially in storage uses, with very little demolition. There has been an overall growth in non-residential development of approximately 1.4 million square feet. These both the residential and non-residential historical data is consistent with the rate of population, household and employment growth that has happened over the past ten year as previously shown through the Census.

Historic Trends- Non-Residential									
By Square Feet									
	95	96	97	98	99	00	01	02	03
CO's Issued									
B- Office		13,440	12,239		1,956	4,054		6,708	52,850
M- Mercantile uses			12,748						
S- Storage Uses			343,800	317,659	20,250	23,511	307,715	802,878	3,960
A- Assembly		17,582	23,491		17,432		1,600	27,539	2,565
Multi/Dorm		71,400							
E- Schools K-12		34,400						45,526	18,469
I- Hospital/Nursing Homes		63,533		89,959		3,870			
	95	96	97	98	99	00	01	02	03
Demolition-Permits									
B- Office					3	1			
S- Storage Uses					1				
Multi/Dorm							1		

The residential and non-residential projects listed below measure the number of approvals and projected approvals for development that would result in permanent certificates of occupancy (CO's) by the year 2014.

RESIDENTIAL

The table below reflects future residential construction based on site-specific analysis of development applications, both approved and anticipated. The table includes all market-rate, affordable and COAH Second Round certified affordable residential development that will have certificates of occupancy, issued per year, by the year 2014. As the table shows, Monroe is projected to have a total residential growth of 5,336 units by 2014.

Monroe Township- Anticipated Development Residential 2005-2013										
	05	06	07	08	09	10	11	12	13	Total
Approved										
Encore	12									12
Regency	100	100	100	100	100	100	100	137		837
Renaissance at Monroe	150	127								277
Cranbury Crossings at Monroe		95	96							191
Stonebridge		130	130	130	130	130	130	130	136	1,046
Monroe Manor			100	100	100	100	100	100	90	690
Stratford at Monroe		110	110	110	110	110	110	110	120	890
Forest Manor	6	6								12
Hidden Pond I			20	21						41
Valley View		8								8
Southfield Estates			40	40	50					130
Cranbury Station Estates		6								6
Cranbury Heights		14	15							29
Millstone River		8	8							16
Primrose Acres			25	25	25	31				106
Diamond in the Rough		9								9
Laurel Estates		6	6							12

Millwood Estates		7	7							14
US Homes			12	12	12					36
Calton Homes			25	25	25	24				99
Hidden Pond II			20	21						41
Verde Group	8									8
Lafayette Knolls			10	11						21
Federal Road	4									4
Millwood Assoc.	8									8
Kara Homes	16	20	21							57
Sunrise Acres			17	20						37
Renaissance Property-Dynasty Estates	18	50	50	44						162
Giancola		5								5
Fleisch		7								7
Toll Brothers- Ochsner/Windhaven		9	10							19
David Estates	6									6
M&M Realty		20	20	28						68
Royal Realty		11	12							23
Matrix			25	25	25	24				99
Monarch Woods		9								9
Renaissance Property-Majestic Woods		6	7							13
Pending										
Dynasty Assoc			6							6
Matrix-Valley View			8							8
Crossroads Plaza			6	6						12
Kings Estates		4								4
Renaissance-Majestic Woods			6	7						13
Egierce			2							2
A&R Construction			2							2
O'Carroll			2							2
Monarch Woods			5	5						10
Diamond Builders			9							9
Adventure Realty		1								1
Pinder Estates		5	6							11
Anticipated										
K. Hovnanian				50	50	50	50	50	44	294
OTHER					4	4	4	4	4	20
TOTAL	328	773	938	780	631	573	494	531	394	5,336

NON-RESIDENTIAL

The table below reflects future non-residential construction based on site-specific analysis of development applications, both approved and anticipated that are expected to have certificates of occupancy, issued per year, by the year 2014. The developments are broken down by use group and the “Other” category in each table reflects projections of developments on parcels of land that are zoned for non-residential development. Total projected demolitions are also captured within this table to reflect those that are permitted and those that are projected as possible loss of development by use group.

As the tables show, Monroe Township is projected to have a non-residential growth in assembly, office, retail and storage uses. The overall non-residential development totals 3,178,035 square feet. There is no projected demolition of non-residential uses within the Plan timeframe. The overall projected non-residential growth of 216,887 square feet for the Township remains.

Monroe Township- Anticipated Development Non-Residential A-Assembly 2005-2013										
	05	06	07	08	09	10	11	12	13	Total
Pending										
Applegarth Prof Center			11,400							11,400
Anticipated										
Other						8,000			10,000	18,000
New Development			11,400			8,000			10,000	29,400
Demolitions										0

Monroe Township- Anticipated Development Non-Residential B-Office 2005-2013										
	05	06	07	08	09	10	11	12	13	Total
Approved										
Synergy Bank		3,400								3,400
Riverbrook			75,000							75,000
Greenfield				60,000						60,000
Barnes & Noble		70,000								70,000
USA Development		12,432								12,432
Applegarth Prof. Center				105,600						105,600
Matrix			5,750							5,750
Concordia Shop. Center		3,276								3,276
Monroe Medical	30,240									30,240
Ben Franklin Bank		17,500								17,500
Anticipated										
Other						12,000		10,000		22,000
New Development	30,240	106,608	80,750	165,600		12,000		10,000		405,198
Demolitions										0

Monroe Township- Anticipated Development Non-Residential M-Mercantile 2005-2013										
	05	06	07	08	09	10	11	12	13	Total
Approved										
Applegarth Prof. Center		14,873								14,873
Concordia Shop. Center			23,802							23,802
Old Amboy		9,400								9,400
Anticipated										
Other							10,000			10,000
New Development		24,273	23,802				10,000			58,075
Demolitions										0

Monroe Township- Anticipated Development Non-Residential S-Storage 2005-2013										
	05	06	07	08	09	10	11	12	13	Total
Approved										
Greenfield			75,000							75,000
Barnes & Noble		2,422,000								2,422,000
USA Development				275,873						275,873
Matrix		244,362								244,362
Liawn Self-Storage	80,800									80,800
Anticipated										
Other						50,000		30,000		80,000
New Development	80,800	2,666,362	75,000	275,873		50,000		30,000		3,178,035
Demolitions										0

Monroe Township- Anticipated Development and Demolitions- Non-Residential 2005-2013										
	05	06	07	08	09	10	11	12	13	Total Sq Ft
Total CO's										
A-Assembly			11,400			8,000			10,000	29,400
B-Office	30,240	106,608	80,750	165,600		12,000		10,000		405,198
M-Mercantile		24,273	23,802				10,000			58,075
S-Storage	80,800	2,666,362	75,000	275,873		50,000		30,000		3,178,035
Subtotal	111,040	2,797,243	190,952	440,873		70,000	10,000	40,000	10,000	3,670,708
Demolitions										0
Total Square Feet	111,040	2,797,243	190,952	440,873		70,000	10,000	40,000	10,000	3,670,108

Natural Resource Protection Ordinance Provisions in Monroe

108-5.11 PRESERVATION OF NATURAL FEATURES

Wherever feasible, all of the following shall be preserved in their natural state:

- A. Floodway areas as defined by the United States Department of Housing and Urban Development, Federal Insurance Program Flood Insurance Rate Map; United States Army Corps of Engineers; the New Jersey Department of Environmental Protection or by the Monroe Environmental Commission.
- B. Areas containing a significant number of specimen trees determined by the Environmental Commission or the municipal agency.
- C. Existing watercourses, ponds, marshes, and swamps.
- D. Wetlands as defined by the New Jersey Wetlands Act of 1970 and delineated on wetlands maps prepared by the New Jersey Department of Environmental Protection.
- E. Wetlands as defined by the New Jersey Department of Environmental Protection Coastal Management Development Policies and contained in the New Jersey Administrative Code and wetlands and wetland (hydric) soils as regulated by the United States Army Corps of Engineers and/or N.J.D.E.P.
- F. Steep slopes in excess of ten percent (10%).
- G. Flora and fauna on the New Jersey and/or Federal Endangered Species List and trees included on the Unique Trees Map of the Monroe Township Environmental Commission Natural Resources Inventory.



108-5.20 FLOODPLAIN MANAGEMENT (SEE FLOOD ORDINANCE)

Within a flood hazard area designated, the following design standards shall apply to developments requiring a floodplain encroachment permit:

- A. Anchoring. All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.
- B. Construction materials and methods.
 - 1. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
 - 2. All new construction of substantial improvements shall be constructed by methods and practices that minimize flood damage.
- C. Utilities.
 - 1. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
 - 2. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood damage.
- 3. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
- D. Subdivision proposals.
 - 1. All subdivision proposals shall be consistent with the need to minimize flood damage.
 - 2. All subdivision proposals shall have public utilities and facilities, such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
 - 3. Base flood elevation data shall be provided for subdivision proposals and other proposed development which is greater than the lesser of fifty (50) lots or five (5) acres.
- E. Residential construction. New construction or substantial improvement of any residential structure shall have the lowest structural member, including the basement, elevated one (1) foot above the base flood elevation.
- F. Nonresidential construction. New construction or substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest structural member, including the basement, elevated one (1) foot above the base flood elevation

or, together with attendant utility and sanitary facilities, be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capacity of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied.

G. Additional conditions. In areas of special flood hazard, any or all of the following measures may also be required:

1. Flood-proofing to include any or all of the following:
 - a. Installation of watertight doors, bulkheads and shutters or similar devices.
 - b. Reinforced walls to resist water pressures.
 - c. Use of paints, membranes or mortars to reduce seepage of water through walls.
 - d. Addition of weight to structures to resist flotation.
 - e. Installation of pumps to lower water levels in structures.
 - f. Pumping facilities, or comparable measures, for the subsurface drainage system of buildings to relieve external foundation wall and basement flood pressures.
 - g. Construction that resists rupture or collapse caused by water pressure or floating debris.
 - h. Installation of valves or controls on sanitary and storm drains which will permit the drains to be closed to prevent backup of sewage or stormwaters into the structure. Gravity drainage of basements may be eliminated by mechanical devices.
 - i. Location of all electrical equipment, circuits and installed electrical appliances in a manner in which will assure that they are not subject to inundation and flooding.
 - j. Adequate emergency electrical power supplies.
2. Imposition of operational controls, sureties and deed restrictions.
3. Requirements for construction of dikes, levees and other protective measures.
4. Installation of an adequate flood warning system on the project site.

5. All fill and other earth work must be established according to the Freehold Soil Conservation District.

H. Floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:

1. Encroachments, including fill, new construction, substantial improvements and other development, are prohibited unless a technical evaluation demonstrates that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
2. If Subsection G (1) above is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions.
3. The placement of any structure in a floodway is prohibited.
4. In all areas of special flood hazard in which base elevation data has been provided and no floodway has been designated, the cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the water surface elevation of the base flood more than two-tenths (0.2) of a foot at any point.

I. Floodplains and resource protection areas. Site plan and subdivision layouts shall comply with the following:

1. No structure or parking area, including but not limited to commercial businesses and residential buildings, or fill, will be allowed within fifty (50) feet of the one-hundred-year floodplain of existing ponds, lakes, floodways, stream corridors, nor within wetlands, marshlands and riparian lands, unless a regulated use permit has been issued in accordance with the procedure and regulations of this chapter.
2. Impervious surfaces shall not exceed twenty percent (20%) of the area of the tract within eight (80) feet of a floodplain, without a regulated use permit.
3. Any other resource protection area, as herein defined, including but not limited to marshlands [areas wherein standing water is retained for twenty-four (24) or more consecutive hours and to which vegetation unique to marshes, swamps or wetlands has become adapted] and areas where conservation is required, shall not be encroached upon if, in the opinion of the Township Engineer, through consultation with the Environmental Commission, encroachment or construction upon such resource area will constitute a hazard to existing drainage patterns and to the balance of

the natural environmental systems within and adjacent to the area of the site.

J. Design waivers in flood hazard areas. The Planning Board may grant waivers from the design standards of this section. In reviewing requests for waivers, the Board shall consider the following:

1. Waivers may be issued for new construction and substantial improvements to be erected on a lot of one-half (1/2) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, provided that the standards of this section have been fully considered. As the lot size increases beyond the one-half (1/2) acre, the technical justification required for issuing the variance increases.
2. Waivers may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places without regard to the procedures set forth in the remainder of this section.
3. Waivers shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
4. Waivers shall only be issued upon a determination that the waiver is the

minimum necessary, considering the flood hazard, to afford relief.

5. Waivers shall only be issued upon:

- a. A showing of good and sufficient cause;
- b. A determination that failure to grant the waiver would result in exceptional hardship to the applicant; or
- c. A determination that the granting of a waiver will not result in increased flood heights, additional threats to public safety or extraordinary public expense; create nuisances; or conflict with existing local laws or ordinances.

6. Any applicant to whom a waiver is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

7. In reviewing a request for a waiver, the Planning Board may consider the following:

- a. The danger to life and property due to increased flood heights or velocities cause by encroachments.

- 
- b. The danger that materials may be swept onto other lands or downstream to the injury of others.
 - c. The proposed water supply and sanitation systems and the insulation of these systems from disease, contamination and unsanitary conditions resulting from flooding.
 - d. The susceptibility of the proposed use to flood damage and the effects of such damage.
 - e. The need for a waterfront location and the availability of alternate locations not subject to flooding within the applicant's property.
 - f. The duration, rate of rise, effects of wave action, velocity and sediment transport of floodwaters expected at the site.
 - g. The safety of access to the property in times of flood for ordinary and emergency vehicles.
 - h. The extent to which the water-carrying capacity of the floodway or channel would be disrupted.
 - i. The degree to which the proposed use would serve the general public health, safety and welfare.
 - j. The degree to which any aspect of the food chain or plant, animal, fish or human life processes would be affected adversely within or beyond the proposed use area.
 - k. Whether the proposed use provides adequate facilities for the proper handling of litter, trash, refuse and sanitary and industrial wastes.
 - l. The degree to which the proposed activity would alter natural water flow or water temperature.
 - m. The degree to which archaeological or historic sites and structures are endangered or rare species of animals or plants and irreplaceable land types would be degraded or destroyed.
 - n. The degree to which the natural, scenic and aesthetic values at the proposed activity site could be retained.
 - o. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities, such as sewer, gas, electrical and water systems, and streets and bridges.
 - p. The requirements listed herein are in addition to the provisions of Chapter 44, "Flood Damage Prevention" of the Monroe Code.



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
P.O. Box 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

JON S. CORZINE
Governor

LISA P. JACKSON
Acting Commissioner

February 9, 2006

Paul Gleitz
Heyer, Gruel & Associates
63 Church Street, 2nd Floor
New Brunswick, NJ 08901

Re: Monroe Township, Middlesex County, Environmental Resource Inventory

Dear Mr. Gleitz:

Thank you for your data request regarding rare species information for Monroe Township, Middlesex County.

Searches of the Natural Heritage Database and the Landscape Project (Version 2) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the topographic map(s) submitted with the Request for Data into our Geographic Information System. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Natural Heritage Database and the Landscape Project habitat mapping for occurrences of any rare wildlife species or wildlife habitat in Monroe Township. Please see Table 1 for species list and conservation status.

Table 1 (on referenced site).

Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
black-throated green warbler	<i>Dendroica virens</i>		Special Concern	G5	S3B
carpenter frog	<i>Rana virgatipes</i>		Special Concern	G5	S4
eastern box turtle	<i>Terrapene carolina</i>		Special Concern	G5	S5B
Fowler's toad	<i>Bufo woodhousii fowleri</i>		Special Concern	G5	S4
Kentucky warbler	<i>Oporornis formosus</i>		Special Concern	G5	S3B
northern parula	<i>Parula americana</i>		Special Concern	G5	S3B
spotted turtle	<i>Clemmys guttata</i>		Special Concern	G5	S4
veery	<i>Catharus fuscescens</i>		Special Concern	G5	S3B
wood turtle	<i>Clemmys insculpta</i>		T	G4	S3

We have also checked the Natural Heritage Database for occurrences of rare plant species or ecological communities. The Natural Heritage Database has records for occurrences of *Calamovilfa brevipilis*, *Carex barrattii*, *Liatris scariosa* var. *novae-angliae*, *Lygodium palmatum*, *Melanthium virginicum* and *Solidago elliottii* that may be in Monroe Township. The attached list provides more information about these occurrences.

Also attached is a list of rare species and ecological communities that have been documented from Middlesex County. If suitable habitat is present at the project site, these species have potential to be present.

Status and rank codes used in the tables and lists are defined in the attached EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS.

In order to red flag the general locations of occurrences of rare and endangered plant species and ecological communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Jamesburg, Freehold and New Brunswick USGS quadrangles. If individual projects are to be located in the areas of these maps that contain letter codes, the Natural Heritage Program can be contacted for additional information.

If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive I-Map-NJ website at the following URL, <http://www.state.nj.us/dep/gis/depsplash.htm> or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,



Herbert A. Lord
Data Request Specialist

cc: Robert J. Cartica
Lawrence Niles
NHP File No. 06-4007434

30 AUG 2004

MIDDLESEX COUNTY
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	CRANK	SRANK
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW		E		G4	S1B
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/S		G5	S2B
ASIO OTUS	LONG-EARED OWL		T/T		G5	S2B,S2N
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1B
CIRCUS CYANEUS	NORTHERN HARRIER		E/U		G5	S1B,S3N
CLEMMYS INSCULPTA	WOOD TURTLE		T		G4	S3
CLEMMYS MUHLENBERGII	BOG TURTLE	LT	E		G3	S2
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2B
FALCO PEREGRINUS	PEREGRINE FALCON		E		G4	S1B,S?N
HALLIAETUS LEUCOCEPHALUS	BALD EAGLE	LT	E		G4	S1B,S2N
HYLA ANDERSONII	PINE BARRENS TREEFROG		T		G4	S3
IXOBRYCHUS EXILLIS	LEAST BITTERN		D/S		G5	S3B
LANIUS LUDOVICIANUS MIGRANS	MIGRANT LOGGERHEAD SHRIKE		E		G4T3Q	S1B,S1N
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON		T/T		G5	S2B
PANDION HALIAETUS	OSPREY		T/T		G5	S2B
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2B,S4N
PODILYMBUS PODICEPS	PIED-BILLED GREBE		E/S		G5	S1B,S3N
LEERSIA ORYZOIDES - POLYGONUM (CAESPITOSUM, HYDROPIPER)	RICE CUTGRASS - (ORIENTAL LADYSTHUMB, MARSHPEPPER KNOTWEED) COASTAL PLAIN				G4	S2S3
HERBACEOUS VEGETATION	INTERMITTENT POND HERBACEOUS VEGETATION					
AESHNA CLEPSYDRA	MOTTLED DARNER				G4	S2S3
ALASMIDONTA UNDULATA	TRIANGLE FLOATER		T		G4	S3
ANAX LONGIPES	COMET DARNER				G5	S2S3

*** Vertebrates

*** Ecosystems

*** Invertebrates

30 AUG 2004

MIDDLESEX COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
BOLORIA SELENE MYRINA	A SILVER-BORDERED FRITILLARY		T		G5T5	S2
CALLOPHRYS IRUS	FROSTED ELFIN		T		G3	S2S3
CALLOPHRYS POLIOS	HOARY ELFIN				G5	S3
CELITHEMIS MARTHA	MARTHA'S PENNANT				G4	S3S4
ENALLAGWA BASIDENS	DOUBLE-STRIPED BLUET				G5	S3
ENALLAGWA PICTUM	SCARLET BLUET				G3	S3
ERYNNIS PERSIUS PERSIUS	A PERSIUS DUSKYWING				G5T2T3	SH
HESPERIA LEONARDUS	LEONARD'S SKIPPER				G4	S2
LASMIGONA SUBVIRIDIS	GREEN FLOATER	E			G3	S1
LESTES EURINUS	AMBER-WINGED SPREADWING				G4	S2
METARRANTHIS PILOSARIA	COASTAL BOG METARRANTHIS				G3G4	S3S4
PAPAIPEMA NECOPINA	SUNFLOWER BORER MOTH				G4?	SH
PONTIA PROTODICE	CHECKERED WHITE		T		G4	S1
SATYRODES EURYDICE	EYED BROWN				G4	S1
SPEYERIA APHRODITE	APHRODITE FRITILLARY				G5	S2S3
SPEYERIA IDALIA	REGAL FRITILLARY				G3	SH
SYMPETRUM AMBIGUUM	BLUE-FACED MEADOWHAWK				G5	S2
AGALINIS AURICULATA	EAR-LEAF FALSE FOXGLOVE				G3	SX
AGASTACHE NEPETOIDES	YELLOW GIANT-HYSSOP				G5	S2
ARTEMISIA CAMPESTRIS SSP CAUDATA	BEACH WORMWOOD				G5T5	S2
ASCLEPIAS RUBRA	RED MILKWEED			LP	G4G5	S2
ASCLEPIAS VERTICILLATA	WHORLED MILKWEED				G5	S2
ASTER RADULA	LOW ROUGH ASTER		E		G5	S1
BIDENS BIDENTOIDES	ESTUARY BURR-MARIGOLD				G3	S2
BIDENS EATONII	EATON'S BEGGAR-TICKS		E		G2	S1.1
CALAMOVILFA BREVIPILIS	PINE BARREN REEDGRASS			LP	G4	S4
CAREX BARRATTII	BARRATT'S SEDGE			LP	G4	S4

*** Vascular plants

30 AUG 2004

MIDDLESEX COUNTY
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
CAREX LOUISIANICA	LOUISIANA SEDGE		E		G5	S1
CAREX POLYMORPHA	VARIABLE SEDGE		E		G3	S1
CAREX UTRICULATA	BOTTLE-SHAPED SEDGE				G5	S2
CAREX WILDENOWII VAR WILDENOWII	WILDENOW'S SEDGE				G5T5	S2
CRATAGUS CALPODENDRON	PEAR HAWTHORN		E		G5	S1
CYPERUS LANCASTRIENSIS	LANCASTER FLAT SEDGE		E		G5	S1
DRABA REPTANS	CAROLINA WHITLOW-GRASS		E		G5	SH
ELATINE AMERICANA	AMERICAN WATERWORT				G4	S2
EUPATORIUM ALTISSIMUM	TALL BONESET				G5	S2
GENTIANA SAPONARIA VAR SAPONARIA	SOAPWORT GENTIAN				G5T?	S3
HELONIAS BULLATA	SWAMP-PINK	LT	E	LP	G3	S3
HOTTONIA INFLATA	FEATHERFOIL		E		G4	S1
HYDROCOTYLE RANUNCULOIDES	FLOATING MARSH-PENNYWORT		E		G5	S1
ISOETES RIPARIA VAR RIPARIA	SHORE QUILLWORT				G5?T5?Q	S3
LATHYRUS OCHROLEUCUS	CREAM VETCHLING		E		G4G5	SH
LIATRIS SCARIOSA VAR NOVAE-ANGLIAE	NORTHERN BLAZING-STAR		E		G5?T3	SH
LISTERA AUSTRALIS	SOUTHERN TWAYBLADE			LP	G4	S2
LYGODIUM PALMATUM	CLIMBING FERN			LP	G4	S2
LYSIMACHIA HYBRIDA	LOWLAND LOOSESTRIFE				G5	S3
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E		G5	S1
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MUDWORT		E		GH	SH
MIMULUS ALATUS	WINGED MONKEY-FLOWER				G5	S3
MYRIOPHYLLUM TENELLUM	SLENDER WATER-MILFOIL		E		G5	S1
MYRIOPHYLLUM VERTICILLATUM	WHORLED WATER-MILFOIL		E		G5	SH
PHORADENDRON LEUCARPUM	AMERICAN MISTLETOE			LP	G5	S2
PLANTAGO MARITIMA VAR JUNCOIDES	SEASIDE PLANTAIN				G5T5	S2

MIDDLESEX COUNTY
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
PLATANHERA FLAVA VAR FLAVA	SOUTHERN REIN ORCHID		E		G4T4?Q	S1
PLATANHERA PERMOENA	PURPLE FRINGELESS ORCHID		E		G5	S1
POLYGALA POLYGAMA	RACEMED MILKWORT				G5	S2
POLYGONUM GLAUCUM	SEA-BEACH KNOTWEED		E		G3	S1
PUCCINELLIA FASCICULATA	SALTWASH ALKALI GRASS				G3G5	S2
PYCNANTHEMUM TORREI	TORREY'S MOUNTAIN-MINT		E		G2	S1
RANUNCULUS FUSILLUS VAR PUSILLUS	LOW SPEARWORT				G5T4?	S2
RHODODENDRON CANADENSE	RHODORA		E		G5	S1
RIBES CYNOSBATI	PRICKLY GOOSEBERRY				G5	SH
SAGITTARIA AUSTRALIS	SOUTHERN ARROWHEAD		E		G5	S1
SAGITTARIA CALYCINA VAR SPONGIOSA	TIDAL ARROWHEAD				G5T4	S3
SCIRPUS MARITIMUS	SALTWASH BULKUSH		E		G5	SH
SCUTELLARIA LEONARDII	SMALL SKULLCAP		E		G4T4	S1
SOLIDAGO ELLIOTTII	ELLIOTT'S GOLDENROD				G5	S3
SOLIDAGO RIGIDA	PRAIRIE GOLDENROD		E		G5T5	S1
STACHYS HYSSOPIFOLIA	HYSSOP HEDGE-NETTLE				G5	S2
TRIGLOCHIN MARITIMA	SEASIDE ARROW-GRASS		E		G5	S1
UTRICULARIA GIBBA	HUMPED BLADDERWORT			LP	G5	S3
UTRICULARIA PURPUREA	PURPLE BLADDERWORT			LP	G5	S3
VERBENA SIMPLEX	NARROW-LEAF VERVAIN		E		G5	S1
VICIA AMERICANA VAR AMERICANA	AMERICAN PURPLE VETCH				G5T5	S2
VIOLA BRITTONIANA VAR BRITTONIANA	BRITTON'S COAST VIOLET				G4G5T4T5	S3
ZIGADENUS LEIMANTHOIDES	DEATH-CAMUS		E		G4Q	S1

Possibly On Project Site
Based On Search Of Natural Heritage Database
Rare Plant Species And Ecological Communities Presently Recorded In
The New Jersey Natural Heritage Database

Scientific Name	Common Name	Federal Status	State Status	Regional Status	G Rank	S Rank	Date Observed	Ident
Vascular Plant								
<i>Calamovilfa brevipilis</i>	Pine Barren Reedgrass			LP	G4	S4	1940-09-29	Y
<i>Carex barratii</i>	Barratt's Sedge			LP	G4	S4	1941-11-27	Y
<i>Liatris scariosa</i> var. <i>novae-angliae</i>	Northern Blazing-star	E	E	LP, HL	G5/T3	SH	1940-09-29	Y
<i>Lygodium palmatum</i>	Climbing Fern			LP, HL	G4	S2	1996-10-31	Y
<i>Melanthium virginicum</i>	Virginia Bunchflower	E	E	LP, HL	G5	S1	????-??-??	Y
<i>Solidago elliotii</i>	Elliott's Goldenrod			HL	G5	S3	1994-09-21	Y

6 Records Selected